SIX DAYS THREE CONFERENCES THREE FORUMS ONE EXHIBITION

EUROPEAN MICROWAVE WEEK 2020
JAARBEURS CONVENTION CENTRE
UTRECHT - THE NETHERLANDS
10 - 15 JANUARY 2021

EUROPEAN MICROWAVE WEEK
JAARBEURS UTRECHT
THE NETHERLANDS
10-15 JANUARY 2021
www.eumweek.com

EUROPEAN MICROWAVE WEEK 2020

CONFERENCE PROGRAMME

EUROPE'S PREMIER MICROWAVE, RF, WIRELESS AND RADAR EVENT

THE ART OF MICROWAVES

50TH EUROPEAN MICROWAVE CONFERENCE 2020
1969 - 2020
The 50th European Microwave Conference

EuMIC 2020
The 15th European Microwave Integrated Circuits Conference

EuRAD 2020
The 17th European Radar Conference

EuMA
European Microwave Association

horizon house

Register online at: www.**eumweek**.com

ANDROID APP ON Google play

Download on the App Store

Table of Contents

The European Microwave Week 2020 organisers would like to thank the following companies for their help and valued support throughout this year's event.

PLATINUM SPONSOR

KEYSIGHT TECHNOLOGIES

COPPER MOUNTAIN TECHNOLOGIES

MiCIAN

NXP

ROHDE&SCHWARZ
Make ideas real

Welcome to the 23rd European Microwave Week

The Corona virus has swept across the globe. We have managed to move the European Microwave Week from September 2020 to January 2021, because we so much value that real-life, person-to-person interaction. Register and visit!

"Be part of the European Microwave Week, that will be remembered as the first big Microwave Conference after Corona."

Welcome! We are excited to host the European Microwave Week in The Netherlands, the country where it all started in 1998, when three conferences merged into the 'Microwave Week'. This turned out to be a strategic and very successful move: 22 years later this week has grown into the biggest event of its kind in Europe. To me, the week can be summarised in four words: Learn, meet, enjoy and explore!

Learn. This week represents the state-of-the-art in RF, microwaves and radar. Academia and industry present well over 400 scientific talks. Although this is more than any individual can absorb, it guarantees that – if you work in this field – you can pack your week with relevant insights and new developments. Short courses will get you up to speed for new topics, workshops will bring you all the new developments for those already working in the field. Exchange ideas with colleagues from academia and industry. Stay skilled in a world that is changing at an unprecedented rate.

"If you work in this field – you can pack your week with relevant insights and new developments."

Meet. This week is where the entire community meets. Meet, to interface with all the relevant industries at the largest microwave and radar tradeshow - this tradeshow alone is more than worth a visit! Stop by the EuMA booth and become a member. That is the first step to get involved in volunteering: Do so for a few years and suddenly realise that you actually know all the famous names in microwaves and radar. Meet, to learn before things even get published. Meet old friends to catch up, meet to make new friends that last a lifetime.

Enjoy. This week's venue maximally facilitates learning and meeting. Utrecht is a historic place that welcomes visitors warmly. Enjoy its canals, churches, modern and ancient art, and over 3000 years of history. Enjoy its famous music scene, century-old restaurants, bars and nightlife. Enjoy the Railway museum where we will host a splendid dinner amidst historic trains. Enjoy the pub crawl and dancing festivities organised by us for you in the heart of the city. Both the conference venue and city centre are within five minutes walking from the railway station, so be prepared to combine work and fun!

"With over 400 scientific papers, around 30 workshops and short courses this will more than satisfy your scientific thirst."

EuMIC, EuMC, EuRAD. The European Microwave Integrated Circuits Conference, the European Microwave Conference and the European Radar Conference together form the scientific heart of the Microwave Week. Keynote speakers from around the globe to inspire our audience, semiconductors that literally work up to a THz, dedicated sessions on Teaching Microwave Engineering, a Focus Day on (Active) Array Antennas, there is just too much to name it all here. Female talent can meet their peers and get together during the Women-in-Microwaves event. EuMC, the oldest of the conferences involved, will be celebrating its 50th anniversary, which is the reason for the golden crown over this year's logo.

"We invite you to immerse yourself in the culture, art and history of Utrecht."

Explore! Browse through this mini-programme to learn about the student activities (including a drone-detecting challenge: build a team, receive hardware and demonstrate your performance on-site), the different fora (the Defence, Security and Space Forum on Space Situational Awareness, the Automotive Forum, this year particularly on waveforms and AI in automotive radar, and the new 5G Forum that bridges the gap between business and technology), a workshop on Quantum Computing for Electronic Engineers, and there is something on 5G at virtually every time-slot. This week is so packed with science and fun, that you'll regret going home when the week is over!

FRANK VAN VLIET
General Chair
TNO, The Netherlands & University of Twente, The Netherlands

BART NAUWELAERS
General Co-Chair
KU Leuven, Belgium

Welcome from the President of the European Microwave Association

On behalf of the European Microwave Association (EuMA), I warmly welcome you to the 23rd edition of the European Microwave Week in Utrecht! EuMA stands up for our microwave and RF community. We promote our microwave discipline wherever we can. We foster networking between scientists, engineers, decision makers and end-users. We pursue this in various ways. The European Microwave Week (EuMW) is our main asset and key event to do so.

EuMA is continuously improving itself to support our microwave community as good as possible. We recently released a 22 pages White Paper "For a Strong & Competitive European Wireless Technologies Ecosystem". This paper substantiates the strategic importance of wireless technologies for the 4th European Industrial Revolution and the digital European society. A free download is available at our website: www.eumwa.org.

EuMA actively supports education and offers to young researchers each year a number of scholarships at selected European industries and research institutes. We expect the next call to be published in the last quarter of 2020.

Most of you are familiar with EuMA, but for those who aren't yet: We offer a membership to all working in the field of microwaves. If you are not a EuMA member yet, I encourage you to join. As member, you will enjoy reduced fees for attending the Week and other EuMA-sponsored conferences and workshops as well as the IEEE IMS and the APMC. You'll also have access to an archive of publications and the online version of the International Journal on Microwave and Wireless Technologies.

The European Microwave Week (EuMW) is the premier microwave conference and exhibition event in Europe. The success of the EuMW is also a result of the collaboration with the IEEE MTT Society (technical co-sponsor of the Week) and the GAAS Association (co-sponsor of EuMIC). But the Week is not only conferences, the Exhibition organised by our long-standing partner Horizon House / Microwave Journal forms an integral part of it.

As everybody knows, preparing and hosting the EuMW is a major effort, from paper submission and review to on-site organisation at the venue, and this is accomplished by a team of volunteers year by year. Therefore, my special and sincere thanks go to Frank VAN VLIET and Bart NAUWELAERS, 2020 General Chair and Vice-chair; to Alex YAROVOY, General TPC Chair; to Marcel VAN DER GRAAF, Operational Officer; to Laura ANITORI Workshops and Short Courses Chair; to Ioan LAGER, Treasurer; as well as to Wim VAN CAPPELLEN and Dominique SCHREURS, EuMC Chair and TPC Chair; to François DEBORGIES and Domine LEENAERTS, EuMIC Chair and TPC Chair; and to Mayazzurra RUGGIANO and Jacco DE WIT, EuRAD Chair and TPC Chair - just to name a few on behalf of the entire team. Thank you!

The European Microwave Week is back again in The Netherlands after the successful events in 1998, 2004, 2008 and in 2012. All members of the team have been working hard to set up an outstanding technical and scientific programme for you and I am sure they will make your stay in Utrecht exciting, enjoyable, and a rewarding experience of Dutch hospitality. I congratulate the team with a lot of very nice innovations like the Chinese Call for Papers.

I would like to cordially invite you to the EuMW 2020. Come to the wonderful city of Utrecht. Join us at EuMW 2020 and discover information you won't get anywhere else. Take the opportunity to meet and talk to colleagues and friends from all over the world you don't see every day. I hope to see you in Utrecht! And most of all: Get involved in our community!

FRANK VAN DEN BOGAART
President
European Microwave Association

EuMA is now also very active on various social media. Follow us @eumassociation on Facebook, LinkedIn, Twitter and Instagram.

Welcome to the 15th European Microwave Integrated Circuits Conference

It is with immense pride that we would like to welcome you all to Utrecht, The Netherlands, for the 15th European Microwave Integrated Circuits (EuMIC 2020) Conference. For once, the Conference will not happen in autumn but will be held on Monday the 11th and Tuesday the 12th of January 2021. Since we do not change a winning team, the EuMIC conference has been jointly organised by the GAAS® Association and EuMA, as ever since 2006. The city of Utrecht is very pleased to host the gathering of microwave experts and IC designers from all over the world.

This conference would not be without the efforts of the numerous authors trying to disseminate their work, and the dedication of the panel of reviewers and TPC members to spend their free time making the best selection in order to provide the most attractive programme. No one would imagine a major Conference without Workshops and Short Courses for which the organisers strive to gather key experts to cover the latest developments. We also have to acknowledge the previous EuMIC teams who did not spare their time to provide precious support. Finally, we would also like to thank all the people who never come under the spotlight though helping tremendously to make this Conference possible.

The EuMIC "raison d'être" is to provide a unique forum where both seasoned experts and new comers can exchange, learn, disseminate on any topic which relates to high frequency integrated circuits. Indeed, there is no proper design of an MMIC or RFIC without state of the art models, no good device without clever semiconductor engineering, no way to meet stringent requirements without bright and fresh ideas and no chance to convince a customer without sound measurements!

If you intend to be there already on Sunday and can refrain from enjoying Utrecht during the day, do register for one or more of the very good Workshops and Short Course. Monday is a busy day with a large offering: beyond the Opening Session, there will be nine regular sessions and the traditional EuMIC Get-together to conclude the day. On Tuesday, which hosts the Opening of the EuMW 2020, EuMIC offers two regular sessions, one joint session with EuMC, the Foundry Panel Session, the interactive Poster Session that will be preceded by a one-minute pitch for all presenters, and the Closing Session.

The EuMIC Opening Session will feature two distinguished invited speakers. Prof. John D. Cressler of Georgia Tech will look at the Challenges of Integrated Circuits for Microwave Applications while Prof. Alwyn Seeds of University College London will present the recent developments in Photonic Integrated Circuits for Microwave Applications.

This year, the EuMIC Closing Session will start with the celebration of our best contributors. Indeed the EuMIC Prize for the best-contributed paper and the EuMIC Young Engineer Prize will be awarded by the EuMIC Prize Committee. Three GAAS® Association PhD student fellowships will also be awarded. This session will be concluded by two application-oriented presentations. Igor Tasevski, Vice President & Head of Product Development Unit Radio at Ericsson will explore Radio ICs for future wireless networks while Ville Kangas, Arctic Weather Satellite Project Manager at the European Space Agency will look at MetOp Second Generation mm-Wave Instruments and Technologies.

We have done all we could do to make this Conference a reality but only you, the attendees, can turn EuMIC 2020 into a success. The EuMIC team is looking forward to meet you: Hartelijk Welkom in Utrecht!

FRANÇOIS DEBORGIES
EuMIC 2020 Chair
ESA, The Netherlands

STEFAN HEINEN
EuMIC 2020 Co-Chair
RWTH Aachen University, Germany

DOMINE LEENAERTS
EuMIC 2020 TPC Chair
NXP, The Netherlands

CHRISTIAN FAGER
EuMIC 2020 TPC Co-Chair
Chalmers University of Technology, Sweden

Welcome to the 50th European Microwave Conference

With great pleasure and honour, the EuMC 2020 team warmly welcomes you to the 50th Microwave Conference, celebrating its golden edition! The history of the EuMC dates back to 1969, when the conference first took place in London. Since then, the conference has evolved into the largest event in Europe dedicated to a broad range of high-frequency topics, ranging from novel semiconductor and packaging technologies, photonics, passive and active microwave/millimeterwave circuits and antenna (arrays), up to system level, with innovative solutions for e.g., biomedical, mobile, and IoT applications.

We have done our very best to offer you an attractive conference where you can present your research and meet colleagues, learn about the latest trends and broaden your horizons, be inspired by world-leading keynote speakers from academia and industry, be exposed to the latest products in the exhibition, and make new friends. Our efforts have led to a rich program throughout the entire week. On Sunday and Monday there are 12 EuMC workshops and short courses on hot-topics, such as RF Technologies for 5G, and Advanced Measurement Techniques for Next Generation Communication Systems. Tuesday morning features the EuMW/EuMC Plenary Opening Session where Lars Reger, Executive Vice President & CTO at NXP Semiconductors, will present the keynote speech "How Connectivity Technologies are Changing Vehicles". Tuesday afternoon, we will host again the Women in Microwaves (WiM) event. This year's WiM event comprises presentations and a panel discussion of leading female scientists from academia and industry. The conference sessions on Tuesday have tracks on power amplifiers, (integrated) antennas, packaging, THz electronics and photonics, and EM field theory and numerical techniques. On Wednesday, the program continues with more sessions on power amplifiers, passive components and filters, metamaterials, IoT, and Energy Harvesting Technologies. In addition, there is the highly recommended short course "Quantum Computing for Electrical Engineers" with 7 talks from experts in the field, organized in three main themes: quantum-computing fundamentals, physical platforms for quantum processors, and electronic interfaces for quantum computers. Plus a focused session on Innovative Antennas for Cubesats and Small-Space platforms. On Thursday, there are sessions on front ends, planar filters, biomedical applications, and characterisation techniques. The Netherlands is hosting an enormous amount of phased array research and development at universities, research institutes, and industry. Thursday is therefore designated as our special day on array technologies. An overview on the latest phased array developments in Radio Astronomy, Space, and Defence are presented in three special sessions. In the EuMC Closing Session, also on Thursday, the EuMC Microwave Prize and two Young Engineer Prizes will be awarded. The Closing Session features a keynote by Hughes Boulnois (Airbus DS) "The Future of High-Throughput Satellites is Laser SatCom" and a keynote on New Frontiers for Wave Engineering Using Metamaterials by Andrea Alù, Founding Director and Einstein Professor at the Photonics Initiative, CUNY Advanced Science Research Center, USA. Last but not least, there are four more short courses and workshops on Friday.

A new element of the 2020 conference are 1-minute poster pitches: In the slot before the morning coffee, the poster presenters of the poster sessions will be pitching their work in the Media Arena for exactly one minute. Action and fun are guaranteed with big traffic lights for the timing, a timer counting down and a big red emergency button.

We hope that you will have a great time at the EuMC. Enjoy the conference!

WIM VAN CAPPELLEN
EuMC 2020 Chair
ASTRON, The Netherlands

DOMINIQUE SCHREURS
EuMC 2020 TPC Chair
KU Leuven, Belgium

Welcome to the 17th European Radar Conference

It is with great pleasure that the EuRAD 2020 organization team welcomes you to the 17th European Radar Conference, the key European event for the present status and future trends in the field of radar research, technology, system design and applications. It covers a wide variety of topics, ranging from radar components and systems, radar propagation and target modelling, advanced signal processing techniques, up to the most innovative radar architectures and concepts and the latest applications. We are proud to host EuRAD 2020 from 13th to 15th January 2021 in Utrecht at the Jaarbeurs, providing an ideal setting from plenary sessions to regular sessions, and individual discussions to workshops. Joining this conference is the ideal opportunity to keep up-to-date with the latest achievements in radar and to interact with international experts from industry and academia. The conference brings together radar experts, researchers, designers and developers from all over the world to continuously stimulate innovation and benefit from cross-fertilization between applications. This year, the conference embraces the theme of "Awareness through Radar", this thread links the plenary talks with the entire conference program, including the Space Situational Awareness Forum and the Automotive Forum.

In the opening session on Wednesday, two excellent keynote speakers will address important aspects of radar for space observations and naval ballistic missile defense. Goutam Chattopadhyay, senior research scientist at NASA Jet Propulsion Laboratory, will present 'Millimeter-Wave and Terahertz Radar Instruments for Planetary, Cometary, Earth Observations, and Security Applications'. The second invited speaker is Captain Jorn Bleijs, Director of Weapon and Sensor Technology for the Netherlands Defence Materiel Organisation in Maritime Systems Department, who will give a talk on 'One step ahead of the enemy: innovative radar solutions are decisive for military use'. The EuRAD Opening is held in conjunction with the Defence, Security and Space Forum (DSS), which focuses further on Space Situational Awareness. For the closing session on Friday, an excellent speaker will address the evolution of radar suites in the context of the Dutch frigate replacement program. The invited speaker is Winston van Oosterhout, Technical Director at Thales Nederland B.V., who will give a talk on "Multi-Band functionally integrated Multi-Function Radar sensor suites". The opening and closing sessions thus complement each other providing contributions from research institution, government, and industry.

This year 175 papers were submitted to the conference and, after a rigorous selection process, 126 papers have been accepted and were organised into 110 oral sessions and 16 interactive poster sessions, some of them shared with EuMC. Six industrial keynotes will open oral sessions addressing recent innovation highlights. Nine attractive workshops/short courses will complete and enhance the EURAD programme, some of them shared with EuMC, on key topics like automotive in-cabin radar and networks with sensor fusion, micro-Doppler radar, advances in sparse array design, multi-beam antennas and beamforming networks, radar system solutions for industrial and consumer sensing, MIMO radar, and cognitive radar signal processing.

We would like to express our deepest gratitude to all the reviewers, the TPC members and the TPC sub-committee chairs for undertaking their task in a professional and timely manner, for their invaluable contribution to the success of EuRAD 2020.

We look forward to meeting you at the EuRAD 2020 conference, and wish you an excellent stay in Utrecht!

MAYAZZURRA RUGGIANO
EuRAD Chair
Thales Nederland B.V.,
The Netherlands

JACCO DE WIT
EuRAD TPC Chair
TNO, The Netherlands

Welcome from the General TPC Chair

It is my sincere pleasure to welcome the European Microwave Week in the Netherlands in historical and at the same time very young city of Utrecht. For almost two years the Technical Program Committee worked hard to make this Dutch-Belgium Edition of the Week a great success.

A good program starts from good papers. Responding to our call for papers the authors from 61 country throughout the globe submitted 838 papers, with the majority of papers outside of the European Union. The first three largest national paper contributors to the week are Germany, China and the Netherlands. As General Technical Programme Committee Chair, I am very grateful to all reviewers and TPC members who are volunteering in the challenging time of corona crisis to make great technical program for EUMW 2020. More than 500 reviewers have laid down a solid basis for the paper selection by providing from 5 to 7 professional reviews per each submitted paper. For the first time in the history of the European Microwave Week all submitted papers were checked for (self) plagiarism using the standard IEEE tool. The Technical Program Committee with 104 members in virtual TPC meeting on March 28 have decided on paper selection having an acceptance rate of around 62 % (including focused sessions). These contributed papers have been complimented with carefully selected industrial keynote presentations and special sessions resulting in total 91 oral sessions and 4 poster sessions. The sessions are placed in the conference matrix as much as possible along topical lines. From submitted papers we could clearly see the major trends in development in a broad field of microwaves: from circuitry to systems. To emphasize these trends, we enriched the program with three dedicated forums: DSS Forum on Space Situational Awareness, Automotive Forum and 5G Forum. The program is completed with carefully tuned workshops and special courses on topics of high interest to the microwave community.

The technical program has been managed through a new version of software system and I would like to thank Marc van Heijningen, Cristina Andrej and the staff from CONVERIA, who have efficiently contributed to the final programme preparation via setting up and managing the CONVERIA system. Special thanks to Marcel van der Graaf for his excellent support of TPC work at all stages. I also would like to express my gratitude to the TPC chairs of the individual conferences Dominique Schreurs, Domine Leenaerts and Jacco de Wit, general TPC co-chair Ronny Harmonnij, WS coordinator Laura Anitori and Focussed/Special Session coordinator Stefania Monni for very efficient team work.

I wish you to enjoy the conference program, meet microwave community at the conference and at the exhibition, visit beautiful down town of Utrecht, recharge your batteries and be inspired by new ideas. Looking forward to meeting you in January in Utrecht.

ALEXANDER YAROVOY
General TPC Chair
Delft University of Technology, The Netherlands

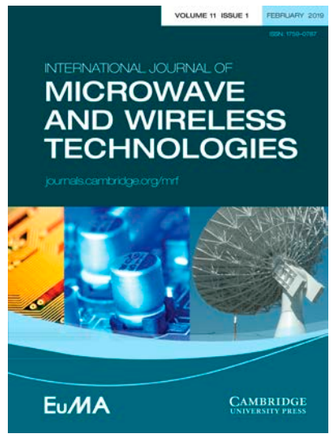
International Journal of Microwave and Wireless Technologies: EuMW 2020 Special Issue

The International Journal of Microwave and Wireless Technologies was created in 2009 by the European Microwave Association (EuMA) and Cambridge University Press for the benefit of the microwave research community in Europe and overseas.

The journal is published ten times a year. It allows academic and industrial researchers to promote their work and stay connected with the most recent developments in microwave and RF technology. The journal is referenced in databases such as Scopus and Google Scholar and is indexed in the Thomson Reuters Web of Science. Following the success of previous microwave weeks, the journal will again publish a special issue dedicated to European Microwave Week 2020.

The authors of several highly ranked papers presented at the conferences will be invited to submit an extended version for publication in the journal. The special issue will be guest edited by Dominique Schreurs, TPC chair of EuMC 2020, Domine Leenaerts, TPC chair of EuMIC 2020, and Jacco de Wit, TPC chair of EuRAD 2020.

Accepted papers will be published online at http://journals.cambridge.org/MRF and can be referenced using their DOI (Digital Object Identifier). Once all submissions are received, the articles will be collated into the Special Issue and published in print, which is expected to appear in June 2021.



DOMINIQUE SCHREURS
EuMC 2020 TPC Chair

DOMINE LEENAERTS
EuMIC 2020 TPC Chair

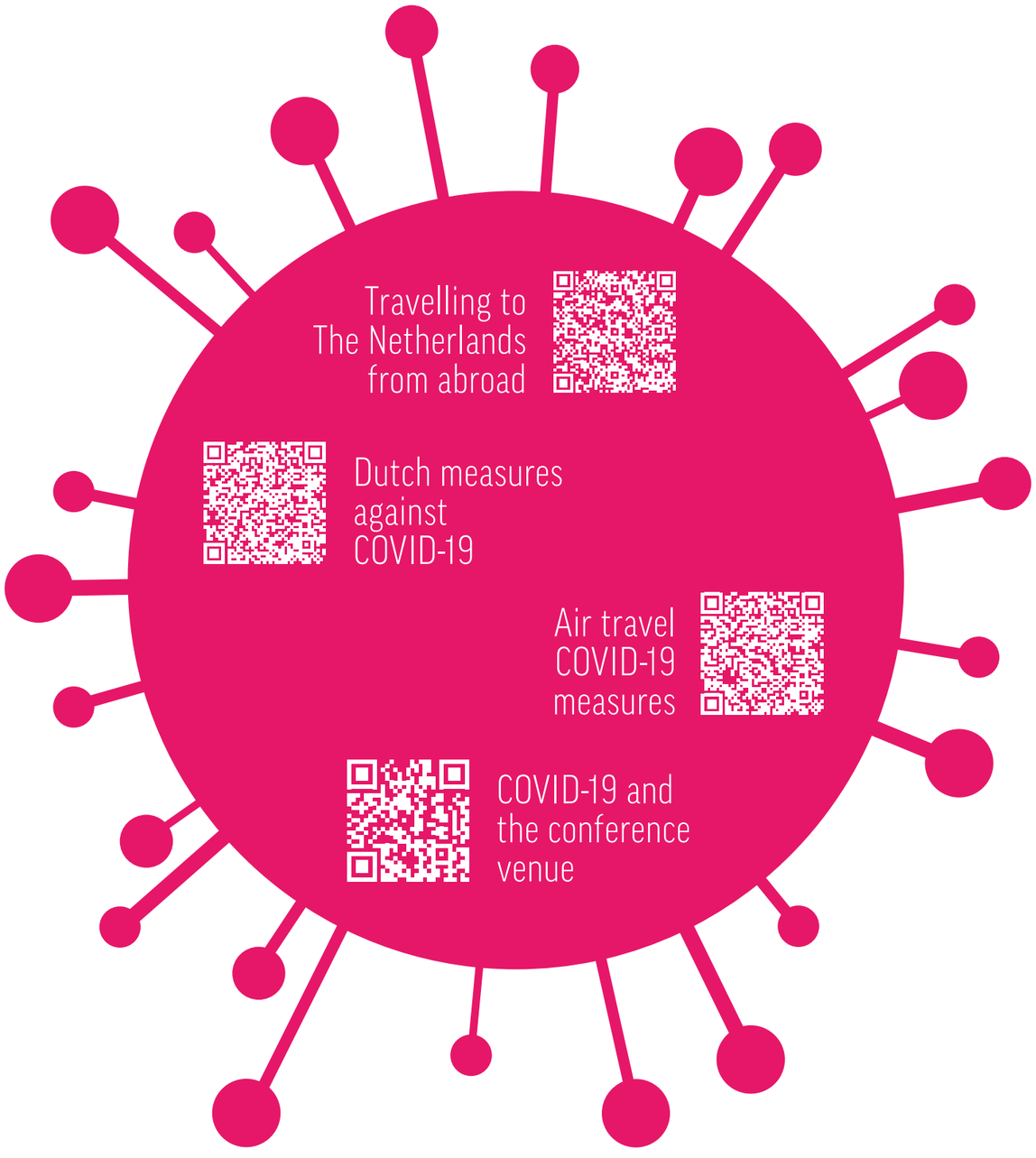
JACCO DE WIT
EuRAD 2020 TPC Chair

Follow us on Social Media

DARYNA PESINA
EuMA Social Media Officer

SOFIA KOTTI
EuMW 2020 Social Media Officer

COVID-19



COVID-19 EXTENDED REFUND POLICY

We understand that uncertainty about the development of the COVID-19 virus is a big concern to many of us. In addition to the regular refund policy, we have therefore implemented an EuMW 2020 extended refund policy where you can cancel your participation to the EuMW 2020 conferences due to COVID-19 related circumstances (including company travelling policies) up to 31 December 2020, and get a full refund of your conference registration fees. No questions asked, no further conditions. It's just another measure that we take to make your life as safe as possible, taking care of at least one uncertainty for you

8 May 2020

Government of the Netherlands

Hygiene rules for everyone

We can only take the next step forward if everyone follows these rules.

Wash your hands frequently.

- *Wash your hands before going out, when you return home, after blowing your nose, before eating and after going to the toilet.*
- *Wash your hands for 20 seconds with soap and water. Dry them thoroughly.*

Cough and sneeze into your elbow.

Use paper tissues to blow your nose.

- *Discard tissues immediately after use.*
- *Always wash your hands after blowing your nose.*

Don't shake hands.

Keep a distance of 1.5 metres from others.

- *This does not apply to people living in one household.*
- *Keeping two arms lengths away reduces the risk of people spreading the infection.*

alleen samen krijgen we corona onder controle

More information:
rijksoverheid.nl/coronavirus
0800 1351

The EuMW 2020 Organising Committee

Frank van Vliet
General Chair
TNO - The Netherlands &
University of Twente - The Netherlands

Bart Nauwelaers
General Co-Chair
KU Leuven - Belgium

Marcel van der Graaf
Operational Officer
TNO - The Netherlands

Ioan Lager
Treasurer
Delft University of Technology - The Netherlands

Marc van Heijningen
Local Arrangments Chair & EuMA Conference Software Officer
TNO - The Netherlands

Alexander Yarovoy
General TPC Chair
Delft University of Technology - The Netherlands

David Prinsloo
Publication Chair
ASTRON - The Netherlands

Ulf Johannsen
Student Activities Chair & Career Platform Chair
Eindhoven University of Technology - The Netherlands

Stefania Monni
Focussed and Special Sessions Chair
TNO - The Netherlands

Laura Anitori
Workshop and Short Courses Chair & Attendee Survey Officer
TNO - The Nethelrands

Marion Matters-Kammerer
Awards and Prizes Chair & WiM Chair
Eindhoven University of Technology - The Netherlands

Annemie van Nieuw-erburgh
EuMA Headquarters Assistant
Belgium

François Deborgies
EuMIC Chair
ESA - The Netherlands

Domine Leenaerts
EuMIC TPC Chair
NXP - The Netherlands

Stefan Heinen
EuMIC Co-Chair
RWTH Aachen University - Germany

Christian Fager
EuMIC TPC Co-Chair
Chalmers University of Technology - Sweden

Wim van Cappellen
EuMC Chair
ASTRON - The Netherlands

Dominique Schreurs
EuMC TPC Chair
KU Leuven - Belgium

Mayazzurra Ruggiano
EuRAD Chair
Thales Nederland B.V. - The Netherlands

Jacco de Wit
EuRAD TPC Chair
TND - The Netherlands

Cristina Andrei
EuMA Conference Software Officer
Brandenburg University of Technology - Germany

Matthias Rudolph
Electronic Submission Advisor
Brandenburg University of Technology - Germany

Daryna Pesina
EuMA Social Media Officer
O. Ya. Usikov Institute for Radiophys-ics and Electronics NAS - Ukraine

Sofia Kotti
Workshop and Short Courses Co-Chair & Social Media Officer
TND - The Netherlands

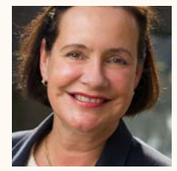
Willem Hol
EuMA Liason

Michel Zoghob
Event Director
Horizon House - United Kingdom

Julie Mills
Event Manager
Horizon House - United Kingdom

Tamara Boogaard
Key Account Manager Jaarbeurs
Jaarbeurs - The Netherlands

Corry Neggers
Conferences Manager Jaarbeurs
Jaarbeurs - The Netherlands



Monique André de la Porte
Utrecht Convention Bureau
The Netherlands

Marco Martorella
DSS Forum Chair
University of Pisa - Italy

Mark Bentum
DSS Forum Co-Chair
Eindhoven University of Technology & ASTRON - The Netherlands

Patrice Gamand
DSS Forum Advisor
RF Consulting PG - France

Patrick Hindle
DSS Forum, Microwave Journal
United Kingdom

Sally Garland
Hotels and Partner Programme
Connex Hotels and Events - United Kingdom

Thomas Zwick
Automotive Forum Chair
Karlsruhe Institute of Technology
Germany

Frank Gruson
Automotive Forum Co-Chair
Continental AG - Germany

Martin Kunert
Automotive Forum Co-Chair
Robert Bosch GmbH - Germany

Cicero Vaucher
Automotive Forum Local Arrangements Chair
NXP - The Netherlands

Bart Smolders
5G Forum Chair
Eindhoven University of Technology
The Netherlands

Ulf Gustavsson
5G Forum Co-Chair
Ericsson - Sweden

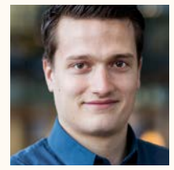
Toon Norp
5G Forum Co-Chair
TNO - The Netherlands

Henri Werij
Sponsoring Advisor
Delft University of Technology - The Netherlands

Mark Oude Alink
Interactive Sessions Chair
University of Twente - The Netherlands

Hao Gao
VISA Chair
Eindhoven University of Technology
The Netherlands

Harijot Bindra
VISA Co-Chair
University of Twente - The Netherlands



Niels Vertegaal
Party Chair
Eindhoven University of Technology
The Netherlands

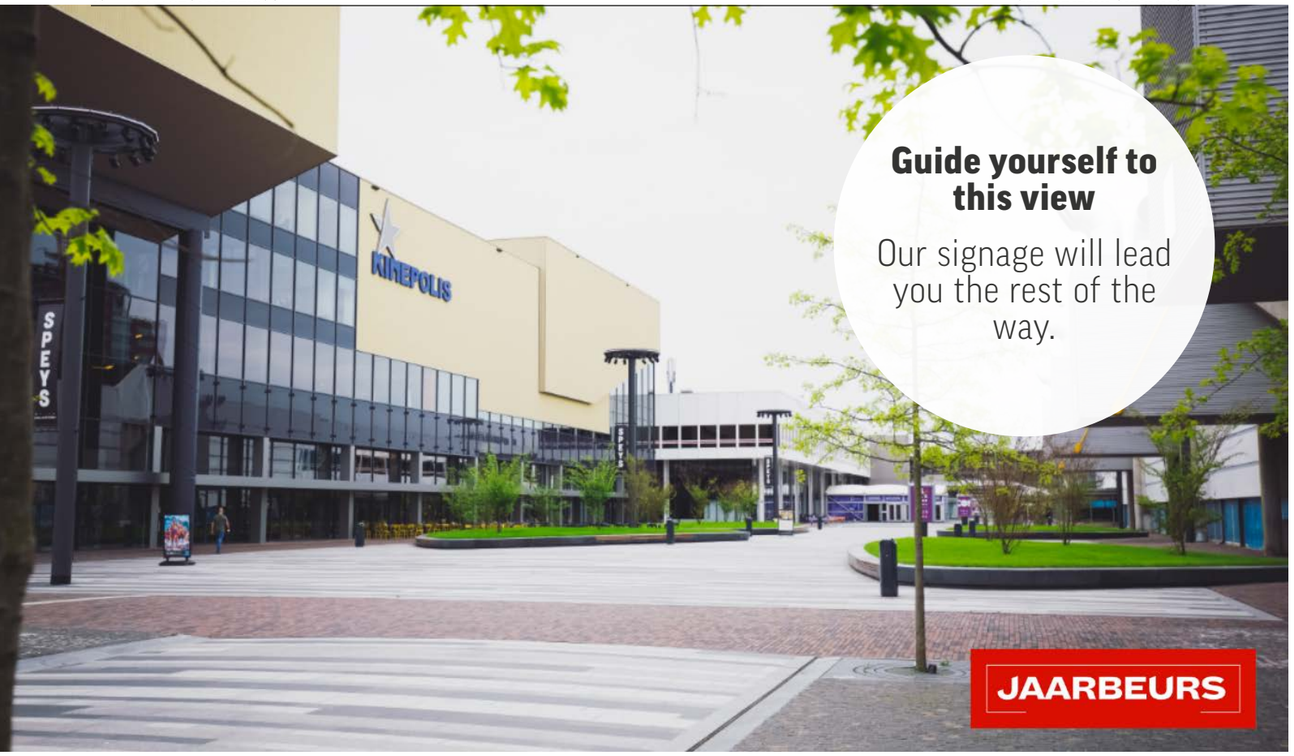
Sander Bronckers
Student Helpers Coordinator
Eindhoven University of Technology
The Netherlands

Jaap Essing
Tom Brazil Doctoral School of Microwaves Chair
TNO - The Netherlands

Jean-Luc Polleux
Career Platform Advisor
Université Paris Est, ESYCOM, CNRS, ESIEE Paris - France

Thierry Parra
Attendee Survey Officer
University of Toulouse, CNRS, LAAS - France

Daniel Stokes
Attendee Survey Officer
National Physical Laboratory - United Kingdom



Travel Information

GETTING TO UTRECHT JAARBEURS

The city of Utrecht is well connected to the European motorway, rail and flight networks. The Jaarbeurs Convention Centre can be accessed through a variety of transportation means.

ADDRESS
Jaarbeurs, Jaarbeursplein, 3521 AL, Utrecht, The Netherlands.

BY AIR
From Schiphol Amsterdam Airport:
Take a direct (Intercity) train from Schiphol Airport to Utrecht Centraal Station (4 × per hour).

From Rotterdam-The Hague Airport:
Take the local RET bus 33 to Rotterdam Centraal station (6 × per hour) and then a direct (Intercity) train from Rotterdam Centraal station to Utrecht Centraal station (4 × per hour).

BY TRAIN
The Jaarbeurs Convention Centre is located within 500 m from Utrecht Centraal train station.

BY CAR
Please refer to the map on the inner back cover of this booklet for parking lot locations near the Jaarbeurs Convention Centre.

HOTEL RESERVATION

Horizon House has teamed up with Connex Hotels and Events, our official hotel booking supplier, to offer you the ability to book your accommodation for EuMW at the most competitive rates available. It is very easy to make an immediate hotel booking.
Simply visit their booking page http://www.connexhotelsandevents.com/eumw-2020-utrecht.html and make your booking, or email sally@connexhotelsandevents.com. You will find a wide range of accommodation to suit every budget. Alternatively, see the hotel booking pages within this programme.

PERSONAL INVITATION (VISA)

A valid passport will be required for entry into the organising country, in this case The Netherlands. Since EuMW events are held in the European Union, no visa is usually required for travellers with passports from a number of countries, like for instance: European Union, Australia, Brazil, Canada, Japan, Singapore, South Korea or the United States. If you are registering as speaker, delegate or exhibitor and you need a visa, we recommend that you speak with the Dutch Consulate, in your own country. You should organise this at least 3 to 4 months prior to the EuMW. The organisers will be pleased to send a letter of invitation to any exhibitor, conference delegate or speaker requesting it. For assistance in obtaining a visa letter, please contact visa@eumw2020.org.

Local Information and Insurance

WI-FI

Wi-Fi is available in the exhibition hall and conference area. Login details can be found within your delegate bag.

ELECTRICITY

Electricity is supplied at 230V, 50 Hz. Type F sockets are used in The Netherlands.

CREDIT CARDS

All major hotels and most restaurants and shops will accept credit cards. It is advisable to carry other identification as well. Visa and MasterCard are the most widely accepted cards.

HISTORY & SIGHTSEEING

The city of Utrecht, located in the centre of The Netherlands, features a rich past and a dynamic present. This 2000 year old city features a wide range of interesting museums and cultural events. Its rich history began about twenty centuries ago. In 47 A.D. the Romans built a fortress as part of reinforcements along the Rhine where the Cathedral square (Domplein) is situated today. It is here where the Union of Utrecht was signed in 1579, which is seen as the beginning of the Dutch Republic. Nowadays, Utrecht is a lively city with a pleasant and intimate atmosphere. The medieval city centre with its canals, wharfs, quaint streets and museum quarter is small enough to explore on foot. Featuring a large student population and many cafés and restaurants it is the ideal place to relax and make new friends. Through its central location, Utrecht serves as the perfect base from which to explore additional must-see Dutch attractions. More information can be found at https://www.visit-utrecht.com.

INSURANCE

It is highly recommended that all participants carry the proper travel and health insurance, as the organiser cannot accept any liability for any accidents or injury that occur during or when travelling to the event. Please also insure that personal items are covered for loss, damage or theft either through a personal policy or by a corporate policy. We cannot accept any liability for personal items that are lost, damaged or stolen during or travelling to and from European Microwave Week 2020.

Conference Information

BADGES AND REGISTRATION

The registration area will be located near the entrance to Exhibition Hall 1 as signposted.
Online registrants will automatically be e-mailed their badge barcode and an order confirmation receipt immediately after they pay. All those who have pre-registered should bring their badge barcode and confirmation with them to the conference where they can print out their badge by scanning their barcode at the Fast Track desk onsite. Processing will be quick and easy but queues may form at busy times, so please arrange to collect your badge well in advance of your first conference session.
Those who have not pre-registered can do so on site until 15th January 2021. There will be on-site registration terminals located within the registration area, where delegates can enter their details and pay immediately by swiping their credit or debit cards through the card readers attached to the terminals. Alternatively, you can pay at the Cashier desk if you require a printed receipt.
If you have any questions regarding registration procedures and payment, please email: eumwreg@aventri.com.

CONFERENCE ROOMS

Conference rooms are located in the Supernova, Media Plaza, and Juliana area as signposted. The conferences will be held in different rooms over the conference dates. Please refer to the Conference Matrix at the back of this booklet for a detailed overview. Delegates can register for one, two or all three of the conferences. Registration at one conference does not allow any access to other conference sessions. Those who wish to register for two or more conferences will receive a discount on these registrations.

SPEAKER PREPARATION SPACE

A speaker preparation area is located in Break Out 4.

INTERACTIVE SESSIONS

The interactive poster papers will be presented on electronic screens, which are located in the exhibition area as signposted on Tuesday, Wednesday and Thursday.

EXHIBITION HOURS

The exhibition area will be located in Exhibition Hall 1 as shown on the Floor Plan in this booklet. As a registered delegate you will have full access to the exhibition area.
The exhibition opening hours are:

- Tuesday 12th January 2021 9.30 – 18.00
- Wednesday 13th January 2021 9.30 – 17.30
- Thursday 14th January 2021 9.30 – 16.30

See the back cover for a full listing of the exhibitors (correct at the time of going to press).

CONFERENCE PROCEEDINGS

All papers published for presentation at your chosen conference will be available to download from an online repository. Four weeks prior to the event, downloading instructions will be communicated to conference registrants.

Workshops and Short Courses

Despite the organiser's best efforts to ensure the availability of all listed workshops and short courses, the list below may be subject to change.

Also workshop numbering is subject to change. Please refer to www.eumweek.com at the time of registration for final workshop availability and numbering.

SUNDAY 10th January 2021			
W-02	EuMIC/EuMC	Half Day PM	Advanced Measurement Techniques for Next Generation Communication Systems
W-03	EuMIC	Full Day	High Performance GaN MMICs
W-06	EuMIC	Full Day	Sub-mmWave On-Wafer Measurements
W-11	EuMIC	Full Day	Integrated Doherty PAs for Cellular and mmWave Applications
W-17	EuMIC/EuMC	Full Day	Advanced RF Technologies for 5G
W-27	EuMC	Half Day AM	Wireless Power Transmission Recent Research Advances
W-29	EuMC	Full Day	Recent Advances in Additive Manufacturing of Microwave Components
S-03	EuMIC	Full Day	Fundamentals of Microwave PA Design
MONDAY 11th January 2021			
W-07	EuMC	Full Day	High-Power Microwave Industrial Applications
W-08	EuMC	Half Day AM	Antenna/Modules in Package for mmWave for 5G
W-10	EuMIC/EuMC	Half Day PM	From Enabling GaN Technology to High-Performing Space-Borne SSPAs at mmWave
W-13	EuMC/EuRAD	Half Day AM	Advanced Applications of In-Band Full-Duplex Technology
W-18	EuMC	Full Day	Measurements at mmWave and Terahertz Frequencies of Three Measurement Quantities: S-Parameters, Power, and Complex Permittivity of Dielectric Materials
W-28	EuMC	Full Day	Microwave Wearable Circuits and Systems for Biomedical Applications
S-05	EuMC/EuRAD	Half Day PM	Multibeam Antennas and Beamforming Networks
S-07	EuMIC/EuMC	Half Day AM	From Device Characterisation to Amplifier Design: Advanced Large Signal Measuring, Fast and Accurate Modelling, and Reliable Designing
S-10	EuMC	Half Day PM	Intuitive Microwave Filter Design with EM Simulation
TUESDAY 12th January 2021			
W-05	EuMC	Full Day	Digital Predistortion for 5G MIMO Wireless Transmitters
W-25	EuMC/EuRAD	Half Day PM	Advanced mmWave Radar System Solutions for Industrial and Consumer Sensing Applications
WEDNESDAY 13th January 2021			
W-12	EuMIC/EuMC	Full Day	High-Efficiency Linear Power Amplifiers for High Bandwidth, High PAR Signals
W-14	EuRAD	Half Day PM	Automotive Radar Networks and Sensor Fusion
S-04	EuMIC/EuMC	Full Day	Quantum Computing for Electrical Engineers
S-08	EuMIC/EuMC	Half Day AM	High Power Amplification for Space Applications
THURSDAY 14th January 2021			
W-15	EuRAD	Half Day PM	Recent Advances in Micro-Doppler Radar and its Applications
W-23	EuRAD	Half Day AM	High Resolution Radar for Automotive
W-31	EuMC	Full Day	5G and Beyond: Enabling RF Architectures and Technologies for Emerging Wireless Systems
FRIDAY 15th January 2021			
W-21	EuMC	Half Day AM	Recent Advances in Topologies, Technologies and Practical Realizations of Microwave Sensors
W-30	EuMC	Half Day AM	Recent Advances on Microwave Filters
W-32	EuMIC/EuMC	Full Day	Practical Aspects of Running a Microwave Laboratory and How to Make Good Measurements Every Time
S-01	EuRAD	Half Day PM	Introduction to MIMO Radar
S-02	EuRAD	Half Day AM	Cognitive Radar Signal Processing

Registration Information

CONFERENCE REGISTRATION DETAILS

See pricing table on the following page.

ONLINE REGISTRATION
- All online registrations should be made at www.eumweek.com.
- Registrations completed up to and including 6th December 2020 will be charged at the 'Advance Discounted Rate' and those from 7th December 2020 will be charged at the 'Standard Rate'.
- Online registration is open from 13th September 2020 up to and during the event until 15th January 2021.

ONSITE REGISTRATION

Onsite registration is available:
- Saturday, 9th January 2021 16:00 – 19:00
- Sunday, 10th January 2021 08:00 – 17:00
- Monday, 11th January 2021 08:00 – 17:00
- Tuesday, 12th January 2021 08:00 – 17:00
- Wednesday, 13th January 2021 08:00 – 17:00
- Thursday, 14th January 2021 08:00 – 17:00
- Friday, 15th January 2021 08:00 – 10:00

Onsite registration will be charged at the Standard Rates.

HOW TO REGISTER

If you have any questions regarding registration procedures and payment, please contact: eumwreg@aventri.com

ONLINE
- Delegates can register for one, two or all three of the conferences.
- Discounts will be given to those registering for two or more conferences.
- In addition to the conferences, delegates can register for forums, short courses or workshops.
- Discount is given when combining a forum, short course or workshop registration with a conference registration.
- Payment can be made online using Amex, Visa, Mastercard or Bank Transfer.
- Registrants paying by Credit Card will be sent an automatic email confirmation, with a receipt and badge barcode.
- Registrants choosing to pay by Bank Transfer will receive their confirmation, but their receipt and badge barcode will be sent only once payment has been received and cleared by Horizon House.

ONSITE
- The registration area will be located through the 'Oost Entree' and to the right, towards Exhibition Hall 1.
- There will be Self Service terminals in the registration area where delegates can enter their details and pay immediately by swiping their credit cards through the readers attached to the terminals.
- Delegates can also choose to 'Pay at Cashier' and then proceed to the Cashier Point and pay using credit cards or cash. Receipts will be given accordingly.

BADGE AND DELEGATE BAG COLLECTION

Online registrants: bring a photo ID and a copy of your registration email badge barcode to the Fast Track check-in desks at the registration area.
Onsite registrants: register using our Self Service terminals and receive your printed badge upon payment.

Scan your badge at the specified delegate bag area to collect your delegate bag.

Registration and badge collection will be quick and easy but queues may form at busy times, so please arrange to collect your badge well in advance of your first conference session.

NL MoD Reduced Rate

For the EuMW 2020 only, personnel of the NL MoD can register at a reduced rate. This very attractive rate includes access to EuRAD, the DSS Forum and the exhibition, lunch boxes on Wednesday and Thursday and the seated EuRAD lunch. The Advance Discounted rate for this is € 100,– (up to and including 6th December 2020), and € 140,– from 7th December 2020 onwards. No further options or combined discounts will be available.

Registration Fees

Full Week ticket: Get the most out of this year's Microwave Week with a Full Week ticket. Combine all three conferences with access to the Defence, Security and Space and the 5G forum (the automotive forum is not included), and top your week off with Workshops or Short Courses of your choosing. To keep you fueled, lunch is included everyday, as are of course the social events: the EuMIC Get-Together, the Welcome reception and the EuRAD seated lunch.

Registration at one conference does not allow access to the sessions of the other conferences.

Reduced rates are offered if you have society membership to any of the following: EuMA, GAAS, IET or IEEE. Reduced rates for the conferences are also offered if you are a Student/Senior (Full-time students 30 years or younger and Seniors 65 or older as of 18th September 2020). The fees shown below are invoiced in the name and on behalf of the European Microwave Association. Fees invoiced by EuMA with respect to the European Microwave Week 2020 are exempt from Dutch VAT. All payments must be in € (Euros) – cards will be debited in € (Euros).

CONFERENCES REGISTRATION	**ADVANCE DISCOUNTED RATE** (FROM 13th SEPTEMBER UP TO & INCLUDING 6th DECEMBER 2020)				**STANDARD RATE** (FROM 7th DECEMBER 2020 & ONSITE)			
	Society Member		**Non-Member**		**Society Member**		**Non-Member**	
1 Conference	Standard	Student/Sr.	Standard	Student/Sr.	Standard	Student/Sr.	Standard	Student/Sr.
EuMC	€ 480,-	€ 130,-	€ 680,-	€ 190,-	€ 680,-	€ 190,-	€ 950,-	€ 260,-
EuMIC	€ 370,-	€ 120,-	€ 520,-	€ 170,-	€ 520,-	€ 170,-	€ 730,-	€ 240,-
EuRAD	€ 330,-	€ 110,-	€ 460,-	€ 160,-	€ 460,-	€ 160,-	€ 650,-	€ 220,-
2 Conferences	Standard	Student/Sr.	Standard	Student/Sr.	Standard	Student/Sr.	Standard	Student/Sr.
EuMC + EuMIC	€ 680,-	€ 260,-	€ 960,-	€ 360,-	€ 960,-	€ 360,-	€ 1.340,-	€ 500,-
EuMC + EuRAD	€ 650,-	€ 250,-	€ 910,-	€ 350,-	€ 910,-	€ 350,-	€ 1.280,-	€ 480,-
EuMIC + EuRAD	€ 560,-	€ 240,-	€ 780,-	€ 330,-	€ 780,-	€ 330,-	€ 1.100,-	€ 460,-
3 Conferences	Standard	Student/Sr.	Standard	Student/Sr.	Standard	Student/Sr.	Standard	Student/Sr.
EuMC + EuMIC + EuRAD	€ 830,-	€ 370,-	€ 1.160,-	€ 520,-	€ 1.160,-	€ 520,-	€ 1.630,-	€ 730,-
Full Week Ticket	€ 1.280,-	€ 750,-	€ 1.690,-	€ 970,-	€ 1.630,-	€ 920,-	€ 2.180,-	€ 1.200,-

BECOME A MEMBER – NOW!

EuMA membership fees: Professional € 25,–/year, Student € 15,–/year.

One can apply for EuMA membership by ticking the appropriate box during registration for EuMW. Membership is valid for one year, starting when the subscription is completed. The discount for the EuMW fees applies immediately.

Members have full e-access to the International Journal of Microwave and Wireless Technologies. The printed version of the journal is no longer available.

EUMA KNOWLEDGE CENTRE
The EuMA website has its Knowledge Centre which presently contains over 20,000 papers published under the EuMA umbrella. Full texts are available to EuMA members only, who can make as many copies as they wish, at no extra-cost.

SPECIAL FORUMS AND SESSIONS REGISTRATION		**ADVANCED DISCOUNTED RATE** (UP TO & INCLUDING 6th DECEMBER 2020)		**STANDARD RATE** (FROM 7th DECEMBER 2020 & ONSITE)	
	Date	**Delegates***	**All Others****	**Delegates***	**All Others****
Automotive Forum	12th January 2021	€ 260,-	€ 360,-	€ 320,-	€ 420,-
5G Forum	15th January 2021	€ 60,-	€ 90,-	€ 80,-	€ 100,-
Defence, Security & Space Forum	13th January 2021	€ 20,-	€ 60,-	€ 20,-	€ 60,-
European Microwave Student School	12th January 2021	€ 40,-	€ 40,-	€ 40,-	€ 40,-
Tom Brazil Doctoral School of Microwaves	14th January 2021	€ 40,-	€ 40,-	€ 40,-	€ 40,-

* those registered for EuMC, EuMIC or EuRAD ** those not registered for a conference

WORKSHOPS AND SHORT COURSES	**IN COMBINATION WITH CONFERENCE REGISTRATION**				**WITHOUT CONFERENCE REGISTRATION**			
	Society Member		**Non-Member**		**Society Member**		**Non-Member**	
	Standard	Student/Sr.	Standard	Student/Sr.	Standard	Student/Sr.	Standard	Student/Sr.
Half Day	€ 100,-	€ 70,-	€ 130,-	€ 100,-	€ 130,-	€ 100,-	€ 170,-	€ 130,-
Full Day	€ 140,-	€ 100,-	€ 190,-	€ 140,-	€ 190,-	€ 140,-	€ 250,-	€ 190,-

CONFERENCE TECHNICAL CO-SPONSORS

EuMIC 2020 – The 15th European Microwave Integrated Circuits Conference

50th European Microwave Conference 2020 – The 50th European Microwave Conference

EuRAD 2020 – The 17th European Radar Conference

EUROPEAN MICROWAVE WEEK SPONSORS

Official Publication: Microwave Journal

Supported by: IET The Institution of Engineering and Technology

Co-Sponsored by: MTT-S

Co-Sponsored by: IEEE

Defence, Security and Space Forum
Space Situational Awareness

Wednesday 13th January 2021
08:30 to 17:50, Auditorium
+ cocktail reception

Chair: Marco Martorella, University of Pisa, Italy
Co-Chair: Mark Bentum, Eindhoven University of Technology & ASTRON, The Netherlands

Space has become a new battleground where both economic and military interests clash. Space Situational Awareness (SSA) refers to keeping track of objects in orbit and predicting where they will be at any given time, in other words: determine a persistent and continuously updated picture of the situation in space. According to NATO's definition, SSA is the knowledge and the understanding of military and non-military events, activities, circumstances and conditions within and associated with the space environment or space-related systems.
To accomplish this, a complex infrastructure must be in place that includes sensors, communications systems, physical phenomena knowledge, technical and management skills that allow for all the necessary systems to operate and interact effectively.
The Defence, Security and Space Forum will address the topic of Space Situational Awareness. When thinking of Space and SSA, we tend to ask ourselves many questions that are related to our ability to understand and handle Space, for instance: What have we learnt in the past years of SSA activities? How is the "New Space Era" affecting Space and its safety? Are our SSA systems keeping up the pace of the new developments in Space? Are we prepared to face what the future may hold?
World-wide renowned experts will present and discuss various SSA-related topics, ranging from space surveillance, challenges and threats in Space to Space Weather, providing some answers to the above questions and with the aim of triggering valuable discussions where SSA will be the primary focus. Technological aspects will be considered that are impacting both military and civilian scenarios. Well-known and new threats will also be discussed in order to understand the risks that space induces.

Registration and Programme Updates

Registration fee is €20 for those who registered for a conference and €60 for those not registered for a conference. Cocktail reception as well as a lunch snack and beverages are included in the fee. The Conference Special Events section of the EuMW website will give further details and updates.

Programme

08:30 – 10:10 **EuRAD opening**

10:10 – 10:50 **Coffee Break**

10:50 – 12:30 **Space Situational Awareness**
Moderator: Mark Bentum
Three renowned experts will present and discuss various SSA-related topics. Peter Knott, Director of Fraunhofer-FHR, will address the radar sensors for SSA. Mohamed Abouzahra and Gregg Hogan, Haystack-MIT-Lincoln Laboratory, will present an emergency-response system supported by NATO and Petra Wijnja, Dutch Airforce, will talk about Space In the Dutch MoD, the current focus and activities of the Defense Space Security Center.

12:40 – 13:40 **Strategy Analytics Lunch & Learn Session**
Eric Higham, Strategy Analytics; "Space Situational Awareness in the New Space Era"
This session will explore some trends, forecasts and drivers that are influencing the congestion in space. The presentation will address evolving space capabilities in the commercial and defence segments of the space industry, along with the benefits these capabilities will enable.

13:50 – 15:30 **Microwave Journal Industry Panel Session**
The Microwave Journal Industry Session will be made up of several company presentations that illustrate the technological innovation that industry is developing for Space Situational Awareness related topics.

15:30 – 16:10 **Coffee Break**

16:10 – 17:50 **Executive Round Table Forum: Space Situational Awareness**
Which technologies need to be implemented to face future challenges? What are the technological gaps that need to be filled? How important is to collaborate to improve SSA? What are the current and future threats that we should consider and try to mitigate or eliminate? How can research help towards improving SSA?

World-wide experts from academia, industry and military areas are invited to this Table for an open discussion about SSA and its crucial role to safeguard Space and guarantee that current and future services, upon which we rely, are preserved

Moderator: Marco Martorella
- René de Jongh, Strategy Director, Thales Netherlands
- Petra Wijnja, Dutch Airforce
- Peter Knott, Director of Fraunhofer-FHR
- Mohamed Abouzahra/Gregg Hogan, Hastack-MIT-Lincoln Laboratory
- Rene Thaens, NATO

17:50 – 18:30 **Cocktail Reception**

2010 Paris – The Defence, Security and Space Forum
2011 Manchester – MMW Imaging Systems
2012 Amsterdam – Defence and Security including Space
2013 Nuremberg – Military Radar vs. Automotive Radar
2014 Rome – Protection and Security of our Infrastructure and Home land
2015 Paris – RF Payloads for Unmanned Aerial Vehicles
2016 London – Challenges and Opportunities for Indoor/Enclosed and Urban Communications and Sensing Technologies
2017 Nuremberg – The Internet of Space: Technologies and Applications
2018 Madrid – Integrating Unmanned Systems in Defence and Security Scenario's
2019 Paris – New Radio Architectures: The Evolution for Satellite Constellations
2020 Utrecht – Space Situtational Awareness

The Automotive Forum
Automotive Radar

Tuesday 12th January 2021
08:30 to 17:50, Auditorium
+ dinner on Monday evening, 11th January 2021

Chair: Thomas Zwick, Karlsruhe Institute of Technology, Germany
Co-Chairs: Martin Kunert, Robert Bosch GmbH & Frank Gruson, Continental AG, Germany
Local Arrangements Chair: Cicero Vaucher, NXP, The Netherlands

Following applications like keyless entry and tire pressure monitoring systems, mobile communications and recently automotive radar made microwave technologies a strong pillar inside the automotive world. The first 77 GHz automotive radar sensors entered the European market in 1999. In 2019, the European Microwave Association (EuMA) for the first time organized the Automotive Forum to provide an open platform for industrial experts to discuss technical aspects, concepts and radar architectures as well as market issues in the area of microwaves in the automotive industry. The forum consists of a good mix of technical presentations, plenary and panel discussions as well as networking time. This year's event will focus on the following topics:

1. Modulation & operation principles
2. Radar architectures
3. Artificial intelligence in automotive radar
4. Automotive radar interference

The forum is mainly devoted to technical experts from automotive industry throughout the whole supply chain. Keynote speakers will present their views on special technical solutions as well as regulatory or strategic issues. The evening before the event, we will get together in a networking dinner.
Early registration is recommended.

Registration and Programme Updates

Advanced Registration fee (up to & incl. 6th December 2020) is €260 for those who registered for a conference and €360 for those not registered for a conference. Standard Registration fee (from 7th Decmber 2020 & onsite) is €320 for those who registered for a conference and €420 for those not registered for a conference.
The networking dinner as well as a lunch snack and beverages are included in the fee. The Conference Special Events section of the EuMW website will give further details and updates. Due to limited room size early registration is recommended.

Programme

SESSION 1: MODULATION AND OPERATION PRINCIPLES
(Chair: Cicero Vaucher, NXP, The Netherlands)

08:30 – 08:50 **Automated Driving: Market Perspective for Radar**
Cédric Malaquin, Yole, France

08:50 – 09:10 **Radar Technology for Assisted and Automated Driving**
Frank Gruson, Continental AG, Germany

09:10 – 09:30 **Hybrid Analog Phased Array and Advanced Algorithms Radar for Long-Range High-Resolution Detection and AI**
Maha Achour, Metawave Corporation, USA

09:30 – 09:50 **MIMO Radar Waveforms for Automotive**
Feike Janson, NXP Semiconductors, The Netherlands

09:50 – 10:10 **Open Discussion on all Presentations of the Session**

10:10 – 10:50 **Coffee**

SESSION 2: RADAR ARCHITECTURES
(Chair: Frank Gruson, Continental, Germany)

10:50 – 11:10 **Achieving True Safety on the Road with an Automotive-Dedicated Imaging Radar Chipset**
Noam Arkind, Arbe Robotics, Israel

11:10 – 11:30 **Asymptotic Electromagnetic Fields Computation as an Optimal Method for Radar-in-Vehicle Performance Prediction**
Alexander Ioffe, Aptiv, Germany

11:30 – 11:50 **Scope, Challenges and Opportunities for 140 GHz Automotive Radar**
Simon Tejero Alfageme, Huawei Technologies Duesseldorf GmbH, Germany

11:50 – 12:10 **Radar Digitalization**
André Roger, Infineon Technologies, Germany

12:10 – 12:30 **Open Discussion on all Presentations of the Session**

12:30 – 13:50 **Lunch**

SESSION 3: ARTIFICIAL INTELLIGENCE IN AUTOMOTIVE RADAR
(Chair: Martin Kunert, Robert Bosch GmbH, Germany)

13:50 – 14:10 **Development of Deep Learning Approaches for Radar-Based Autonomous Driving**
Georg Kuschk, Astyx GmbH, Germany

14:10 – 14:30 **CNN-Based Signal Processing for Automotive Sensors**
Tim Berthold, Dream Chip Technologies GmbH, Germany
Nicolai Behmann, IMS Hannover, Germany

14:30 – 14:50 **Reflex-Level Object Type Classification for Automotive Radar**
Michael Ulrich, Robert Bosch GmbH, Germany

14:50 – 15:10 **Machine Learning and Radar Techniques for Enhanced Vehicle Perception**
Sonia Ghelani, Texas Instruments, USA

15:10 – 15:30 **Open Discussion on all Presentations of the Session**

15:30 – 16:10 **Coffee**

SESSION 4: AUTOMOTIVE RADAR INTERFERENCE
(chair: Thomas Zwick, Karlsruhe Institute of Technology, Germany)

16:10 – 16:30 **Automotive Radar Mutual Interference - Snapshots of Today's Situation**
Alicja Ossowska, Valeo Schalter und Sensoren GmbH, Germany & Richard Körber, Astyx GmbH, Germany

16:30 – 16:50 **Radar to Radar Interference: Real Threat and Opportunities**
Francesco Laghezza, NXP Semiconductors, The Netherlands

16:50 – 17:10 **Methods to Avoid Radar Interference - An Overview of the Swedish Radcom Project**
Karl Vanas, Volvo Car Corporation, Sweden

17:10 – 17:30 **IMIKO-Radar: Methods for Cooperative Interference Mitigation**
Werner Sörgel, Tim Poguntke and Thomas Binzer, Robert Bosch GmbH, Germany

17:30 – 17:50 **Open Discussion on all Presentations of the Session**

The 5G Forum
From Technology to Business

Friday, 15th January 2021,
08:45 to 15:45, Auditorium

Chair: Bart Smolders, Eindhoven University of Technology, The Netherlands

Co-Chairs: Toon Norp, TNO, The Netherlands & Ulf Gustavsson, Ericsson, Sweden

The introduction of 5G is a major trend in cellular telecommunications; in various countries 5G frequency licenses are being awarded and 5G networks are rolled out. 5G promises to support a range of new applications - automotive, public safety, media, health, satellite communication, and factory automation to name a few - are supported using the same NR radio interface technology. The concept of 5G network slicing enables a single 5G network infrastructure to provide multiple virtual networks, each optimised for a particular application, service or industrial customer. In Europe, there are three pioneer frequency bands earmarked for 5G. Two of these - the 700 MHz band and the 3.5 GHz band - are in the same sub 6 GHz range of spectrum where most current cellular technologies can be found. The third pioneer band is the 26 GHz band; a new frequency band which will introduce microwave technology in cellular networks.

For the microwave industry, 5G will be a major new market opportunity. The market of billions of mobile phones is interesting, and on top of that, the application of microwave frequencies in 5G will imply the deployment of huge numbers of small basestations with electronic beam-steering capabilities. It is therefore of interest for the microwave community to get a system- and technology-level overview of what 5G will bring and how microwave technology can play a role in 5G

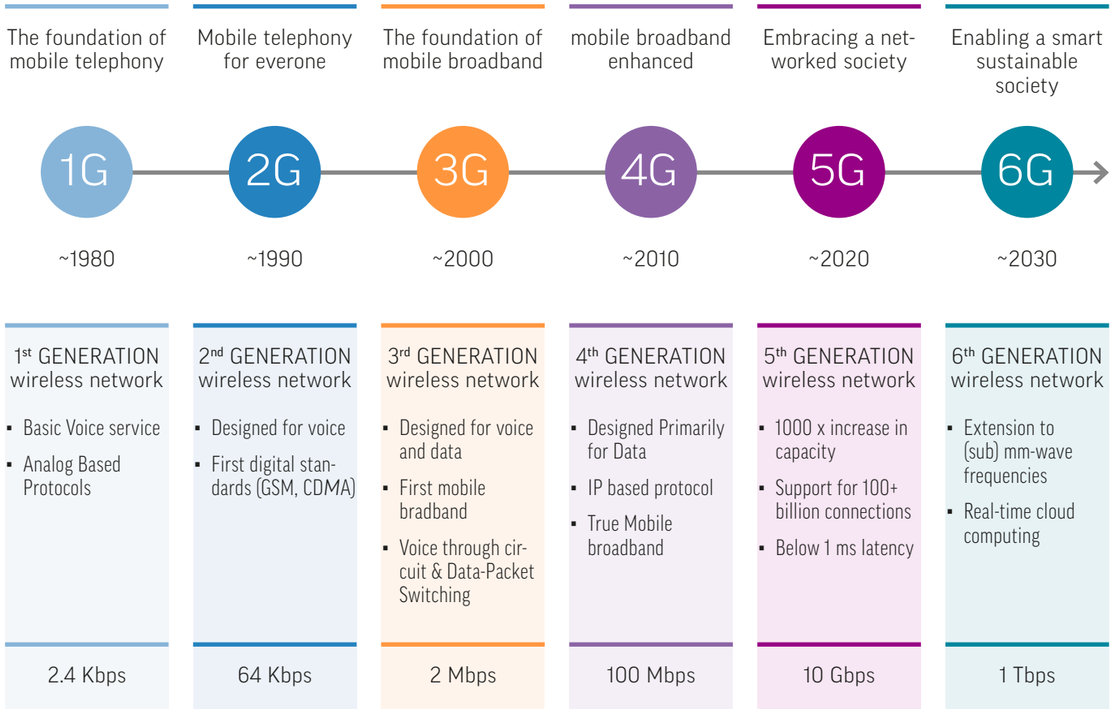
The 2020 5G Forum hosts a mix of technical presentations, posters, demo sessions and a panel discussion. Technical presentations from industrial experts will address 5G strategic and market needs and discuss how these can be met with technology solutions. Poster and demo sessions during lunch allow research projects to show their advances with new 5G technology and provides an excellent networking opportunity.

Registration and Programme Updates

Please refer to the special forums and session fees table for registration fees. Lunch and beverages are included in the fee. The Conference Special Events section of the EuMW website will give further details and updates

Programme

08:45 – 09:00	**Chairman welcome speech**
09:00 – 09:30	**What can you do with 5G?** Anders Furuskär, Ericsson, Sweden
09:30 – 10:00	**5G Frequency Licensing and Regulations in Europe** Peter Disseldorp, Radiocommunications Agency Netherlands
10:00 – 10:30	**5G OTA Testing** Pertti Kangas, Keysight Technologies
10:30 – 10:45	**Coffee**
10:45 – 11:15	**Semiconductor Technology for 5G Handsets and Base Stations** Domine Leenaerts, NXP Semiconductors, The Netherlands
11:15 – 11:45	**Beamforming Concepts in 5G** David Astely, Ericsson, Sweden
11:45 – 12:15	**Pitches of posters and demo sessions that will be given during lunch**
12:15 – 13:45	**Lunch combined with posters and demo session**
13:45 – 14:15	**5G, but why? Business First, Technology Second** Jacob Groote, 5G EVP, KPN, The Netherlands
14:15 – 14:45	**Opportunities for 5G features in Autonomous Driving** Andreas Kwoczek, Volkswagen, Germany
14:45 – 15:15	**The Role of 5G in Factory Automation**
15:15 – 15:45	**Panel discussion with the speakers of the day** Moderator: Toon Norp, TNO, Netherlands
15:45 – 16:00	**Chairman closing remarks**



Welcome from the Student Activities Chair

The European Microwave Week programme offers valuable events for engineers at every stage of their microwave career. Special emphasis is placed on supporting students and young professionals in our field by a number of dedicated and Corona-proof student activities. For Bachelor and Master students, the Student School, organised by Prof. David Ricketts, is devoted to teaching everything the beginning engineer needs to know about the basics of modern radars with the focus on building their very own radar transceiver in the hands-on part of the course. To keep everybody motivated, the best transceiver design is awarded with a cash prize, kindly sponsored by Thales Nederland. The Student School is also open for interested PhD students who wish to build up knowledge in this area.

PhD students may also participate in the Tom Brazil Doctoral School of Microwaves. This event, founded in 2011, was in former years simply known as the Doctoral School of Microwaves. It has been renamed in honour of Tom Brazil, who passed away in 2018, for his outstanding contribution to Microwaves in general and Microwave education in particular. Tom Brazil was one of the two founding fathers of the Doctoral School. The School is this year organized as a one-day event with lectures on the design of integrated active array systems for 5G millimetre-wave, covering everything from microwave IC design to signal processing. The in-depth technical programme is complemented with a lecture on concurrent engineering for complex systems, which presents a methodology for working in multi-disciplinary teams, and a lecture on boosting productivity and creativity for a successful completion of a PhD project.

Creativity is also the essential ingredient for the Student Design Competitions. Student teams, which may consist of Bachelor, Master and/or PhD students, take part in one of the two competitions organized by Ampleon and ASTRON. While Ampleon's competition is "biased" on a challenging amplifier topic, ASTRON wants to know how to accurately locate drones using the radio frequency interference emissions of the their electric motors. The best teams will be awarded with cash prizes, so you can expect to see high quality student designs to be presented on the exhibition floor.

For those who want to take their acquired skills to industry, there is the Career Platform. This three-day event aims to bring the jobs and career opportunities to students and young professionals, all in a single place and time. This unique place provides multiple activities like career workshops, a recruitment space, a start-up panel, and special sessions to boost the careers of the next generation of microwave engineers. All these activities are centred around the Career Lounge, a cosy area with comfortable seats and refreshments, where contacts to companies can be made in an informal fashion.

For the first time in the history of the European Microwave Week, this year's edition features a social event for all young and young-at-heart microwave enthusiasts: Microwave Nightfever! Organised by the Student Activities committee, IEEE Young Professionals and IEEE MTT-S Young Professionals. Everyone is welcome and there will be some complimentary drinks and snacks on a first come first serve basis. It's especially during these informal events that long-lasting relations are made and networks grow!

In this spirit and on behalf of the entire Student Activities committee, I would like to express a warm welcome to all students and young professionals that take part in this special edition of the European Microwave Week! Thank you for staying connected to our community and for choosing this event as your must-visit conference despite the restrictions caused by the Covid-19 pandemic. Special thanks also to the entire Student Activities team, the vast majority of them PhD students themselves. Your dedication and hard work in the recent period have ensured that we can offer a high-quality programme to our colleagues. The future is looking bright!

ULF JOHANNSEN
Student Activities Chair
Eindhoven University of Technology, The Netherlands

Student Design Competitions

Tuesday, 12th January to Wednesday, 13th January 2021
Exhibition Hall

The Student Design Competitions involve master and doctoral students designing and measuring a microwave device developed prior to the conference. This competition is open to all students. Measurements will be open to attend for all EuMW participants. A representative of the design team must be present at the conference. This year, two competitions will be offered:

Outsmart your fellow students on a level Microwave playing field.

Competitions

Thrust 1: Drone Localisation System
Design a drone localisation system operating from 0.5 GHz to 1.5 GHz. The system should be able to determine the position of drones by detecting the radio frequency interference transmitted by the drones.

This thrust is organised and sponsored by ASTRON. Prizes are co-sponsored by the IEEE Benelux AP/MTT joint chapter. For questions please contact David Prinsloo (prinsloo@astron.nl).

For more information and additional competition details visit www.bit.ly/eumw2020sdc.

Thrust 2: Wideband Amplifier Biasing Network
Design and realise a biasing network for RF high power amplifiers, considering low insertion loss at the operation bandwidth and low input impedance at the low frequency region. This thrust is organised and sponsored by Ampleon Netherlands BV.

For questions please contact Adam Cooman (adam.cooman@ampleon.com).

For more information visit www.ampleon.com/news/events/student-design-competition-at-eumw-2020.html.

Women in Microwaves
Stronger Together

Tuesday, 12th January 2021
Media Arena

WiM Chair: Marion Matters-Kammerer, Eindhoven University of Technology, The Netherlands
WiM Co-Chair: Dominique Schreurs, KU Leuven, Belgium

Register (free of charge) for this unique hybrid (on-site and online) networking event via: women.microwaves@eumw2020.org

The Women in Microwaves event will be in the theme of "Stronger Together".
The past months have shown to us the importance of bringing people together, be it in-person or online. Cooperating in research, industry and education, networking on national and international level and interacting with your colleagues are key aspects in our work and career. In this context we will organize a symposium with several international female speakers showing to us their career paths. We will engage in joint discussions and actively extend our networks.
Don't miss this dedicated and unique event and meet with colleagues from around the world. Join as in the Media Arena at:

12:30 to 13:50 - Lunch Lecture
16:10 to 17:50 - Panel Discussion and Drinks

More details on the final program will be published via the conference website.

Career Platform

Tuesday, 12th January to Thursday, 14th January 2021
Various locations, refer to programme

Chair: Ulf Johanssen, Eindhoven University of Technology, The Netherlands

The Career Platform is a three-day event that is conducted with the support of EuMW, EuMA and the IEEE MTT-S / Region 8 Young Professionals. The Career Platform is dedicated to students, graduates, and young professionals where they can get in touch with companies to increase their network and inform themselves about current job offers. This unique place provides multiple activities like career workshops, recruitment space, a start-up panel, and special sessions to boost the career of the next generation of microwave/millimetre-wave, radar, wireless, and integrated circuits engineers. All these activities are centred around the Career Lounge, a cosy area with comfortable seats and refreshments, where contacts to companies can be made in an informal fashion. During the conference, all this will be supported by social media (Facebook, LinkedIn, Xing, etc.) as well as the European RF andMicrowave job portal www.rf-and-microwavejobs-in-europe.eu, which is the virtual marketplace for students and companies to meet at and in-between European Microwave Weeks.

Events

08:30 – 17:50 **Career Lounge**
Tuesday, 12th Juanuary to Thursday, 14th January 2021
Where: Round Control
No registration and free access (including visitors)
A space dedicated to informal chats with the Career Platform's partner-companies.

10:50 – 17:50 **Job Dating**
Thursday, 14th January 2021
Where: BOR6
Companies can invite candidates and book time slots during the Career Platform. Companies that are participating in the Career Platform might invite candidates to 1-on-1 interviews in a quiet environment. The companies can book time slots and hand out invitations to their candidates during the first two days of the Career Platform (12th and 13th January 2021). The Job Dating will take place on the third day of the Career Platform (14th January 2021).

13:50 – 15:30 **Career Workshops**
Tuesday, 12th January 2021
Where: Media Arena
No registration – Restricted to M.Sc. and Ph.D. students

Workshop 1: "Transferable Skills and Networking" (45min)
Presenter: Arjen van Vliet, University of Utrecht
Do you realise what skills you've acquired at university? People tend not to think much about these things. Transferable skills are useful in all kinds of professional contexts, and you carry them with you from one job to the next. If you want to convince an employer that you're the right person for a job or an internship, you need the ability to present your skills with clarity and conviction. This workshop will make you aware of the transferable skills you've developed during your studies, at your (temporary) jobs, and during your extracurricular activities and help you to present them while networking.

10 minutes break

Workshop 2: "Improve your Curriculum Vitae (CV) for a Great First Impression" (45min)
Presenter: Arjen van Vliet, University of Utrecht
You will learn what is standard practice for writing an effective CV. Using instruction videos and detailed explanations of do's and don'ts, we will show you the different components that make up CVs. We'll also discuss how employers select from all the CVs and letters they receive, and how you can use this knowledge to your advantage. During the workshop, you will start working on your CV and give each other feedback. There will be plenty of time for you to ask any questions you may have.

13:50 – 15:30 **Start-Up Panel**
Wednesday, 13th January 2021
Where: Media Arena
No registration – free access (including exhibition visitors)
Do you have an idea for a start-up? You need some help to make it grow? Then the Start-Up Panel at the EuMW 2020 can help you. Multiple incubators and start-up programs from the EU will present what they are doing and how they can help you. The short presentations of each entity are followed by an open discussion.

WHAT IS IN IT FOR YOU?

Get ready to start your own company.
Meet your future employer.
Boost your CV.
Expand your network.

10:50 – 12:30 **Special Session**
Wednesday, 13th January 2021
Where: Media Arena
No registration – free access (including exhibition visitors)

The European Microwave Industry Market and Professional Opportunities
Top industry-leading speakers will give their vision and insights. The session will describe the main market of the European Microwave Industry with a focus on Professional Opportunities.

Connect with us on social media for more

08:30 – 17:30 **Company Wall and Job Wall**
12th Juanuary to Thursday, 14th January 2021
Where: Loopbrug
No registration – free access (including exhibition visitors)

The company wall is an additional space where companies can present themselves and their work on a poster (A0 or A1). Furthermore, at the same location is a job wall where companies can announce vacancies (A4).

For details on the program and speakers, visit www.eumweek.com/docs/Career_platform.html

5th European Microwave Student School "Practical Workshop: Build a Frequency-Modulated Continuous Wave Radar in 1-day"

Tuesday, 12th January 2021
Beam (Introduction) + Transitzone C (Hands-on)

The registration fee for this event is €40.
For further information please visit https://www.eumweek.com/students/studentschool.html.

During the EuMW 2020 we will celebrate the fifth edition of the European Microwave Student School. In this workshop you will learn the theory and design of FMCW radar. With this theoretical foundation, you will design, simulate and fabricate by hand, each component of your radar. You will then work in a team to assemble a complete radar and test it before the end of the class. The only background you need is basic microwave engineering knowledge and a desire to learn and build with your hands!
This workshop is sponsored by Thales Nederland B.V.

Programme

08:30 – 10:10 **Introduction and Theory of FMCW Radars and System Simulation of a 2.4 GHz Radar**
David Ricketts, Professor (North Carolina State University, US)

10:10 – 10:50 **Coffee break**

10:50 – 12:30 **Hands-on Session 1: Radar Component Design and Simulation.**
David Ricketts, Professor (North Carolina State University, US)

12:30 – 13:50 **Lunch**

13:50 – 15:30 **Hands-on Session 2 : Radar Component Fabrication**
David Ricketts, Professor (North Carolina State University, US)

15:30 – 16:10 **Coffee break**

16:10 – 17:00 **Hands-on Session 3: Radar Component Testing and System Assembly**
David Ricketts, Professor (North Carolina State University, US)

17:00 – 17:50 **Testing of Radars with Teams**

Tom Brazil Doctoral School of Microwaves "The Route to 5G: Design of mmWave Active Array Systems, from RFIC to Signal Processing"

Thursday, 14th January 2021
Spark

M.Sc. and Ph.D. students can register via the delegate registration of the EuMW by selecting the Doctoral School. The registration fee for this event is €80. The possible number of participants is limited, so secure your ticket well in advance."

Every year, the European Microwave Week features the Doctoral School of Microwaves, which is a one-day workshop. In memory of Tom Brazil, who was one of the founders of this event, it has now been renamed "Tom Brazil Doctoral School of Microwaves". Its objective is to cover the needs of a Ph.D. student that go beyond the standard conference programme. This year's Doctoral School will have lectures on technical topics, as well as on boosting your soft skills, by experts from both academia and industry. The overall theme of the technical topics is 5G mmWave with a focus on the design of integrated active array systems, covering the fields all the way from RFIC to signal processing. The Doctoral School will start with a lecture on the applications and requirements for 5G mmWave communication. From there, the lectures will go bottom-up from the system's subcomponents, having lectures on IC and antenna design for 5G mmWave, towards the design of a full active array system for mmWave applications. These lectures will emphasize multi-physics and co-design related aspects. Next to these hardware-oriented lectures, the signal processing side of 5G mmWave systems will also be covered. In one of the lectures, the stochastic modelling of radio hardware imperfections to bridge the gap between circuit design and communication engineering is discussed, whereas in another lecture the focus will be on beamforming and massive MIMO for 5G mmWave from a signal processing perspective. The technical programme is complemented with a lecture on concurrent engineering for complex systems, which presents a methodology for working in multi-disciplinary projects, and a lecture on high-performance leadership. .

Programme

08:30 – 09:20 **mmWave Applications for 5G Mobile Communication Systems**
Wolfgang Templ (Nokia Bell Labs, Germany)

09:20 – 10:10 **Integrated Circuits for 5G Wireless Communication**
Giovanni Mangraviti (IMEC, Belgium)

10:10 – 10:50 **Coffee break**

10:50 – 11:40 **Antenna Design for 5G mmWave Communication**
Daniele Cavallo (Delft University of Technology, the Netherlands)

11:40 – 12:30 **Leaving the Field Behind – How the best get better**
Paul Rulkens (Agrippa Consulting, the Netherlands)

12:30 – 13:50 **Lunch**

13:50 – 14:40 **Modern AESA Panel Array for mmWave Applications**
Patrick Schuh (Hensoldt, Germany)

14:40 – 15:30 **Stochastic Modelling of Radio Hardware Imperfections – Bridging the gap between circuit design and communication engineering**
Ulf Gustavsson (Ericsson, Sweden)

15:30 – 16:10 **Coffee break**

16:10 – 17:00 **5G mmWave Massive MIMO – System Architectures, Beamforming and Signal Processing**
Thomas Eriksson (Chalmers University of Technology, Sweden)

17:00 – 17:50 **Concurrent Engineering for Large Multi-disciplinary Projects**
Michel van Pelt (ESA, the Netherlands)

SUNDAY

Room	08:30 - 10:10	10:50 - 12:30	13:50 - 15:30	16:10 - 17:50	EVENING PROGRAMME
Mission 1	W-03 High Performance GaN MMICs				
Mission 2	W-17 Advanced RF Technologies for 5G				
Quest	W-29 Recent Advances in Additive Manufacturing of Microwave Components				
Auditorium	S-03 Fundamentals of Microwave PA Design				
Expedition	W-11 Integrated Doherty PAs for Cellular and mmWave Applications				
Flash	W-27 Wireless Power Transmission Recent Research Advances		W-02 Advanced Measurement Techniques for Next Generation Communication Systems		
Spark	W-06 Sub-mmWave On-Wafer Measurements				

EuMW EuMC EuRAD EuMIC Student Activity EuMIC/EuMC EuMC/EuRAD

MONDAY

Room	08:30 - 10:10	10:50 - 12:30		13:50 - 15:30	16:10 - 17:50	EVENING PROGRAMME
Mission 1	EuMIC02 D-Band to H-Band Amplifiers			EuMIC05 ICs for mmWave Beamforming Systems	EuMIC08 ICs for Communication and Sensing	
Mission 2	EuMIC03 GaN MMIC Power Amplifiers			EuMIC06 Advances in mmWave and High Power Technologies	EuMIC09 Advanced Solutions for Integrated Power Amplifiers	
Quest	EuMIC04 Receivers and LNAs			EuMIC07 Oscillators and Switches	EuMIC10 Nonlinear Modelling	
Expedition	W-28 Microwave Wearable Circuits and Systems for Biomedical Applications					
Polar		EuMIC01 EuMIC Opening				
Auditorium	W-13 Advanced Applications of In-Band Full-Duplex Technology		Technology in Context Philosophical Lecture	S-05 Multibeam Antennas and Beamforming Networks		
Spark	W-08 Antenna/Modules in Package for mmWave for 5G			W-10 From Enabling GaN Technology to High-Performing Space-Borne SSPAs at mmWave		
Flash	S-07 From Device Characterisation to Amplifier Design: Advanced Large Signal Measuring, Fast and Accurate Modelling, and Reliable Designing			S-10 Intuitive Microwave Filter Design with EM Simulation		
Glow	W-18 Measurements at mmWave and Terahertz Frequencies of Three Measurement Quantities: S-Parameters, Power, and Complex Permittivity of Dielectric Materials					
Beam	W-07 High-Power Microwave Industrial Applications					
Off-site						Automotive Forum Networking Dinner 18:30 - 22:00
Off-site						EuMIC Get-Together 18.30 - 21.00

MONDAY 08:30 – 10:10

	Mission 1	Mission 2	Quest
	EuMIC02 D-Band to H-Band Amplifiers Chair: Michael Schlechtweg[1] Co-Chair: Herbert Zirath[2] [1]Fraunhofer Institute for Solid State Physics IAF, [2]Chalmers University of Technology	**EuMIC03** GaN MMIC Power Amplifiers Chair: Franco Giannini[1] Co-Chair: Patrick Schuh[2] [1]University of Rome Tor Vergata, [2]Hensoldt	**EuMIC04** Receivers and LNAs Chair: Julien Lintignat[1] Co-Chair: Ana Peláez[2] [1]XLIM UMR 7252, University of Limoges/ CNRS, [2]Televes S.A.
08:30 – 08:50	**EuMIC02-1** A 200 mW D-Band Power Amplifier with 17.8% PAE in 250-nm InP HBT Technology Ahmed Ahmed[1], Munkyo Seo[2], Ali Farid[1], Miguel Urteaga[3], James Buckwalter[1], Mark Rodwell[1] [1]University of California, Santa Barbara, [2]Department of Electrical and Computer Engineering, Sungkyunkwan University, South Korea., [3]Teledyne Scientific and Imaging	**EuMIC03-1** Single-Chip 100-Watt S-Band Power Amplifier in 0.25 µm GaN HEMT MMIC Technology Gijs van der Bent[1], Peter de Hek[1], Frank E. van Vliet[1], Zineb Ouarch Provost[2] [1]TNO, [2]UMS	**EuMIC04-1** A CMOS Wide-Band Low Noise Mixer for LTE Application Olim Hidayov[1] [1]Analog Devices GmbH
08:50 – 09:10	**EuMIC02-2** G-Band Power Amplifiers in 130 nm InP Technology Mingquan Bao[1], Vessen Vassilev[2], David Gustafsson[1], Herbert Zirath[2] [1]Ericsson AB, [2]Chalmers University of Technology	**EuMIC03-2** 34 dBm GaN Doherty Power Amplifier for Ka-band satellite downlink Anna Piacibello[1], Rocco Giofrè[2], Roberto Quaglia[3], Vittorio Camarchia[1] [1]Politecnico di Torino, [2]Università di Roma "Tor Vergata", [3]Cardiff Univeristy	**EuMIC04-2** 20-Gb/s 60-GHz OOK Receiver for High-Data-Rate Short-Range Wireless Communications Ali Ferschischi[1], Sami Ur Rehman[1], Vincent Ries[1], Corrado Carta[1], Frank Ellinger[1] [1]Technische Universität Dresden, Germany
09:10 – 09:30	**EuMIC02-3** Full H-Band LNA in 35 nm mHEMT Technology with Constant Current Bias Control Rainer Weber[1], Arnulf Leuther[1], Roger Lozar[1], Hermann Massler[1] [1]Fraunhofer IAF	**EuMIC03-3** A GaN-on-Si MMIC Power Amplifier with 10 W Output Power and 35% Efficiency for Ka-Band Satellite Downlink Paolo Colantonio[1], Rocco Giofrè[2] [1]University of Rome Tor Vergata, [2]University of Roma Tor Vergata	**EuMIC04-3** An 8 Gbps Adaptive Receiver for RF over FSO in 28 nm CMOS Fatemeh Aghlmand[1], Saransh Sharma[1], Azita Emami[1] [1]California Institute of Technology
09:30 – 09:50	**EuMIC02-4** A Full D-Band Low Noise Amplifier in 130 nm SiGe BiCMOS using Zero-Ohm Transmission Lines Tim Maiwald[1], Julian Potschka[1], Katharina Kolb[1], Marco Dietz[1], Klaus Aufinger[2], Akshay Visweswaran[3], Robert Weigel[1] [1]FAU Erlangen-Nürnberg, [2]Infineon Technologies AG, [3]imec, Leuven	**EuMIC03-4** Ka-Band 4 W GaN/Si MMIC Power Amplifier for CW Radar Applications Chiara Ramella[1], Corrado Florian[2], Elisa Cipriani[2], Marco Pirola[1], Franco Giannini[4], Paolo Colantonio[4] [1]Politecnico di Torino - DET, [2]University of Bologna, [3]ESA / ESTEC, [4]University of Rome Tor Vergata	**EuMIC04-4** A High-Gain SiGe BiCMOS LNA for 5G In-Band Full-Duplex Applications Tahsin Alper Ozkan[1], Abdurrahman Burak[1], Ilker Kalyoncu[1], Mehmet Kaynak[2], Yasar Gurbuz[1] [1]Sabanci University, [2]IHP Microelectronics GmbH
09:50 – 10:10	**EuMIC02-5** Design of a 240-GHz LNA in 0.13 µm SiGe BiCMOS Technology Md Najmussadat[1], Raju Ahamed[1], Mikko Varonen[2], Dristy Parveg[2], Yehia Tawfik[1], Kari Halonen[1] [1]School of Electrical Engineering, Aalto University., [2]VTT Technical Research Centre of Finland	**EuMIC03-5** Real-Time, In-Circuit Temperature Sensing of an X-Band GaN Power Amplifier Simon Mahon[1], Olivia Ell[1], Leigh Milner[2], Evgeny Kuxa[1], Anthony Parker[1], Melissa Gorman[1], Michael Heimlich[1] [1]Macquarie University, [2]Defence Science and Technology Group	**EuMIC04-5** A Ku Band MMIC Sigle Chip Frequency Converter for Telecom Satellite Applications Davide Resca[1], Francesco Scappaviva[1], Andrea Biondi[1], Luca Cariani[1], Francesco Vitulli[2] [1]MEC s.r.l, [2]Thales Alenia Space Italia

MONDAY 10:50 – 12:30

ROOM **Polar**

EuMIC01
EuMIC Opening Session
Chairs: François Deborgies[1], EuMIC Chair and Domine Leenaerts[2], EuMIC TPC Chair
Co-chairs: Stefan Heinen[3], EuMIC Co-Chair and Christian Fager[4], EuMIC TPC Co-Chair
[1]ESA-ESTEC, [2]NXP, [3]RWTH Aachen University, [4]Chalmers University of Technology

10:50 – 11:00 Welcome Address
Opening of the European Microwave Integrated Circuits Conference 2020
François Deborgies
EuMIC Chair

11:00 – 11:45 Integrated Circuits for Microwave Applications
Prof. John D. Cressler, Georgia Institute of Technology

11:45 – 12:30 Photonic Integrated Circuits for Microwave Applications
Prof. Alwyn Seeds, University College London

Photonics has found application in microwave systems for low loss transmission and distribution of wideband signals, for signal processing and for signal generation, particularly at THz frequencies. Photonic systems require sub-micron alignment of components due to the short wavelength of the optical sources- commonly in the range 0.8 microns to 1.6 microns. This leads to high assembly costs and significant operating environment challenges. The integration of the components required for a microwave photonic system offers the prospect of reduced assembly costs and the ability to deploy systems in challenging environments. This presentation will describe hybrid and monolithic approaches to integration using Indium Phosphide (InP) technology, including the development of advanced devices such as Uni-Travelling Carrier (UTC) THz photodiodes and advanced tuneable semiconductor lasers. It will also introduce system techniques such as comb generation and optical phase-locking for THz frequency synthesis. The presentation will also introduce advanced technologies for the monolithic integration of semiconductor lasers on Silicon (Si) substrates, which could offer major cost reductions and integration scale increases for future systems. The presentation will conclude with a summary of future opportunities and challenges for integrated microwave photonics.

MONDAY 13:50 – 15:30

Mission 1

EuMIC05
ICs for mmWave Beamforming Systems

Chair: Frank E. van Vliet[1]
Co-Chair: Pierre Busson[2]
[1]TNO, [2]ST Microelectronics

13:50 – 14:10

EuMIC05-1
A Downconversion Link for a 5G Repeater using a Passive Power Adjustment Technique and Analog Predistortion
Julian Potschka[1], Katharina Kolb[1], Tim Maiwald[1], Marco Dietz[1], Amelie Hagelauer[1], Klaus Aufinger[2], Robert Weigel[1]
[1]Friedrich-Alexander University Erlangen-Nuremberg (FAU), [2]Infineon Technologies AG

14:10 – 14:30

EuMIC05-2
A V-Band Vector Modulator Based Phase Shifter in BiCMOS 0.13 µm SiGe Technology
Kevin Drenkhahn[1], Ahmed Gadallah[2], Aniello Franzese[2], Christoph Wagner[1], Andrea Malignaggi[2]
[1]TU Ilmenau, [2]IHP - Leibniz-Institut für innovative Mikroelektronik

14:30 – 14:50

EuMIC05-3
A 65 nm CMOS SOI 4-bit Digitally Controlled Variable Gain Amplifier for Ka-Band Beamforming
Steeven Voisin[1], Vincent Knopik[1], Jeremie Forest[1], Eric Kerhervé[2]
[1]STMicroelectronics, [2]University of Bordeaux, Bordeaux INP, UMR CNRS 5218, IMS Laboratory

14:50 – 15:10

EuMIC05-4
34-42 GHz CMOS Transceiver Frontend for Versatile Arrays
Sumeet Londhe[1], Noam Smilovich[1], Shay Avner[1], Noam Bar-Helmer[2], Samuel Jameson[2], Eran Socher[1]
[1]Tel Aviv University, [2]Rafael Advanced Teachnologies

15:10 – 15:30

EuMIC05-5
A 28 GHz and 38 GHz High-Gain Dual-Band LNA for 5G Wireless Systems in 22 nm FD-SOI CMOS
Xin Xu[1], Stefan Schumann[1], Ali Ferschischi[1], Wolfgang Finger[2], Corrado Carta[1], Frank Ellinger[1]
[1]Technische Universität Dresden, [2]Globalfoundries Dresden LLC & Co. KG

Mission 2

EuMIC06
Advances in mmWave and High Power Technologies

Chair: Peter Magnee[1]
Co-Chair: Rüdiger Quay[2]
[1]NXP Semiconductors, [2]IAF-Fraunhofer: Fraunhofer Institute for Applied Solid-State Physics

13:50 – 14:10

EuMIC06-1
Back Gate Impact on the Noise Performances of 22FDX Fully-Depleted SOI CMOS
Ousmane Kane[1], Luca Lucci[1], Pascal Scheiblin[1], Thierry Poiroux[1], Jean Charles Barbe[1], François Danneville[2]
[1]CEA LETI, [2]IEMN, Univ. Lille, UMR 8520 CNRS, Avenue Poincaré, F-59652 Villeneuve d'Ascq

14:10 – 14:30

EuMIC06-2
Design of III-V Vertical Nanowire MOSFETs for Near-Unilateral Millimeter-Wave Operation
Stefan Andrić[1], Lars Ohlsson Fhager[1], Lars-Erik Wernersson[1]
[1]Lund Univeristy

14:30 – 14:50

EuMIC06-3
DC and RF Characterization of Nano-Ridge HBT Technology Integrated on 300 mm Si Substrates
Sachin Yadav[1], Abhitosh Vais[1], Rana Y. Elkashlan[1], Liesbeth Witters[1], Komal Vondkar[1], Yves Mols[1], Amey Walke[1], Hao Yu[1], Reynald Alcotte[1], Mark Ingels[1], Piet Wambacq[1], Robert Langer[1], Bernardette Kunert[1], Niamh Waldron[1], Bertrand Parvais[1], Nadine Collaert[1]
[1]imec, Leuven

14:50 – 15:10

EuMIC06-4
Reconfigurable PCM GeTe-Based Latching 6-bit Digital Switched Capacitor Bank
Tejinder Singh[1], Raafat R. Mansour[1]
[1]University of Waterloo

15:10 – 15:30

EuMIC06-5
A GaN/SiC UHF PA for Particle Accelerators with 100-145V Quasi-Static Drain Modulation
Gabriele Formicone[1], James Custer[1]
[1]Integra Technologies, Inc.

Quest

EuMIC07
Oscillators and Switches

Chair: Vadim Issakov[1]
Co-Chair: Patrice Gamand[2]
[1]University of Magdeburg, [2]ALPHA-RLH

13:50 – 14:10

EuMIC07-1
Free-Running 2.4 GHz Ring Oscillator-Based FSK TX/RX for Ultra-Small IoT Motes
David Burnett[1], Filip Maksimovic[1], Brad Wheeler[1], Osama Khan[1], Ali Niknejad[1], Kristofer Pister[1]
[1]University of California, Berkeley

14:10 – 14:30

EuMIC07-2
Linearity Enhancement Method for a Wide-Band Digitally Controlled Oscillator
Yun Fang[1], Zhong Tang[1], Xiao-Peng Yu[1], Zhiwei Xu[1], Hao Gao[2]
[1]Zhejiang University, [2]Eindhoven University of Technology (TU/e)

14:30 – 14:50

EuMIC07-3
A 33% Tuning Range Cross-Coupled DCO with "Folded" Common Mode Resonator Covering both 5G MMW Bands in 16-nm CMOS FinFET
Igor Gertman[1], Run Levinger[1], Sergey Bershansky[1], Jasmin Kadry[1], Gil Horovitz[1]
[1]Intel Corp.

14:50 – 15:10

EuMIC07-4
A Non-Reflective T/R Switch with Leakage Cancellation Technique for 5G mmWave Application
Yi-Tong Wang[1], Lin-Sheng Wu[1], Liang-Feng Qiu[1], Li-Yun Shi[1], Junfa Mao[1]
[1]Shanghai Jiao Tong University

15:10 – 15:30

EuMIC07-5
RF SPST Switch Based on Innovative Heterogeneous GaN/SOI Integration Technique
Frederic Drillet[1], Jerome Loraine[1], Hassan Saleh[1], Imene Lahbib[1], Brice Grandchamp[1], Lucas Iogna-Prat[1], Insaf Lahbib[1], Ousmane Sow[1], Gregory U'Ren[1]
[1]X-FAB

MONDAY 16:10 – 17:50

Mission 1

EuMIC08
ICs for Communication and Sensing

Chair: Herbert Zirath[1]
Co-Chair: Ian Gresham[2]
[1]Chalmers University of Technology, [2]Anokiwave

16:10 – 16:30

EuMIC08-1
A 1-to-4 SiGe BiCMOS Analog Demultiplexer Sampling Front-End for a 116 GBaud-Receiver
Philipp Thomas[1], Tobias Tannert[1], Markus Grözing[1], Xuan-Quang Du[1], Manfred Berroth[1]
[1]University of Stuttgart

16:30 – 16:50

EuMIC08-2
An Analog Costas Loop MMIC in 130 nm SiGe BiCMOS Technology for Receiver Synchronization of QPSK and BPSK Modulated Signals
Eswara Rao Bammidi[1], Ingmar Kallfass[1]
[1]Institute of Robust Power Semiconductor Systems (ILH) - University of Stuttgart

16:50 – 17:10

EuMIC08-3
Design Considerations on the Realization of Signal Sources at mm-Waves
Leonardo Pantoli[1], Habeeb Bello[1], Giorgio Leuzzi[1], Herman Jalli Ng[2], Dietmar Kissinger[2]
[1]University of L'Aquila, [2]IHP-Leibniz-Institut für innovative Mikroelektronik, [3]Institute of Electronic Devices and Circuits, Ulm University

17:10 – 17:30

EuMIC08-4
A 95-135 GHz Low Power Dicke Radiometer in SiGe BiCMOS Technology
Roee Ben-Yishay[1], Danny Elad[1]
[1]ON Semiconductor

17:30 – 17:50

EuMIC08-5
E/W-Band CPW-based Amplifier MMICs Fabricated in a 60 nm GaN-on-Silicon Foundry Process
Robert Malmqvist[1], Rolf Jonsson[1], Anders Bernland[1], Mingquan Bao[2], Rémy Leblanc[3], Koen Buisman[4], Christian Fager[4], Kristoffer Andersson[2]
[1]Swedish Defence Research Agency (FOI), [2]Ericsson Research, Ericsson AB, [3]OMMIC SAS, [4]Chalmers University of Technology

Mission 2

EuMIC09
Advanced Solutions for Integrated Power Amplifiers

Chair: Joseph Staudinger[1]
Co-Chair: Paolo Colantonio[2]
[1]NXP Semiconductor Inc, [2]University of Rome Tor Vergata

16:10 – 16:30

EuMIC09-1
Design of a Compact Power Amplifier with 18.6 dBm 60 GHz 20.5% PAE in 22 nm FD-SOI
Mengqi Cui[1], Zoltán Tibenszky[1], Corrado Carta[1], Frank Ellinger[1]
[1]Technische Universität Dresden

16:30 – 16:50

EuMIC09-2
Ka-Band Dual Input Stacked 22 nm CMOS FDSOI Power Amplifier with Transformer-Based Power Combiner
Jere Rusanen[1], Nuutti Tervo[1], Timo Rahkonen[1], Aarno Pärssinen[1], Janne P. Aikio[1]
[1]University of Oulu

16:50 – 17:10

EuMIC09-3
A 28-GHz High Linearity and High Efficiency Class-F Power Amplifier in 90-nm CMOS Process for 5G Communications
Bo-Ze Lu[1], Yunshan Wang[1], Zhi-Jia Huang[1], Kun-You Lin[1], Huei Wang[1]
[1]National Taiwan University

17:10 – 17:30

EuMIC09-4
A 2 GHz Compact 60 W Fully Integrated 3-Way Doherty for Simultaneous Dual-Band Operation
Marc Vigneau[1], Mariano Ercoli[1]
[1]Ampleon

17:30 – 17:50

EuMIC09-5
A High-Linear Ka-Band Power Amplifier with Diode-Based Analogue Predistortion
Junlei Zhao[1], Adam Cooman[1], Alireza Shamsafar[1], Mohadig Rousstia[1], Domenico Calzona[1], Sergio Pires[1]
[1]Ampleon Netherlands B.V.

Quest

EuMIC10
Nonlinear Modelling

Chair: Justin King[1]
Co-Chair: Valeria Vadalà[2]
[1]Trinity College Dublin, [2]University of Ferrara

16:10 – 16:30

EuMIC10-1
Advanced Modelling Techniques Enabling E-Band Power Amplifier Design for 5G Backhauling
Valeria Vadalà[1], Antonio Raffo[1], Alberto Colzani[2], Matteo Angelo Fumagalli[2], Giuseppe Sivverini[2], Gianni Bosi[1], Giorgio Vannini[1]
[1]University of Ferrara, [2]SIAE Microelettronica S.p.A.

16:30 – 16:50

EuMIC10-2
Simulating Drain Lag of GaN HEMTs with Physics-Based ASM Model
Petros Beleniotis[1], Frank Schnieder[2], Matthias Rudolph[1]
[1]Brandenburg University of Technology (BTU) Cottbus-Senftenberg, [2]Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik

16:50 – 17:10

EuMIC10-3
Modelling of InP DHBTs in a Transferred-Substrate Technology with Diamond Heat Spreader
Tom Keinicke Johansen[1], Maruf Hossain[2], Ralf Doerner[2], Hady Yacoub[2], Ksenia Nosaeva[2], Tanjil Shivan[2], Wolfgang Heinrich[2], Viktor Krozer[2]
[1]Technical University of Denmark, [2]Ferdinand-Braun-Institut (FBH) Leibniz-Institut für Höchstfrequenztechnik

17:10 – 17:30

EuMIC10-4
Energy and Charge Conservation for FET Models
Ciarán Wilson[1], Marek Schmidt-Szalowski[2], Justin King[3]
[1]University College Dublin, [2]Ampleon Netherlands, [3]Trinity College Dublin

17:30 – 17:50

EuMIC10-5
Estimation of Large-Signal Output Capacitance of a Power Transistor
Marek Schmidt-Szalowski[1], Mauro Marchetti[2], Gustavo Avolio[2]
[1]Ampleon, [2]Anteverta MW|Maury Microwave

TUESDAY

Room	08:30 – 10:10	10:50 – 12:30		13:50 – 15:30	16:10 – 17:50	EVENING PROGRAMME
Mission 1	**EuMIC11** Transceiver and Transmitter ICs		**EuMIC13** Foundry Panel	**EuMC07** Wireless Communication Systems	**EuMC14** Microwave and mmWave Systems	
Mission 2	**EuMC01** Power Amplifiers for Sub 6 GHz Application			**EuMC08** Power Amplifiers Based on III-V & CMOS Technologies for 5G	**EuMC15** Doherty and Load Modulated Power Amplifier Structures	
Quest	**EuMIC/EuMC01** Silicon Integrated Sub-mmWave Circuits			**EuMC09** Terahertz Electronic Devices	**EuMC16** Terahertz Photonic Devices and System	
Expedition	**EuMC12** Design and Characterisation Techniques			**EuMC10** MIMO and 5G Antennas	**EuMC17** Phased and Transmit Arrays	
Polar				**EuMIC14** 1-Minute Poster Pitch (13:50 - 14:10)	**EuMIC16** EuMIC Closing Session	
Auditorium	**Automotive Forum** Automotive Radar: Waveforms, Architectures, AI and Interference		**Technology in Context** Philosophical Lecture	**Automotive Forum** Automotive Radar: Waveforms, Architectures, AI and Interference		
Spark	**EuMC02** Array Antennas			**EuMC11** Waveguide and Horn Antennas	**EuMC18** 5G Antenna Systems	
Flash	**EuMC03** Advanced Packaging Components and Techniques			**EuMC12** Advanced Packaging Solutions for mmWave Applications	**EuMC19** 3D-Printing Technologies	
Glow	**EuMC04** Theoretical and Computational Electromagnetics			**EuMC13** Numerical Methods in Microwave Technology	**EuMC20** Modelling of Field Radiation and Scattering	
Beam	**Student School** Build Your Own Radar: Instruction			**W-25** Advanced mmWave Radar System Solutions for Industrial and Consumer Sensing Applications		
Media arena	**EuMC05** 1-Minute Poster Pitch (09:40 - 10:10)		**Women in Microwaves** Lunch Lecture	**Career Platform** How to Stand Out in a Job Application	**Women in Microwaves** Panel Discussion	
Fluor					**Teaching Microwaves** Increase Your Microwave Lecturing Skills	
Round control		**Career Platform** Career Lounge: Meet Jobs, Build Careers				
Transitzone B			**Automotive Forum** Lunch			
Transitzone C		**Student School** Build Your Own Radar: Hands-On Experience				
loopbrug	**Career Platform** Company Wall and Job Wall					
Beatrix		**Opening of the European Microwave Week** EuMC/EuMW Opening				
Juliana 2	**W-05** Digital Predistortion for 5G MIMO Wireless Transmitters					
Hall 1			**EuMC06** Interactive Poster Session	**EuMIC15** Interactive Poster Session		
Hall 1	**Student Design Competition** Detect a Drone / Build (a part of) an Amplifier					
Off-site				**Women in Microwaves** Utrecht City Tour		**EuMW Welcome Reception** 18.30 - 22.00

EuMW EuMC EuRAD EuMIC Student Activity EuMIC/EuMC EuMC/EuRAD

TUESDAY 08:30 – 10:10

Mission 2

EuMC01
Power Amplifiers for Sub 6 GHz Application

Chair: Olof Bengtsson[1]

Co-Chair: Mark van der Heijden[2]

[1]Ferdinand-Braun-Institut (FBH), [2]NXP Semiconductors

08:30 – 08:50

EuMC01-1
Efficiency and Linearity of Digital "Class-C Like" Transmitters

Dieuwert Mul[1], Robert Bootsman[1], Quinten Bruinsma[1], Yiyu Shen[1], Sebastian Krause[2], Rüdiger Quay[2], Marco Pelk[1], Fred van Rijs[3], Rob Heeres[3], Sergio Pires[3], Morteza S. Alavi[1], Leo C.N. de Vreede[1]

[1]Delft University of Technology, [2]Fraunhofer IAF, [3]Ampleon Netherlands B.V.

08:50 – 09:10

EuMC01-2
A 2.4/3.5 GHz Dual-Band Power Amplifier with Filter-Based Bias Network and SRFT Matching

Saraunsh Bayaskar[1], Paolo Enrico de Falco[2], Taylor Barton[3]

[1]Qorvo, [2]University of Colorado, Boulder, [3]University of Colorado Boulder

09:10 – 09:30

EuMC01-3
A Miniaturized 160 W Power Amplifier with 40% Efficiency at 9 dB Power Back-Off over 2.3–4.7 GHz

Mustazar Iqbal[1], Rui Hou[1], Gunnar Johansson[1], Richard Hellberg[1], Bo Berglund[1]

[1]Ericsson AB

09:30 – 09:50

EuMC01-4
2-GHz Class-E Power Amplifier Using a Compact Redundancy-Free Harmonic Tuning Circuit

Shinichi Tanaka[1], Hirotaka Asami[1]

[1]Shibaura Institute of Technology

09:50 – 10:10

EuMC01-5
A 90W 1-3 GHz Power Amplifier Module

Mohammad Ghazizadeh[1], Sayyed-Hossein Javid-Hosseini[1], Vahid Nayyeri[1]

[1]Iran University of Science & Technology

Spark

EuMC02
Array Antennas

Chair: Ilona Rolfes[1]

Co-Chair: Antti Räisänen[2]

[1]Ruhr-University Bochum, [2]Aalto University

08:30 – 08:50

EuMC02-1
Endfire Coupled-Mode Patch Antenna Array with Balanced Feeding

Haozhan Tian[1], Tatsuo Itoh[2]

[1]University of California Los Angeles (UCLA), [2]University of California, Los Angeles

08:50 – 09:10

EuMC02-2
Gap-Waveguide Cavity Slot Array Based on Two Metal Layers at 120 GHz

Teng Li[1], Florian Boes[1], Karina Schneider[1], Thomas Zwick[1]

[1]Karlsruhe Institute of Technology

09:10 – 09:30

EuMC02-3
A Wideband Slot Array Antenna with Cosecant Squared Pattern

Qiang Wang[1], Fengyun Cui[1], Lin Pan[2], Panpan Chen[1], Lincui Li[1]

[1]Institute of Engineering Electronics, China Academy of Engieering physics, [2]China Academy of Engieering physics

09:30 – 09:50

EuMC02-4
A C-band Transmitarray for Spatial Muliplexing and Diversity Applications

Pavel Turalchuk[1], Irina Munina[2], Vitaliy Kirillov[2], Alexander Verevkin[2], Dmitry Zelenchuk[3]

[1]St. Petersburg Electrotechnical University "LETI", [2]St. Petersburg Electrotechnical University "LETI", [3]Queen's University Belfast

09:50 – 10:10

EuMC02-5
A Low-Profile Shared-Aperture Dual-Band Broadband Antenna Array for SAR Applications

Tao Dong[1], Ke Li[1], Zhenghuan Xia[1], Xinhua Li[1]

[1]Beijing Institute of Satellite Information Engineering

Flash

EuMC03
Advanced Packaging Components and Techniques

Chair: Kamal K Samanta[1]

Co-Chair: Miguel Sanchez-Soriano[2]

[1]Sony Europe B V, [2]University of Alicante

08:30 – 08:50

EuMC03-1
BenzoCycloButene-Based In-Package Substrate Integrated Waveguides for Sub-THz Applications

Giuseppe Acri[1], Emmanuel Pistono[2], Florence Podevin[1], Philippe Ferrari[2], Luigi Boccia[3], Anne-Sophie Grimault[4], Nicolas Zerounian[4], Frédéric Aniel[4], Loïc Vincent[5]

[1]INPG, RFIC-Lab, [2]UGA, RFIC-Lab, [3]University of Calabria, [4]Centre de Nanosciences et Nanotechnologies, [5]INPG, CIME

08:50 – 09:10

EuMC03-2
Large Scale Array Antenna Packaging for 5G mmWave Base Station

Dohyuk Ha[1], Kwanghyun Baek[1], Juneseok Lee[1], Sanghoon Park[1], Jung-Ho Park[1], Jinsu Heo[1], YoungJu Lee[1]

[1]Samsung Electronics

09:10 – 09:30

EuMC03-3
Integrated Microfluidic Cooling for S-Band 10-Watt CW Power Amplifiers on Hybrid PCBs

Huaiqiang Yu[1]

[1]Sichuan Institute of Piezoelectric and Acousto-optic Technology (SIPAT)

09:30 – 09:50

EuMC03-4
A U-Band Rectangular Waveguide-to-Coplanar Waveguide Transition Using Metal Ridge

Yunfeng Dong[1], Vitaliy Zhurbenko[1], Tom Keinicke Johansen[1]

[1]Technical University of Denmark

09:50 – 10:10

EuMC03-5
Via-Less Waveguide-to-Stripline Transition Using 2D Electromagnetic Bandgap Structure

Zhi Li[1], Kevin Xu[1], Nathan Chordas-Ewell[1], Dongyin Ren[2], Jun H. Choi[1], Ryan Wu[2]

[1]The State University of New York at Buffalo, [2]NXP Semiconductors

Glow

EuMC04
Theoretical and Computational Electromagnetics

Chair: Francisco Mesa[1]

Co-Chair: Alessandro Galli[2]

[1]Universidad de Sevilla, [2]Sapienza University of Rome

08:30 – 08:50

EuMC04-1
Designing Microwave Circuits Using Genetic Algorithms Accelerated by Convolutional Neural Networks

Takuma Akada[1], Kazuhiro Fujimori[1]

[1]Graduate School of Natural Science and Technology, Okayama University

08:50 – 09:10

EuMC04-2
A DE/WD/VM Hybrid Algorithm for Multiple-Constraint Synthesis of Concentric Ring Arrays

Shaoyi Xie[1], Jiawei Li[1], Hao Shao[1], Letian Guo[1], Guangjian Deng[1]

[1]Northwest Institute of Nuclear Technology

09:10 – 09:30

EuMC04-3
An Efficient Butterfly Factorization-Based Method for Electromagnetic Near-Field Calculations

XiaoWei Huang[1], XinQing Sheng[1]

[1]Beijing Institute of Technology

09:30 – 09:50

EuMC04-4
A Randomized Low-Rank Decomposition Based Method for Solving Volume-Surface Integral Equation

Yan-Nan Liu[1]

[1]CAEP Software Center for High Performance Numerical Simulation

TUESDAY 08:30 – 10:10

Quest

EuMIC/EuMC01
Silicon Integrated Sub-mmWave Circuits

Chair: Christophe Gaquiere[1]
Co-Chair: François Deborgies[2]
[1]University of Lille, [2]ESA-ESTEC

08:30 – 08:50
EuMIC/EuMC01-1
A 240-GHz FMCW Radar Transceiver with 10 dBm Output Power using Quadrature Combining
Faisal Ahmed[1], Muhammad Furqan[1], Klaus Aufinger[1], Andreas Stelzer[2]
[1]Infineon Technologies AG, [2]Johannes Kepler Universität

08:50 – 09:10
EuMIC/EuMC01-2
A 160 GHz High Output Power and High DC-to-RF Efficiency Fundamental Oscillator in a 130-nm SiGe BiCMOS Process
Xingcun Li[1], Wenhua Chen[1], Yunfan Wang[1], Zhenghe Feng[1]
[1]Tsinghua University

09:10 – 09:30
EuMIC/EuMC01-3
250 GHz SiGe SPDT Resonator Switch
Yehia Tawfik[1], Ahamed Raju[1], Mikko Varonen[2], Md Najmussadat[1], Kari Halonen[1]
[1]Aalto University, [2]VTT Technical Research Centre of Finland

09:30 – 09:50
EuMIC/EuMC01-4
Compact and Transfer Printable 64 Gb/s Differential Transimpedance Amplifier in 130-nm SiGe BiCMOS
Mesut Inac[1], Adel Fatemi[1], Friedel Gerfers[2], Andrea Malignaggi[1]
[1]IHP - Leibniz Institut für innovative Mikroelektronik, [2]Technische Universität Berlin

09:50 – 10:10
EuMIC/EuMC01-5
A 122-242 GHz Dynamic Frequency Divider in an Advanced BiCMOS Technology
Badou Sene[1], Herbert Knapp[1], Daniel Reiter[1], Nils Pohl[2]
[1]Infineon Technologies AG, [2]Ruhr University Bochum

Mission 1

EuMIC11
Transceiver and Transmitter ICs

Chair: Sébastien Chartier[1]
Co-Chair: Ingmar Kallfass[2]
[1]Fraunhofer Institute for Applied Solid State Physics (IAF), [2]Institute of Robust Power Semiconductor Systems (ILH) - University of Stuttgart

EuMIC11-1
Single Chip Transmitter with Integrated Up-Converter and PLL for Ku-Band M2M Applications
Maurice van Wanum[1], Enrico Lia[2], Lex de Boer[1], Lennaert Bronts[1], Marien Rodenburg[1], Sebastiaan Jacobs[1], Inês Inácio[1], Marc van Heijningen[1], Frank E. van Vliet[1]
[1]TNO, [2]ESA-ESTEC

EuMIC11-2
A Full E-Band Single-Channel SiGe Transceiver MMIC for Monostatic FMCW Radar Systems
Christian Bredendiek[1], Steffen Hansen[1], Gunnar Briese[1], Nils Pohl[2]
[1]Fraunhofer FHR, [2]Ruhr-Universität Bochum

EuMIC11-3
A 76 GHz CMOS Low-PDC Transmitter with 15 dBm PSAT at 150°C for Automotive Radar
Nobumasa Hasegawa[1], Shuya Kishimoto[1], Shinji Yamaura[1]
[1]DENSO CORPORATION

EuMIC11-4
A W-Band Transceiver Chip for Future 5G Communications in InP-DHBT Technology
Maruf Hossain[1], Tanjil Shivan[1], Michael Hrobak[1], Thualfiqar Al-Sawaf[1], Dimitri Stoppel[1], Hady Yacoub[1], Nils Weimann[1], Wolfgang Heinrich[1], Viktor Krozer[1]
[1]Ferdinand-Braun-Institut (FBH) Leibniz-Institut für Höchstfrequenztechnik

EuMIC11-5
A Low Power Consumption 65-nm CMOS True Time Delay N-path Circuit Achieving 2 ps Delay Resolution
Erez Zolkov[1], Roy Weiss[1], Asher Madjar[1], Emanuel Cohen[1]
[1]Technion - Israel Institute of Technology

Expedition

EuMIC12
Design and Characterisation Techniques

Chair: Ernesto Limiti[1]
Co-Chair: Simona Donati Guerrieri[2]
[1]5 EE Dept, University of Rome "Tor Vergata", Rome, Italy, [2]Politecnico di Torino

EuMIC12-1
Effects of Load Impedances at Third Order Intermodulation Tones
Eigo Kuwata[1], Yashar Alimohammadi[1], Xuan Liu[1], James Bell[1], Paul Tasker[1], Shintaro Shinjo[2], Johannes Benedikt[1]
[1]Cardiff Univeristy, [2]Mitsubishi Electric Corporation

EuMIC12-2
Intermodulation Distortion Analysis of Microwave Tunable Filters Using Barium Strontium Titanate Capacitor and Varactor Diode
Patricia Bouça[1], Ricardo Figueiredo[1], João Matos[1], Paula Vilarinho[2], Nuno Borges Carvalho[1]
[1]University of Aveiro / Instituto de Telecomunicações, [2]University of Aveiro

EuMIC12-3
Non-Linear Analysis of a Broadband Power Amplifier at 300 GHz
haitham ghanem[1], Benjamin Schoch[2], Ingmar Kallfass[2], Pascal Szriftgiser[3], Malek Zegaoui[1], Mohammed Zaknoune[1], François Danneville[1], Guillaume Ducournau[1]
[1]IEMN, Univ. Lille, UMR 8520 CNRS, Avenue Poincaré, F-59652 Villeneuve d'Ascq, [2]Institute of Robust Power Semiconductor Systems, University of Stuttgart, [3]Laboratoire de Physique des Lasers Atomes et Molécules (PhLAM)

EuMIC12-4
Global Assessment of PA Variability through Concurrent Physics-Based X-Parameter and Electro-Magnetic Simulations
Simona Donati Guerrieri[1], Chiara Ramella[1], Fabrizio Bonani[1], Giovanni Ghione[1]
[1]Politecnico di Torino

EuMIC12-5
Spatial Power Combining and Impedance Matching Silicon-IC-to-Waveguide Contactless Transition
Piyush Kaul[1], Alhassan Aljarosha[2], Bart Smolders[2], Marion K. Matters-Kammerer[2], Rob Maaskant[2]
[1]Eindhoven University of Technology, [2]Eindhoven Univeristy of Technology

TUESDAY 10:50 – 12:30

Beatrix

EuMW01
EuMW/EuMC Opening Session

Chair: Prof. Frank E. van Vliet[1], General Chair
Co-Chair: Wim van Cappellen[2], EuMC Chair
[1]TNO, [2]ASTRON

10:50 – 10:55
Welcome Address: Opening of the European Microwave Week 2020
Frank E. van Vliet
General Chair

10:55 – 11:05
EuMA Welcome Address
Frank van den Bogaart
EuMA President

11:05 – 11:10
Greetings from the EuMW 2020 Platinum Sponsor

11:10 – 11:15
Greetings from the IEEE MTT-S
Alaa Abunjaileh
IEEE MTT-S President

11:15 – 11:35
Awards Ceremony
Andy Gibson
Manchester Metropolitan University

EuMA Pioneer Award

EuMA Distinguished Service Award

Certificate of Recognition for EuMW 2019 General Chair

International Journal of Microwave and Wireless Technologies Best Paper Prize

11:35 – 12:10
How Connectivity Technologies are Changing Vehicles
Lars Reger[1]
[1]Executive Vice President & CTO, NXP Semiconductors
Advances is connectivity technologies are opening up new ways for cars to interact with their passengers, objects in their surroundings and other cars. Ultra-Wideband (UWB) technology is growing in importance because of its ability to provide precise, secure and real-time localization capabilities. Designed to give spatial awareness to cars, mobiles, and other smart devices, UWB is ensuring higher levels of security against car theft from relay station attacks in first series cars that are on the road today. But it can do much more. NXP, as well as Volkswagen and Continental, have demonstrated a variety of exciting new use cases for UWB in automotive applications. Automotive radar technology is also evolving to include connectivity-light functionality. How will RFIC, microwave technology and connectivity transform the driving experience of tomorrow?

12:10 – 12:30
Interactive EuMW Quiz
Wim van Cappellen
EuMC Chair

TUESDAY 12:30 – 14:20

Meet:
Visit to benefit from in-depth discussions during Tuesday's poster session.

Hall 1

EuMC06
EuMC Interactive Poster Session 1

Chair: Jan Geralt bij de Vaate[1]
Co-Chair: Mark Oude Alink[2]
[1]ASTRON, [2]University of Twente

EuMC06-1
Miniature Wilkinson Power Divider Based on Slow-Wave Microstrip Technology
Hamza Issa[1], Darine Kaddour[2], Philippe Ferrari[3]
[1]BAU, [2]Univ. Grenoble Alpes, Grenoble INP, LCIS, [3]Univ. Grenoble Alpes, RFIC-Lab

EuMC06-2
Extended Smith Chart Concept and Application to Oscillator Analysis
Shigeki Takeda[1], Chun-Ping Chen[2], Tetsuo Anada[2]
[1]Antenna Giken Co., Ltd., [2]Kanagawa University

EuMC06-3
High Quality Integrated Inductors in Fan-out Wafer-Level Packaging Technology for mmWave Applications
Kavin Senthil Murugesan[1], Mykola Chernobryvko[2], Sherko Zinal[2], Marco Rossi[2], Ivan Ndip[2], Mathias Boettcher[2], Klaus-Dieter Lang[2], Marcel Wieland[3], Christian Goetze[3], Saquib Bin Halim[3], Jean Trewhella[3]
[1]TU Berlin, [2]Fraunhofer Institut für Zuverlässigkeit und Mikrointegration (IZM), [3]Global Foundries

EuMC06-4
Coupled-Resonator Bandpass Power Dividers Based on Connected-Coupling Mechanisms
Shih-Cheng Lin[1], Yuan-Chun Lin[1], Sheng-Fuh Chang[1]
[1]National Chung Cheng University

EuMC06-5
Compact Wideband Bandpass Filter Using Miniaturized Staircase Interdigital Resonators
Abdulrahman Widaa[1], Chang Jiang You[2], Mohammed Awad[2], Jingye Cai[2]
[1]Kiel University, [2]University of Electronic Science and Technology of China

EuMC06-6
An X-band Cross-Coupled SIW Cavity VCO
Teanette van der Spuy[1], Tinus Stander[1]
[1]University of Pretoria

EuMC06-7
Wideband transversal acoustic wave filters. Application to connected cars.
Rafael Perea-Robles[1], Jordi Mateu[1], Carlos Collado[1], Robert Aigner[2]
[1]Technical University of Catalonia, [2]Qorvo

EuMC06-8
A 24-38 GHz CMOS Wideband Frequency Quadrupler for Multi-Band Applications
Ping-Hsun Wu[1]
[1]ITRI

EuMC06-9
Flexible Self-Resonant Detector Coil for Magnetic Resonance Imaging of Carbon-13
Vitaliy Zhurbenko[1], Juan D. Sánchez-Heredia[1], Wenjun Wang[1], Jan H. Ardenkjær-Larsen[1]
[1]Technical University of Denmark

EuMC06-10
A Novel Compact Microstrip Diplexer with Closely Spaced Channels
Ali Kursad Gorur[1], Alper Turkeli[2], Engın Dogan[3], Ceyhun Karpuz[4], Adnan Gorur[3]
[1]Nevsehir Haci Bektas Veli University, [2]Nevsehir Hacı Bektas Veli University, [3]Nigde Omer Halisdemir University, [4]Pamukkale University

EuMC06-11
Alternative Solutions for Reducing the Undesired Coupling Effect in Stub Loaded Microstrip Filters for Ka-Band Applications
Celia Gomez Molina[1], Juan Hinojosa[1], Fernando Quesada Pereira[1], Vicente Enrique Boria Esbert[2], Marco Guglielmi[2], Alejandro Alvarez Melcon[1], Giuseppe Macchiarella[3]
[1]Universidad Politécnica de Cartagena, [2]Universidad Politécnica de Valencia, [3]Politecnico di Milano

EuMC06-12
Compact Dual-Band Bandpass Filter Using Single Perturbed Rectangular Patch Resonator with Stubs
Jiawei Liu[1], Yonghong Zhang[1], Xiang Wan[1]
[1]University of Electronic Science and Technology of China

EuMC06-13
Open-/Short- Circuited Coupled-Line Structures for the Design of High-Selectivity Bandpass Filter
Photos Vryonides[1], Salman Arain[1], Abdul Quddious[2], Symeon Nikolaou[1]
[1]Frederick University Nicosia, Cyprus, [2]University of Cyprus

EuMC06-14
Phase De-Embedding of Microwave Filter with Use of Cauchy Method and Extraction of Approximated Polynomial Greatest Common Divisor
Jędrzej Michalczyk[1], Jerzy Julian Michalski[2]
[1]SpaceForest Ltd., [2]SpaceForest

EuMC06-15
A New Method to Design Ceramic Filters with Finite Transmission Zeros
Huairen Yi[1], Zhengxiang Ma[1]
[1]Futurewei Technologies

EuMC06-16
A 28 GHz >30 dBm Output P1dB SPDT Switch with Integrated ESD Protection in CMOS 65 nm
Seunghyun Jang, Sunwoo Kong[1], Hui Dong Lee[1], Jeehoon Park[1], Kwang-Seon Kim[1], Bonghyuk Park[1]
[1]ETRI

EuMC06-17
Design of a Low Noise Amplifier MMIC from 71-76GHz using GaAs mHEMT Technology
PRATIK DESHPANDE[1], Kai Parow Souchon[2], Jim Mayock[1], Qing Sun[1], Ben Rackauskas[2], Richard Reeves[2], Petar Jankovic[3], Václav Valenta[3]
[1]VIPER RF, [2]STFC Rutherford Appleton Laboratory, [3]European Space Agency, ESA/ESTEC

EuMC06-18
Multi-Band, Multi-Technology Remote Unit (RU) Based on RFSoC
Samuel Pereira[1], Luís Almeira[1], Arnaldo Oliveira[1], Nuno Borges Carvalho[1], Paulo Monteiro[1]
[1]Universidade de Aveiro

TUESDAY 13:50 – 15:30

Mission 1

EuMC07
Wireless Communication Systems

Chair: Ilona Rolfes[1]
Co-Chair: Alexander Koelpin[2]
[1]Ruhr-University Bochum, [2]Brandenburg University of Technology

13:50 – 14:10

EuMC07-1
Millimetre-Wave and Sub-Terahertz Technology and Research Trends for High Data Rate Communications - An Industry View
Renato Lombardi[1]
INDUSTRIAL KEYNOTE
[1]Huawei IT

14:10 – 14:30

EuMC07-2
5G mm-Wave Over-The-Air Measurements of an Agile Multi-Beam Front-End
Steffen Spira[1], Kurt Blau[1], Reiner Thomä[1], Matthias A. Hein[1]
[1]Technische Universität Ilmenau

14:30 – 14:50

EuMC07-3
D-band Transmission Hub for Point to MultiPoint Wireless Distribution
Maruf Hossain[1], Viktor Krozer[2], Trung Le[3], et al.*
[1]I Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, Berlin, Germany, [2]Goethe University Frankfurt/M, Frankfurt 60323, Germany, [3]HF Systems Engineering GmbH, Kassel 34123, Germany*
*For the complete author and affiliation list, please refer to the conference proceedings.

14:50 – 15:10

EuMC07-4
Miniaturized Slot-Loaded SIW Resonator and Its Application to C-Band Low Phase Noise Oscillator
Samundra Kumar Thapa[1], Chen Baichuan[1], Adel Barakat[1], Kuniaki Yoshitomi[1], Ramesh Kumar Pokharel[1]
[1]Kyushu University

15:10 – 15:30

EuMC07-5
A 61-GHz RFID Frontend with SiGe Transceiver MMIC and SIW Coupling Network
Dominic Funke[1], Steffen Hansen[2], Christian Bredendiek[2], Thorben Grenter[3], Gerd vom Bögel[3], et al.*
[1]Ruhr-University Bochum, [2]Fraunhofer Institute for High Frequency Physics and Radar Techniques (FHR), [3]Fraunhofer Institute for Microelectronic Circuits and Systems (IMS), [4]Fraunhofer Institute for Photonic Microsystems (IPMS)
*For the complete author list, please refer to the conference proceedings.

Mission 2

EuMC08
Power Amplifiers Based on III-V & CMOS Technologies for 5G Applications

Chair: Paul Tasker[1]
Co-Chair: Ana Peláez[2]
[1]Cardiff Univeristy, [2]Televes S.A.

13:50 – 14:10

EuMC08-1
4.5 GHz mMIMO PA for 5G with Flip-Chip Integration
Sergio Pires[1], Anh Nghiem[2]
INDUSTRIAL KEYNOTE
[1]Ampleon Netherlands BV, [2]Ampleon Netherlands B.V.

14:10 – 14:30

EuMC08-2
A 28 GHz Power Amplifier Combing Linearizer, Adaptive Bias and Gm Compensation to P1dB and Improve Back-Off Efficiency
Yu-Teng Chang[1], Li-Cheng Hung[1], Hsin-Chia Lu[1]
[1]National Taiwan University

14:30 – 14:50

EuMC08-3
A 28 GHz and 38 GHz High-Gain Dual-Band Power Amplifier for 5G Wireless Systems in 22 nm FD-SOI CMOS
Xin Xu[1], Songhui Li[1], Laszlo Szilagyi[1], Christian Matthus[1], Wolfgang Finger[2], Corrado Carta[1], Frank Ellinger[1]
[1]Technische Universität Dresden, [2]Globalfoundries Dresden LLC & Co. KG

14:50 – 15:10

EuMC08-4
A 38-GHz High Linearity and High Efficiency Power Amplifier for 5G Applications in 65-nm CMOS
Xin-Yi Li[1], Yu-Chun Chen[1], Yunshan Wang[1], Tianwei Huang[1], Huei Wang[1]
[1]National Taiwan University

15:10 – 15:30

EuMC08-5
95 GHz 13 dBm IQ-Combined PA in 65 nm CMOS
Tal Elazar[1], Eran Socher[2]
[1]Tel Aviv University, [2]TAU

Quest

EuMC09
Terahertz Electronic Devices

Chair: Jan Stake[1]
Co-Chair: Jeffrey Hesler[2]
[1]Chalmers University of Technology, [2]Virginia Diodes Inc

13:50 – 14:10

EuMC09-1
Generation and Detection of Wideband Modulated Signals for mmWave Applications
Jeffrey Hesler[1], Steven Durant[1], Theodore Reck[1], Eric Bryerton[1], Daniel Koller[1], Gerhard Schoenthal[1]
INDUSTRIAL KEYNOTE
[1]Virginia Diodes Inc.

14:10 – 14:30

EuMC09-2
InGaAs HEMT MMIC Technology on Silicon Substrate with Backside Field-Plate
Arnulf Leuther[1], Thomas Merkle[1], Laurenz John[1], Tim Christoph[1], Rolf Aidam[1], Axel Tessmann[1]
[1]Fraunhofer Institute for Applied Solid State Physics IAF

14:30 – 14:50

EuMC09-3
140-190 GHz Broadband Amplifier in 300-nm InP/GaAsSb DHBT Technology
Wei Quan[1], Sara Hamzeloui[1], Akshay Mahadev Arabhavi[1], Ralf Flückiger[2], Olivier J. S. Ostinelli[1], Colombo Bolognesi[1]
[1]Millimeter-wave Electronics Laboratory, ETHz, [2]DIRAMICS

14:50 – 15:10

EuMC09-4
Short-Range Wireless Transmitter Using Mesoscopic Dielectric Cuboid Antenna in 300-GHz Band
Kazuki Yamada[1], Yuto Samura[1], Oleg Minin[2], Atsushi Kanno[3], Norihiko Sekine[3], Junichi Nakajima[4], Igor Minin[2], Shintaro Hisatake[1]
[1]University of Gifu, [2]University of National Research Tomsk State, [3]National Institute of Information and Communications Technology, [4]SoftBank

15:10 – 15:30

EuMC09-5
A 119 GHz Bandwidth Distributed Amplifier with a ±2 ps Group Delay Variation
Bas van de Ven[1], Tanjil Shivan[2], Xiao Liu[1], Maruf Hossain[2], Viktor Krozer[2], Marion K. Matters-Kammerer[1]
[1]Eindhoven University of Technology (TU/e), [2]Ferdinand-Braun-Institut (FBH) Leibniz-Institut für Höchstfrequenztechnik

Expedition

EuMC10
MIMO and 5G Antennas

Chair: Bart Smolders[1]
Co-Chair: Thomas Zwick[2]
[1]Eindhoven University of Technology (TU/e), [2]Karlsruhe Institute of Technology (KIT)

13:50 – 14:10

EuMC10-1
Advances in Integrated Transceivers and Antennas for 5G Mobile Communications
Florian Pivit[1]
INDUSTRIAL KEYNOTE
[1]Nokia Bell Labs, Ireland

14:10 – 14:30

EuMC10-2
MIMO Antenna Design with Reconfigurable Radiation Pattern and High Port Isolation
Yi-Feng Cheng[1], Kwok-Keung M. Cheng[1]
[1]The Chinese University of Hong Kong

14:30 – 14:50

EuMC10-3
An Outphasing MIMO Architecture Prototype
Bernhard Gäde[1], Stefan Erhardt[1], Georg Fischer[1], Ralf Müller[1]
[1]Friedrich-Alexander University of Erlangen-Nuremberg

14:50 – 15:10

EuMC10-4
Broadband Fan-out Phased Antenna Array at 28 GHz for 5G Applications
Imran Aziz[1], Dapeng Wu[2], Erik Öjefors[2], Johanna Hanning[2], Erik Wiklund[2], Dragos Dancila[1]
[1]Uppsala University, [2]Sivers IMA AB

15:10 – 15:30

EuMC10-5
A Novel Automotive Ultra-Wideband 5G-MIMO-Antenna Array Printed on a Foil
Zafer Toprak[1], Simon Senega[1], Stefan Lindenmeier[1]
[1]University of the Bundeswehr Munich

TUESDAY 13:50 – 15:30

	Spark	Flash	Glow
	EuMC11 Waveguide and Horn Antennas Chair: Lorenz-Peter Schmidt[1] Co-Chair: Józef Modelski[2] [1]Uni Erlangen, [2]Warsaw University of Technology	**EuMC12** Advanced Packaging Solutions for mmWave applications Chair: Kaynak Mehmet[1] Co-Chair: Mikko Varonen[2] [1]IHP Microelectronics GmbH, [2]VTT Technical Research Centre of Finland	**EuMC13** Numerical Methods in Microwave Technology Chair: Ke Wu[1] Co-Chair: Noushin Karimian[2] [1]Polytechnique Montreal, [2]The University of Manchester
13:50 – 14:10	**EuMC11-1** Elliptical Dual-Polarized High Gain Horn Antenna for Cell Partitioning in Millimeter-Wave Mobile Communications Thomas Arthur Herbert Bressner[1], Martin Johansson[2], Ulf Johannsen[1], Bart Smolders[1] [1]Eindhoven Univeristy of Technology, [2]Ericsson AB	**EuMC12-1** Advanced Multilayer Components and Front-End Modules for Millimetre-Wave and 5G Applications Kamal K Samanta[1] [1]Sony Europe B V	**EuMC13-1** Power Delivery Network Impedance Profile and Voltage Droop Optimization Aurea Edna Moreno-Mojica[1], Jose E. Rayas-Sanchez[1], Felipe J. Leal-Romo[1] [1]ITESO - The Jesuit University of Guadalajara
14:10 – 14:30	**EuMC11-2** A Compact 30-50 GHz Platelet Corrugated Feedhorn for Cryogenic Radio Astronomical Applications Chau-Ching Chiong[1], Chen Chien[1], Shou-Ting Jian[1], Chin-Ting Ho[1], Yuh-Jing Hwang[1] [1]Institute of Astronomy and Astrophysics, Academia Sinica	**EuMC12-2** BiCMOS Through-Silicon Via (TSV) Signal Transition at 240/300 GHz for mmWave & Sub-THz Packaging and Heterogeneous Integration Matthias Wietstruck[1], Steffen Marschmeyer[1], Christian Wipf[1], Matteo Stocchi[1], Mehmet Kaynak[1] [1]IHP - Leibniz Institut für innovative Mikroelektronik	**EuMC13-2** Technique for Eliminating Resonant Artifacts in Low Loss Material Measurement MuhibUr Rahman[1], Ke Wu[1] [1]POLY-GRAMES
14:30 – 14:50	**EuMC11-3** A Cost-Effective W-band Slotted Waveguide Antenna Stanislav Sekretarov[1], Artur Kondrykov[1], Dmytro Vavriv[1] [1]Institute of Radio Astronomy of the National Academy of Sciences of Ukraine	**EuMC12-3** Mode-Matched Common-Strip Coupler Interface for Millimeter-Wave and Terahertz Chip-to-Chip Waveguide Interconnects Ahmed Sakr[1], Walid Dyab[2], Ke Wu[3] [1]Faculty of Engineering, Cairo University, [2]Prince Sultan University, [3]Polytechnique Montreal	**EuMC13-3** Spectral Analysis of a Fabry-Perot Open Resonator with a Plane-Wave Expansion Method Bartlomiej Salski[1], Tomasz Karpisz[1], Pawel Kopyt[1], Jerzy Krupka[1] [1]Warsaw University of Technology
14:50 – 15:10	**EuMC11-4** A Compact Substrate Integrated Self-Diplexing Antenna for WiFi and ISM Band Applications Sounik Kiran Kumar Dash[1], Qingsha S Cheng[1], Rusan Kumar Barik[1], Nrusingha Charan Pradhan[2], Karthikeyan Sholampettai Subramanian[2] [1]Southern University of Science and Technology, Shenzhen, China, [2]National Institute of Technology Tiruchirappalli, Tiruchirappalli 620015	**EuMC12-4** DC-to-Ka-Band Broadband Chip-to-Chip Interconnect Using Aerosol Jet Printing Jubaid Qayyum[1], Cameron Crump[1], John Albrecht[1], Ahmet Ulusoy[2], John Papapolymerou[1] [1]Michigan State University, [2]Karlsruhe Institute of Technology (KIT)	**EuMC13-4** A Fast Sensitivity Analysis Method for Lumped Impedance Elements in Antenna Design Biyi Wu[1], XinQing Sheng[1] [1]Beijing Institute of Technology
15:10 – 15:30	**EuMC11-5** Substrate Integrated Waveguide Leaky-Wave Antennas with Tailored Characteristics for Millimeter-Wave Applications DONGZE ZHENG[1], Ke Wu[2] [1]École Polytechnique de Montréal, [2]POLY-GRAMES	**EuMC12-5** A CMOS-Compatible Solution for Propagation Channels on Silicon in the Millimeter-Wave Band Ihsan El Masri[1], Thierry Le gouguec[2], Pierre-Marie Martin[2], Rozenn Allanic[2], Cédric Quendo[2] [1]Université de Bretagne Occidentale, [2]Lab-STICC-Université de Bretagne Occidentale	

TUESDAY 14:20 – 16:10

Hall 1

EuMIC15
EuMIC Interactive Poster Session

Chair: Christian Fager[1]
Co-Chair: Mark Oude Alink[2]
[1]Microwave Electronics Laboratory, Chalmers University of Technology, [2]University of Twente

Meet:
Visit to benefit from in-depth discussions during Tuesday's poster session.

EuMIC15-1
A PLL Frequency Synthesizer In 65 nm CMOS for 60 GHz Sliding-IF Transceiver
Yang Liu[1], Zhiqun Li[2], Hao Gao[3]
[1]Nanjing Institute of Technology, [2]Southeast University, [3]Eindhoven University of Technology (TU/e)

EuMIC15-2
A Suitable Approach to Assess Thermal Properties of GaN Power Bars
Rocco Giofrè[1], Paolo Colantonio[2], Matthias Auf der Maur[2], Andrea Reale[2]
[1]University of Roma Tor Vergata, [2]University of Rome Tor Vergata (Italy)

EuMIC15-3
A Large-Signal Behavioural Modeling Approach of GaN HEMTs for Power Amplifier Design
M. Oguz Yegin[1], Armagan Gurdal[2], Ulas Ozipek[2], Ekmel Özbay[2]
[1]Bilkent University, [2]Nanotechnology Research Center (NANOTAM), Bilkent University

EuMIC15-4
A Broadband 60-GHz Low Noise Amplifier with 3.2 dB Noise Figure and 24 dB Gain
Ali Ferschischi[1], Hatem Ghaleb[1], Sami Ur Rehman[1], Corrado Carta[1], Frank Ellinger[1]
[1]Technische Universität Dresden, Germany

EuMIC15-5
An Advanced Ageing Methodology for Robustness Assessment of Normally-Off AlGaN/GaN HEMT
Florent Albany[1], Arnaud Curutchet[1], Nathalie Labat[1], François Lecourt[2], Ewa Walasiak[2], Hassan Maher[3], Yvon Cordier[4], Nicolas Defrance[5], Nathalie Malbert[1]
[1]IMS Bordeaux, [2]OMMIC SAS, [3]LN2-UMI, [4]CRHEA, [5]IEMN

EuMIC15-6
A 30-36.6 GHz Low Jitter Degradation SIL QVCO with Frequency-Tracking Loop in 65 nm CMOS for 5G Frontend Applications
Jhe-Wei Li[1], Wei-Cheng Chen[1], Jung Chou[1], Yu-Cheng Liu[2], Hong-Yeh Chang[1]
[1]National Central University, [2]ITRI

EuMIC15-7
A Three Stage Gain Cell Topology with an Active Ultra-Wideband Input Matching in H-Band
Athanasios Gatzastras[1], Hermann Massler[2], Arnulf Leuther[2], Sébastien Chartier[2], Ingmar Kallfass[1]
[1]Institute of Robust Power Semiconductor Systems (ILH) - University of Stuttgart, [2]Fraunhofer Institute for Applied Solid State Physics (IAF)

EuMIC15-8
Empowering GaN-Si HEMT Nonlinear Modelling for Doherty Power Amplifier Design
Gianni Bosi[1], Antonio Raffo[1], Rocco Giofrè[2], Valeria Vadalà[1], Giorgio Vannini[1], Ernesto Limiti[2]
[1]University of Ferrara, [2]University of Rome ""Tor Vergata""

EuMIC15-9
Orthogonalization of Multi-Port Scattering Matrices with the Generalized S-Parameter Transformation to Reduce Surrogate Model Complexity
Petrie Meyer[1]
[1]Stellenbosch University

EuMIC15-10
Multi-Gigabit RF-DAC Based Duobinary/PAM-3 Modulator in 130 nm SiGe HBT
Frida Strömbeck[1], Zhongxia Simon He[1], Herbert Zirath[1]
[1]Chalmers University of Technology

EuMIC15-11
167-GHz and 155-GHz High Gain D-band Power Amplifiers in CMOS SOI 45-nm Technology
Abdelaziz Hamani[1], Alexandre Siligaris[1], Benjamin Blampey[1], Jose Luis Gonzalez-Jimenez[1]
[1]Université Grenoble-Alpes/CEA-Leti

EuMIC15-12
Over 40 W, X-Band GaN on SiC MMIC Amplifier
Charles Alphonce Mjema[1], Benoit Haentjens[1], Erwan Fourn[2]
[1]Vectrawave, [2]IETR, INSA Rennes

EuMIC15-13
Ku-Band 25 W High Power Amplifier using 0.25 µm GaN Technology
Santosh Gedela[1], Simplice N'Gongo[2], Kishore Bantupalli[1], Suman K[1]
[1]Astra Microwave Products Limited, [2]AELIUS SEMICONDUCTORS PTE. LTD.

EuMIC15-14
High Power Density 4 to 16 GHz Non-Uniform Distributed Power Amplifier with a Novel Trifilar
Simon Mahon[1], Leigh Milner[2], Irfan Shahid[1], Anthony Parker[1], Melissa Gorman[1], Michael Heimlich[1]
[1]Macquarie University, [2]Defence Science and Technology Group

EuMIC15-15
Third Order Notch over Multi-Bias and Temperature in GaN and GaAs HEMTs
Mohammad Abdul Alim[1], Ali A Rezazadeh[2], Christophe Gaquiere[3]
[1]University of Chittagong, [2]The University of Manchester, [3]The University of Lille

TUESDAY 16:10 – 17:50

Mission 1

EuMC14
Microwave and mmWave Systems

Chair: Kamran Ghorbani[1]
Co-Chair: Jan Vrba[2]
[1]RMIT University, [2]Czech Technical University in Prague

16:10 – 16:30

EuMC14-1
Output Signal Characteristics of Optical Fiber Feed Direct Digital RF Transmitter Using SFP+ Module
Ryo TAMURA[1], Mizuki Motoyoshi[1], Suguru Kameda[1], Noriharu Suematsu[1]
[1]Research Institute of Electrical Communication, Tohoku University

16:30 – 16:50

EuMC14-2
Multi-source Intermodulation in a Loaded-line Phase Shifter
Martin Mattsson[1], Dan Kuylenstierna[1]
[1]Chalmers University of Technology

16:50 – 17:10

EuMC14-3
Compact Microwave Based Water-Cut Sensor Suitable for Downhole Installation
Muhammad Akram Karimi[1], Muhammad Arsalan[2], Atif Shamim[1]
[1]King Abdullah University of Science and Technology (KAUST), [2]Saudi Aramco

17:10 – 17:30

EuMC14-4
Millimeter-Wave Outphasing using Analog-Radio over Fiber for 5G Physical Layer Infrastructure
Roel Budé[1], Meerten Versluis[1], Gleb Nazarikov[1], Simon Rommel[1], Bart van Ark[1], Ulf Johannsen[1], Idelfonso Tafur Monroy[1], Bart Smolders[1]
[1]Eindhoven University of Technology

17:30 – 17:50

EuMC14-5
In-Vehicle Breathing Rate Monitoring Based on WiFi Signals
Muhammad Manzar Hussain[1], Alper Akbilek[1], Florian Pfeiffer[1], Bernd Napholz[2]
[1]perisens GmbH, [2]Daimler AG

Mission 2

EuMC15
Doherty and Load Modulated Power Amplifier Structures

Chair: Vittorio Camarchia[1]
Co-Chair: Didier Belot[2]
[1]Politecnico di Torino, [2]CEA - LETI

16:10 – 16:30

EuMC15-1
A 1000 W Wideband Recursive Four-Way Doherty Amplifier for Base Station Application
Xiaolong Yue[1], Yongqiang Zhou[1]
[1]Ericsson

16:30 – 16:50

EuMC15-2
High Power 400 W Symmetric Doherty with Extended Back-off Efficiency Range for 5G Cellular Infrastructure Applications
Ramanujam Embar[1], Roy McLaren[1], Mir Masood[1]
[1]NXP Semiconductors, USA

16:50 – 17:10

EuMC15-3
Load Modulated Balanced Amplifier Designed for AM-PM Linearity
Kimon Vivien[1], Paolo Enrico de Falco[2], Pascal Pierre-Charles-Felix[2], Olivier Venard[1], Geneviève Baudoin[1], Taylor Barton[2]
[1]ESYCOM - ESIEE Paris, [2]Colorado University, [3]SOMOS Semiconductor

17:10 – 17:30

EuMC15-4
High-Efficiency Asymmetric Doherty Power Amplifier with Spurious Suppression Circuit
Yuki Takagi[1], Naoki Hasegawa[1], Yoshichika Ohta[1], Ryo Ishikawa[2], Kazuhiko Honjo[2]
[1]SoftBank Corp. / Technology Research Laboratory, [2]The University of Electro-Communications

17:30 – 17:50

EuMC15-5
500 W Three-way GaN Doherty Power Amplifier for Sub-6 GHz 5G New Radio Base Transceiver Systems
Hyunuk Kang[1], Woojin Choi[1], Inan Kim[2], Dongwoo Lee[2], Youngoo Yang[1]
[1]Sungkyunkwan University, [2]Wave Electronics Co., Ltd.

Quest

EuMC16
Terahertz Photonic Devices and System

Chair: Marion K. Matters-Kammerer[1]
Co-Chair: Idelfonso Tafur Monroy[2]
[1]Eindhoven University of Technology - TU/e, [2]Eindhoven University of Technology (TU/e)

16:10 – 16:30

EuMC16-1
Photonics-enabled Millimetre-wave Phased-Array Antenna with True Time Delay Beam-steering
Muhsin Ali[1], Robinson Cruzoe Guzmán[1], Luis Enrique Garcia-Muñoz[1], Frédéric van Dijk[2], Guillermo Carpintero[1]
[1]Universidad Carlos III de Madrid, [2]III-V Lab

16:30 – 16:50

EuMC16-2
Investigation of De-Embedding Techniques Applied on Uni-Traveling Carrier Photodiodes
Dimitrios Konstantinou[1], Christophe Caillaud[2], Simon Rommel[1], Ulf Johannsen[1], Idelfonso Tafur Monroy[1]
[1]Eindhoven University of Technology (TU/e), [2]III-V Lab, a joint Lab from Nokia, Thales and CEA

16:50 – 17:10

EuMC16-3
All-Digital Outphasing Modulator for Radio-over-Fiber System
Yuma Kase[1], Shinichi Hori[1], Naoki Oshima[1], Kazuaki Kunihiro[1]
[1]NEC Corporation

17:10 – 17:30

EuMC16-4
A Low Power CMOS Driver Integrated With Mach-Zehnder Modulator for PAM4 Optical Transmissions
Tai-Hsing Lee[1]
[1]ITRI

17:30 – 17:50

EuMC16-5
Performance of Phase Modulated RoF for 5G Fronthaul Uplink
Emine Moutaly[1], Salim FAci[2], Catherine Algani[2], Billabert Anne-laure[2], Philippos Asimakopoulos[3], Nathan J.Gomes[3]
[1]Ecole Supérieure Polytechnique, [2]Conservatoire National des Arts et Metiers, [3]University of Kent

Expedition

EuMC17
Phased and Transmit Arrays

Chair: Ioan Lager[1]
Co-Chair: Thomas Emanuelsson[2]
[1]Delft University of Technology, [2]Gapwaves AB

16:10 – 16:30

EuMC17-1
Modular and Scalable Millimeter-Wave Patch Array Antenna for 5G MIMO and Beamforming
Lingyun Ren[1], Bohao Lu[1], Fang Lu[1], Yonghui Shu[1]
[1]SAGE Millimeter, Inc.

16:30 – 16:50

EuMC17-2
Dual-Band Dual-Linearly Polarized Transmit Array at Ka-Band
Reda MADI[1], Antonio Clemente[2], Ronan Sauleau[3]
[1]CEA - LETI, [2]CEA-LETI, [3]CNRS, Institut d'Électronique et de Télécommunications de Rennes, UMR-6164

16:50 – 17:10

EuMC17-3
Origami-Inspired Shape-Changing Phased Array
D. Elliott Williams[1], Charles Dorn[1], Sergio Pellegrino[1], Ali Hajimiri[1]
[1]Caltech

17:10 – 17:30

EuMC17-4
Amplitude Varying Phased Array Linearization
Sara Hesami[1], Sina Rezaei Aghdam[2], John Dooley[3], Thomas Eriksson[2], Christian Fager[1]
[1]Microwave Electronics Laboratory, Chalmers University of Technology, [2]Chalmers University of Technology, [3]Maynooth University

17:30 – 17:50

EuMC17-5
Sidelobe Level Suppression and Scan-Loss Compensation In A Wide-Angular Scanning Linear Array Using Subarrays Amplitude Control
Fannush Akbar[1], Leonardus Ligthart[2], Gamantyo Hendrantoro[1], Ioan Lager[2]
[1]Institut Teknologi Sepuluh Nopember, [2]TU Delft

TUESDAY 16:10 – 17:50

Spark

EuMC18
5G Antenna Systems

Chair: Dirk Heberling[1]
Co-Chair: Józef Modelski[2]
[1]RWTH Aachen University, [2]Warsaw University of Technology

16:10 – 16:30

EuMC18-1
Dual-Polarized Integrated Lens Antenna for Outdoor 60 GHz Point-to-Point Systems
Andrey Mozharovskiy[1], Alexey Artemenko[1], Sergey Tikhonov[1], Sergey Churkin[1], Roman Maslennikov[1]
[1]Radio Gigabit LLC

16:30 – 16:50

EuMC18-2
28-GHz Wideband Dual-Polarized Parasitic-Patch Antenna Array on Tile-Scale Package
Mohadig Rousstia[1], Alireza Shamsafar[1], Junlei Zhao[1], Sergio Pires[1], Jorge Teixeira[1], Giuseppe Scalise[2], Luigi Boccia[2]
[1]Ampleon Netherlands BV, [2]University of Calabria

16:50 – 17:10

EuMC18-3
Phased Array Antenna with Beamforming Network for 5G mmWave Communication System
Anil Kumar Pandey[1]
[1]Keysight Technologies

17:10 – 17:30

EuMC18-4
Millimeter-Wave Dual-Polarized Filtering Patch Antenna Array for 5G Applications
Yingqi Zhang[1], Wanchen Yang[1], Wenquan Che[1], Quan Xue[1], Shaowei Liao[1], Wenhai Zhang[1]
[1]South China University of Technology

17:30 – 17:50

EuMC18-5
Development of Flexible & Quasi-Optically Transparent CPW Antennas for 5G by Meshing Construction
Maxime WAWRZYNIAK[1], Julien Bras[2], Aurore Denneulin[2], Tan-Phu Vuong[1]
[1]Univ. Grenoble Alpes, Grenoble INP, CNRS, IMEP LaHC, [2]Univ. Grenoble Alpes, CNRS, Grenoble INP, LGP2, F-38000 Grenoble, France

Flash

EuMC19
3D-Printing Technologies

Chair: John Papapolymerou[1]
Co-Chair: Kaynak Mehmet[2]
[1]Michigan State University, [2]kaynak@ihp-microelectronics.com

16:10 – 16:30

EuMC19-1
3D-Printed 3 dB Hybrid Coupler for D-Band Applications
Konstantin Lomakin[1], Laura Klein[2], Mark Sippel[2], Klaus Helmreich[2], Gerald Gold[2]
[1]Friedrich-Alexander University Erlangen-Nürnberg (FAU), [2]Friedrich-Alexander Universität Erlangen-Nürnberg

16:30 – 16:50

EuMC19-2
Optimization of the Conductivity of Microwave Components Printed by Inkjet on Polymeric Substrates by Photonic Sintering
Chaimaa El Hajjaji[1], Nicolas Delhote[1], Serge Verdeyme[1], Malgorzata Piechowiak[2], Olivier Durand[2]
[1]XLIM UMR7252, Université de Limoges/CNRS, Limoges, FRANCE, [2]CTTC Center for Technology Transfers in Ceramics, france

16:50 – 17:10

EuMC19-3
Additively Manufactured Six-Port for mmWave Applications
Laura Klein[1], Konstantin Lomakin[1], Mark Sippel[1], Klaus Helmreich[1], Gerald Gold[1]
[1]Friedrich-Alexander Universität Erlangen-Nürnberg

17:10 – 17:30

EuMC19-4
3D Printed Spherical Cavity Resonator With Fine Tuning Using Nanomagnetic Thin Film
Yuxiao He[1], Eric Drew[2], Premjeet Chahal[1], John Zhang[2], John Papapolymerou[1]
[1]Michigan State University, [2]Georgia Institute of Technology

17:30 – 17:50

EuMC19-5
A Fully Integrated Conductive and Dielectric Additive Manufacturing Technology for Microwave Circuits and Antennas
Mengze Li[1], Yang Yang[1], Yunpeng Zhang[2], Francesca Iacopi[1], Shlomit Ram[2], Jaim Nulman[2]
[1]University of Technology Sydney, [2]University of Electronic Science and Technology of China, [3]Nano Dimension

Glow

EuMC20
Modelling of Field Radiation and Scattering

Chair: Alessandro Galli[1]
Co-Chair: Guy Vandenbosch[2]
[1]Sapienza University of Rome, [2]KU Leuven

16:10 – 16:30

EuMC20-1
Plasmon Resonances of Conformal Graphene Strip Placed on Circular Dielectric Rod: From Microwaves to Infrared Range
Sergii Dukhopelnykov[1]
[1]Institute of Radio-Physics and Electronics NASU

16:30 – 16:50

EuMC20-2
Design of Three-Layer Radome for Millimeter-Wave Antenna
Tomoshige Furuhi[1], Natsumi Minamitani[1], Shun Sakaida[1], Kaoru Sudo[1], Kengo Onaka[1], Takaya Wada[1], Hisao Hayafuji[1]
[1]Murata Manufacturing Co., Ltd.

16:50 – 17:10

EuMC20-3
Improved Modeling of Radiation Effects in Coplanar Waveguides with Finite Ground Width
Gia Ngoc Phung[1], Uwe Arz[1], Karsten Kuhlmann[1], Ralf Doerner[2], Wolfgang Heinrich[2]
[1]Physikalisch-Technische Bundesanstalt (PTB), [2]Ferdinand-Braun-Institut (FBH) Leibniz-Institut für Höchstfrequenztechnik

17:10 – 17:30

EuMC20-4
H-polarized Plane Wave Scattering by Cylindrically Conformal Periodic Finite Array with PEC and Resistive Patches
Alexander Svezhentsev[1], Vladimir Volski[2], Guy Vandenbosch[2]
[1]O.Usikov IRE NAS of Ukraine, [2]Katholieke Universiteit Leuven

17:30 – 17:50

EuMC20-5
Scattering of Surface Waves by a Discontinuity in Surface Impedance
Tobias Schaich[1], Anas Al Rawi[2], Mike Payne[1]
[1]University of Cambridge, [2]BT Group plc

TUESDAY 16:10 – 17:50

ROOM **Polar**

EuMIC16
EuMIC Closing Session

Chairs: François Deborgies[1], EuMIC Chair and Domine Leenaerts[2], EuMIC TPC Chair
Co-chairs: Stefan Heinen[3], EuMIC Co-Chair and Christian Fager[4], EuMIC TPC Co-Chair
[1]ESA-ESTEC, [2]NXP, [3]RWTH Aachen University, [4]Chalmers University of Technology

16:10 – 16:20 Awards Ceremony

Marion Matters-Kammerer, Awards and Prizes Chair
Ulf Johannsen, Student Activities Chair
Alexander Yarovoy, General TPC Chair
Franco.Giannini, GAAS® Association

EuMIC Prize
EuMIC Young Engineer Prize
GAAS® Association Student Fellowships

16:20 – 17:00 Radio ICs for future wireless networks

Igor Tasevski, Vice President & Head of Product Development Unit Radio, Ericsson

Stretching beyond traditional mobile access, wireless networks is on a quest to transform connectivity, as we know it today. With the ambition to provide data sharing anywhere at any time, for anyone and anything, the implementation challenges are demanding. Emerging RF technologies for 5G, such as MIMO and scaled phased arrays have reached a significant level of maturity, enabling product deployments and standards completion. First generations of millimeter-wave Radio IC are already deployed in products but improvements regarding power consumption, size and functionality are in need to facilitate even more cost effective deployments. Applications and use cases vary between geographies, however the trend is clear - phased arrays, massive MIMO, and millimeter-wave have significantly changed the way we build wireless networks for the future. The presentation will provide an overview of challenges and technology choices in the areas of advanced Radio IC development and antenna integration for 3GPP radio access applications. It will also reflect on various market dynamics and industry trends. Technology considerations for Radio HW research and emerging 6G application trials will be discussed. The emphasis is on projects where new RF capabilities are key differentiators.

17:00 – 17:40 MetOp SG mm-Wave Instruments and Technologies

Ville Kangas, Arctic Weather Satellite Project Manager, European Space Agency

17:40 – 17:50 Closing Remarks and Invitation to EuMIC 2021 in London

François Deborgies, Chris Clifton[1]
[1]EuMIC 2021 Chair

TUESDAY 16:10 – 17:50

Fluor

EuMW02
Special Session Teaching Microwave Engineering

Chair: Elmine Meyer[1]
Co-Chair: Ulf Johannsen[1]
[1]Eindhoven Univeristy of Technology

16:10 – 16:30

EuMW02-1
Lessons from Build-a-Radio/Radar in a Day: The Ins and Outs of Experiential Design for Students
David Ricketts[1]
[1]North Carolina State University

16:30 – 16:50

EuMW02-2
Evolution of Microwave Teaching Methods and a Vision for the Future
Petrie Meyer[1]
[1]Stellenbosch University

16:50 – 17:10

EuMW02-3
Learn Electromagnetics with Student-Led-Tutorials
Mark Bentum[1], Ramiro Serra[2], Ulf Johannsen[2], Chantal Brans[3]
[1]Eindhoven University of Technology (TU/e), [2]Eindhoven Univeristy of Technology, [3]Eindhoven University of Technology

17:10 – 17:30

EuMW02-4
Curriculum Design for Part-Time Study in Microwave Engineering
Tinus Stander[1]
[1]University of Pretoria

17:30 – 17:50

EuMW02-5
Challenges of First-Time Lecturing of an RF/ Microwave Engineering Course in a Kenyan University
Shamim Omar Nassar[1]
[1]RAF International University

Mission 2

EuMC21
Special Antenna Systems

Chair: Alexandros Feresidis[1]
Co-Chair: Lorenz-Peter Schmidt[2]
[1]University of Birmingham, [2]Uni Erlangen

16:10 – 16:30

EuMC21-1
Low-Loss Electro-Mechanical Beam Steering of High Gain THz Antenna
Muhammad Rabbani[1], James Churm[1], Alexandros Feresidis[1]
[1]University of Birmingham

16:30 – 16:50

EuMC21-2
A Tactical Broadband High Power Fork-Shaped Monopole Antenna
Ahmad Emadeddin[1], Abbas Akbarzadeh-Jahromi[2], B. L. G. Jonsson[1]
[1]KTH - Royal Institute of Technology, [2]University of Tehran

16:50 – 17:10

EuMC21-3
Passive Antenna Systems Embedded into a Load Bearing Wall for Improved Radio Transparency
Lauri Vähä-Savo[1], Alejandra Garrido Atienza[1], Christian Cziezerski[1], Mikko Heino[1], Katsuyuki Haneda[1], Clemens Icheln[1], Xiaoshu Lü[2], Klaus Viljanen[3]
[1]School of Electrical Engineering, Aalto University., [2]University of Vaasa, [3]School of Engineering, Aalto University.

17:10 – 17:30

EuMC21-4
Compact Dual and Wide Band Monopole-Like Antenna Based on SRR for WLAN Applications
Nilton Santos-Valdivia[1], Patricia Castillo-Aranibar[1], Alejandro García-Lampérez[2], Daniel Segovia-Vargas[2]
[1]Universidad Católica San Pablo, [2]Universidad Carlos III de Madrid

17:30 – 17:50

EuMC21-5
Compact Pattern-Switching Patch Antenna
Abdullah Haskou[1], Anthony Pesin[1], Ali Louzir[1]
[1]InterDigital, Inc.

Expedition

EuMC22
Novel Circuits Solutions for Energy Transfer in the Near-Field and Far-Field

Chair: Yi Wang[1]
Co-Chair: Giuseppina Monti[2]
[1]University of Birmingham, [2]University of Salento

16:10 – 16:30

EuMC22-1
Input-Power-Synchronous Adaptively Biased Wide-Dynamic-Range High-Efficiency Rectifier with Zero-Threshold GaAs HEMTs
Jun Yamazaki[1], Ryo Ishikawa[1], Kazuhiko Honjo[1]
[1]The University of Electro-Communications

16:30 – 16:50

EuMC22-2
Automatically switchable two-way rectifier
Massimo Del Prete[1], Diego Masotti[2], Alessandra Costanzo[2]
[1]Datalogic S.p.a., [2]University of Bologna

16:50 – 17:10

EuMC22-3
A High Sensitivity RF Energy Harvester for Diverse Environments
IBRAHIM KAGAN AKSOYAK[1], ADAMANTIA CHLETSOU[2], John Papapolymerou[2], Ahmet Ulusoy[1]
[1]Karlsruhe Institute of Technology, [2]Michigan State University

17:10 – 17:30

EuMC22-4
Proposal and Demonstration of Power Conversion-Chip/Amplifier Integrated Antenna
Shinji Hara[1], Asako Suzuki[1], Hiroshi Hirayama[2]
[1]Nagoya University, [2]Nagoya Institute of Technology

Auditorium

EuMC23
[Focussed Session] Innovative Antennas for Cubesats and Small-Space Platforms

Chair: Nelson Fonseca[1]
Co-Chair: Mauro Ettorre[2]
[1]European Space Agency, ESA/ESTEC, [2]University of Rennes 1

16:10 – 16:30

EuMC23-1
Design of a Dual Circularly Polarized Elliptical Feed Horn for CubeSat Reflectarray Applications
Mustafa Murat Bilgic[1], Min Zhou[1], Peter Meincke[1], Andreas Ericsson[1], Erik Jørgensen[1], Michael Lumholt[1]
[1]TICRA

16:30 – 16:50

EuMC23-2
Compact Reconfigurable Antenna for Nanostallites
Simone Genovesi[1], Francesco Alessio Dicandia[2]
[1]University of Pisa, [2]Greenwaves

16:50 – 17:10

EuMC23-3
3D Printed Ceramic Low-Profile GNSS Antenna for SmallSats
Maxime Romier[1]
[1]ANYWAVES

17:10 – 17:30

EuMC23-4
Compact End-Fire Antenna Designs for PicoSat Integration and Other Small Satellite Missions
Victoria Gomez-Guillamon Buendia[1], Symon K. Podilchak[2], Salvatore Liberto[1], Dimitris E. Anagnostou[1], George Goussetis[1], Constantin Constantinides[3], Tom Walkinshaw[3], Maarten van der Vorst[4]
[1]Heriot-Watt University, [2]The University of Edinburgh, [3]Alba Orbital, [4]ESA-ESTEC

WEDNESDAY

Room	08:30 – 10:10	10:50 – 12:30	13:50 – 15:30	16:10 – 17:50	EVENING PROGRAMME
Progress			W-14 Automotive Radar Networks and Sensor Fusion		
Mission 1		EuRAD02 Dual Use & Waveform Design	EuRAD04 Doppler Processing Techniques for Low Reflectivity Targets	EuRAD06 Emerging & Industrial Applications	
Mission 2	EuMC21 Special Antenna Systems	EuMC27 [Focussed Session] Emerging Microwave Technology: Asia-Pacific	EuMC33 Advances on RF Power Amplifier Behavioural Modelling	EuMC39 Solid State High Power Amplifiers for Satellite and Radar Applications	
Quest		EuRAD03 Design and Calibration Concepts for Advanced Radar Systems	EuRAD05 Radar Circuits and Systems	EuRAD07 Radar Scenario Simulations	
Expedition	EuMC22 Novel Circuits Solutions for Energy Transfer in the Near-Field and Far-Field	EuMC28 Novel Wireless Power Transfer and Energy Harvesting Systems	EuMC34 Recent Advances in RFID and IoT Sensors	EuMC40 [Focussed Session] Emerging Antenna Technologies for RFID	
Polar	EuRAD01 EuRAD Opening Session				
Auditorium	EuMC23 [Focussed Session] Innovative Antennas for Cubesat Platforms	DSS Forum Space Situational Awareness	DSS Forum Strategy Analytics Lunch	DSS Forum Space Situational Awareness	DSS Forum Cocktail Reception
Spark	S-08 High Power Amplification for Space Applications		EuMC35 Integrated Antennas	EuMC41 SATCOM and mmWave Antennas	
Flash	EuMC24 Additive Manufacturing and Emerging Materials for mmWave Applications	EuMC29 Reconfigurable Planar Passive Components	EuMC36 Transmission Lines and Passive Components	EuMC42 Planar Power Dividers/ Combiners	
Glow		EuMC30 Non-Planar Filters	EuMC37 Non-Planar Filters and Devices	EuMC43 Non-Planar Devices and Systems	
Beam	EuMC25 Metamaterials for Circuits and Sensors	EuMC31 Frequency Selective Surfaces, Reflectors and Metamaterial Antennas	EuMC38 Metasurfaces and FSSs Applications	EuMC44 [Special Session] Silicon-Based Ka-Band Massive MIMO Systems	
Media arena	EuMC26 1-Minute Poster Pitch (09:40 - 10:10)	Career Platform [Special Session] Industry Market and Professional Opportunites	IEEE Young Professionals	Career Platform Startup Panel	
Fluor	S-04 Quantum Computing for Electrical Engineers				
Shuttle		IEEE Young Professionals			
Round control		Career Platform Career Lounge: Meet Jobs, Build Careers			
loopbrug	Career Platform Company Wall and Job Wall				
Juliana 2	W-12 High-Efficiency Linear Power Amplifiers for High Bandwidth, High PAR Signals				
Hall 1	Student Design Competition Detect a Drone / Build (a part of) an Amplifier)	EuMC32 Interactive Poster Session	Student Design Competition Detect a Drone / Build (a part of) an Amplifier		
Off-site					Microwave Nightfever 20.00 - 24.00

EuMW EuMC EuRAD EuMIC Student Activity EuMIC/EuMC EuMC/EuRAD

WEDNESDAY 08:30 – 10:10

Flash

EuMC24
Additive Manufacturing and Emerging Materials for mmWave Applications

Chair: Andrei Muller[1]
Co-Chair: Chris Clifton[2]
[1]École polytechnique fédérale de Lausanne (EPFL),Nanolab, [2]Sony Europe B V

08:30 – 08:50
EuMC24-1
High Performance Cooling Solution for Highly Integrated RF-PCBs
Jens Leiss[1]
[1]IMST GmbH

08:50 – 09:10
EuMC24-2
Monolithic SLA-Based Capacitively-Loaded High-Q Coaxial Resonators and Bandpass Filters
Kunchen Zhao[1], Dimitra Psychogiou[1]
[1]University of Colorado at Boulder

09:10 – 09:30
EuMC24-3
3D Printed Double Ridged Waveguide Rotman Lens System
Karina Hoel[1], Nathan Jastram[2], Stein Kristoffersen[1], Dejan Filipovic[2]
[1]Norwegian Defence Research Establishment (FFI), [2]University of Colorado at Boulder

09:30 – 09:50
EuMC24-4
Investigation of a Composite Embedded RF Passive Devices
Grzegorz Beziuk[1], Kamran Ghorbani[1], Thomas Baum[2], Kelvin Nicholson[2]
[1]RMIT University, [2]DST Group, Port Melbourne

09:50 – 10:10
EuMC24-5
A Minimally Invasive Monitoring Concept for Plasma-Assisted Surface Treatments in PET Bottles
Dennis Pohle[1], Felix Mitschker[1], Jonathan Jenderny[1], Marcel Rudolph[1], Christian Schulz[1], Peter Awakowicz[1], Ilona Rolfes[1]
[1]Ruhr University Bochum

Beam

EuMC25
Metamaterials for Circuits and Sensors

Chair: Ferran Martín[1]
Co-Chair: Francisco Medina[2]
[1]Universitat Autònoma de Barcelona, [2]Universidad de Sevilla

08:30 – 08:50
EuMC25-1
Glide Symmetry to Improve the Bandgap Operation of Periodic Microstrip Defected Ground Structures
Boules A. Mouris[1], Armando Fernández-Prieto[2], Ragnar Thobaben[1], Jesús Martel[2], Francisco Mesa[2], Oscar Quevedo-Teruel[1]
[1]KTH Royal Institute of Technology, [2]Universidad de Sevilla

08:50 – 09:10
EuMC25-2
Differential CRLH Coupled-Line Unit Cell with High Common Mode Rejection Ratio
Mariam Ateyya[1], Amr Safwat[1]
[1]Faculty of Engineering, Ain Shams University

09:10 – 09:30
EuMC25-3
Capacitively-Loaded Slow-Wave Transmission Lines for Sensitivity Improvement in Phase-Variation Permittivity Sensors
Jan Coromina[1], Jonathan Muñoz-Enano[1], Paris Vélez[1], Amir Ebrahimi[2], James Scott[2], Kamran Ghorbani[2], Ferran Martín[1]
[1]Universitat Autònoma de Barcelona, [2]RMIT University

09:30 – 09:50
EuMC25-4
Implementation of K-Band Mushroom Metamaterial Filter for Satellite Applications
Arash Arsanjani[1], Luke Robins[1], Reinhard Teschl[1], Wolfgang Bösch[1]
[1]Graz University of Technology

09:50 – 10:10
EuMC25-5
Compact Size Wideband 0-dB Microstrip Forward Coupler
Mohamed Elsheikh[1], Amr Safwat[2]
[1]Ain Shams University, [2]Faculty of Engineering, Ain Shams University

WEDNESDAY 08:30 – 10:10

ROOM **Polar**

EuRAD01
EuRAD Opening Session

EuRAD Chair: Mayazzurra Ruggiano[1], EuRAD Chair

Co-Chair: Jacco de Wit[2], EuRAD TPC Chair

[1]Thales Nederland B.V., [2]TNO

08:30 – 08:40 Welcome Address: Opening of the European Radar Conference 2020

Mayazzurra Ruggiano

EuRAD Chair

08:40 – 09:20 Millimeter-Wave and Terahertz Radar Instruments for Planetary, Cometary, Earth Observations, and Security Applications

Goutam Chattopadhyay[1]

[1]NASA-Jet Propulsion Laboratory, California Institute of Technology

Radar instruments play a critical role in NASA's planetary, cometary, and Earth observing missions. Sometimes they guide space crafts to the surface of another planet (such as Mars) or a comet and some other times they are used for answering fundamental scientific questions by exploring cometary and planetary bodies, including our own Earth. Until recently, the majority of NASA's radar instruments were below 100 GHz. However, in recent years, there has been a lot of interest in using millimeter-wave and terahertz radars to answer critical scientific questions. One such instrument developed by us is a 183 GHz (G-Band) differential absorption radar providing a new measurement capability of simultaneously measuring water vapor and ice content in clouds in Earth's atmosphere with high precision and spatial resolution. Profiling of water vapor within clouds is a critical requirement to address the key unsolved science questions regarding the processes regulating cloud lifecycle and the transport of water vapor by convection. Another instrument we developed is a 90 GHz (W-Band) frequency modulated continuous wave (FMCW) radar for understanding the origin, dynamics, and evolution of jets from a comet. When deployed, this will provide clues to the formation of comets and therefore the early stages of the Solar System. The same W-band radar is also being planned for investigating plumes on icy moons, such as Europa and Enceladus, which will shed light on subsurface processes and structure on these potentially life-harboring bodies. We are also building a revolutionary in situ radar instrument for short-range mapping of near-surface atmospheric water vapor on Mars. This highly compact and low-power differential absorption radar operates near the 557 GHz water absorption line to measure absolute humidity along its beam path with as good as few-ppm level accuracy. This instrument allows us, for the first time, range-resolved absolute humidity estimates on Martian surface. Apart from science instrument radars, we also developed a 670 GHz FMCW radar for imaging at stand-off distances for security applications.

09:20 – 10:00 One Step Ahead of the Enemy: Innovative Radar Solutions are Decisive for Military Use

Jorn Bleijs[1]

[1]Netherlands Defence Materiel Organisation

High-quality kill chains are a requirement for the military to timely detect and recognize potential threats and be able to neutralize them before they can successfully complete their mission. Radar technology and effective sensor-weapon integration are essential in this respect. Efforts in these areas resulted in a Dutch configuration to support anti-air warfare operations during the last four decades. This Dutch configuration always has been at the forefront of innovations.

Threats are evolving. Think of ballistic missiles and supersonic missiles. Continuous development is necessary to keep ahead of the threat and implement new functionality/capability. For this continuous development, we defined a roadmap for radar and integrated sensor suites for the Dutch armed forces. Various studies are being performed together with TNO and Thales Netherlands collaborating in the Dutch Radar Centre of Expertise (D-RACE), and also with international partners like the US Navy, in order to obtain a future-proof Integrated Air and Missile Defence capability. Multi-band sensor integration will provide the Royal Netherlands Navy with the operational flexibility required to effectively counter future threats.

This keynote will elaborate on the importance of radar and integrated sensor suites for future naval operations and the solutions that the Royal Netherlands Navy is aiming for.

Hotel Booking Form January 2021

Rooms are held on a guaranteed basis. For this reason, you are asked to supply a credit card number and full company details. If your travel plans change and you wish to cancel your accommodation, please contact Sally Garland on +44 (0)7775 744193 or email sally@connexhotelsandevents.com to avoid any non-arrival or cancellation charges, as each hotel has a different cancellation policy, full cancellation details will be clearly marked on every booking confirmation. Prepay rates are non-refundable and non-cancelable.

FOR MORE HOTEL OPTIONS AND TO RESERVE YOUR ROOM ONLINE VISIT
http://www.connexhotelsandevents.com/eumw-2020-utrecht.html
Or complete the booking form below and email to Sally@connexhotelsandevents.com

Contact Name _____ Company _____

Adress _____

City _____ Post Code _____

Telephone _____ Fax _____

Email _____

Date of Arrival _____ Date of Departure _____

Number of rooms required

Single Room(s) _____ Twin Room(s) _____ Double Room(s) _____

First choice Hotel _____ Second choice Hotel _____

Guest Names _____

In order to guarantee the accommodation, please provide us with your credit card details:

Credit Card Number _____ Name on Card _____ Expiry Date ____/____

I authorise that any no show or late cancellation charges, as stipulated in the Hotelzon / Connex booking confirmation will be charged to this credit card

Signed _____ Date _____

Connex Hotels and Events

Tel: +44 (0)7775 744193
Email: sally@connexhotelsandevents.com

The below rates are based on single occupancy, during the main days of the show and the standard room type of the hotel. Other room types or pre and post show nights may have different prices

HOTEL	TO JAARBEURS	ROOMS FROM*		
NH HOTEL (HEADQUARTERS HOTEL)– ★★★★ Jaarbeursplein, 24, 3521 AR Utrecht	5 minute by walk	EuMW Flexible	€ 195,– € 249,–	B&B B&B
PARK PLAZA UTRECHT – ★★★★ Westplein 50, 3531 BL Utrecht	7 minute by walk	EuMW Prepay Flexible	€ 139,– € 146,– € 152,–	B&B RO B&B
THE ANTHONY HOTEL – ★★★ Kanaalstraat 197-199, 3531 CG Utrecht	8 minute by walk	Flexible	€ 158,–	RO
HAMPTON BY HILTON UTRECHT CENTRAL STATION – ★★★ Boven Catharijnepoort 4, 3511 WN Utrecht	10 minute by walk	EuMW Flexible	€ 154,– € 200,–	B&B B&B
CROWNE PLAZA CENTRAL STATION - ★★★★ Catharijne Esplanade 13, 3511 WK Utrecht	10 minute by walk	Prepay Flexible	€ 222,– € 216,–	B&B RO
INNTELS HOTEL UTRECHT CENTRE – ★★★ Smakkelaarshoek 24, 3511 EC Utrecht	10 minute by walk	EuMW Prepay Flexible	€ 174,– € 150,– € 185,–	B&B RO B&B
THE HUNFELD – ★★★ Mariaplaats 4, 3511 LH Utrecht	13 minute by walk	Prepay Flexible	€ 158,– € 172,–	RO RO
APOLLO HOTEL UTRECHT CITY CENTRE – ★★★ Vredenburg 14, 3511 BA Utrecht	14 minute by walk	Flexible	€ 139,–	B&B
MOTHER GOOSE HOTEL – ★★★ Ganzemarkt 26, 3512 GE Utrecht	17 minute by walk	Flexible	€ 153,–	RO
EYE HOTEL – ★★★ Wijde Begijnestraat 1-4, 3512 AW Utrecht	20 minute by walk	Prepay Flexible	€ 168,– € 183,–	RO RO
COURT HOTEL CITY CENTRE – ★★★★ Korte Nieuwstraat 14, 3512 NM Utrecht	20 minute by walk	Prepay Flexible	€ 160,– € 164,–	RO RO
NH CENTRE UTRECHT – ★★★★ Janskerkhof 10, 3512 BL Utrecht	20 minute by walk	Prepay Flexible	€ 141,– € 158,–	B&B B&B
BASTION HOTEL – ★★★ Mauritiuslaan 1, 3526 LD Utrecht	11 minute by transport	Flexible	€ 102,–	RO
HOLIDAY INN EXPRESS UTRECHT – PAPENDORP – ★★★ Van Deventerlaan 10, 3528 AE Utrecht	16 minute by transport	Prepay Flexible	€ 116,– € 123,–	B&B B&B
STAR LODGE HOTEL – ★★ Biltsestraatweg 92, 3573 PS Utrecht	16 minute by transport	Flexible	€ 120,–	RO
HOTEL MITLAND – ★★★ Ariënslaan 1, 3573 PT Utrecht	20 minute by transport	Flexible	€ 110,–	RO
POSTILLION HOTEL UTRECHT BUNNIK – ★★★★ Baan van Fectio 1, 3981 HZ Bunnik	25 minute by transport	Flexible	€ 121,–	RO
CARLTON PRESIDENT HOTEL – ★★★★ Floraweg 25, 3542 DX Utrecht	25 minute by transport	Prepay Flexible	€ 100,– € 140,–	RO B&B
HOTEL THEATER FIGI – ★★★ Het Rond 2, 3701 Zeist	21 minute by transport	Prepay	€ 66,–	B&B

*All rates quoted include VAT at the current rate. 6 % City tax is not included

Prepay: Room rate will be charged at the time of booking, to the credit card used to guarantee the reservation, after this the room is non-refundable.

Flexible: Room can be cancelled or amended up until a few days before arrival, individual policy will be stated on the booking confirmation

RO: Room rate does not include breakfast; however, breakfast is available at the hotel at an extra cost

B&B: Room rate includes breakfast.

WEDNESDAY 10:50 – 12:30

	Mission 2	Expedition	Flash	Glow
	EuMC27 [Focussed Session] Emerging Microwave Technologies in Asia-Pacific Region Chair: Kamran Ghorbani[1] Co-Chair: Luca Perregrini[2] [1]RMIT University, [2]University of Pavia	**EuMC28** Novel Wireless Power Transfer and Energy Harvesting Systems Chair: Naoki Shinohara[1] Co-Chair: Jiafeng Zhou[2] [1]Kyoto University, [2]University of Liverpool	**EuMC29** Reconfigurable Planar Passive Components Chair: Petronilo Martín-Iglesias[1] Co-Chair: Anthony Ghiotto[2] [1]ESA ESTEC, [2]University of Bordeaux INP	**EuMC30** Non-Planar Filters Chair: Richard Snyder[1] Co-Chair: Cristiano Tomassoni[2] [1]RS Microwave, [2]University of Perugia
10:50 – 11:10	**EuMC27-1** A Polarization-Insensitive Frequency Selective Surface Based Rasorber with Narrow-Band Absorption Between Two Transmission Bands Mehran Manzoor Zargar[1], Archana Rajput[1], Kushmanda Saurav[1], Shiban Kishen Koul[2] [1]INDIAN INSTITUTE OF TECHNOLOGY JAMMU, [2]INDIAN INSTITUTE OF TECHNOLOGY DELHI	**EuMC28-1** An Electronically Steerable Millimeter-Wave Reflectarray for Wireless Power Delivery J. Gabriel Buckmaster[1], Thomas H. Lee[1] [1]Stanford University	**EuMC29-1** VO2-Based Transmit/Receive Switch Junwen Jiang[1], Raafat R. Mansour[1] [1]University of Waterloo	**EuMC30-1** Compact On-Board Dielectric Filters and Diplexers for High-Power Satellite Applications Luca Pelliccia[1], Fabrizio Cacciamani[1], Paolo Valleroton-da[1], Alessandro Cazzorla[1], Francesco Aquino[1], Roberto Sorrentino[1], Walter Steffé[2], Cristiano Tomassoni[3], Jaione Galdeano[4], Petronilo Martín-Iglesias[4] **INDUSTRIAL KEYNOTE** [1]RF Microtech Srl, [2]Thales Alenia Space Italia, [3]University of Perugia, [4]ESA ESTEC
11:10 – 11:30	**EuMC27-2** Efficient Design and Experimental Verification of High-Q MPhC BPF for mmWave Applications Erika Katsuno[1], Chun-Ping Chen[1], Tetsuo Anada[1], Shigeki Takeda[2], Zhewang Ma[3] [1]Kanagawa University, [2]Antenna Giken Co., Ltd., [3]Saitama University	**EuMC28-2** Evaluation of Simultaneous Wireless Information and Power Transfer with Distributed Antennas Ibrahim Can Sezgin[1], Jose-Ramon Perez-Cisneros[1], Christian Fager[1] [1]Chalmers University of Technology	**EuMC29-2** Low-Loss K-Band Photoconductive Switches in SIW Technology Elena Shepeleva[1], Mikhail Makurin[1], Artem Vilenskiy[2] [1]Samsung R&D Institute Russia, [2]Chalmers University of Technology	**EuMC30-2** Hybrid Inline TE/TM Mode Dielectric Resonator Filters with Wide Spurious Free Range and Controllable Transmission Zeros Patrick Boe[1], Daniel Miek[1], Fynn Kamrath[1], Michael Höft[1] [1]Christian-Albrechts-Universität zu Kiel
11:30 – 11:50	**EuMC27-3** Compact SIW Based Wideband Phase Shifter Loaded with Square Complementary Omega (SCO) Array Karthik Thothathri Chandrasekaran[1], Arokiaswami Alphones[1], Karim Muhammad Faeyz[1], Nasimuddin Nasimuddin[2] [1]Nanyang Technological University, [2]Agency for Science and Technology (A*STAR)	**EuMC28-3** An Ambient-Insensitive Battery-Less Wireless Node for Simultaneous Powering and Communication Giacomo Paolini[1], Diego Masotti[1], Marco Guermandi[1], Mazen Shanawani[1], Luca Benini[1], Alessandra Costanzo[1] [1]University of Bologna	**EuMC29-3** Reconfigurable Substrate Integrated Waveguide Circuits Using Dielectric Fluids Matthew Brown[1], Carlos Saavedra[1] [1]Queen's University	**EuMC30-3** Narrow-Band and Low-loss Bandpass Filter for 5G Built of Silica-Based Post-Wall Waveguide Yusuke Uemichi[1], Shinnosuke Tsuchiya[1], Toru Yamaguchi[1], Xu Han[1], Osamu Nukaga[1], Shuhei Amakawa[2], Ning Guan[1] [1]Fujikura Ltd., [2]Hiroshima University
		EuMC28-4 A 24 GHz Unit Rectenna for Millimeter-Wave Power Transmission Application Hye-Won Jo[1], Sol Kim[1], ByungKuon Ahn[1], Hyunyoung Cho[1], Jong-Won Yu[1] [1]Korea Advanced Institute of Science and Technology	**EuMC29-4** Wideband PCB-to-Connectors Impedance Adapters for Liquid Crystal-Based Low-Loss Phase Shifters Jinfeng LI[1] [1]Imperial College London	**EuMC30-4** A New Directional Filter Design Huairen Yi[1], Zhengxiang Ma[1] [1]Futurewei Technologies
		EuMC28-5 Loop Antenna Array System with Simultaneous Operation of OAM Multiplex Communication and Wireless Power Transfer Wataru Wada[1], Ryo Ishikawa[1], Akira Saitou[1], Hisanosuke Miyake[1], Haruki Kikuchi[1], Hiroshi Suzuki[1], Kazuhiko Honjo[1] [1]The University of Electro-Communications	**EuMC29-5** High-Performance Compact Reflection Type Phase Shifter Operating at 2 GHz Using a Transdirectional Coupler Olivier Occello[1], Leonel Tiague[1], Marc Margalef-Rovira[1], Loic Vincent[2], Fabien Ndagijimana[3], Philippe Ferrari[1] [1]Univ. Grenoble Alpes, RFIC-Lab, [2]Univ. Grenoble Alpes, CIME, [3]Univ. Grenoble Alpes, G2ELab	**EuMC30-5** Design of an X/Ku Band Coaxial Overmoded Waveguide Diplexer for High Power Microwaves Jiawei Li[1], Guangjian Deng[1], Letian Guo[1] [1]Northwest Institute of Nuclear Technology

WEDNESDAY 10:50 – 12:30

	Beam	Mission 1	Quest
	EuMC31 Frequency Selective Surfaces, Reflectors and Metamaterial Antennas Chair: Christian Person[1] Co-Chair: Thomas Dallmann[2] [1]Telecom Bretagne, [2]Fraunhofer Institute for High Frequency Physics and Radar Techniques FHR	**EuRAD02** Dual Use & Waveform Design Chair: Stephen Harman[1] Co-Chair: R. Firat Tigrek[2] [1]Aveillant Limited, [2]Eindhoven University of Technology (TU/e)	**EuRAD03** Design and Calibration Concepts for Advanced Radar Systems and Subsystems Chair: Peter Gardner[1] Co-Chair: Claire Migliaccio[2] [1]The University of Birmingham, [2]Université Côte d'Azur
10:50 – 11:10	**EuMC31-1** Design of a Polarization Rotating FSS for Polarimetric Automotive Radar Measurements Arvid Sims[1], Tim Freialdenhoven[2], Thomas Dallmann[2] [1]Keysight Technologies, [2]Fraunhofer Institute for High Frequency Physics and Radar Techniques FHR	**EuRAD02-1** Peak Sidelobe Level Based Waveform Optimization for OFDM Joint Radar-Communications Musa Furkan Keskin[1], R. Firat Tigrek[2], Canan Aydogdu[1], Franz Lampel[3], Henk Wymeersch[3], Alex Alvarado[4], Frans M. J. Willems[2] [1]Chalmers University, [2]Eindhoven University of Technology (TU/e)	**EuRAD03-1** An overarching strategy for radar antenna design, optimization, and system integration Giorgia Zucchelli[1], Rick Gentile[1] **INDUSTRIAL KEYNOTE** [1]The Mathworks
11:10 – 11:30	**EuMC31-2** A Ka-Band Polarization Rotating Multilayer Reflector for Polarimetric Radars Tim Freialdenhoven[1], Thomas Dallmann[1] [1]Fraunhofer FHR	**EuRAD02-2** Adaptive Filter Design for Simultaneous In-Band Full-Duplex Communication and Radar Seyed Ali Hassani[1], Barend van Liempd[2], André Bourdoux[2], François Horlin[3], Sofie Pollin[4] [1]KU Leuven, [2]imec, Leuven, [3]ULB, [4]KULeuven	**EuRAD03-2** Angle-Dependent Mutual Coupling in Antenna Arrays by Electromagnetic Modelling of Sub-Volumes Ricard Grove[1], Poul Leth-Espensen[2], Jørgen Dall[1] [1]DTU Space, [2]Terma A/S
11:30 – 11:50	**EuMC31-3** Gradient Optimization on Third Order Bandpasses for a 24 GHz Metasurface Lens Christoph Kohlberger[1], Gernot Hueber[1], Christoph Wagner[2], Andreas Stelzer[2] [1]Silicon Austria Labs, [2]DICE Danube Integrated Circuit Engineering GmbH & Co. KG, [3]JKU Linz	**EuRAD02-3** Design and Measurements of MSK-LFM RadCom System Husileng Bao[1], Ziemann Arvid[1], Zhongxia Simon He[2] [1]Chalmers University of Technology, [2]SenWellen (Shenzhen) Communications Technologies Ltd. Co.	**EuRAD03-3** Phase Noise Investigation for a Radar System with Optical Clock Distribution Stephan Kruse[1], Meysam Bahmanian[1], Pascal Kneuper[1], Christian Kress[1], Heiko Gustav Kurz[2], Thomas Schneider[3], J. Christoph Scheytt[1] [1]Heinz Nixdorf Institute, University of Paderborn, [2]Volkswagen Aktiengesellschaft, [3]Technische Universität Braunschweig
11:50 – 12:10	**EuMC31-4** FR-4 PCB Process-based mmWave Phased Array Antenna Using Planar High-Impedance Surfaces Jae-Yeong Lee[1], Jaehyun Choi[1], Dongkwon Choi[1], Youngno Youn[1], Junho Park[1], Wonbin Hong[1] [1]Pohang University of Science and Technology (POSTECH)	**EuRAD02-4** An Ultrahigh-Resolution Continuous Wave Synthetic Aperture Radar with Photonic-Assisted Signal Generation and Dechirp Processing Ruoming Li[1], Wangzhe Li[1], Bingnan Wang[1], Zhilei Wen[1], Yuchen Luan[1], Zhenli Yang[1], Yang Xing[1], Jiyao Yang[1], Zhenwei Mo[1] [1]Institute of Electronics of the Chinese Academy of Sciences	**EuRAD03-4** Increasing the Efficiency and Robustness of Angular Radar Calibration by Exploiting Phase Symmetry André Dürr[1], Matthias Linder[1], Christian Waldschmidt[1] [1]Ulm University
12:10 – 12:30	**EuMC31-5** An Equivalent Circuit Diagram for a Hexagonal Ring Frequency Selective Surface Andreas Röhrner[1], Georg Strauss[1], Thomas F. Eibert[2] [1]Munich University of Applied Sciences, [2]Technical University of Munich	**EuRAD02-5** Discrete-Phase Sequence Design with Stopband and PSL Constraints for Cognitive Radar Mohammad Alaee-Kerahroodi[1], Sumit Kumar[2], Bhavani Shankar Mysore Rama Rao[1], Kumar Vijay Mishra[1] [1]Interdisciplinary Centre for Security, Reliability and Trust, [2]University of Luxembourg	**EuRAD03-5** Phase Control Method for Subsampling PLL by Varying Phase and Frequency of Clock Signal of S/H Circuit Osamu Wada[1], Hiroyuki Mizutani[1], Hideyuki Nakamizo[1] [1]Mitsubishi Electric Corporation

WEDNESDAY 12:30 – 14:20

Hall 1

EuMC32
EuMC Interactive Poster Session 2

Chair: Jan Geralt bij de Vaate[1]
Co-Chair: Mark Oude Alink[2]
[1]ASTRON, [2]University of Twente

EuMC32-1
Photonic Microwave Oscillator based on an Ultra-stable-laser and an Optical Frequency Comb
Michele Giunta[1], Maurice Lessing[1], Jialiang Yu[2], Marc Fischer[1], Matthias Lezius[1], Xiaopeng Xie[3], Giorgio Santarelli[4], Yann Le Coq[5], Ronald Holzwarth[1]
[1]Menlo Systems GmbH, [2]Physikalisch-Technische Bundesanstalt (PTB), [3]State Key Laboratory of Advanced Optical Communication Systems and Networks, [4]LP2N, IOGS-CNRS-Universités de Bordeaux, [5]LNE-SYRTE, Observatoire de Paris

EuMC32-2
Design and Development of 3.5 THz Schottky-Based Fundamental Mixer
Divya Jayasankar[1], Vladimir Drakinskiy[2], Mats Myremark[2], Peter Sobis[2], Jan Stake[2]
[1]Research Institutes of Sweden, [2]Chalmers University of Technology, [3]Omnisys Instruments

EuMC32-3
A 122 GHz On-Chip 3-Element Patch Antenna Array with 10 GHz Bandwidth
Vincent Lammert[1], Mohamed Hamouda[2], Robert Weigel[1], Vadim Issakov[2]
[1]FAU Erlangen-Nuremberg / Infineon Munich, [2]Infineon Technologies AG, [3]FAU Erlangen-Nuremberg, [4]Infineon Technologies AG / OVGU Magdeburg

EuMC32-4
Development of Second-Harmonic Terahertz Gyrotrons with Highly Selective Cavities
Ilya Bandurkin[1], Alexey Fedotov[1], Andrey Fokin[1], Mikhail Glyavin[1], Alexey Luchinin[1], Ivan Osharin[1], Dmitriy Radishev[1], Andrey Savilov[1], Andrei Starodubov[2], Yoshinori Tatematsu[3]
[1]Federal research center Institute of Applied Physics of the Russian Academy of Sciences (IAP RAS), [2]Saratov State University, [3]FIR Center, University of Fukui

EuMC32-5
High Power High Efficiency 475-520 GHz Source Based on Discrete Schottky Diodes
Diego Moro-Melgar[1], Oleg Cojocari[1], Ion Oprea[1]
[1]ACST GmbH

EuMC32-6
THz Wave Scattering by Double-Layer Infinite Graphene Strip Grating Without One Strip in Every Layer
Mstyslav Kaliberda[1], Leonid Lytvynenko[2], Sergey Pogarsky[1]
[1]V.N.Karazin Kharkiv National University, [2]Institute of Radio Astronomy of the National Academy of Sciences of Ukraine

EuMC32-7
Evaluation of Twin Silver Nanotubes as a Possible Sensor of the Charged Particle Beam Position
Dariia Herasymova[1]
[1]Institute of Radio-Physics and Electronics NASU

EuMC32-8
Scattering of Natural Waves of Planar Dielectric Waveguide with PEC Wall by Graphene Strip Grating in THz Range
Mstyslav Kaliberda[1], Leonid Lytvynenko[2], Sergey Pogarsky[1]
[1]V.N. Karazin Kharkiv National University, [2]Institute of Radio Astronomy of the National Academy of Sciences of Ukraine

EuMC32-9
Optimization Algorithms for Accurate FMCW Millimeter-Wave and Terahertz Thickness Measurements
Nina Susan Schreiner[1], Michael Bortz[1], Wolfgang Sauer-Greff[2], Ralph Urbansky[2], Fabian Friederich[1]
[1]Fraunhofer Institute for Industrial Mathematics ITWM, [2]Technische Universität Kaiserslautern

EuMC32-10
Complex Conductivity Extraction in Monolayer Graphene at Microwave Frequency by Free Space Technique
Houssemeddine Krraoui[1]
[1]ESPCI

EuMC32-11
Precision Phase Shift Measurement System in the Frequency Range of 1-18 GHz
Anton Widarta[1]
[1]National Metrology Institute of Japan NMIJ/AIST

EuMC32-12
Aperture Synthesis Method to Investigate on the Reflection Properties of Typical Road Surfaces
Jochen Jebramcik[1], Ilona Rolfes[1], Jan Barowski[1]
[1]Ruhr-University Bochum

EuMC32-13
Hybrid Beamforming Analysis Based on MIMO Channel Measurements at 28 GHz
Joerg Eisenbeis[1], Magnus Tingulstad[1], Nicolai Kern[1], Zsolt Kollar[1], Jerzy Kowalewski[1], Pablo Ramos López[1], Thomas Zwick[1]
[1]Karlsruhe Institute of Technology (KIT)

EuMC32-14
Angle-Shifted Conformal Array with Multibeam Folded Ground Structures for Wide Coverage
Young-Jun Kim[1], Gun-Hark Noh[1], Han Lim Lee[1]
[1]Chung-Ang University

EuMC32-15
Angle Estimation of Coherent Targets via Toeplitz Induced Compressed Matrix Method for the Bistatic MIMO Radar
evans Baidoo[1], Jurong Hu[1], Bilguun Batbaatar[1], Benjiman Kwakye[1]
[1]Hohai University

EuMC32-16
A Logarithmic Frequency-Diverse Array System for Precise Wireless Power Transfer
Enrico Fazzini[1], Mazen Shanawani[1], Alessandra Costanzo[1], Diego Masotti[1]
[1]University of Bologna

EuMC32-17
Gain Enhancement Technique for On-Chip Monopole Antenna
Carmine Mustacchio[1], Luigi Boccia[1], Emilio Arnieri[1], Giandomenico Amendola[1]
[1]Università della Calabria

EuMC32-18
A Single Smart Cut POI Substrate Design for UHF, L and S Band Filters
Eric Butaud[1], Thierry Laroche[2], Vincent Barec[1], Alexandre Clairet[2], Marie Bousquet[3], Florent Bernard[2], Raphaël Caulmilone[1], Eric Michoulier[2], Emilie Courjon[2], Isabelle Huyet[1], Brice Tavel[1], Gabrielle Aspar[2], Yann Lamy[3], Ajit Defrasne[2], Alexandre Raveski[2], Sylvain Ballandras[2], Christophe Didier[1]
[1]SOITEC Grenoble, [2]frec|n|sys SASU, [3]CEA LETI

EuMC32-19
A Dynamic CAD Model for Phase Change Material (PCM) Switches
Ines Bettoumi[1], Cyril Guines[1], Pierre Blondy[1]
[1]XLIM - CNRS - Universite de Limoges

EuMC32-20
A Machine Learning-Based Microwave Device Model for Fully Printed VO2 RF Switches
Shuai Yang[1], Ahmad Khusro[2], Weiwei Li[1], Mohammad Vaseem[1], Mohammad Hashmi[2], Atif Shamim[1]
[1]King Abdullah University of Science and Technology (KAUST), [2]Jamia Millia Islamia (A Central University), [3]Nazarbayev University

EuMC32-21
Additive Manufacturing of Coplanar Transmission Lines on Alumina Substrate up to 24 GHz using Laser Assisted Selective Metallization
Konstantin Lomakin[1], Li Wang[2], Alexander Job[2], Robert Süß-Wolf[2], Jörg Franke[2], Gerald Gold[2]
[1]Friedrich-Alexander University Erlangen-Nürnberg (FAU), [2]Friedrich-Alexander Universität Erlangen-Nürnberg

WEDNESDAY 13:50 – 15:30

Mission 2

EuMC33
Advances on RF Power Amplifier Behavioural Modelling and Characterisation

Chair: Gustavo Avolio[1]
Co-Chair: José Carlos Pedro[2]
[1]Anteverta MW|Maury Microwave, [2]Universidade de Aveiro - IT

13:50 – 14:10
EuMC33-1
Accurate and Efficient Modulation Distortion Analysis of Active Components
Jan Verspecht[1]
INDUSTRIAL KEYNOTE
[1]Keysight Technologies Inc

14:10 – 14:30
EuMC33-2
An AM-PM Compensation of Differential Power Amplifier using Capacitance Neutralization
Takuma Torii[1], Masatake Hangai[1], Shintaro Shinjo[1]
[1]Mitsubishi Electric Corporation

14:30 – 14:50
EuMC33-3
Emulation of Load Modulated Amplifiers Using Tabulated Load-Pull Data From a Single Amplifier
Jose-Ramon Perez-Cisneros[1], William Hallberg[2], Christian Fager[1], Koen Buisman[1]
[1]Chalmers University of Technology, [2]Qamcom IRP Technology AB

14:50 – 15:10
EuMC33-4
On the Power and Beam Dependency of Load Modulation in mmWave Active Antenna Arrays
Alberto Brihuega[1], Matias Turunen[1], Lauri Anttila[1], Thomas Eriksson[2], Mikko Valkama[1]
[1]Tampere University of Technology, [2]Chalmers University of Technology

15:10 – 15:30
EuMC33-5
Incorporating Gate-Lag Effects into the Cardiff Behavioural Model
Yashar Alimohammadi[1], Eigo Kuwata[1], Xuan Liu[1], Ehsan Azad[1], James Bell[1], Lei Wu[1], Paul Tasker[1], Johannes Benedikt[1]
[1]Cardiff Univeristy, [2]Huawei Technologies Co., Ltd., China

Expedition

EuMC34
Recent Advances in RFID and IoT Sensors

Chair: Alessandra Costanzo[1]
Co-Chair: Nuno Borges Carvalho[2]
[1]University of Bologna, [2]University of Aveiro / Instituto de Telecomunicações

13:50 – 14:10
EuMC34-1
Intelligent Packaging for Tropical Fruit Management and Ripening Monitoring
Cecilia Occhiuzzi[1], N. D'Uva, S. Nappi, S. Amendola, C. Gialluca, V. Chiabrando, L. Garavaglia, G. Giacalone, Gaetano Marrocco[2]
INDUSTRIAL KEYNOTE
[1]Università di Roma "Tor Vergata", [2]University of Roma Tor Vergata

14:10 – 14:30
EuMC34-2
A Time Dependent Temperature Compensated Limiter for Passive Differential UHF RFID
Dominik Mair[1], Georg Saxl[1], Christof Happ[1], Moritz Fischer[1], Thomas Ußmüller[1]
[1]University of Innsbruck

14:30 – 14:50
EuMC34-3
Low-IF Interferometric Receiver Architecture for Massive-IoT Wireless Systems
Intikhab Hussain[1], Ke Wu[2]
[1]Ecole Polytechnique de Montreal, [2]Polytechnique Montreal

14:50 – 15:10
EuMC34-4
High-Accuracy 3D SAW RFID Tag Localization Using a Multi-Antenna Mobile Robot Based Synthetic Aperture Approach
Pau Caldero[1], Matthias Gareis[2], Martin Vossiek[2]
[1]Siemens Mobility GmbH, [2]Friedrich-Alexander University Erlangen-Nuremberg (FAU)

15:10 – 15:30
EuMC34-5
Energy Harvesting for Battery-Free Wireless Sensors Network Embedded in a Reinforced Concrete Beam
Alassane Sidibe[1], Gaël Loubet[2], Alexandru Takacs[1], Daniela Dragomirescu[2]
[1]LAAS-CNRS, UPS, [2]LAAS-CNRS, INSA

Spark

EuMC35
Integrated Antennas

Chair: Ke Wu[1]
Co-Chair: Symon K. Podilchak[2]
[1]Polytechnique Montreal, [2]University of Edinburgh

13:50 – 14:10
EuMC35-1
Unified Integration of Self-Oscillating Mixer-Antenna for Compact Receiver Frontend
Srinaga Nikhil Nallandhigal[1], Ke Wu[2]
[1]Ecole Polytechnique de Montreal, [2]POLY-GRAMES

14:10 – 14:30
EuMC35-2
Octa Cross-Slot Patch Antenna with Quad-beam Reconfigurability for 5.8 GHz Application
TARUN PRAKASH[1], Raghvendra Kumar Chaudhary[2], Ravi Kumar Gangwar[2]
[1]Indian Institute of Technology (ISM), Dhanbad, [2]INDIAN INSTITUTE OF TECHNOLOGY (ISM) DHANBAD

14:30 – 14:50
EuMC35-3
Investigation of Integration for OAM Communication Using Loop Antenna Array and Analysis of Alignment Tolerance for Practical Use
Haruki Kikuchi[1], Akira Saitou[1], Hisanosuke Miyake[1], Wataru Wada[1], Hiroshi Suzuki[1], Ryo Ishikawa[1], Kazuhiko Honjo[1]
[1]The University of Electro-Communications

14:50 – 15:10
EuMC35-4
High Gain Beam-Steerable Reconfigurable Antenna using Combined Pixel and Parasitic Arrays
Devakumaran Subramaniam[1], Thennarasan Sabapathy[1], Muzammil Jusoh[1], Ping Jack Soh[1], Mohamed Nasrun Osman[1], Symon K. Podilchak[2], Dominique Schreurs[3], Callum John Hodgkinson[4], Mudrik Alaydrus[5]
[1]Universiti Malaysia Perlis, [2]University of Edinburgh, [3]KU Leuven, [4]The University of Edinburgh, [5]Universitas Mercu Buana

15:10 – 15:30
EuMC35-5
Ka-Band Coupled-Resonator Filtering Magneto-†' Electric Dipole Antenna
Hossein Sarbandi Farahani[1], BEHROOZ REZAEE[1], Wolfgang Bösch[1]
[1]Graz University of Technology

Flash

EuMC36
Transmission Lines and Passive Components

Chair: Maurizio Bozzi[1]
Co-Chair: Bart Nauwelaers[2]
[1]University of Pavia, [2]KU Leuven

13:50 – 14:10
EuMC36-1
TFLE-Thin Film Lumped Elements Reflective and Non-Reflective Filtering Solutions
Rafi Hershtig
INDUSTRIAL KEYNOTE

14:10 – 14:30
EuMC36-2
Realization of Dual Band Matching Networks Using Cascaded Filters
Farzad Yazdani[1], Raafat R. Mansour[1]
[1]University of Waterloo

14:30 – 14:50
EuMC36-3
A Wideband DC Isolated Substrate Integrated Coaxial Line Transition for System Integration
Satya Krishna Idury[1], Soumava Mukherjee[1]
[1]Indian Institute of Technology Jodhpur

14:50 – 15:10
EuMC36-4
Millimeter-Wave E-plane Transmission Lines in Multi-layer Substrate
Thanh Tuan Nguyen[1], Kunio Sakakibara[1], Nobuyoshi Kikuma[1]
[1]Nagoya Institute of Technology

15:10 – 15:30
EuMC36-5
A Design Approach for an Integrated Self-Biased Ka-Band Isolator
Wanja M. Gitzel[1], Oktay Arikan[1], Manuel Heidenreich[2], Jörg Töpfer[2], Arne F. Jacob[1]
[1]Hamburg University of Technology, [2]Ernst-Abbe-Hochschule Jena

WEDNESDAY 13:50 – 15:30

Glow

EuMC37
Non-Planar Filters and Devices

Chair: Giuseppe Macchiarella[1]
Co-Chair: Cristiano Tomassoni[2]
[1]Politecnico di Milano, [2]University of Perugia

13:50 – 14:10
EuMC37-1
An Efficient Microwave Filter Design Procedure Based on Space Mapping
Juan Carlos Melgarejo Lermas[1], Marco Guglielmi[1], Santiago Cogollos Borrás[1], Vicente Enrique Boria Esbert[1]
[1]Universitat Politècnica de València

14:10 – 14:30
EuMC37-2
Enhancing the Out-of-Band Response of Hybrid Wide-Band Filters in Rectangular Waveguide
Joaquin Valencia Sullca[1], Marco Guglielmi[1], Santiago Cogollos Borrás[1], Vicente Enrique Boria Esbert[1]
[1]Technical university of Valencia

14:30 – 14:50
EuMC37-3
A Substrate-Less Current Mode Combining Power Module Utilizing Ridge Gap Waveguide
Sam Chieh[1], Alex Phipps[1], Everly Yeo[1]
[1]Naval Information Warfare Center Pacific

14:50 – 15:10
EuMC37-4
Evaluating Resonant Cavity Surface Treatment Procedures with a New Unloaded Q-Factor Measurement Method
Jure Soklič[1], Holger Arthaber[1]
[1]TU Wien

Beam

EuMC38
Metasurfaces and FSSs Applications

Chair: Pierre Blondy[1]
Co-Chair: Oscar Quevedo-Teruel[2]
[1]XLIM, [2]KTH Royal Institute of Technology

13:50 – 14:10
EuMC38-1
Diffractive Metasurfaces for Microwave Beamforming Applications
Ryan Stevenson[1]
INDUSTRIAL KEYNOTE
[1]Kymeta Corporation

14:10 – 14:30
EuMC38-2
Fully Inkjet Printed Dual-Polarization Broadband Tuneable FSS Using Origami "Eggbox" Structure
Yepu Cui[1], Samantha Van Rijs[1], Ryan Bahr[1], Manos M. Tentzeris[1]
[1]Georgia Institute of Technology

14:30 – 14:50
EuMC38-3
High Gain Arbitrarily-Oriented Linearly-Polarized Leaky-Wave Antenna by Tensorial Impedance Surfaces
Amrollah Amini[1], Homayoon Oraizi[2]
[1]Iran University of Science and Technology, [2]Iran University of Science & Technology

14:50 – 15:10
EuMC38-4
Electromagnetic Analysis of a Jigsaw-Shaped FSS for Conformal Application
Yan Zhang[1], Tao Dong[2], Da Sun[1], Yecheng Wang[1], Shanwei Lü[1]
[1]Beihang University, [2]Beijing Institute of Satellite Information Engineering

15:10 – 15:30
EuMC38-5
Additively Manufactured Conformal All-Dielectric Frequency Selective Surface
R. Adeline Mellita[1], Karthikeyan Sholampettai Subramanian[2], Damodharan Perumal[1]
[1]Indian Institute of Information Technology Design & Manufacturing, Kancheepuram, Chennai 600127, [2]National Institute of Technology Tiruchirappalli, Tiruchirappalli 620015

Mission 1

EuRAD04
Doppler Processing Techniques for Low Reflectivity Targets Characterisation

Co-Chair: Nerea del Rey-Maestre[2]
[1]Thales Nederland B.V., [2]University of Alcalá

13:50 – 14:10
EuRAD04-1
Radar Measurements for the Assessment of Features for Drone Characterization
Jacco de Wit[1], Daniel Gusland[2], Roeland Trommel[3]
[1]TNO, [2]Norwegian Defence Research Establishment (FFI), [3]Thales Nederland B.V.

14:10 – 14:30
EuRAD04-2
Drone Recognition by Micro-Doppler and Kinematic
Frederic Barbaresco[1]
[1]Thales Land & Air System

14:30 – 14:50
EuRAD04-3
Multiple-Bursts Iterative Adaptive Approach For Doppler Ambiguities Resolution From PRF Agile Radars
Linda Aouchiche[1], Laurent Ferro-Famil[1], Jean-Philippe Ovarlez[2]
[1]University of Rennes 1, [2]ONERA

14:50 – 15:10
EuRAD04-4
Deep Learning-Based Identification of Human Gait by Radar Micro-Doppler Measurements
Vasileios Papanastasiou[1], Roeland Trommel[2], Ronny Harmanny[2], Alexander Yarovoy[1]
[1]TU Delft, [2]Thales Nederland B.V.

15:10 – 15:30
EuRAD04-5
Distinguishing Living and Non-Living Subjects in a Scene Based on Vital Parameter Estimation
Manjunath Thindlu Rudrappa[1], Reinhold Herschel[1], Peter Knott[1]
[1]Fraunhofer FHR

Quest

EuRAD05
Radar Circuits and Systems

Chair: Nils Pohl[1]
Co-Chair: Cicero Vaucher[2]
[1]Ruhr University Bochum, [2]NXP Semiconductors

13:50 – 14:10
EuRAD05-1
A Fully Integrated 78 GHz Automotive Radar System-on-Chip in 22nm FD-SOI CMOS
Philipp Ritter[1], Xiaolei Gai[1], Michael Geyer[1], Tilman Gloekler[1], Thomas Schwarzenberger[1], Gregor Tretter[1], Yikun Yu[1], Guenter Vogel[1]
[1]Robert Bosch GmbH

14:10 – 14:30
EuRAD05-2
A Fully Integrated K-Band UWB Radar IC for Collision Avoidance of Drone and Small UAVs
ByeongJae Seo[1], SeungHwan Jung[2], SangGyun Kim[2], YunSeong Eo[1]
[1]Kwangwoon University, [2]Grit Custom-IC

14:30 – 14:50
EuRAD05-3
A Ka-Band Solid-State Doppler Polarimetric Cloud Radar
Vadym Volkov[1], Dmytro Vavriv[1], Volodymyr Vynogradov[1], Ievgen Bulah[1], Andrii Kravtsov[1], Vladyslav Ksenofontov[1], Ilia Kulahin[1]
[1]Institute of Radio Astronomy of National Academy of Sciences of Ukraine

14:50 – 15:10
EuRAD05-4
M-Sequence Radar for High Resolution Ranging with Mixed-Signal Radar Receiver Baseband Using 130 nm SiGe BiCMOS Technology
Abdul Rehman Javed[1], J. Christoph Scheytt[1]
[1]University of Paderborn

15:10 – 15:30
EuRAD05-5
A Maritime Harmonic Radar Search and Rescue System Using Passive and Active Tags
Holger Heuermann[1], Thomas Harzheim[1], Marc Mühmel[1]
[1]FH Aachen, University of Applied Sciences

WEDNESDAY 16:10 – 17:50

Mission 2

EuMC39
Solid State High Power Amplifiers for Satellite and Radar Applications

Chair: Markus Mayer[1]
Co-Chair: Bertrand Gerfault[2]
[1]Arelis, [2]Thales Electron Devices

16:10 – 16:30

EuMC39-1
20 W Linearized Q-band Solid State Power Amplifier for Satellite Communication Application
Francesco Vitulli[1], Andrea Suriani[1], Ernesto Limiti[2], Antonino Massari[1], Rocco Giofrè[3]
[1]Thales Alenia Space Italia, [2]University of Rome Tor Vergata (Italy), [3]Università di Roma "Tor Vergata"

16:30 – 16:50

EuMC39-2
Design and Characterization of a Ka-Band 40 W RF Chain Based on GH15-10 GaN Technology for Space Solid State Power Amplifier Applications
Amel MAATI[1]
[1]THALES AVS / MIS

16:50 – 17:10

EuMC39-3
L-Band Digital Doherty SSPA Design for Compact SATCOM Terminal Applications
Tomáš Götthans[1], Roman Maršálek[1], Tomáš Urbanec[1], Martin Slanina[1], Ondrej Kučera[2], Kamil Pesek[2], Suat Ayöz[2], Amitabh Chowdhary[3]
[1]Brno University of Technology, [2]Honeywell Aerospace, [3]European Space Agency, ESA/ESTEC

17:10 – 17:30

EuMC39-4
A High Efficiency MMIC X-Band GaN Power Amplifier
Mohammed Ayad[1], Nicolas Poitrenaud[1], Véronique Serru[1], Marc Camiade[1], Jan Grünenpütt[2], Klaus Riepe[2]
[1]United Monolithic Semiconcuctors SAS, [2]United Monolithic Semiconductors GmbH

17:30 – 17:50

EuMC39-5
A 10 W, 35 % Power Added Efficiency 6 to 18 GHz GaN Power Amplifier
ahmed gasmi[1], Rémy Leblanc[1], Bertrand Wroblewski[1], François Lecourt[1], Julien Poulain[1], Adrien Cutivet[1], Ahmad Alhajjar[1]
[1]OMMIC SAS

Expedition

EuMC40
[Focussed Session] Emerging Antenna Technologies for RFID Applications

Chair: Giovanni Andrea Casula[1]
Co-Chair: Riccardo Colella[2]
[1]Università degli Studi di Cagliari, [2]Insitute of Clinical Physiology - National Research Council Italy

16:10 – 16:30

EuMC40-1
Miniaturized Grid Array Antenna for Body-Centric RFID Communications in 5G S-Band
Jack Hughes[1], Cecilia Occhiuzzi[2], John Batchelor[1], Gaetano Marrocco[2]
[1]University of Kent, [2]University of Roma "Tor Vergata"

16:30 – 16:50

EuMC40-2
Millimeter-Wave Chipless RFID Tag for Authentication Applications
Raymundo De Amorim Junior[1], Etienne Perret[1], Romain Siragusa[1], Nicolas Barbot[1]
[1]Grenoble-inp/LCIS University Grenoble Alpes Valence, France

16:50 – 17:10

EuMC40-3
On Increasing of Read Range of Miniaturized UHF tags
Imbolatiana Rakotomalala[1], Smail Tedjini[1], Riccardo Colella[2], Francesco P. Chietera[3], Pierre Lemaître-Auger[1], Luca Catarinucci[3]
[1]Grenoble-inp/LCIS University Grenoble Alpes Valence, France, [2]Insitute of Clinical Physiology - National Research Council Italy, [3]Department of Innovation Engineering, University of Salento

17:10 – 17:30

EuMC40-4
A Smart Parking Sensor with Multi-Purpose Antenna for Car Detection and Sensor Charging
Moritz Fischer[1], Marian Guggenberger[1], Thomas Ußmüller[1]
[1]University of Innsbruck

17:30 – 17:50

EuMC40-5
Laser-Fabricated Antennas for RFID Applications
Almudena Rivadeneyra[1], José F. Salmeron[1], Noel Rodriguez[1], Diego P. Morales[1], Riccardo Colella[2], Francesco P. Chietera[3], Luca Catarinucci[4]
[1]University of Granada, [2]National Research Council (CNR), [3]Department of Innovation Engineering, University of Salento, [4]University of Salento

Spark

EuMC41
SATCOM and mmWave Antennas

Chair: Peter De Maagt[1]
Co-Chair: Matthias Geissler[2]
[1]ESA-ESTEC, [2]IMST GmbH

16:10 – 16:30

EuMC41-1
Flight Model 7-Panel Slot-Array Deployable Antenna Measurement Results of MicroX-SAR 100 Kg Class Demonstration Satellite
Budhaditya Pyne[1], Hirobumi Saito[1], Prilando Riziki Akbar[1], Koji Tanaka[2], Jiro Hirokawa[3], Takashi Tomura[3]
[1]Synspective Inc., [2]Japan Aerospace Exploration Agency, [3]Tokyo Institute of Technology

16:30 – 16:50

EuMC41-2
Low-Cost Millimeter-Wave Patch Antenna Array in Package for 5G Communication Applications
Xiao-Lan Tang[1], Zhang Ju Hou[1]
[1]Shenzhen Sunway Communication Co. Ltd.

16:50 – 17:10

EuMC41-3
A Compact Low-Noise Frontend for Rx/Tx-Integrated SatCom Arrays
Anton Sieganschin[1], Thomas Jaschke[1], Arne F. Jacob[1]
[1]Hamburg University of Technology

17:10 – 17:30

EuMC41-4
Design of 94-GHz Wideband Waveguide-Fed Patch Antenna and Array in eWLB Package
Chuanming Zhu[1], Zongming Duan[1]
[1]The 38th Research Institute of China Electronic Technology Group Corporation

17:30 – 17:50

EuMC41-5
5G Wideband Dual-Polarized mm-Wave Antennas and 60-GHz Motion-Recognition mm-Wave Antennas in a Non-mm-Wave Antenna Integrating Packages in a Full-Screen Metal-Framed Phone
Huan-Chu Huang[1], Ruipeng Li[2]
[1]Etheta Communication Technology Co., Ltd., [2]Pousen System Technology Co., Ltd.

Flash

EuMC42
Planar Power Dividers/Combiners

Chair: Bart Nauwelaers[1]
Co-Chair: Petronilo Martín-Iglesias[2]
[1]KU Leuven, [2]ESA ESTEC

16:10 – 16:30

EuMC42-1
Generalized Gysel Power Divider with Arbitrary Power Ratio and Real Termination Impedances
Chao Gai[1], Yulong Zhao[1], Mohamed Helaoui[1], Fadhel M. Ghannouchi[1]
[1]University of Calgary

16:30 – 16:50

EuMC42-2
Miniaturized Couplers with Combined Microstrip and Slotline Ports
Mohamed Elsawaf[1], Amr Safwat[2]
[1]Ain Shams University, [2]Faculty of Engineering, Ain Shams University

16:50 – 17:10

EuMC42-3
Broadband Equal-Split Planar 4-Way Power Divider-Combiner Suitable for High Power Applications
Jeremy Furgal[1], Kevin Xu[2], Jun H. Choi[2], Jay Lee[1]
[1]Syracuse University, [2]State University of New York at Buffalo

17:10 – 17:30

EuMC42-4
Dual-Band Semi-Lumped-Element Power Dividers at UHF/SHF Bands
Tadashi Kawai[1], Kensuke Nagano[1], Akira Enokihara[1]
[1]University of Hyogo

17:30 – 17:50

EuMC42-5
A Dual-Band Balun Architecture With Unequal Port-Terminations
Rahul Gupta[1], Sabina Kairatova[2], Mohammad Hashmi[2], Galymzhan Nauryzbayev[2]
[1]IIIT-Delhi, [2]Nazarbayev University, Nur-Sultan, Kazakhstan

WEDNESDAY 16:10 – 17:50

Glow

EuMC43
Non-Planar Devices and Systems

Chair: Vicente Enrique Boria Esbert[1]
Co-Chair: Richard Snyder[2]
[1]Technical university of Valencia, [2]RS Microwave

16:10 – 16:30

EuMC43-1
Ridge-Gap Waveguide Enabled Wireless Power Transfer for Electrical Vehicle Application
Walid Dyab[1], Mourad Ibrahim[1], Ahmed Sakr[2], Ke Wu[3]
[1]Prince Sultan University, [2]Faculty of Engineering, Cairo University, [3]Polytechnique Montreal

16:30 – 16:50

EuMC43-2
A Compact Ridge Waveguide Four-Port Junction Circulator
Guangjian Deng[1], Letian Guo[1], Jiawei Li[1], Wenhua Huang[1], Hao Shao[1], Shaoyi Xie[1]
[1]Northwest Institute of Nuclear Technology

16:50 – 17:10

EuMC43-3
A Turnstile OMT Covering a Full Octave using Ridge Waveguide (25–50 GHz)
Doug Henke[1], Ivan Wevers[1], Lewis B. G. Knee[1]
[1]NRC Herzberg Astronomy and Astrophysics

17:10 – 17:30

EuMC43-4
Stripline Dual-Band Ferrite Circulators Operating on Weak Field Conditions
Vincent Olivier[1], Laure Huitema[1], Bertrand Lenoir[1], Hamza Turki[2], Christophe Breuil[2], Philippe Pouliguen[3], Thierry Monédière[1]
[1]Xlim - UMR 7252 - CNRS- Universite De Limoges, [2]INOVEOS SAS, [3]DGA (Direction Générale de l'Armement)

17:30 – 17:50

EuMC43-5
Broadband 32-Way E-Band Inline Power Combiner for High-Power MMIC Amplifiers
Anil Kumar Pandey[1]
[1]Keysight Technologies

Beam

EuMC44
[Special Session] Silicon-Based Ka-Band Massive MIMO Antenna Systems for New Telecommunication Services

Chair: Ulf Johannsen[1]
Co-Chair: Bart Smolders[2]
[1]Eindhoven Univeristy of Technology, [2]Eindhoven University of Technology

16:10 – 16:30

EuMC44-1
SILIKA: Silicon-Based Ka-Band Massive-MIMO Antenna Systems for New Telecommunication Services
Bart Smolders[1]
[1]Eindhoven University of Technology - TU/e

16:30 – 16:50

EuMC44-2
Antenna Systems for 5G mmWave Radio Access
Guy Vandenbosch[1]
[1]KU Leuven

16:50 – 17:10

EuMC44-3
IC Design Aspects for 5G mmWave Systems
Christian Fager[1], Eduardo Anjos[2], Artem Roev[1], Parastoo Taghikhani[1], Marianna Ivashina[1], Rob Maaskant[1], Koen Buisman[3], Anders Höök[3], Dominique Schreurs[4], Guy Vandenbosch[4], Marcel Geurts[5]
[1]Chalmers University of Technology, [2]KU Leuven, [3]Saab AB, [4]KULeuven, [5]NXP Semiconductors

17:10 – 17:30

EuMC44-4
Signal Processing for mmWave Antenna Systems
Ulf Gustavsson[1]
[1]Ericsson Research

17:30 – 17:50

EuMC44-5
The SILIKA Demonstrator
Marcel Geurts[1], Eduardo Anjos[2], Marzieh SalarRahimi[2]
[1]NXP Semiconductors, [2]KU Leuven

Mission 1

EuRAD06
Emerging & Industrial Applications

Chair: Naruto Yonemoto[1]
Co-Chair: André Bourdoux[2]
[1]ENRI/MPAT, [2]imec, Leuven

16:10 – 16:30

EuRAD06-1
Millimetre-Wave Radar for Touchless Interaction: Soli in the Pixel 4
Jian Wang[1], Jaime Lien[2]
INDUSTRIAL KEYNOTE
[1]Google LLC, [2]Google LCC

16:30 – 16:50

EuRAD06-2
Background and Clutter Removal Techniques for Ultra Short Range Radar
Matthias G. Ehrnsperger[1], Maximilian Noll[1], Uwe Siart[1], Thomas F. Eibert[1]
[1]Technische Universität München

16:50 – 17:10

EuRAD06-3
Standoff Non-Line-of-Sight Vibration Sensing Using Millimeter-Wave Radar
Samuel Wagner[1], Anh-Vu Pham[1]
[1]University of California, Davis

17:10 – 17:30

EuRAD06-4
Multi-Phase CW Doppler Radar for Measuring Small Periodic Displacement
Jae-Hyun Park[1], Jae-Young Sim[1], Jong-Ryul Yang[1]
[1]Yeungnam University

17:30 – 17:50

EuRAD06-5
Sensory Substitution Device for the Visually Impaired Using 122 GHz Radar and Tactile Feedback
Pascal Kneuper[1], Stephan Kruse[1], Bjoern Luchterhandt[2], Jan Tünnermann[3], Ingrid Scharlau[2], J. Christoph Scheytt[1]
[1]Heinz Nixdorf Institute, University of Paderborn, [2]University of Paderborn, [3]University of Marburg

Quest

EuRAD07
Radar Scenario Simulations

Chair: Stéphane Kemkemian[1]
Co-Chair: Mohammed Jahangir[2]
[1]Thales Defence Mission Systems (TDMS), [2]University of Birmingham

16:10 – 16:30

EuRAD07-1
Radar Signature Prediction with Shooting-and-Bouncing Rays and Hybrid Method
David Prestaux
INDUSTRIAL KEYNOTE

16:30 – 16:50

EuRAD07-2
Radar Target Simulator and Antenna Positioner for Real-Time Over-the-Air Stimulation of Automotive Radar Systems
Muhammad Ehtisham Asghar[1], Sreehari Buddappagari Jayapal Gowdu[1], Florian Baumgärtner[2], Sebastian Graf[3], Felix Kreutz[1], Andreas Löffler[4], Johannes Nagel[2], Thomas Reichmann[2], Ralf Stephan[1], Matthias A. Hein[1]
[1]Technische Universität Ilmenau, [2]Mercedes-Benz AG, [3]dSPACE GmbH, [4]Continental AG

16:50 – 17:10

EuRAD07-3
Back Scattering of Traffic Participants Based on an Automotive Radar Measurement
Sevda Abadpour[1], Axel Diewald[1], Thomas Zwick[1], Mario Pauli[1], Sören Marahrens[1]
[1]Karlsruhe Institute of Technology (KIT)

17:10 – 17:30

EuRAD07-4
SimROS : A Simulator for the Design of HF Surface Wave Radar. Application to Maritime Target Detection
Alain Reineix[1], Christophe Guiffaut[1], Nicolas Bourey[2], Muriel Darces[2], Marc Hélier[2], Sebastien Reynaud[3], et al.*
[1]XLIM - CNRS - Universite de Limoges, [2]Sorbonne Université, [3]CISTEME, [4]ONERA, [5]IEEA*
*For the complete author and affiliation list, please refer to the conference proceedings.

17:30 – 17:50

EuRAD07-5
Synthetic Sea-Clutter for Long Integration Processing
Sabrina Machhour[1], Stéphane Kemkemian[1], Pierre-Albert Breton[1], Vincent Corretja[1]
[1]Thales Defence Mission Systems (TDMS)

THURSDAY

Room	08:30 – 10:10	10:50 – 12:30		13:50 – 15:30	16:10 – 17:50	EVENING PROGRAMME
Progress	**W-23** High Resolution Radar for Automotive					
Mission 1	**EuRAD08** Object Classification in Automotive Radars	**EuRAD12** [Focussed Session] Radar Interference Cancellation		**EuRAD16** Automotive		
Mission 2	**EuRAD09** Defence Applications	**EuRAD13** [Special Session] Radar and Electronic Warfare		**EuRAD17** Advanced Techniques and Innovative Array Configurations for DoA		
Quest	**EuRAD10** SAR Processing	**EuRAD14** Surveillance and SAR		**EuRAD18** SAR Applications		
Expedition	**EuMC/EuRAD01** Radar Receivers and Front-Ends	**EuMC49** Front-End and Active Module		**EuMC54** Low Noise Amplifier and Phased Array Module		
Polar					**Closing of the European Microwave Week** EuMC/EuMW Closing and Awards Ceremony	
Auditorium	**EuMC45** [Special Session] Focus Day: Array Antennas for Radio Astronomy	**EuMC/EuRAD02** [Special Session] Focus Day: Active Array Antennas for Space	**Technology in Context** Philosophical Lecture	**EuMC/EuRAD03** [Special Session] Focus Day: Active Array Antennas for Defence		**HAM Radio Social** 18.00 - 21.00
Spark	**EuMC46** Advanced Planar Filter Principles and Technologies	**EuMC50** Compact Planar Filtering Devices		**W-15** Recent Advances in Micro-Doppler Radar and its Applications		
Flash	**EuMC47** Dielectric Measurements	**EuMC51** Calibration and Characterisation Techniques		**EuMC55** Antenna Characterisation Techniques		
Glow	**EuMC48** Microwave Monitoring and Sensing of Biomedical Parameters	**EuMC52** Biological Microwave Effects and Imaging Techniques		**EuMC56** [Focussed Session] Electromagnetics in Biomedical Applications		
Beam	**Tom Brazil Doctoral School of Microwaves** The Route to 5G: Design of mmWave Active Array Systems, from RFIC to Signal Processing					
Media arena	**EuRAD11** 1-Minute Poster Pitch (09:40 - 10:10)	**EuMC53** 1-Minute Poster Pitch (12:00 - 12:30)		**EuMC57** In Recognition: Prof.Dr. A.T. de Hoop		
Round control		**Career Platform** Career Lounge: Meet Jobs, Build Careers				
BOR 6		**Career Platform** Job Dating				
loopbrug	**Career Platform** Company Wall and Job Wall					
Juliana Congress Room 1	**W-31** 5G and Beyond: Enabling RF Architectures and Technologies for Emerging Wireless Systems					
Hall 1			**EuRAD15** Interactive Poster session	**EuMC58** Interactive Poster Session		

EuMW EuMC EuRAD EuMIC Student Activity EuMIC/EuMC EuMC/EuRAD

THURSDAY 08:30 – 10:10

Expedition

EuMC/EuRAD01
Radar Receivers and Front-Ends

Chair: Massimo C Comparini[1]
Co-Chair: Jens Engelmann[2]
[1]Telespazio, Italy & France, [2]Thales DIS AIS Deutschland GmbH

08:30 – 08:50

EuMC/EuRAD01-1
A 1.5-40 GHz FMCW Radar Receiver Front-End
Mantas Sakalas[1], Niko Joram[2], Frank Ellinger[2]
[1]Baltic Institute of Advanced Technology, [2]Technical University Dresden

08:50 – 09:10

EuMC/EuRAD01-2
Analysis of Time-Interleaved ADC Offset and Gain Mismatch Errors in PMCW Radar
Daan Rosenmuller[1], Kostas Doris[2], Georgi Radulov[1], Marion K. Matters-Kammerer[1]
[1]Eindhoven University of Technology, [2]NXP Semiconductors

09:10 – 09:30

EuMC/EuRAD01-3
Analogue Baseband Processing for Single Chip Radar Proximity Sensor
Maurice van Wanum[1], Michael Polushkin[1], Raymond van Dijk[1]
[1]TNO

09:30 – 09:50

EuMC/EuRAD01-4
Active MMIC Circulator Performance in a Phased-Array-Like Environment
Laila Marzall[1], Shane Verploegh[1], Tommaso Cappello[1], Zoya Popovic[1], Michael Roberg[2]
[1]University of Colorado at Boulder, [2]Qorvo

09:50 – 10:10

EuMC/EuRAD01-5
A 9 to 12.1 GHz Sub-Sampling AD-PLL Based on a Stochastic Flash TDC and a DCO with a "Folded" Common-Mode Resonator Exhibiting less than 90 fs Jitter*
Run Levinger[1], Evgeny Shumaker[1], Aryeh Farber[1],
[1]Intel Corporation
*Paper title has been shortened. Please refer to the conference proceedings for the complete title

Auditorium

EuMC45
[Special Session] Focus Day: Array Antennas for Radio Astronomy

Chair: Mark Bentum[1]
[1]Eindhoven Univeristy of Technology

08:30 – 08:50

EuMC45-1
Aperture Arrays in Radio Astronomy - Overview of Past, Present and Future Radio Telescopes
Mark Bentum[1]
[1]Eindhoven University of Technology (TU/e)

08:50 – 09:10

EuMC45-2
First In-Flight Results of the NCLE Instrument - A Low Frequency Radio Receiver Exploring the Dark Ages in Lunar Orbit
Eric Bertels[1]
[1]ISIS - Innovative Solutions in Space B.V.

09:10 – 09:30

EuMC45-3
The Mid-Frequency Aperture Array
Kristian Zarb Adami[1]
[1]University of Oxford

09:30 – 09:50

EuMC45-4
DISTURB: A 30 MHz to 3 GHz Solar Monitoring Phased Array System
David Prinsloo[1], Pieter Benthem[1], Michiel A. Brentjens[1], Paulus P. Krüger[1], Dick Boersma[2], Lars Venema[1], Ronald de Wild[1], Richard A. Fallows[1], Edo Loenen[3], Erwin Platen[3], Paul Stewart[3], Ludo Visser[3], André Bos[3], Bert Van den Oord[4], Wietse Bouwmeester[5]
[1]Netherlands Institute for Radio Astronomy - ASTRON, [2]Netherlands Institute for Space Research (SRON), [3]Science [&] Technology Corporation, [4]Royal Netherlands Meteorological Institute - KNMI, [5]Delft University of Technology

09:50 – 10:10

EuMC45-5
Coherent Receiver Arrays for Radio Astronomy in the Tera Hertz Regime
Jan Geralt Bij de Vaate[1]
[1]Netherlands Institute for Space Research (SRON)

Spark

EuMC46
Advanced Planar Filter Principles and Technologies

Chair: Roberto Gomez-Garcia[1]
Co-Chair: Miguel Sanchez-Soriano[2]
[1]University of Alcala, [2]University of Alicante

08:30 – 08:50

EuMC46-1
Cover-Ended Resonators to Increase Corona Discharge Thresholds in Microstrip Bandpass Filters
Aitor Morales-Hernández[1], Miguel Sanchez-Soriano[1], Stephan Marini[1], Vicente Enrique Boria Esbert[2], Marco Guglielmi[2]
[1]University of Alicante, [2]iTeam - Universitat Politècnica de València

08:50 – 09:10

EuMC46-2
Comparative Analysis of Out-of-Band Power Handling Capacities for Lossy Filters
Liang-Feng Qiu[1], Lin-Sheng Wu[1], Bin Xia[1], Junfa Mao[1]
[1]Shanghai Jiao Tong University

09:10 – 09:30

EuMC46-3
Co-Designed Quasi-Circulator and Bandpass Filter
Andrea Ashley[1], Dimitra Psychogiou[1]
[1]University of Colorado Boulder

09:30 – 09:50

EuMC46-4
3-D Metal Printed Inline Quasi-Elliptic Bandpass Filter
Jiayu Rao[1], Kenneth Nai[2], Jiasheng Hong[1]
[1]Heriot-Watt University, [2]Renishaw PLC

09:50 – 10:10

EuMC46-5
High-Order Fully-Reconfigurable Balanced Bandpass Filters Using Mixed Technology Resonators
Dakotah Simpson[1], Dimitra Psychogiou[1]
[1]University of Colorado Boulder

Flash

EuMC47
Dielectric Measurements

Chair: Andrej Rumiantsev[1]
Co-Chair: Xiaobang Shang[2]
[1]MPI Corporation, [2]National Physical Laboratory (NPL)

08:30 – 08:50

EuMC47-1
Characterization of Permittivity of Liquids-in-Flow with Spherical Dielectric Resonators
Georg Sterzl[1], Jan Hesselbarth[1]
[1]University of Stuttgart

08:50 – 09:10

EuMC47-2
Microwave Characterisation of the Coefficient of Thermal Expansion and the Thermal Evolution of Electric Conductivity for Metalised Substrate
Thibault Charlet[1], Olivier Tantot[1], Nicolas Delhote[1], Clément Hallépée[1], Serge Verdeyme[1], David Nevo[2]
[1]Xlim - UMR 7252 - CNRS- Limoges University, [2]Thales Alenia Space France

09:10 – 09:30

EuMC47-3
Solid and Non-Solid Dielectric Material Characterization for Millimeter and Sub-Millimeter Wave Applications
Alain Peden[1], Daniel BOURREAU[1]
[1]IMT Atlantique

09:30 – 09:50

EuMC47-4
Novel Method for Measuring Complex Permittivity of Thin Films at Millimeter Frequencies
Yuto Kato[1], Masahiro Horibe[1]
[1]National Institute of Advanced Industrial Science and Technology

THURSDAY 08:30 – 10:10

Glow

EuMC48
Microwave Monitoring and Sensing of Biomedical Parameters

Chair: Luciano Tarricone[1]
Co-Chair: Marco Pasian[2]
[1]University of Salento, [2]University of Pavia

08:30 – 08:50

EuMC48-1
A High Frequency Dielectrophorosis Cytometer For Continuous Flow Biological Cells Refinement
Thomas Provent[1], Audrey Mauvy[2], Rémi Manczak[1], Sofiane Saada[2], Claire Dalmay[1], Barbara Bessette[2], Fabrice Lalloué[2], Arnaud Pothier[1]
[1]XLIM Research Institute, Univ. Limoges, UMR CNRS 7252, [2]CAPTuR, EA3842 Limoges University

08:50 – 09:10

EuMC48-2
Head Motion and Eyes Blinking Detection: A mmWave Radar for Assisting People with Neurodegenerative Disorders
Emanuele Cardillo[1], Gaia Sapienza[2], Changzhi Li[3], Alina Caddemi[1]
[1]University of Messina, [2]Tre Ali Onlus, [3]Texas Tech University

09:10 – 09:30

EuMC48-3
Heartbeat and Respiration Detection Using a Low Complexity CW Radar System
Panagiota Kontou[1], Souheil Ben Smida[1], Spyridon Nektarios Daskalakis[1], Symeon Nikolaou[1], Mauro Dragone[1], Dimitris E. Anagnostou[1]
[1]Heriot-Watt University, Edinburgh

09:30 – 09:50

EuMC48-4
Measuring Vital Signs on Fingertip Using K-Band Spherical Dielectric Resonator
Chung-Tse Chang[1], Chin-Lung Yang[2], Utpal Dey[3], Jan Hesselbarth[3]
[1]Department of Electrical Engineering, National Cheng Kung University 1, University Road Tainan City Taiwan, [2]National Cheng Kung University, [3]Universität Stuttgart

09:50 – 10:10

EuMC48-5
An Adaptive Filter Technique for Platform Motion Compensation in Unmanned Aerial Vehicle Based Remote Life Sensing Radar
Victor Lubecke[1], Shekh Md Mahmudul Islam[1], Lana C. Lubecke[2], Christian Grado[1]
[1]University of Hawaii at Manoa, [2]Kalani High School

Mission 1

EuRAD08
Object Classification in Automotive Radars

Chair: Marlene Harter[1]
Co-Chair: Frank Gruson[2]
[1]Offenburg University Of Applied Sciences, [2]Continental AG

08:30 – 08:50

EuRAD08-1
Driving a Zero-Road-Fatality Reality
Noam Arkind[1]
INDUSTRIAL KEYNOTE
[1]Arbe Robotics

08:50 – 09:10

EuRAD08-2
Road User Classification with Polarimetric Radars
Julius Tilly[1], Fabio Weishaupt[1], Ole Schumann[1], Jürgen Dickmann[1], Gerd Wanielik[2]
[1]Mercedes-Benz AG, [2]TU Chemnitz

09:10 – 09:30

EuRAD08-3
Short Range Height Classification in FMCW Radar
Arun Vijayaraghavan[1], Arie Koppelaar[2], Francesco Laghezza[2]
[1]TU-Delft, [2]NXP Semiconductors

09:30 – 09:50

EuRAD08-4
Object Detection on Radar Imagery for Autonomous Driving using Deep Neural Networks
Ana Stroescu[1], Liam Daniel[1], Dominic Phippen[1], Mikhail Cherniakov[1], Marina Gashinova[2]
[1]EESE, University of Birmingham, [2]University of Birmingham

09:50 – 10:10

EuRAD08-5
Statistical Image Segmentation and Region Classification Approaches for Automotive Radar
Liam Daniel[1], Yang Xiao[1], Edward Hoare[1], Mikhail Cherniakov[1], Marina Gashinova[1]
[1]University of Birmingham

Mission 2

EuRAD09
Defence Applications

Chair: Willem A. Hol[1]
Co-Chair: Mayazzurra Ruggiano[1]
[1]Thales Nederland B.V.

08:30 – 08:50

EuRAD09-1
Gabor Transforms for Compressing RESM Data
Andrew Stove[1]
[1]Stove Specialties

08:50 – 09:10

EuRAD09-2
R&T Activities related to RF Sensor Technologies at the European Defence Agency
Roland Krebs[1]
INDUSTRIAL KEYNOTE
[1]European Defense Agency

09:10 – 09:30

EuRAD09-3
Looking into the future: NATO Surveillance
Rene Thaens[1]
INDUSTRIAL KEYNOTE
[1]NATO NCI Agency

09:30 – 09:50

EuRAD09-4
Formidable Shield: A Dutch perspective
Martien Joosten[1]
INDUSTRIAL KEYNOTE
[1]Thales Nederland B.V.

09:50 – 10:10

EuRAD09-5
Target-Borne ECM Against OFDM-Based Imaging Passive Radars
Elisa Giusti[1], Amerigo Capria[1], Marco Martorella[2]
[1]Consorzio Nazionale Interuniversitario Telecomunicazioni (CNIT), [2]University of Pisa

Quest

EuRAD10
SAR Processing

Chair: Krzysztof Kulpa[1]
Co-Chair: Alicja Ossowska[2]
[1]Warsaw University of Technology, [2]Valeo Schalter und Sensoren GmbH

08:30 – 08:50

EuRAD10-1
Enhanced Azimuth Resolution in Synthetic Aperture Radar Using the MUSIC Algorithm
AmirHosein Oveis[1]
[1]RaSS Center - CNIT

08:50 – 09:10

EuRAD10-2
Guided Generative Adversarial Network for Super Resolution of Imaging Radar
Hyun-Woong Cho[1], Woosuk Kim[1], Sungdo Choi[1], Minsung Eo[1], Seungtae Khang[1], Jongseok Kim[1]
[1]Samsung Advanced Institute of Technology

09:10 – 09:30

EuRAD10-3
Spatial-Variant Phase Error Compensation for Widebeam Spotlight Synthetic Aperture Radar
Pavel Makarov[1], Ersin Aytac[1], Nurullah Akkaya[1]
[1]Near East University

09:30 – 09:50

EuRAD10-4
An Accurate SAR Imaging Method Based on Total Variation & Non-convex Regularization
Zhongqiu Xu[1]
[1]Aerospace Information Research Institute, Chinese Academy of Sciences

09:50 – 10:10

EuRAD10-5
An Accurate Range Model for Airborne CSSAR Ground Moving Target Imaging
Yongkang Li[1], Lei Wang[1], Yifeng Wu[2]
[1]Northwestern Polytechnical University, [2]AVIC Leihua Electronics Technology Research Institute

THURSDAY 10:50 – 12:30

Auditorium

EuMC/EuRAD02
[Special Session] Focus Day: Active Array Antennas for Space

Chair: Giovanni Toso[1]
Co-Chair: Natanael Ayllon[1]
[1]European Space Agency

10:50 – 11:10

EuMC/EuRAD02-1
Recent Developments on MMICs for Active Array
Thibaut Huet[1]
[1]United Monolithic Semiconductors SAS

11:10 – 11:30

EuMC/EuRAD02-2
Architecture and Capacity Evolution in Active Antennas for Earth Observation, Telecom, and Deep Space at AIRBUS DS SPAIN
Antonio Montesano[1]
[1]Airbus Defence & Space

11:30 – 11:50

EuMC/EuRAD02-3
Additive Manufacturing: Enabling Technology for GEO Active Antennas
Esteban Menargues[1], Tomislav Debogovic[1], Mathieu Billod[1], Ignacio Echeveste[2], Francisco Cano[2], Antonio Montesano[2]
[1]SWISSto12, [2]Airbus Defence & Space

11:50 – 12:10

EuMC/EuRAD02-4
Active antenna development at Thales Alenia Space
Christophe Benoist[1], Michael Blum[1], Anne Couarraze[1], Thierry Girard[1], Jérémie Le Guen[1], Benoit Lejay[1], Laurent Levert[1], Madivanane Nadarassin[1], Olivier Perrin[1], Thierry Rostan[1], Julien Rotureau[1], Hassan Solhi[1], Eric Vourch[1]
[1]Thales Alenia Space

12:10 – 12:30

EuMC/EuRAD02-5
Airbus UK Active Antenna Developments, Challenges and the Future
Sonya Amos[1], Glyn Thomas[1], Steve McLaren[2], Carolina Tienda-Herrero[2], David Dupuy[2]
[1]Airbus Defence & Space, [2]Airbus Defence and Space

Expedition

EuMC49
Front-End and Active Module

Chair: Nathalie Deltimple[1]
Co-Chair: Ernesto Limiti[2]
[1]Bordeaux INP, IMS Laboratory, [2]5 EE Dept, University of Rome "Tor Vergata", Rome, Italy

10:50 – 11:10

EuMC49-1
Experimental Results of Advanced Wideband Data Converters for Direct K-Band Software Defined Radio
Romain Pilard[1], Julien Duvernay[1], Benjamin Boujon[1], Andrew Glascott-Jones[1]
[1]Teledyne e2v

11:10 – 11:30

EuMC49-2
Ka-Band TDD Front-End with Gate Shunt Switched Cascode LNA and Three-Stack PA on 22 nm FDSOI CMOS Technology
Mikko Hietanen[1], Jere Rusanen[1], Janne P. Aikio[1], Nuutti Tervo[1], Timo Rahkonen[1], Aarno Pärssinen[1]
[1]University of Oulu

11:30 – 11:50

EuMC49-3
Phase-noise reduction through an external high-Q network using a black-box oscillator model
Mabel Pontón[1], Franco Ramirez[2], Amparo Herrera Guardado[2], Almudena Suárez[2]
[1]University of Cantabria, [2]Universidad de Cantabria

11:50 – 12:10

EuMC49-4
Iterative Learning Control for Signal Separation in Dual-RF Input Doherty Transmitter
Jun Peng[1], Weimin Shi[2], Jingzhou Pang[3], Fei You[1], Songbai He[1]
[1]University of Electronic Science & Technology of China, [2]The Hong Kong University of Science and Technology, [3]University College Dublin

12:10 – 12:30

EuMC49-5
A Decade Bandwidth Mixers Based on Planar Transformers and Quasi-Vertical Schottky Diodes Implemented in GaAs MMIC Technology
Nikolai Drobotun[1], Daniil Danilov[2], Alexey Drozdov[2]
[1]Tomsk State University of Control Systems and Radioelectronics (TUSUR), [2]MICRAN, Research and Production Company

Spark

EuMC50
Compact Planar Filtering Devices

Chair: Jerzy Julian Michalski[1]
Co-Chair: Dimitra Psychogiou[2]
[1]SpaceForest, [2]University of Colorado Boulder

10:50 – 11:10

EuMC50-1
Full Planar Interdigital Filter Design Flow
Itzhak Shapir[1]
INDUSTRIAL KEYNOTE
[1]The Wave Whisperer Microwave Consulting

11:10 – 11:30

EuMC50-2
Surface Mountable L- and C-Band Pre-Distorted Filters for Frequency Converters of High Throughput Satellite Systems
Paolo Vallerotonda[1], Alessandro Cazzorla[2], Davide Tiradossi[2], Luca Pelliccia[2], Roberto Sorrentino[2], Francesco Vitulli[2], et al.*
[1]RF Microtech s.r.l / University of Perugia, [2]RF Microtech s.r.l, [3]Thales Alenia Space Italia*
*For the complete author and affiliation list, please refer to the conference proceedings.

11:30 – 11:50

EuMC50-3
Vertically Integrated Microwave-Filters Using Functional Via Structures in LTCC
Ömer Faruk Yildiz[1], Ole Thomsen[2], Marc Bochard[2], Cheng Yang[1], Christian Schuster[1]
[1]Hamburg University of Technology (TUHH), [2]KOA EUROPE GmbH

11:50 – 12:10

EuMC50-4
Design and Comparison of Filter Structures in the Millimeter-Wave Frequency Range on Outer- and Inner-Layers of Organic Circuit Boards
Andreas Scharl[1], Felix Sepaintner[1], Johannes Jakob[1], David Scholz[1], Franz Xaver Röhrl[1], Werner Bogner[1], Stefan Zorn[2]
[1]DIT Deggendorf Institute of Technology, [2]Rohde & Schwarz GmbH & Co. KG

12:10 – 12:30

EuMC50-5
Miniaturized Signal-Interference Bandpass Filters Using Resonant RF Signal Paths
Dimitra Psychogiou[1], Roberto Gómez-García[2]
[1]University of Colorado, Boulder, [2]University of Alcala, Madrid

Flash

EuMC51
Calibration and Characterisation Techniques

Chair: Nick Ridler[1]
Co-Chair: Ralf Doerner[2]
[1]National Physical Laboratory (NPL), [2]Ferdinand-Braun-Institut (FBH) Leibniz-Institut für Höchstfrequenztechnik

10:50 – 11:10

EuMC51-1
Broadband Wafer-Level Characterization of Next-Generation Semiconductors: Requirements, Challenges, and Solutions
Andrej Rumiantsev[1]
INDUSTRIAL KEYNOTE
[1]MPI Corporation

11:10 – 11:30

EuMC51-2
Meander Type Design for On Wafer Calibration up to 330 GHz
Marco Cabbia[1], Marina Deng[1], Sébastien Fregonese[2], Chandan Yadav[3], Arnaud Curutchet[3], Magali De Matos[3], Didier Céli[4], Thomas Zimmer[3]
[1]University of Bordeaux, IMS laboratory, [2]CNRS, IMS Laboratory, [3]IMS laboratory, [4]STMicroelectronics

11:30 – 11:50

EuMC51-3
A CPW Excitation Using a Contactless Dielectric Waveguide Probe for the V-Band
Amr Samir[1], Mohamed Basha[1], Ahmed Hegazy[1], Safieddin Safavi-Naeini[1]
[1]University of Waterloo

11:50 – 12:10

EuMC51-4
Quantitative Scanning Microwave Microscopy of Few-Layer Platinum Diselenide
xiaopeng wang[1], Kuanchen Xioing[1], Lei Li[1], James C. M. Hwang[1], Xin Jin[2], Gianluca Fabi[2], Marco Farina[3], et al.[1]
[1]Cornell University, Ithaca, NY, [2]Anokiwave, Inc., [3]Università Politecnica delle Marche, [4]Universität der Bundeswehr München, [5]IHP-Leibniz Institute for Innovative Microelectron
[1]For the complete author list, please refer to the conference proceedings.

12:10 – 12:30

EuMC51-5
Dispersion in Millimeter-Wave and THz Dielectric Waveguides: Modeling, Measurement and Performance Limitations
Joren Vaes[1], Patrick Reynaert[1]
[1]KU Leuven ESAT-MICAS

THURSDAY 10:50 – 12:30

	Glow	Mission 1	Mission 2	Quest
	EuMC52 Biological Microwave Effects and Imaging Techniques Chair: Katia Grenier[1] Co-Chair: Juan-Mari Collantes[2] [1]LAAS-CNRS, [2]UPV/EHU	**EuRAD12** [Focussed Session] Radar Interference Cancellation and Waveform Agility Chair: Stefan Brüggenwirth[1] Co-Chair: Christoph Fischer[2] [1]Fraunhofer Institute for High Frequency Physics and Radar Techniques (FHR), [2]Hensoldt Sensors GmbH	**EuRAD13** [Special Session] Radar and Electronic Warfare Chair: Sue Robertson Co-Chair: Mayazzurra Ruggiano[1] [1]Thales Nederland B.V.	**EuRAD14** Surveillance and SAR Chair: Volker Ziegler[1] Co-Chair: Willem A. Hol[2] [1]Airbus Defence and Space GmbH, [2]Thales Nederland B.V.
10:50 – 11:10	**EuMC52-1** Novel challenges and available solutions for in situ real time SAR (Specific Absorption Rate) assessment in any environment and up to millimeter waves Gwenaël Gaborit[1], Lionel DUVILLARET[1] **INDUSTRIAL KEYNOTE** [1]Kapteos S.A.S.	**EuRAD12-1** FMCW-Interference of Frequency Agile OFDM Radars Christina Knill[1], Benedikt Schweizer[1], Simon Stephany[1], David Werbunat[1], Christian Waldschmidt[1] [1]Ulm University	**EuRAD13-1** Cognitive Electronic Warfare (EW) as a Training Aid Warren du Plessis[1], Nicholas Osner[1] [1]University of Pretoria	**EuRAD14-1** Next Generation AESA Radar Architectures Chris Mountford[1] **INDUSTRIAL KEYNOTE** [1]Leonardo UK
11:10 – 11:30	**EuMC52-2** A Coplanar Waveguide System for Drug Delivery Mediated by Nanoelectroporation: an Experimental and Numerical Study Laura Caramazza[1], Alessandra Paffi[1], Micaela Liberti[1], Francesca Apollonio[1] [1]Department of Information Engineering, Electronics and Telecommunications, Sapienza University of Rome	**EuRAD12-2** PMCW Waveform Cross-correlation Characterization and Interference Mitigation André Bourdoux[1], Marc Bauduin[1] [1]IMEC	**EuRAD13-2** A brief introduction to Electronic Warfare and the AOC Sue Robertson	**EuRAD14-2** Small UAV-Based High Resolution SAR using Low-Cost Radar, GNSS/RTK and IMU Sensors Jan Svedin[1], Anders Bernland[1], Andreas Gustafsson[1] [1]Swedish Defence Research Agency (FOI)
11:30 – 11:50	**EuMC52-3** Generating Bipolar Nanosecond Pulsed Electric Field using Open Circuit Transmission Line Technique and Avalanche Transistors Ilan Wyn Davies[1], Christopher P. Hancock[1] [1]Bangor University	**EuRAD12-3** Radar Waveform Coexistence: Interference Comparison on Multiple-Frame Basis Jeroen Overdevest[1], Francesco Laghezza[1], Feike Jansen[1], Alessio Filippi[1] [1]NXP Semiconductors	**EuRAD13-3** Collecting Intelligence from Modern Radar Systems David Stupples	**EuRAD14-3** Recent L-C- and X-Band MetaSensing Airborne SAR Campaigns for Emerging Applications Karlus Macedo[1], Gerard Masalias[1], Alex Coccia[1], Adriano Meta[1] [1]MetaSensing
11:50 – 12:10	**EuMC52-4** 7T MRI Loop Antenna for Carotid Imaging Lars Hinge[1], Nicolai Mortensen[1], Vitaliy Zhurbenko[1], Vincent Öltman Boer[2], Wenjun Wang[1] [1]Technical University of Denmark, [2]Copenhagen University Hospital Hvidovre	**EuRAD12-4** Interference Avoidance and Mitigation in Automotive Radar Mouhammad Alhumaidi[1], Markus Wintermantel[1] [1]Continental AG	**EuRAD13-4** MicroESM: broadening the application of passive radar detection John Roe	**EuRAD14-4** The SWALIS Project: First Results for Airborne Radar Measurements in Ka-Band Jean-Claude Kokou KOUMI[1], Stéphane Méric[1], Eric Pottier[2], Guy GRUNFELDER[3] [1]Institut d'Électronique et de Télécommunications de Rennes, Insa Rennes, [2]Institut d'électronique et de télécommunications de Rennes, IETR, [3]CNRS, Institut d'Électronique et de Télécommunications de Rennes, UMR-6164
12:10 – 12:30	**EuMC52-5** Intracellular Delivery of Graphene Oxide Quantum Dots for Bio-Imaging and Ferric Ion Sensing Based on Bulk Acoustic Wave Resonator Miaosen Zhang[1], Shan He[1], Xuexin Duan[1], Wei Pang[1], Yanyan Wang[1] [1]Tianjin University	**EuRAD12-5** Analysis of Automotive Radar Interference Mitigation for Real-World Environments Mate Toth[1], Johanna Rock[2], Paul Meissner[3], Alexander Melzer[3], Klaus Witrisal[2] [1]Infineon Technologies AG, Graz University of Technology, [2]Graz University of Technology, [3]Infineon Technologies Austria AG	**EuRAD13-5** Microwave Photonics as an Emerging Technology to enhance EW receivers David Lazaro Loscos	**EuRAD14-5** Direct Ocean Surface Velocity Measurement for Chinese Gaofen-3 SAR Satellite Lei Liu[1], Mihai Datcu[2], Qingjun Zhang[1], Gottfried Schwarz[2], Yadong Liu[1], Jie Liu[1] [1]Beijing Institute of Spacecraft System Engineering, China Academy of Space Technology, [2]Remote Sensing Technology Institute, German Aerospace Center (DLR)

THURSDAY 12:30 – 14:10

Hall 1

EuRAD15
EuRAD Interactive Poster Session

Chair: Jacco de Wit[1]
Co-Chair: Mark Oude Alink[2]
[1]TNO, [2]University of Twente

Explore:
Discover the latest development in the field of Radars at Thursday's poster session.

EuRAD15-1
On the Needlessness of Signal Bandwidth for Precise Holographic Wireless Localization
Melanie Lipka[1], Stefan Brückner[1], Erik Sippel[1], Martin Vossiek[1]
[1]FAU Erlangen-Nuremberg

EuRAD15-2
Dynamic Estimation of Vital Signs with mmWave FMCW Radar
Guigeng Su[1], Nikita Petrov[2], Alexander Yarovoy[1]
[1]Delft University of Technology, [2]TU Delft

EuRAD15-3
Further Investigation of Two-Way Classification for Activities of Daily Living
Ronny G. Guendel[1]
[1]Delft University of Technology

EuRAD15-4
Human Walking Detection by Cascaded Deep Neural Networks Classifying Micro-Doppler Signals
Jihoon Kwon[1], Nojun Kwak[2], Junho So[3]
[1]Hanwha Systems, [2]Seoul National University, [3]Agency for Defense Development

EuRAD15-5
A Radar Target Simulator for Generating Synthesised and Measured Micro-Doppler-Signatures of Vulnerable Road Users
Johannes Iberle[1], Patrick Rippl[1], Thomas Walter[1]
[1]University of Applied Sciences Ulm

EuRAD15-6
RCS-Enhancement for Improving the Detectability of Bikes in Road Safety Applications
Corentin Charlo[1], Stéphane Méric[2], Raphaël Gillard[1]
[1]Institut d'Électronique et de Télécommunications de Rennes, Insa Rennes, [2]IETR, INSA

EuRAD15-7
A Cognitive FMCW Radar to Minimize a Sequence of Range-Doppler Measurements
Marco Altmann[1], Peter Ott[1], Nicolaj C. Stache[1], Dmitrii Kozlov[1], Christian Waldschmidt[2]
[1]Hochschule Heilbronn, [2]Ulm University

EuRAD15-8
A Novel Velocity Estimation Algorithm for TDM-MIMO Based Automotive Radar
Ben Wang[1], Dejian Li[1], Dapeng Lao[1], Jiamin Chen[1]
[1]Hisilicon Technologies Co., Ltd.

EuRAD15-9
Scalable 2×2 MIMO Radar with BPSK Data Communication at 79 GHz
Wael A. Ahmad[1], Arzu Ergintav[1], Maciej Kucharski[1], Dietmar Kissinger[2], Herman Jalli Ng[1]
[1]IHP - Leibniz-Institut für innovative Mikroelektronik, [2]Ulm University

EuRAD15-10
Deep Neural Network Detection for Pulsed Radar-Embedded M-PSK Communications
Christopher Liu[1], Ric Romero[2]
[1]USN, [2]Naval Postgraduate School

EuRAD15-11
Vibrating Antenna Doppler Radar
Nathan Chordas-Ewell[1], Kevin Xu[1], Ravi Kadlimatti[1], Adly T. Fam[1], Jun H. Choi[1]
[1]The State University of New York at Buffalo

EuRAD15-12
A New Radar Based On Panel Active Array
Jia Fang[1]
[1]cetc38

EuRAD15-13
Series-Fed Single-Layer Ring Resonator Antenna Array with Wide Fan-Beam and High Gain
Hyunyoung Cho, Hye-Won Jo[1], ByungKuon Ahn[1], Ju-Ik Oh[1], Jong-Won Yu[1]
[1]Korea Advanced Institute of Science and Technology

EuRAD15-14
High Permittivity CPW-SIW Power Divider for Antenna Feed Networks in Airborne Phased Arrays Applications
Diego Lorente Catalan[1], Alicja Schreiber[1], Markus Limbach[1], Hector Esteban Gonzalez[2], Vicente Enrique Boria Esbert[2]
[1]German Aerospace Center (DLR), [2]Universidad Politécnica de Valencia

EuRAD15-15
Novel Noise-Tolerant Method for Extracting Target Resonances Using Pulse Radar
Mihail Georgiev[1], Paul Rice[2], Jian-Kang Zhang[1]
[1]McMaster University, [2]Patriot One Technologies

EuRAD15-16
Avoiding Interference in Multi-Emitter Environments: A Reinforcement Learning Approach
Serkan Ak[1], Stefan Brüggenwirth[1]
[1]Fraunhofer Institute for High Frequency Physics and Radar Techniques (FHR)

THURSDAY 13:50 – 15:30

Auditorium

EuMC/EuRAD03
[Special Session] Focus Day: Active Array Antennas for Defence

Chair: Peter Knott[1]
Co-Chair: Patrick Langlois[2]
[1]Fraunhofer FHR, [2]EDA

13:50 – 14:10

EuMC/EuRAD03-1
Research progress of intelligent active phased array radar
Jun Sun[1]
[1]Nanjing Research Institute of Electronics Technology

14:10 – 14:30

EuMC/EuRAD03-2
Digital Frontends for Multi-Functional RF Systems
Michael Brandfass[1]
[1]Hensoldt Sensors GmbH

14:30 – 14:50

EuMC/EuRAD03-3
Naval and ground-based multi-mission AESA radars
Simon van der Berg[1]
[1]Thales Nederland B.V.

14:50 – 15:10

EuMC/EuRAD03-4
AESA Radar for Space Situational Awareness – about the status of GESTRA
Helmut Wilden[1], C. Kirchner[1], Andreas R. Brenner, Thomas Eversberg[2]
[1]Fraunhofer FHR, [2]German Aerospace Center (DLR)

15:10 – 15:30

EuMC/EuRAD03-5
AESA Radar Development at Lincoln Lab
David Conway[1]
[1]MIT Lincoln Laboratory

Expedition

EuMC54
Low Noise Amplifier and Phased Array Module

Chair: Almudena Suarez Rodriguez[1]
Co-Chair: Jean-François Villemazet[2]
[1]University of Cantabria, [2]Thales Alenia Space France

13:50 – 14:10

EuMC54-1
A Full Ka-Band GaN-on-Si Low-Noise Amplifier
Dristy Parveg[1], Mikko Varonen[1], Mikko Kantanen[1]
[1]VTT Technical Research Centre of Finland

14:10 – 14:30

EuMC54-2
A High Linearity W-Band LNA With 21-dB Gain and 5.5-dB NF in 0.13 µm SiGe BiCMOS
Huanbo Li[1], Jixin Chen[1], Debin Hou[1], Wei Hong[1], Pinpin Yan[1]
[1]Southeast University

14:30 – 14:50

EuMC54-3
A MMIC Low-Noise Amplifier Realized with Two Different Gate Length GaN-on-Si Technologies
Lorenzo Pace[1], Patrick Ettore Longhi[1], Walter Ciccognani[1], Sergio Colangeli[1], Rémy Leblanc[2], Ernesto Limiti[1]
[1]University of Rome "Tor Vergata", [2]OMMIC SAS

14:50 – 15:10

EuMC54-4
G-Band Frequency Converters in 130 nm InP DHBT Technology
Ahmed Hassona[1], Vessen Vassilev[1], Herbert Zirath[1]
[1]Chalmers University of Technology

15:10 – 15:30

EuMC54-5
Millimetre-Wave Active Phased Array SiP Module for UE Devices in 5G Communications
Wenyao Zhai[1], Hari Krishna Pothula[2], Morris Repeta[2], David Wessel[2], Wen Tong[2]
[1]Huawei Technologies, [2]Huawei Technologies CO., LTD

Flash

EuMC55
Antenna Characterisation Techniques

Chair: Nuno Borges Carvalho[1]
Co-Chair: Olof Bengtsson[2]
[1]Instituto de Telecomunicacões, Universidade de Aveiro, [2]Ferdinand-Braun-Institut (FBH)

13:50 – 14:10

EuMC55-1
Preliminary Characterization of the Digitally Formed Beams of PHAROS2 Phased Array Feed
Giuseppe Pupillo[1], Alessandro Navarrini[2], Andrea Melis[2], Raimondo Concu[2], Pierluigi Ortu[2], Pasqualino Marongiu[2], Giovanni Naldi[1], Simone Rusticelli[1], Andrea Saba[3], Alessandro Scalambra[1], Luca Schirru[2], Adelaide Ladu[2], Tonino Pisanu[2], Enrico Urru[2]
[1]INAF - IRA, [2]INAF - OAC, [3]ASI

14:10 – 14:30

EuMC55-2
Characterization and Calibration Challenges of a K-Band Large Scale Active Phased-Array Antenna with a Modular Architecture
Naimeh Ghafarian[1], Wael Abdel-Wahab[1], Amir Raeesi[1], Ehsan Haj Mirza Alian Aminabad[1], Ardeshir Palizban[1], Ahmad Ehsandar[1], Milad Khaki[1], Mohammad-Reza Nezhad-Ahmadi[1], Safieddin Safavi-Naeini[1]
[1]University of Waterloo

14:30 – 14:50

EuMC55-3
A Low Complexity Approach for Calibration and Characterization of a Millimeter-Wave Phased-Array Transceiver-Antenna Module
Mehdi Salehi[1], Safieddin Safavi-Naeini[2], Mohammad-Reza Nezhad-Ahmadi[2]
[1]Sinclair Technologies, [2]University of Waterloo

14:50 – 15:10

EuMC55-4
A Reproducible Semi-Virtual Test-Drive for Analysis of Car-to-Car/Car-to-X Diversity Performance at 5.9 GHz in Noisy Fading Conditions
Anton Dobler[1], Olha Voitsun[1], Stefan Lindenmeier[1]
[1]University of the Bundeswehr Munich

15:10 – 15:30

EuMC55-5
A Preliminary Study on Uncertainty of NB-IoT Measurements in Reverberation Chambers
Anouk Hubrechsen[1], Vincent Neylon[2], Kate Remley[2], Robert Jones[2], Robert Horansky[2], Sander Bronckers[1]
[1]Eindhoven University of Technology (TU/e), [2]National Institute of Standards and Technology

Glow

EuMC56
[Focussed Session] Electromagnetics in Biomedical Applications

Chair: Maarten Paulides[1]
Co-Chair: Desmond T.B. Yeo[2]
[1]Eindhoven University of Technology (TU/e), [2]GE Global Research

13:50 – 14:10

EuMC56-1
Ultra-High Field MRI RF Transmit Coil Arrays
Carel van Leeuwen[1], Bart Steensma[1], Alexander Raaijmakers[1]
[1]University Medical Center Utrecht

14:10 – 14:30

EuMC56-2
Non-Invasive Brain Stimulation: From Field Modeling to Neuronal Activation
Rob Mestrom[1], Debby Klooster[1], Elles Raaijmakers[1], Maarten van Rossum[1], Martijn van Beurden[1], Paul Boon[2]
[1]Eindhoven University of Technology, [2]Ghent University

14:30 – 14:50

EuMC56-3
7T MRI Fractionated Dipole Antenna for CarotidImaging
Nicolai Mortensen[1], Lars Hinge[2], Vitaliy Zhurbenko[2], Vincent Oltman Boer[3]
[1]Technical University of Denmark, [2]DTU, [3]DRMCR

14:50 – 15:10

EuMC56-4
Simulation Comparison of Birdcage Coil and Metamaterial Liner for MRI at 3T and 4.7T
Adam Maunder[1], Nicola De Zanche[1], Ashwin Iyer[1]
[1]University of Alberta

15:10 – 15:30

EuMC56-5
PNS Estimation of a High Performance Head Gradient Coil by a Coupled Electromagnetic Neurodynamic Simulation Method
Yihe Hua[1], Desmond T.B. Yeo[1], Thomas KF Foo[1]
[1]GE Global Research

THURSDAY 13:50 – 15:30

Media Arena

EuMC57
[Special Session] In Recognition: Prof.Dr. A.T. de Hoop

Chair: Peter Zwamborn[1]
Co-Chair: Arnold van Ardenne[2]
[1]TNO Defense, Safety and Security, [2]ASTRON (retired)

13:50 – 14:10

EuMC57-1
A few Introductory remarks
Arnold van Ardenne[1]
[1]ASTRON (retired)

14:10 – 14:30

EuMC57-2
To have "(De) Hoop" in Difficult Times
Guy Vandenbosch[1]
[1]KU Leuven

14:30 – 14:50

EuMC57-3
Time-domain Antenna Engineering – A Story About Scientific Affinity
Ioan Lager[1]
[1]Delft University of Technology

14:50 – 15:10

EuMC57-4
The Cagniard-deHoop Method of Moments (CdH-MoM) – A New Time-Domain Integral-Equation Technique Based on EM Reciprocity and the Cagniard-deHoop Method
Martin Stumpf

Mission 1

EuRAD16
Automotive

Chair: André Bourdoux[1]
Co-Chair: Noam Arkind[2]
[1]imec, Leuven, [2]Arbe Robotics

13:50 – 14:10

EuRAD16-1
Channel Influence for the Analysis of Interferences Between Automotive Radars
Lizette Lorraine Tovar Torres[1], Maximilian Steiner[1], Christian Waldschmidt[1]
[1]Universität Ulm

14:10 – 14:30

EuRAD16-2
Automotive Radar Interference Mitigation via Multi-Hop Cooperative Radar Communications
Canan Aydogdu[1], Musa Furkan Keskin[1], Henk Wymeersch[1]
[1]Chalmers University of Technology

14:30 – 14:50

EuRAD16-3
An Efficient Sparse Sensing Based Interference Mitigation Approach For Automotive Radar
Tai Fei[1], Honghao Guang[1], Yuliang Sun[1], Christopher Grimm[1], Ernst Warsitz[2]
[1]HELLA GmbH & Co. KGaA,

14:50 – 15:10

EuRAD16-4
Over-the-Air Vehicle-in-the-Loop Test System for Installed-Performance Evaluation of Automotive Radar Systems in a Virtual Environment
Sreehari Buddappagari Jayapal Gowdu[1], Ehtisham Asghar Muhammad[1], Johannes Nagel[1], Ralf Stephan[1], Matthias A. Hein[1]
[1]TU Ilmenau, [2]Mercedes-Benz AG

15:10 – 15:30

EuRAD16-5
A Roadside Camera-Radar Sensing Fusion System for Intelligent Transportation
Lefei Wang[1], Zhaoyu Zhang[1], Xin Di[1], Jun Tian[1]
[1]Fujitsu Research and Development Center Co., Ltd, China

Mission 2

EuRAD17
Advanced Techniques and Innovative Array Configurations for Direction of Arrival Estimation

Chair: Laurent Ferro-Famil[1]
Co-Chair: Francois Le Chevalier[2]
[1]University of Rennes 1, [2]TU Delft

13:50 – 14:10

EuRAD17-1
An IEEE 802.15.4 Wireless Half-Cubic Node Based on a Switched-Beam Antenna for Indoor Direction of Arrival Estimation
Alessandro Cidronali[1], Giovanni Collodi[1], Matteo Lucarelli[1], Stefano Maddio[1], Marco Passafiume[1], Giuseppe Pelosi[1]
[1]University of Florence

14:10 – 14:30

EuRAD17-2
Improving an IEEE 802.15.4 Based Direction of Arrival Estimation System Reliability in a Real Case Scenario Exploiting a Smart Multichannel Approach
Alessandro Cidronali[1], Giovanni Collodi[1], Matteo Lucarelli[1], Stefano Maddio[1], Marco Passafiume[1], Giuseppe Pelosi[1]
[1]University of Florence

14:30 – 14:50

EuRAD17-3
Selecting the best DOA estimates among estimates obtained using Toeplitz matrix approximation and general covariance matrix
Volodymyr Vasylyshyn[1]
[1]Kharkiv national Air force university

14:50 – 15:10

EuRAD17-4
A Discriminant-Based RMSE Improvement Technique for Classical Prony Method in Small Array Radars
Atsushi Yoshizawa[1], Shigenori Uchida[1]
[1]Sony Corp.

15:10 – 15:30

EuRAD17-5
Direction of Arrival Estimation using the Generalized SPICE Criterion
Adham Sakhnini[1]
[1]Centre for Mathematical Sciences, Lund University

Quest

EuRAD18
SAR Applications

Chair: Debora Pastina[1]
Co-Chair: Mikhail Cherniakov[2]
[1]University of Rome La Sapienza, [2]University of Birmingham

13:50 – 14:10

EuRAD18-1
Realistic SAR Implementation for Automotive Applications
Hasan Iqbal[1], Andreas Löffler[1], Mohamed Nour Mejdoub[1], Frank Gruson[1]
[1]Continental AG

14:10 – 14:30

EuRAD18-2
Space-Variant Phase Error Estimation and Correction for Automotive SAR
Masoud Farhadi[1], Reinhard Feger[1], Johannes Fink[2], Thomas Wagner[1], Markus Gonser[2], Jürgen Hasch[2], Andreas Stelzer[1]
[1]Johannes Kepler University Linz, [2]Robert Bosch GmbH

14:30 – 14:50

EuRAD18-3
Ego-Motion Estimation for a Sensor Platform by Fusion of Radar and IMU Data
Patrick Wallrath[1], Reinhold Herschel[2]
[1]Fraunhofer Institute for High Frequency Physics and Radar Techniques FHR, [2]Fraunhofer FHR

14:50 – 15:10

EuRAD18-4
Azimuth Ambiguity Discrimination Using Doppler Spectrum of the Compressive Sensing-Based SAR Image with Downsampled PRF
Ryogo Horiuchi[1], Takehiro Hoshino[1], Noboru Oishi[1], Kei Suwa[1]
[1]Mitsubishi Electric Corporation

15:10 – 15:30

EuRAD18-5
Spatial Mapping of Material Properties utilizing FMCW Near Field Radar Scans
Sebastian Pawliczek[1], Reinhold Herschel[2], Nils Pohl[1]
[1]Ruhr University Bochum, [2]Fraunhofer FHR

THURSDAY 14:30 – 16:20

Enjoy:

Don't miss the Week's last opportunity to enjoy an insightful walk between the posters of Thursday's session..

Hall 1

EuMC58
EuMC Interactive Poster Session 3

Chair: Sander Bronckers[1]
Co-Chair: Mark Oude Alink[2]
[1]Eindhoven University of Technology, [2]University of Twente

EuMC58-1
Design of Wideband Frequency Selective Absorber Based on Multilayer Structures
YE Han[1], Longjie Xu[1], Hanjing Xu[1], Siyu Xie[1]
[1]Nanjing University of posts and telecommunication

EuMC58-6
GaN-FET Class-E Amplifier for 60-MHz Radar
Frederick Raab[1]
[1]Green Mountain Radio Research

EuMC58-11
Cross-Polarization Chipless Tag for Orientation Sensing
Nicolas Barbot[1], Olivier Rance[1], Etienne Perret[1]
[1]Grenoble Alpes University

EuMC58-16
A 79-GHz Automotive Wide-Beam Patch Antenna With I-Shaped Parasitic Elements
Guan-Ren Su[1], Eric S. Li[1], Jia-Chang Chen[2], Ting-Wei Kuo[2], Yu-You Lin[2], Kuo-Sheng Chin[2]
[1]National Taipei University of Technology, [2]Chang Gung University

EuMC58-2
A 2.5 GHz Tunable Negative Varactor of Inductance Using Reconfigurable Non-Foster Circuit
Ngoc Duc Au[1]
[1]Soongsil University

EuMC58-7
A High Efficiency Compact Class F GaN MMIC Power Amplifier for 5G Applications
Rachit Joshi[1], Min-Hsin Liu[1], Shawn S. H. Hsu[1]
[1]National Tsing Hua University

EuMC58-12
Anti-Aliasing Digital Predistortion for Nonuniform-Sampling-Rate Concurrent Dual-Band Transmitters
Long Chen[1], Wenhua Chen[1], Youjiang Liu[2], Zhenghe Feng[1]
[1]Tsinghua University, [2]China Academy of Engineering Physics

EuMC58-17
Hemishperical Coverage Antenna using Pattern Reconfiguration of Electronically Steerable Parasitic Array Radiator and Microstrip Patch
ByungKuon Ahn[1], Hyunyoung Cho[1], Hye-Won Jo[1], Ju-Ik Oh[1], Jong-Won Yu[1]
[1]Korea Advanced Institute of Science and Technology

EuMC58-3
Design of a Cloak with Diagonally Slotted Square Patch for TE and TM Scattering Reduction
Archana Rajput[1], Mehran Manzoor Zargar[1], Kushmanda Saurav[1], Shiban Kishen Koul[2]
[1]INDIAN INSTITUTE OF TECHNOLOGY JAMMU, [2]Indian Institute of Technology Delhi

EuMC58-8
Reliable Structural Failure Detection in Eye Bolts using Reflectometry Signals
H. V. H. Silva Filho[1], D. C. P. Barbosa[1], M. S. Coutinho[1], M. T. de Melo[1], R. G. M. dos Santos[1], Ignacio Llamas Garro[2]
[1]Universidade Federal de Pernambuco, [2]Centre Tecnològic de Telecomunicacions de Cataluny

EuMC58-13
A Complementary Series-Parallel Resonant Circuit Pair and Its Application in Linearization of Power Amplifiers
Zeji Gu[1]
[1]Ampleon USA

EuMC58-18
Antenna Library for IoT Devices with Antenna Boosters
Jaume Anguera[1]
[1]Fractus Antennas and Universitat Ramon Llull

EuMC58-4
A Compact Load-Modulation Amplifier for Improved Efficiency Next Generation Mobile
Ahmed Abdulkhaleq[1], Maan Yahya[2], Yasir Al-Yasir[3], Naser Ojaroudi Parchin[3], Maryam Sajedin[4], Syed Muhammad Syed Anera[1], Ashwain Rayit[1], Issa Elfergani[4], Raed A. Abd-Alhameed[3], Jonathan Rodriguez[4]
[1]Saras Technology, [2]Northern Technical University, [3]University of Bradford, [4]Instituto de Telecomunicações

EuMC58-9
Integrated System with Enhanced Performances to Recover Energy from Microstrip Circuits
Miguel Sanchez-Soriano[1], Yves Quéré[2], Cédric Quendo[2]
[1]University of Alicante, [2]University of Brest

EuMC58-14
Technique for Load-Independent Millimeter-Wave Output Power Monitoring for Mass-Volume Testing
Matthias Saurer[1], Vadim Issakov[1], Oliver Frank[1]
[1]Infineon Technologies

EuMC58-19
Analysis and Optimization of Packaged Floating-Ground RF Power GaN-HEMTs
Sophie Paul[1], Wolfgang Heinrich[1], Olof Bengtsson[1]
[1]Ferdinand-Braun-Institut (FBH)

EuMC58-5
A 65 W Power Amplifier without Load Modulation to Achieve 50% Efficiency at 8 dB Power Back-Off over 1.8-2.5 GHz
Paul Saad[1], Rui Hou[1], Richard Hellberg[1], Bo Berglund[1]
[1]Ericsson AB

EuMC58-10
An Efficient Wireless Power Transfer for Retinal Prosthesis using Artificial Intelligent Algorithm
Nam Ha-Van[1], Lam Vu Tung[1]
[1]Soongsil University

EuMC58-15
A Microstrip Filtering Patch Antenna with Asymmetric Gain Response
Yun Wu[1], Jinhao Dai[1], Liang Sun[1], Yi Wang[2], Yunlong Lu[3], Jifu Huang[3]
[1]Institute of Physics, Chinese Academy of Sciences (IOP, CAS), [2]Univerisity of Birmingham, [3]Ningbo University

THURSDAY 16:10 – 17:50

ROOM Polar

EuMW03
EuMW/EuMC Closing Session

Chair: Frank E. van Vliet[1], General Chair
Co-Chair: Wim van Cappellen[2], EuMC Chair
[1]TNO, [2]ASTRON

16:10 – 16:20 Session Welcome
Frank E. van Vliet
General Chair

16:20 – 16:50 The Future of High-Throughput Satellites is Laser SatCom
[1]
[1]Airbus Defence & Space

16:50 – 17:10 Awards Ceremony
Marion K. Matters-Kammerer
Awards and Prizes Chair

17:10 – 17:40 New Frontiers for Wave Engineering Using Metamaterials
Andrea Alù[1]
[1]CUNY Advanced Science Research Center, Photonics Initiative

Metamaterials are engineered materials with properties that go well beyond what offered by nature, providing unprecedented opportunities to tailor and enhance the control of waves. In this talk, I discuss our recent activity at microwaves and THz frequencies, showing how suitably tailored meta-atoms and their arrangements open exciting avenues for wave manipulation, including metasurfaces with enhanced wavefront manipulation, and magnet-free nonreciprocity and topological phenomena. Insights into the underlying physics and new devices based on these concepts will be presented.

17:40 – 17:50 Closing Remarks
Frank E. van Vliet, Nick Ridler[1]
[1]EuMW 2021 General Chair

FRIDAY

Room	08:30 – 10:10	10:50 – 12:30		13:50 – 15:30	16:10 – 17:50	EVENING PROGRAMME
Progress				EuRAD25 Closing Session		
Mission 1	EuRAD19 MIMO Radar	EuRAD22 Automotive Radar MIMO Processing				
Mission 2	EuRAD20 Passive Radars	EuRAD23 Target Characterisation with Radar				
Quest	EuRAD21 New Radar Concepts	EuRAD24 [Special Session] Civilian Radar Research and Development in China				
Expedition	S-02 Cognitive Radar Signal Processing			S-01 Introduction to MIMO Radar		
Auditorium	5G Forum 5G: From Technology to Business		Technology in Context Philosophical Lecture	5G Forum 5G: From Technology to Business		
Flash	W-21 Recent Advances in Topologies, Technologies and Practical Realizations of Microwave Sensors					
Glow	W-30 Recent Advances on Microwave Filters					
BOR 2	W-32 Practical Aspects of Running a Microwave Laboratory and How to Make Good Measurements Every Time					
Transitzone A			EuRAD Seated Lunch			
Transitzone B			5G Forum and WS/SC Seated Lunch			

EuMW EuMC EuRAD EuMIC Student Activity EuMIC/EuMC EuMC/EuRAD

FRIDAY 08:30 – 10:10

Mission 1

EuRAD19
MIMO Radar

Chair: Andreas Stelzer[1]
Co-Chair: Matthew Ritchie[2]
[1]Johannes Kepler University Linz, [2]UCL

08:30 – 08:50

EuRAD19-1
Radar Imaging Using Electrically Large Arrays With High Range Resolution at 160 GHz
André Dürr[1], Benedikt Schneele[1], Dominik Schwarz[1], Christian Waldschmidt[1]
[1]Ulm University

08:50 – 09:10

EuRAD19-2
On the Impact of Channel Imbalance on MIMO Radar Performance
Ricard Grove[1], Jørgen Dall[1]
[1]DTU Space

09:10 – 09:30

EuRAD19-3
MIMO ISAR Based UWB Imaging System for Non-Destructive Testing
Harun Cetinkaya[1], Sandra Nowok[1], Reinhold Herschel[1]
[1]Fraunhofer FHR

09:30 – 09:50

EuRAD19-4
Coherent MIMO Radar Systems in Three-Dimensional Surveillance Scenarios
David R. Sanchez-Jacome[1], Salvatore Maresca[2], Carsten Rockstuhl[1], Paolo Ghelfi[3], Antonella Bogoni[4]
[1]Karlsruhe School of Optics and Photonics, Karlsruhe Institute of Technology, Karlsruhe, Germany, [2]Scuola Superiore Sant'Anna - TECIP, [3]PNTLab, Consorzio Nazionale Interuniversitario per le Telecomunicazioni (CNIT), Pisa, [4]TeCIP Institute, Scuola Superiore Sant'Anna, Pisa

09:50 – 10:10

EuRAD19-5
Sparse MIMO Array for Improved 3D mmWave Imaging Radar
Rabia Zainab Syeda[1], Timofey Savelyev[2], Martijn van Beurden[1], Bart Smolders[1]
[1]Eindhoven University of Technology, [2]Radarxense BV

Mission 2

EuRAD20
Passive Radars

Chair: María-Pilar Jarabo-Amores[1]
Co-Chair: Nathan Goodman[2]
[1]University of Alcalá, [2]University of Oklahoma

08:30 – 08:50

EuRAD20-1
Airborne Targets Detection by UAV-Embedded Passive Radar
Benjamin GABARD[1], Valentine WASIK[1], Olivier RABASTE[1], Thierry DELOUES[1], Dominique POULLIN[1], Hervé JEULAND[1]
[1]ONERA

08:50 – 09:10

EuRAD20-2
Comparing Phase-Locked and Non-Phase-Locked Architectures for Dual-Channel DVB-S Passive Radar
Octavio Cabrera[1], Pierfrancesco Lombardo[1], Fabiola Colone[1], Carlo Bongioanni[1]
[1]Sapienza University

09:10 – 09:30

EuRAD20-3
Characterization of Single Frequency Networks for Passive Radar Applications
Volker Winkler[1], Steffen Lutz[1], Michael Brandfass[1]
[1]Hensoldt Sensors GmbH

09:30 – 09:50

EuRAD20-4
Passive DVB-T SAR Phenomenology: First Results from a Bistatic Campaign
George Atkinson[1], Michael Antoniou[1], Mikhail Cherniakov[1]
[1]University of Birmingham

09:50 – 10:10

EuRAD20-5
A DVB-T Passive Radar 3D-Detection Approach Based on Non-Coherent Spatial Integration
Nerea del Rey-Maestre[1], María-Pilar Jarabo-Amores[1], David Mata-Moya[1], Anabel Almodóvar-Hernández[1], Pedro José Gómez-del-Hoyo[1]
[1]University of Alcalá

Quest

EuRAD21
New Radar Concepts

Chair: Daniel O'Hagan[1]
Co-Chair: Pierfrancesco Lombardo[2]
[1]Fraunhofer FHR, [2]Sapienza University of Rome

08:30 – 08:50

EuRAD21-1
Cognitive approaches to detection of small targets
Ellis Humphreys[1], Michael Antoniou[1], Christopher Baker[1], William Stafford[2]
[1]University of Birmingham, [2]BAE Systems

08:50 – 09:10

EuRAD21-2
Co-Engineering of a Radar System with Mixed Grey Wolf Optimizer: Application to Concealed Object Classification
Julien Marot[1], Claire Migliaccio[2], Jérôme Lanteri[3], Paul Lauga[4], Salah Bourennane[4]
[1]Institut Fresnel, Aix Marseille Université, [2]Université Côte d'Azur, [3]Université Cote d'Azur - CNRS, [4]Inst. Fresnel, ,Aix Marseille Université

09:10 – 09:30

EuRAD21-3
Millimeter- and Submillimeter-Wave Differential Absorption Radar
Ken Cooper[1], Richard Roy[1], Jose V. Siles[1], Matthew Lebsock[1], Luis Millan[1], Raquel Rodriguez-Monje[1], Robert Dengler[1], Omkar Pradhan[1], Leslie Tamppari[1], Brian Drouin[1]
[1]Jet Propulsion Laboratory, California Institute of Technology

09:30 – 09:50

EuRAD21-4
Passive Radio Imaging of Hybrid Radar System for Security Inspections
Naruto Yonemoto[1]
[1]ENRI/MPAT

09:50 – 10:10

EuRAD21-5
The Application of Performance Metrics to Staring Radar for Drone Surveillance
Mohammed Jahangir[1], Bashar Ahmad[2], Christopher Baker[3]
[1]University of Birmingham, [2]Aveillant Limited, [3]The University of Birmingham

FRIDAY 10:50 – 12:30

	Mission 1	Mission 2	Quest
	EuRAD22 Automotive Radar MIMO Processing Chair: Reinhard Feger[1] Co-Chair: Kevin Cinglant[2] [1]Johannes Kepler University Linz, [2]ZF	**EuRAD23** Target Characterisation with Radar Chair: Christopher Baker[1] Co-Chair: Jacco de Wit[2] [1]University of Birmingham, [2]TNO	**EuRAD24** [Special Session] Civilian Radar Research and Development in China Chair: Cheng Hu[1] Co-Chair: Alexander Yarovoy[2] [1]Beijing Institute of Technology, [2]TU Delft
10:50 – 11:10	**EuRAD22-1** High Angle Resolution Automotive Radar Based on Simultaneous 12 Tx Doppler-Multiplex MIMO Nadjah Touati[1], Christian Sturm[1] [1]Valeo Schalter und Sensoren GmbH	**EuRAD23-1** Physics Based Radar Simulation Thijs van Putten[1], Rogier van Aken[1], Michael Phillips[1] **INDUSTRIAL KEYNOTE** [1]Siemens Digital Industries Software	**EuRAD24-1** Probabilistic Deep Models for Radar Target Recognition Bo Chen[1] [1]Xidian University
11:10 – 11:30	**EuRAD22-2** Fast Chirp MIMO Radar System using Doppler Offset Orthogonal Codes Takaaki Kishigami[1], Kenta Iwasa[1], Tomohiro Yui[1], Hidekuni Yomo[1], Akihiko Matsuoka[1], Junji Satou[1] [1]Panasonic Corporation	**EuRAD23-2** Towards Safe Autonomous Driving: Challenges of Pedestrian Detection in Rain with Automotive Radar Dagmar Steinhauser[1], Thomas Brandmeier[1], Patrick Held[1], Bernhard Thöresz[1] [1]Technische Hochschule Ingolstadt	**EuRAD24-2** Entomological Radar Signal Processing and Experimental Validation Cheng Hu[1], Weidong Li[1], Rui Wang[1] [1]Beijing Institute of Technology
11:30 – 11:50	**EuRAD22-3** Millimeter-Wave Automotive Radar using Extrapolation for Improved Angular Resolution Cristian-Alexandru Alistarh[1], Laura Anitori[2], Symon K. Podilchak[3], John Thompson[3], Pascual David Hilario Re[4], Mathini Sellathurai[4], George Goussetis[4], Jaesup Lee[5] [1]Heriot-Watt University, [2]TNO, [3]The University of Edinburgh, [4]Heriot Watt University, [5]Samsung Advanced Institute of Technology	**EuRAD23-3** High Resolution 802.11Ax-Based Passive Radar for Human Movement Monitoring Hasan Can Yildirim[1], Laurent Storrer[1], François Rottenberg[1], Jérôme Louveaux[2], Philippe De Doncker[1], François Horlin[1] [1]Université Libre de Bruxelles, [2]Université catholique de Louvain	**EuRAD24-3** Coherent Multidimensional Agility Radar Signal Processing Wen-Qin Wang Wang[1] [1]University of Electronic Science & Technology of China
11:50 – 12:10	**EuRAD22-4** Kalman Tracking in Driver Assistance Systems - Collision Warning for Vulnerable Road Users Simon Hüsges[1], Christoph Degen[1] [1]Hochschule Niederrhein University of Applied Sciences	**EuRAD23-4** Refraction Compensation for Non-Destructive Testing of Fibre-Composite Materials André Froehly[1], Reinhold Herschel[1] [1]Fraunhofer FHR	**EuRAD24-4** The State-of-the-Art of Terahertz Technologies and Applications Weidong Hu[1] [1]Beijing Institute of Technology
12:10 – 12:30	**EuRAD22-5** Automatic Delay and Phase Mismatch Calibration in FMCW MIMO Radar Adrian Figueroa[1], Niko Joram[1], Frank Ellinger[1] [1]TU Dresden	**EuRAD23-5** Size estimation of space debris models from their RCS measured in anechoic chamber Selenia Ghio[1], Marco Martorella[2] [1]Consorzio Nazionale Interuniversitario Telecomunicazioni (CNIT), [2]CNIT - University of Pisa	**EuRAD24-5** Microwave photonics Radar Technology Wangzhe Li[1] [1]Institute of Electronics of the Chinese Academy of Sciences

FRIDAY 13:50 – 15:10

ROOM	Progress
	EuRAD25 EuRAD Closing Session EuRAD Chair: Mayazzurra Ruggiano[1], EuRAD Chair Co-Chair: Jacco de Wit[2], EuRAD TPC Chair [1]Thales Nederland B.V., [2]TNO
13:50 – 14:30	Multi-Band functionally integrated Multi-Function Radar sensor suites Winston van Oosterhout[1] [1]Thales Nederland B.V. Current and future naval missions are evolving. The operational scene that we know today is likely to change at an increasing pace: technological developments occur not only in defense mission systems, but also in threats that rely on the very same developments. This means that future missions have a high level of uncertainty, increasing the naval challenges that we know today. Naval combat systems call for developments that are designed around the expectation for the unexpected. One of the answers to overcome such uncertainty, is the extension of today's multi-function radar systems to multi-band, functionally integrated sensor suites. With scalability in the genes, reconfigurability is the extension to deploy the benefits that multi-band radar sensor suites have to offer. This is further augmented by the incremental capability upgrades that have emerged with radar systems which have a large dependency on software defined functionalities. This talk shows developments that Thales has undertaken in the Dutch radar ecosystem to provide an answer in the radar and adjacent domains to overcome the challenges that are foreseen in the naval domain. A sneak preview is given of the suite architectural setup, main subsystems and underlying technologies to highlight the benefits of multi-band functionally integrated multi-function radar sensor suites.
14:30 – 14:50	Awards Ceremony Marion K. Matters-Kammerer[1], Mayazzurra Ruggiano[2], Jacco de Wit[3] [1]Awards and Prizes Chair, [2]EuRAD Chair, [3]EuRAD TPC Chair
14:50 – 15:10	Closing Remarks and Invitation to EuRAD 2021 in London Mayazzurra Ruggiano, James Watts[1] [1]EuRAD 2021 Chair

Welcome from the Workshop and Short Courses Chair

The Workshops and Short Courses program is one of the major scientific components of the European Microwave Week. In this year edition, despite the difficulties due to the Corona virus pandemic and the necessity to re-organize the conference, we are pleased and proud to be able to offer a wide range of workshops and short courses, covering all most relevant topics in the microwave field, ranging from classical to upcoming technology areas. A total of 32 workshops and short courses will be presented throughout the entire week, and will cover topics of interest to both experts as well as junior scientists entering the amazing microwave world.

Short courses offer the possibility to get acquainted with a new topic while workshops will get you up to speed on a specific subject through a hand-picked set of lectures given by the best scientists and "microwave practitioners" in the field. Upcoming technologies and applications like 5G and full-duplex communications, quantum computing, as well as automotive radar and micro-Doppler target classification, will be presented by world recognized experts in the field. A large number of workshops will also address technological topics like GaN, CMOS, SiGe as well as THz-technologies. Fundamental knowledge is provided in short courses on circuit design and high power amplifiers, MIMO and cognitive radar fundamentals. Workshops and short courses on practical measurements methodologies and filter design will also be presented. Each workshop and short course is individually endorsed by one or two of the conferences within the EuMW. However, they are available and accessible to any scientist or engineer wishing to gain a broader perspective on microwave and RF systems and devices, or to learn about a new specialism within our broad field.

The workshop and short courses program is distributed throughout the entire week. Workshops that focus on topics relevant to EuMIC mainly take place from Sunday to Tuesday. On Thursday and Friday we present most of the workshops endorsed by EuRAD. Throughout the whole week EuMC workshops take place.

Slides for the workshops and short courses will be provided electronically. Please note that upon registration to one WS/SC, you will receive not only the proceedings of that workshop, but of all workshops and short courses presented during the entire week. These will be available for download via a weblink provided after registration to one of the WS/SC. The material will be available for download from 2 to 31 January 2021.

We are very grateful to all the organizers, presenters and authors of the workshop and short course materials for their hard work. It is thanks to their outstanding spirit and dedication to this field and to this conference that the European Microwave Week 2020 has survived the pandemic.

I would like to thank the whole EuMW2020 team and my collaborator Sofia Kotti who supported me in the organization of the workshops and short courses for their hard work and dedication to this conference. Despite all difficulties of this pandemic year, it was a real pleasure and a source of fun to be able to work, organize and re-organize this conference with you all. Thanks for making the microwave field so lively and exciting.

Finally, I would like to encourage everyone working in this field to become part of our community and join us in organizing future European Microwave Conferences. There is so much to learn from this community, even beyond microwaves!

LAURA ANITORI
Workshop and Short Courses Chair
TNO, The Netherlands

SOFIA KOTTI
Workshop, Short Courses Co-Chair
TNO, The Netherlands

SUNDAY 08:30 – 17:50

S-03
EuMIC

Fundamentals of Microwave PA Design

Chair: Paolo Colantonio[1]
Co-Chair: Franco Giannini[1]
[1]University of Roma Tor Vergata

Room: Auditorium

Semiconductor Power Amplifiers are key components in radio frequency and microwave transmitter systems. They have received a great deal of attention and development effort over the last decades and are still a hot topic in research area. This short course aims to provide a comprehensive overview of all aspects of fundamental semiconductor microwave power amplifier design. It is an introductory course, aimed at graduate engineers who have moved into the field of RF design, as well as to microwave designers who aim to deeply understand the power amplifier basic concepts. This short course features a range of presentations and will provide a comprehensive overview and basic understanding on recent important progress and novel state-of-the-art achievements in semiconductor power amplifiers. Very recent advances in semiconductor amplifiers and their applications will also be covered.
Starting from the fundamental concepts on semiconductor devices, the core of a power amplifier design, the theoretical foundations of a power amplifier design are discussed. It will include fundamental concepts and state-of-the-art results on actual designs of a range of semiconductor power amplifiers using existing foundries. The load pull technique is also addressed and focused on the designer perspective.
The presentations will also cover a variety of advanced topics, and will provide the attendees with a clear overview of the main streams of current and important research trends worldwide in this field, as the Doherty architecture and the more recent load modulation power amplifier design concepts.
The short course will also focus on the major challenges, such as stability (small and large signal) and how to address these in amplifier design. Finally, accounting for the linearity issue, a basic overview on linearization techniques and their adoption to properly mitigate the amplifier distortion effects will conclude the short course.

PROGRAMME

Semiconductor Devices for PAs
Iltcho Angelov[1]
[1]Chalmers University of Technology

PA Theoretical Foundation
Franco Giannini[1]
[1]University of Roma Tor Vergata

Design and Model Oriented Load Pull Techniques
Marco Pirola[1]
[1]Politecnico di Torino

The Doherty Power Amplifier
Paolo Colantonio[1]
[1]University of Roma Tor Vergata

Load Modulated PAs
Steve Cripps[1]
[1]Cardiff University

X-Parameters High-Power PAs Modeling for System Level Analysis
Alessandro Cidronali[1]
[1]University of Florence

Linear and Nonlinear Stability Analysis of Power Amplifiers
Giorgio Leuzzi[1]
[1]University of L'Aquila

Linearization Techniques Overview
Pere L. Gilabert[1], Gabriel Montoro[1]
[1]Universitat Politècnica de Catalunya

Design of a C-band Single-Stage Hybrid 100W GaN PA
Francesco Scappaviva[1], Davide Resca[1]
[1]MEC srl

SUNDAY 08:30 – 17:50

W-03
EuMIC

High Performance GaN MMICs

Chair: Rüdiger Quay[1]
Co-Chair: Farid Medjdoub[2]
[1]Fraunhofer IAF, [2]University of Lille

Room: Mission 1

GaN technologies are ongoing drivers for system advancements. The workshop gives an overview of the progress of important Gallium Nitride MMIC technologies available to the microwave and RF community for frequencies from 400 MHz to 200 GHz. Important industrial major vendors of GaN MMICs do contribute. Eight international speakers will give their view to the evolution of important applications such as sensing, defence, data com, and 5 and 6G with emphasis on IC technology. Their roadmaps will be provided to enable the audience to estimate the progress of MMIC on a global scale. Further, the research progress with respect to higher frequency scaling beyond commercial technologies are addressed.
The first talk by Qorvo addresses various self-configuring and frequency reconfigurable GaN design techniques with applications to power amplifiers, switches, limiters and self-interference rejection.
The UMS presentation will present the recent development of GaN power technologies addressing X to Q bands. The link with applications like space and 5G applications will be emphasized through different demonstrators, some of them being complete System-In-Package.
The paper by Win will provide an overview of WIN Semiconductor's GaN platforms used in wireless Infrastructure and satellite communications. Device-level RF performance data will be presented along with select MMIC results from several customers.
The talk by Ommic will review how scaled down GaN /Si fully complements sub 40-nm CMOS to meet the stringent specifications and cost budget of mmW 5G base stations, handsets and backhaul links.
The presentation by Wolfspeed will discuss size, power density, and efficiency the demands, focus on key developments to enable MMICs for backhaul and satcom, and present examples of designs.
The talk by Fraunhofer will discuss several design approaches for enhancing the performance of GaN-based amplifier MMICs for applications above 100 GHz.
The presentation by Sumitomo introduces real GaN HEMT 5G basestation PAs in terms of performance, reliability, and cost competitiveness.
The final speaker will give a talk on the impact of GaN with a European defense perspective.

PROGRAMME

Self-Configuring, Adapting and Reconfigurable GaN MMICs
Charles Campbell[1]
[1]Qorvo

Recent Development of GaN Power Technology Applied to RF Sensors
Didier Floriot[1]
[1]United Monolithic Semiconductors

WIN GaN HEMT Platforms
David Danzilio[1]
[1]Win Semiconductors

State-Of-The-Art mmW GaN/Si MMICs
Marc Rocchi[1]
[1]Ommic

Design of High Performance Microwave and Millimeter Wave GaN HPAs
Jeremy Fisher[1]
[1]Wolfspeed

Design of GaN Power Amplifier MMICs Operating Beyond 100 GHz
Maciej Ćwikliński[1]
[1]Fraunhofer IAF

GaN HEMT Power Amplifier Technologies for 5G Basestations
Kazutaka Inoue[1]
[1]Sumitomo

Perspectives using GaN Devices in Defense Systems
Jean-Marc Tanguy[1]
[1]French MOD

SUNDAY 08:30 – 17:50

W-06
EuMIC

Sub-mmWave On-Wafer Measurements

Chair: Viktor Krozer[1]
Co-Chair: Ralf Doerner[1]
[1]Ferdinand-Braun-Institut (FBH)

Room: Spark

The workshop focuses on on-wafer device characterisation techniques, methodologies, and modelling for device operating well beyond 100 GHz. Many of these aspects have entered into focus due to the increased interest in electronic and photonic devices, circuits, and systems for communications and sensing applications. The presentations will present effects especially important at mm-wave and sub-mm-wave frequencies, potential pitfalls and how to overcome those when performing on-wafer measurements. The workshop will cover electronic and photonic approaches to on-wafer characterisation of active and passive devices, will enlighten broadband measurement capabilities, and will present not only small-signal characterisation, but also large-signal, noise, and power characterisation techniques. On-wafer antenna measurement systems and photonic approaches to on-wafer optoelectronic device characterisation will be discussed.

PROGRAMME

Uncertainties in On-Wafer Measurements at mm- and Sub-mm-Wave Frequencies
Uwe Arz[1]
[1]Physikalisch Technische Bundesanstalt (PTB)

A Practical Guide for Verifying On-Wafer Measurement System Integrity at sub-mm-Wave Frequencies
Ralf Doerner[1], Andrej Rumiantsev[2]
[1]Ferdinand-Braun-Institut (FBH), [2]MPI Corporation

Guidelines for the Design of Calibration Substrates, Including the Suppression of Parasitic Modes, Influence of Microwave Probes and Crosstalk Effects up to W-Band
Gia Ngoc Phung[1]
[1]Physikalisch Technische Bundesanstalt (PTB)

Broadband 220 GHz VNA Calibration and Measurement Techniques
Steve Reyes[1]
[1]Anritsu

Impact of Calibration Uncertainties on Device Modelling
Tom Keinicke Johansen[1]
[1]Technical University of Denmark

On-Wafer Noise Measurements Above 110 GHz
Mikko Kantanen[1]
[1]Millimeter Wave Laboratory of Finland – MilliLab

Micromachined Wafer Probes with Integrated Detectors for Power Measurements
Robert Weikle, II[1]
[1]University Virginia / Dominion Inc.

Sub-THz Load-Pull Techniques
Marco Spirito[1]
[1]Delft University of Technology

On-Wafer Antenna and Photomixer Measurements up to 750 GHz
Guillaume Ducournau[1]
[1]University of Lille

Non-Contact Probing for On-Chip Characterization of mm-Wave and THz Devices
Kubilay Sertel[1]
[1]The Ohio State University / TeraProbes

SUNDAY 08:30 – 17:50

W-11
EuMIC

Integrated Doherty PAs for Cellular and mmWave Applications

Chair: Rocco Giofrè[1]
Co-Chair: Joseph Staudinger[2]
[1]University of Roma Tor Vergata, [2]NXP Semiconductors

Room: Expedition

The ability of the Doherty architecture of operating at high efficiency at significant output power back-off has led the RF and microwave community to re-discover its concept and adapt it to the requirements of modern high frequency transmitters both for terrestrial and space applications. In the former case, upcoming 5th generation cellular (5G) represents a keen area of interest for both academia and industry. Required power levels are such that both Si- and III-V-based technologies can be viable semiconductor platforms to implement highly performing integrated DPAs. On the other hand, under the pressure of the evolving mobile cellular networks (e.g. 5G), satellite-based communications are asked to significantly improve their performance to remain competitive. Therefore, they are evolving towards high throughput satellites (HTS) adopting spectral efficient digital modulation schemes and multi-beam active antennas. In this context, the implementation of high efficiency and linearity DPAs in GaN technology has potential significantly change the landscape.
This workshop aims to report about recent progress on integrated Doherty PAs for both cellular (sub 6Ghz) and mm-wave applications, starting from the assessment of the scenarios, in both ground and space applications, to the system level evaluation, also describing advanced experimental characterization techniques at device/circuit level, and actual MMIC Doherty implementations on state-of-art GaN-based and Si-based semiconductor technologies.

PROGRAMME

Challenges and Opportunities of 5G mm-Wave Power Amplifiers from an Industrial Point of View
Maurizio Pagani[1], Renato Lombardi[1]
[1]Huawei Italy

GaN Enabling Technology for mm-Wave Applications
Rémy Leblanc[1]
[1]OMMIC Foundry

Advanced GaN Power Amplifier MMICs for Millimeter-Wave Applications
Keigo Nakatani[1], Shintaro Shinjo[1]
[1]Mitsubishi Electric Corporation

Is GaN Doherty PA Ready for Space Applications?
Vittorio Camarchia[1]
[1]Politecnico of Turin

Sub 6 GHz Power Amplifiers for 5G – An Ericsson Prospective
Vincenzo Carrubba[1]
[1]Ericsson

High Power RF GaN Doherty Design from Technology to Circuit
Cédric Cassan[1]
[1]NXP Semiconductors

GaN-on-SiC Integrated Power Amplifiers for 5G Multi-User Massive MIMO Applications
Jangheon Kim[1], Abdulrhman M.S. Ahmed[1]
[1]Wolfspeed

DPA Solutions for Sub 6 GHz 5G mMIMO (With Emphasis on Si Based Solutions)
John Gajadharsing[1], Jean-Jacques Bouny[1]
[1]Ampleon The Netherlands BV

SUNDAY 08:30 – 17:50

W-17
EuMIC/
EuMC

Advanced RF Technologies for 5G

Chair: Florinel Balteanu[1]
Co-Chair: Andrei Grebennikov[2]
[1]Skyworks Solutions, [2]Sumitomo Electric Group

Room: Mission 2

5G is supposed to transform our world, creating an ecosystem where everyone is connected to everything, all the time. Worldwide adoption of 3G/4G smartphones and the transition to 5G has been the main engine behind semiconductor industry with a very active research area. Mobile cellular subscribers are expected to reach more than 6 billion by 2020 and 5G LTE will bring high data capacity as low latency using sub-6GHz and mm-Wave spectrum. The workshop presents the current status of 5G RF technologies and techniques to deliver an over gigabit-per-second data rate and low latency. The high speed wireless ecosystem which includes 5G LTE and WiFi 6 (802.11ax) will be deployed in the near future and will use two frequency domains: sub 6GHz frequency domain and mm-Wave spectrum. Mm-Wave will be used initially to increase the capacity for backhaul 5G networks and allow low latency. From this prospective and the concurrently deployment for 5G LTE New Radio (NR) with the actual 4G LTE will increase the complexity for 5G RF Front End Modules (RF FEMs) and will be covered in this workshop.

PROGRAMME

5G New Radio Design Challenges
Laurent Noel[1], Dominique Brunel[1]
[1]Skyworks Solutions Inc.

Industrial RF SOI and BiCMOS Technologies Targeting 5G Wireless Market
Frederic Gianesello[1]
[1]ST Microlectronics

Design and Integration of Multiband High Efficiency Linear PA Modules for 5G
Alexandre Giry[1]
[1]LETI

5G Front Module for Mobile Applications
Florinel Balteanu[1]
[1]Skyworks Solutions

High Efficiency and Wideband GaN PA Techniques for Sub-6 GHz 5G Base-Station Applications
Shuichi Sakata[1], Shintaro Shinjo[1]
[1]Mitsubishi Electric Corporation

Do SOI Technologies Bring Added Value for New Connectivity Challenges?
Didier Belot[1]
[1]CEA-LETI

Advanced Modeling and Characterization Techniques for mm-Wave Antenna Arrays
Koen Buisman[1], Christian Fager[1]
[1]Chalmers University of Technology

The 5G NR Signals Impact on the RFPA Envelope Impedance and Bias Network Design
Sergio Pires[1], Jan-Willem van Velzen[1]
[1]Ampleon

Fully Tunable mm-Wave Solutions in Advanced BiCMOS Technology
Gaëtan Prigent[1]
[1]University of Toulouse

Technical Challenges and Trends for 4G/5G Acoustic Filters
Marie Bousquet[1]
[1]CEA LETI

SUNDAY 08:30 – 12:30

W-27
EuMC

Wireless Power Transmission Recent Research Advances

Chair: Nuno Borges Carvalho[1]
Co-Chair: Alessandra Costanzo[2]
[1]Universidade de Aveiro, [2]University of Bologna

Room: Flash

This workshop will be devoted to present the recent research advances in the area of Wireless Power Transmission, the work herein presented will be devoted mainly to radiative wireless power transmission and will address the new advancements in the area, spanning from European, Asian and American speakers.
It is expected to address the most recent results in these area and the approaches followed to increase significantly the end to end energy efficiency.
The presentations will address also some of the recent advances when combining wireless power with information, and discuss some of these ideas of Simultaneous Wireless Information and Power Transmission as an enabler of long-range radiative wireless power application.

PROGRAMME

Towards a Common Metrology Paradigm for Wireless Power
Paul Jaffe[1]
[1]U.S. Naval Research Laboratory

Novel Beam Forming Technology for High Efficiency and Safe Wireless Power Transfer
Naoki Shinohara[1]
[1]Kyoto University

Emerging Developments on Integrated SWIPT Receivers
Steven Claessens[1]
[1]KU Leuven

System and Circuit-Level Design for RF Energy on Demand in Industrial IoT
Alessandra Costanzo[1]
[1]University of Bologna

SWIPT – Combining Wireless Power with Backscatter Communications
Nuno Borges Carvalho[1]
[1]Universidade de Aveiro

SUNDAY 08:30 – 17:50

W-29
EuMC

Recent Advances in Additive Manufacturing of Microwave Components

Chair: Maurizio Bozzi[1]
Co-Chair: Cristiano Tomassoni[2]
[1]University of Pavia, [2]University of Perugia

Room: Quest

Additive Manufacturing (AM) is becoming a very popular technology in several fields. It originated as a solution for fast prototyping of objects mainly used in the mechanical engineering area. In the last years, this technology has found many additional applications, including the manufacturing of microwave/millimetre-wave components.
Several AM technologies are currently available. The material used for the manufacturing can be very different, ranging from plastic to metal and ceramics. Plastic and ceramic objects can be used directly as dielectric material or as a support to be subsequently metallized.
The application of AM to microwave/millimetre-wave components requires special attentions to some particular aspects. As an example, in the manufacturing of microwave filters, small manufacturing tolerances, minimum surface roughness, and low surface resistivity are of key importance.
This workshop offers an overview of the latest developments in the use of AM for the implementation of microwave components. The use of several AM technologies will be shown and compared. Different applications including sensors, filters, high power components, etc. will be considered. Solutions adopted to improve the component performance will be illustrated. Manufactured components and their applications will be presented.
A time slot will be devoted to questions and open discussion, involving all speakers and the attendees.

PROGRAMME

Additive Manufacturing of New Classes of Filters with Non-Conventional Geometries
Cristiano Tomassoni[1]
[1]University of Perugia

Microwave and Millimetre-Wave 3D Printed Waveguide Filters
Yi Wang[1]
[1]University of Birmingham

Additive Manufacturing Applied to Reconfigurable Microwave Filters
Nicolas Delhote[1]
[1]University of Limoges

Development of All Metal RF Components Via Selective Laser Melting
Oscar Antonio Peverini[1]
[1]CNR-IEIIT

Inkjet-/3D-/4D-Printed "Sero-Power" Wireless Ultrabroadband Modules for IoT, SmartAg and Smart Cities Applications
Manos M. Tentzeris[1]
[1]Georgia Institute of Technology

High Power 3D Printed Parts: From Multipactor to Thermal Aspects
Petronilo Martín-Iglesias[1]
[1]European Space Agency

Implementation of Microfluidic Sensors by Additive Manufacturing
Maurizio Bozzi[1]
[1]University of Pavia

Polymer-Based 3D Printing for Earth Observation Satellite Payload Front Ends
Stepan Lucyszyn[1]
[1]Imperial College London

SUNDAY 13:50 – 17:50

W-02
EuMIC/
EuMC

Advanced Measurement Techniques for Next Generation Communication Systems

Chair: Dominique Schreurs[1]
Co-Chair: Antonio Raffo[2]
[1]University of Leuven, [2]University of Ferrara

Room: Flash

The workshop focuses on recent advances in large-signal measurement techniques for microwave applications. In particular, starting from the main issues that hinder measurement accuracy under nonlinear high-frequency operation of devices, circuits, and systems, the speakers will present the state-of-the-art performance of ultra wideband instrumentation and will discuss actual measurement scenarios of interest for next generation communication systems.

The challenges related to ultra wideband measurements will be clearly discussed by particularly explaining how measurement techniques that represent an acceptable solution for large-signal characterization under CW excitation lose meaning when actual modulated signals are considered. Moreover, the importance of performing accurate measurements will be highlighted in connection of using large-signal microwave measurements for the extraction of behavioral models. These models, whose uncertainty almost coincides with measurement uncertainty, allow the designer to simplify the design flow and thereby reducing the time and cost related to multiple foundry runs.

This workshop will represent a unique and amazing opportunity for the attendees to discuss their doubts about state-of-the-art measurement and modelling techniques with some of the most important scientists in the field.

PROGRAMME

Traceability for Large-Signal Measurement Applications

Dylan Williams[1]
[1]National Institute of Standards and Technology

Characterizing Modulation Distortion of Active Devices in the Frequency Domain

Jan Verspecht[1]
[1]Keysight Technologies

Wideband Modulated Load-Pull for Design Validation and Verification

Mauro Marchetti[1]
[1]Anteverta-mw

Behavioural Model Generation for Advanced Microwave Transistors

Paul Tasker[1]
[1]Cardiff University

MONDAY 08:30 – 12:30

S-07
EuMIC/
EuMC

From Device Characterisation to Amplifier Design: Advanced Large Signal Measuring, Fast and Accurate Modelling, and Reliable Designing

Chair: Steve Dudkiewicz[1]
Co-Chair: Osman Ceylan[1]
[1]Maury Microwave

Room: Flash

The wireless telecommunications industry has responded to our insatiable demand for high-speed streaming with the development of 4G LTE and 5G communications systems. These systems use complex and high-order modulation schemes with high peak-to-average ratios (PAPR) in order to meet the needed high-speed cellular data rate within a given limited bandwidth. Therefore, highly optimized and engineered RF amplifiers are needed to achieve adequate linearity and high efficiency also at the deep back-off power levels.
Device characterization and modeling is the first and most important step for high-performance power amplifier design. Accurate modeling of a high-power RF solid-state device requires extended large signal analysis in a wide frequency range, including several harmonics and wide operation range, such as Class-C, B, and AB. Today's rapidly changing and competitive wireless telecommunication technology world also needs reduced time from development to market. Therefore, preparing a reliable and verified device model and designing a power amplifier should be done precisely in a short time.

In this short course, fundamentals of high-power RF device characterization techniques, basics of Load-Pull, calibration methods, high-speed nonlinear measurement methods with harmonics, Enhanced Poly Harmonic (EPHD) model extraction from measured data, and high power RF amplifier design with EPHD model will be introduced. High-power transistors for sub-6 GHz applications and mmW devices are considered in the sessions.

PROGRAMME

Fundamentals of Large Signal Characterization and High-Power Amplifier Design Considerations

Osman Ceylan[1]
[1]Maury Microwave

Wideband Active Load-Pull and Baseband Control

Mauro Marchetti[1]
[1]Anteverta-mw

mmW Device Characterization and Modeling

Alireza Shamsafar[1]
[1]Ampleon BV

Modeling of High-Power RF Transistors and Applications

Mitra Gilasgar[1]
[1]Ampleon BV

Behavioural Models and EPHD Modeling

Wissam Saabe[1]
[1]AMCAD Engineering (France)

MONDAY 08:30 – 17:50

W-07
EuMC

High-Power Microwave Industrial Applications

Chair: Zoya Popovic[1]
Co-Chair: Vadim Yakovlev[2]
[1]University of Colorado, [2]Worcester Polytechnic Institute

Room: Beam

This workshop addresses the increasing industrial applications of high-power microwaves. In 2009, the IEEE MTT-S IMS Workshop "Recent Advances in Microwave Power Applications and Techniques (RAMPaNT)" received significant interest among IMS attendees and won the "Best Quality Workshop" Award. The RAMPAnT Workshop was designed as an inauguration forum that introduced the MTT community to microwave energy applications in science and industry. For the past 10 years, topics related to this Workshop have gradually increased in scope. This Workshop proposed for the EuMW2020 will review the recent advancements in industrial and scientific applications of high-power microwave technology. The discussions will cover well-established systems and processes as well as new trends and emerging applications: beyond well-known microwave heating of food products, they include powder metallurgy (include sintering of particulate materials), microwave-assisted chemistry, microwave plasma generation, manufacturing of nanomaterials and composites (including microwave-assisted 3D printing), waste-to-fuel conversion, etc. Topics that support many of the applications, such as advanced multiphysics modeling and accurate characterization of material parameters, will also be discussed. The Workshop includes ongoing developments of solid-state technology and prospects of the use of solid-state generation in high-power applications for more flexibility and control.

PROGRAMME

High Power Industrial Microwave Applications and Market Trends
Jens Hofmann[1]
[1]MUEGGE GmbH

Review of Systems and Processes in Microwave Power Drying Applications
Peter-A. Püschner[1]
[1]Püschner GmbH

Microwave-Induced Plasma – From Academia to Industry
Kostyantin Achkasov[1]
[1]Consultant

Field-Assisted Manufacturing of Materials
Bala Vaidhyanathan[1]
[1]Loughborough University

Microwave Assisted Metallurgy Using Hybrid Systems
Paolo Veronesi[1]
[1]University of Modena and Reggio Emilia

Principles and Practice of High-Power In-Cavity SSPA Combining
Zoya Popovic[1]
[1]University of Colorado

The Challenge of Scaling-Up Microwave Assisted Technologies
Marilena Radoiu[1]
[1]Microwave Technologies Consulting

Development of Solid-State Technology and Its Impact on Microwave Power Engineering
Klaus Werner[1]
[1]pink RF

Advanced Multiphysics Simulation of Microwave Power Processes and Systems
Vadim Yakovlev[1]
[1]Worcester Polytechnic Institute

Measurement of Temperature-Dependent Complex Permittivity of Materials
José M. Catalá-Civera[1]
[1]Universidad Politècnica De València

In Situ Monitoring of High-Power Microwave Material Processing
Sébastien Vaucher[1]
[1]EMPA - Swiss Federal Laboratories for Material Science and Technology

MONDAY 08:30 – 12:30

W-08
EuMC

Antenna/Modules in Package for mmWave for 5G

Chair: Rajesh Mandamparambil[1]
Co-Chair: Rob Maaskant[2]
[1]NXP, [2]Chalmers University of Technology

Room: Spark

This combined Workshop/Short Course addresses the key challenges in terms of material, process and testing of IC packages. Advanced packaging level approaches will be discussed, allowing packaging of different semiconductor compounds (Si, GaN), as well as multi-die System-in-Package solutions. A complete chip-package co-design flow will be explored which allows improvement of RF performance and power efficiency. An overview of the latest material developments in the mmw/ RF domain will be presented. Challenges on mmW packaging especially on antennas integration will be discussed. Phased array antenna modules for 5G is an important driver and their pros and cons will be shared.

PROGRAMME

Analysis of 5G mmW Use Cases and Its Implications on Phased Array Antenna Module Realizations
Thomas Emanuelsson[1]
[1]Gapwaves AB

Needs and Challenges in Packaging for mm-Wave Antennas
Stefania Monni[1]
[1]TNO

Advanced pPackaging Approaches for 5G and mm-Wave Applications
Tanja Braun[1]
[1]Fraunhofer IZM

Innovative Packaging Material Developments for RF Applications
Ruud de Wit[1]
[1]Henkel

mmWave Reference Design Flow and Correlation with Measurements
Mart van Gijsel[1]
[1]Keysight Technologies

MONDAY 08:30 – 12:30

W-13
EuMC/
EuRAD

Advanced Applications of In-Band Full-Duplex Technology

Chair: Kenneth E. Kolodziej[1]
Co-Chair: Taneli Riihonen[2]
[1]MIT Lincoln Laboratory, [2]Tampere University

Room: Auditorium

Many wireless systems could benefit from the ability to transmit and receive on the same frequency at the same time, which is known as In-Band Full-Duplex (IBFD) and/or Simultaneous Transmit and Receive (STAR). This technology could lead to enhanced spectral efficiency for future wireless networks, such as fifth-generation New Radio (5G NR) and beyond, and/or could enable capabilities and applications that were previously considered impossible, such as IBFD with phased array systems. In this workshop, experts from academic and federal research institutions will discuss advanced applications of IBFD that move beyond basic communication systems. Presentations will contain details and measured results that encompass military, radar and multiple-input multiple-output (MIMO) applications.

PROGRAMME

Omni- and Directional Approaches to In-Band Full-Duplex Systems

Kenneth E. Kolodziej[1]
[1]MIT Lincoln Laboratory

Robust Transceiver Design for Full-Duplex Relay-Assisted MIMO Systems

Aydin Sezgin[1]
[1]Ruhr-University Bochum

Joint Radar and Communication Using In-Band Full-Duplex Technology

Sofie Pollin[1]
[1]KU Leuven

Simultaneous Transmit and Receive Radios Beyond Full-Duplex Communications

Taneli Riihonen[1]
[1]Tampere University

MONDAY 08:30 – 17:50

W-18
EuMC

Measurements at mmWave and Terahertz Frequencies of Three Measurement Quantities: S-Parameters, Power, and Complex Permittivity of Dielectric Materials

Chair: Xiaobang Shang[1]
Co-Chair: Nick Ridler[1]
[1]National Physical Laboratory (NPL)

Room: Glow

There is a rapid increase in exploitation of the millimetre-wave and submillimeter-wave spectrum, driven by demands from diverse applications including wireless backhaul links for 5G mobile networks, radar sensors for advanced or autonomous vehicles, space deployed radiometers for remote sensing of climate change, security imaging (e.g. terahertz body scanners), and medical diagnosis. Advancement in these applications has led to an increased demand for accurate and traceable electrical measurements for devices and integrated circuits operating at these high frequencies.

This workshop will review the latest developments that are taking place for the three electrical measurement quantities, namely S-parameters, power and complex permittivity of dielectric materials, at millimetre-wave and terahertz frequencies. Most of these activities are undertaken in a recent European Metrology Programme for Innovation and Research (EMPIR) project, 18SIB09 TEMMT, which involves 19 partners globally. The workshop consists of 14 proposed talks and will present the current state of the art of the measurements, specifically,
i Waveguide S-parameter measurements up to 1.5 THz
ii Planar S-parameter measurements up to 1.1 THz
iii Calibration technique for power measurements at D-band (110-170 GHz)
iv Material characterizations at millimetre-wave and terahertz frequencies using free-space method, TDS, open and closed resonators techniques.
Calibration and verification techniques of these measurements, together with measurement uncertainties, will also be covered in the workshop.

PROGRAMME

Considerations for Calibrating and Measuring Using Vector Network Analysers at Millimetre and Submillimetre Wavelengths

Nick Ridler[1]
[1]National Physical Laboratory (NPL)

Vector Network Analysis and Waveguide Interfaces to 1.5 THz

Jeffrey Hesler[1]
[1]Virginia Diodes Inc.

On-Wafer Traceable Mixed-Mode S-parameter Calibration

Djamel Allal[1]
[1]LNE

Nanorobotic On-Wafer Probe Station Under Scanning Electron Microscope

Kamel Haddadi[1]
[1]University of Lille

Numerical Modelling of On-Wafer Scattering Parameter Measurements

Thomas Flisgen[1]
[1]Ferdinand-Braun-Institut (FBH)

Development of Probing-System for Accurate On-Wafer Measurements up to 1.1 THz

Faisal Mubarak[1]
[1]VSL

Enabling Over Temperature S-Parameter Measurement Confidence to THz Frequencies

Anthony Lord[1], Gavin Fisher[1]
[1]FormFactor

Practical Steps to Improve On-Wafer S-Parameters High Frequency Measurements

Robin Schmidt[1]
[1]Keysight Technologies

Calibration of RF Power at 110-170 GHz

Gia Ngoc Phung[1]
[1]Physikalisch-Technische Bundesanstalt (PTB)

Measurement of Electrical Properties of Materials in the Frequency Range up to 110 GHz with the Help of Fabry-Perot Resonator

Marcin Wojciechowski[1], Jerzy Krupka[1]
[1]GUM (Central Office of Measures)

Uncertainties and Error Analysis of Material Parameter Extraction Methods

Alireza Kazemipour[1]
[1]METAS

Free-Space Broadband Measurements of THz Dielectric Properties and Material Data From the TEMMT Project

Mira Naftaly[1]
[1]National Physical Laboratory (NPL)

Material Characterization by Closed Resonator Method and In-Situ On-Wafer Measurement Method for 6G Application

Masahiro Horibe[1]
[1]National Metrology Institute of Japan (NMIJ) / National Institute of Advanced Industrial Science and Technology (AIST)

MONDAY 08:30 – 17:50

W-28
EuMC

Microwave Wearable Circuits and Systems for Biomedical Applications

Chair: Milica Popović[1]
Co-Chair: Alessandra Costanzo[2]
[1]McGill University Montreal, [2]University of Bologna

Room: Expedition

Microwave techniques are being increasingly exploited to realize next generation biomedical sensors able to be less invasive than traditional ones. Furthermore the exploitation of novel materials for their realizations, such as textiles and flexible substrates, enable their use in wearable solutions.
This workshop presents a significant number of research activities in this field from different countries and continents, spanning from materials characterization, by microwave techniques, to circuit-level realization up to the system level implementation, with in depth analysis of the signal processing challenges to enable real-time monitoring of the sensors. Some significant implementations are presented, such as systems for wearable breast cancer diagnosis, temperature measurements and liquids detection.

PROGRAMME

Challenges and Complexity of Dielectric Tissue Characterisation

Martin O'Halloran[1]
[1]National University of Ireland

Recent Progress in Microwave Breast Tissue Screening with Time-Domain Radar

Milica Popović[1], Lena Kranold[1]
[1]McGill University Montreal

Fast, 2D Microwave Tomographic Breast Imaging Utilizing a Discrete Dipole Approximation-Based Reconstruction Algorithm

Paul Meaney[1], Samar Hosseinzadegan[2], Andreas Fhager[2], Mikael Persson[2]
[1]Thayer School of Engineering at Dartmouth, [2]Chalmers University of Technology

Backscattering Communication for Biomedical Sensors Readout

Nuno Borges Carvalho[1]
[1]Universidade de Aveiro

Microwave Passive Sensing for Wearable Applications

Alessandra Costanzo[1], Francesca Benassi[1], Diego Masotti[1]
[1]University of Bologna

Muscle Rupture Detection with Microwave Techniques

Andreas Fhager[1]
[1]Chalmers University of Technology

Wearable Wireless Thermometers for Internal Body Temperature Measurements

Zoya Popovic[1], Robert Streeter[1]
[1]University of Colorado

MONDAY 13:50 – 17:50

S-05
EuMC/
EuRAD

Multibeam Antennas and Beamforming Networks

Chair: Piero Angeletti[1]
Co-Chair: Giovanni Toso[1]
[1]European Space Agency

Room: Auditorium

Multi-Beam Antennas (MBAs) find application in several fields including wireless and satellite communications, RADARs for electronic surveillance and remote sensing, science (e.g. radio telescopes), RF navigation systems, etc.
Beam-Forming Networks (BFNs) play an essential role in any antenna system relaying on a set of radiating elements to generate a beam.
Depending mainly on the antenna mission (i.e. operational frequency, pattern requirements, transmitting and/or receiving functionality, number of beams to be generated, etc.) different MBA architectures may be selected: from antenna systems completely based on independent feeds illuminating a number of reflectors, to hybrid systems based on both arrays and reflectors, from phased arrays to lens antennas.
The trade-off on the antenna solution largely involves the BFN interconnectivity and flexibility requirements, with a wide range of applicable BFN architectures with different complexity and performance.
The course presents design principles and state-of-the-art in Multi-Beam Antennas (MBAs) and Beam-Forming Networks (BFNs) covering both theoretical and practical aspects. The covered topics include:

Overview of Multibeam Antennas and system requirements.
- Satellite Communication Systems;
- Wireless Communications;
- RADARs.

Multibeam Array Antennas
- Linear and Planar Direct Radiating Arrays (based on Periodic or Aperiodic lattices)
- Reflector-based architectures (Single-Feed-per-Beam, Multiple-Feed-per-Beam)
- Lens-based architectures (free space and constrained)

Analog Beamforming Networks
- Corporate divider/combiners;
- Blass and Nolen matrices;
- Butler matrices.

Digital Beamforming Networks

Overview of some Operational Multibeam Antennas/BFNs
- MBAs for Spaceborne Narrowband and Broadband Satellite Communication Systems
- MBAs for Wireless Communications

On-going European Developments and Current Design and Technological Challenges

MONDAY 13:50 – 17:50

S-10
EuMC

Intuitive Microwave Filter Design with EM Simulation

Chair: Daniel Swanson[1]
[1]DGS Associates LLC

Room: Flash

Microwave filters are one of the basic building blocks in RF systems along with amplifiers, mixers and oscillators. At some point, you may be called on to design or specify a filter, even though you are not a filter design expert. Luckily, there is simple design method for narrow band filters that is easy to learn and quite universal. It can be applied to any lumped element or distributed topology and any manufacturing technology except SAW/BAW. And, the method is valid for bandwidths from a fraction of a percent up to 20 percent or more.
This short course is a "no math" approach to filter design that requires only simple algebra and no knowledge of complex filter synthesis techniques. The root of the design flow is based on Dishal's method, with the addition of EM simulation for accuracy and port tuning for updates to the filter geometry. The basic design method can also be expanded to include cross-coupled filters and multiplexers.
Two design flow examples have been prepared for this short course. The first is a high Q cavity combline bandpass filter and the second is a microstrip combline bandpass filter. The design flow can be realized using software from many different vendors. Example project files will be made available to attendees.

MONDAY 13:50 – 17:50

W-10
EuMIC/
EuMC

From Enabling GaN Technology to High-Performing Space-Borne SSPAs at mmWave

Chair: Rocco Giofrè[1]
Co-Chair: Paolo Colantonio[1]
[1]University of Roma Tor Vergata

Room: Spark

The development for next generation Very High Throughput Satellites (vHTS) systems, will make use of Ka/Q/V gateways, where the forward payload link will operate in K-band. This kind of spacecraft will offer high capacity, large number of users and communication volumes (1 Terabit/s per satellite), with lower cost per GBPS, increasing the flexibility being the the satellite capacity allocated only when-&-where it is needed. Traditionally, demand for high power levels at high frequencies has been satisfied by using TWTAs as amplifying device; this is because SSPA technology was unable to attain similar performance levels. However, technological advancements such as linearization, miniaturisation, and the use of different materials such as GaN, have levelled the playing field open the actual possibility to replace TWTA with SSPAs.
This workshop aims to report about recent progress on millimetre wave GaN-based SSPAs for space applications, starting from the assessment of the scenarios, in both ground and space segments, to the actual SSPA design, realization and tests, also describing state-of-art GaN semiconductor technologies.

PROGRAMME

Space Initiatives at European Level
Fabio Vitobello[1]
[1]REA

SSPAs for High-Throughput Satellites: Challenges and Solutions
Václav Valenta[1]
[1]European Space Agency

The Space Market Needs in Term of SSPAs and HPAs for 5G Application
François Bouscasse[1]
[1]Airbus Defence

MiGaNSOS: Millimetre Wave Gallium Nitride Space Evaluation and Application to Observation Satellites
Ernesto Limiti[1]
[1]University of Roma Tor Vergata

Design of High Efficiency Power Amplifier Based on GaN Technology for Ka-Band
Rocco Giofrè[1], Paolo Colantonio[1]
[1]University of Roma Tor Vergata

Ka-Band HPA MMICs for Cryosat-2 Follow-On Mission (CS2-FO)
Chiara Ramella[1], Corrado Florian[2]
[1]Politecnico of Turin, [2]University of Bologna

TUESDAY 08:30 – 17:50

W-05
EuMC

Digital Predistortion for 5G MIMO Wireless Transmitters

Chair: Anding Zhu[1]
Co-Chair: Pere L. Gilabert[2]
[1]University College Dublin, [2]Universitat Politècnica de Catalunya

Room: Juliana 2

In the existing cellular base stations, to guarantee linearity, digital predistortion (DPD) is widely used to compensate for the nonlinear distortion generated by RF power amplifiers (PAs). In 5G, particularly in wideband millimetre wave transmitters, the conventional DPD is no longer workable. With increasing demands for higher data rates, the signal bandwidth will continue to increase. At millimetre wave bands, the modulation signal bandwidths can reach hundreds of MHz or even multi-GHz and the peak to average power ratio of the signal may well exceed 10 dB. This requires not only very high sampling rates for digital signal processing but also sophisticated DPD models to compensate the nonlinearity, that leads to high power consumption and high cost. In the meantime, to increase power efficiency and meet demands for high capacity, dense networks of base stations will be deployed and transmitters with multiple antennas (e.g., with massive MIMO architectures) and multiple power amplifiers will be used. In these transmitters, the output power of each PA will be significantly reduced compared to that in the existing high-power base stations, which leaves limited headroom for digital predistortion in terms of power and cost budget. New digital compensation solutions for linear and nonlinear distortion compensation of ultra-wideband or multi-band 5G systems will be required. In addition, due to multiple antennas and PAs are used in MIMO transceivers, characterization and compensation of coupling effects between the antenna array and the PAs must be addressed.
In this workshop, we will discuss the requirement of 5G wireless transmitters and related modelling and system design challenges that we are facing. Particular emphasis will be given to MIMO system architectures, digital compensation model selection, feedback loop data acquisition, model extraction algorithms and various system architecture, and model order reduction techniques. System characterisation, theoretical analysis, experimental test and hardware/software system implementation issues will also be discussed.

PROGRAMME

DPD Requirement and Development for 5G: Industrial Perspective
John Wood[1]
[1]Wolfspeed

Beam-Oriented Digital Predistortion for Massive MIMO Transmitter
Wenhua Chen[1]
[1]Tsinghua University

Digital Predistortion for 5G Beam-Forming Architectures
Chao Yu[1]
[1]Southeast University

Digital Predistortion for 5G MIMO Transmitters: OTA-Based Data Acquisition
Anding Zhu[1]
[1]University College Dublin

Linearizing Strongly Nonlinear Systems: DPD Methods and Application to mmWave Active Arrays
Mikko Valkama[1]
[1]Tampere University

A Circuit Model to Behavioural Model Volterra-Based Approach: Parameters Estimation and Linearization Procedures for DPD Design
Carlos Crespo-Cadenas[1], Juan A. Becerra[1]
[1]Universidad de Sevilla

Model Order Reduction Techniques for Digital Predistortion Linearization of NR-5G Amplification Architectures
Pere L. Gilabert[1]
[1]Universitat Politècnica de Catalunya

Power Consumption Reduction Techniques for Digital Predistortion of Broadband RF Power Amplifiers
Yue Li[1]
[1]University College Dublin

Distortion-Aware Precoding for Massive MIMO Downlink
Sina Rezaei Aghdam[1]
[1]Chalmers University of Technology

TUESDAY 13:50 – 17:50

W-25
EuMC/
EuRAD

Advanced mmWave Radar System Solutions for Industrial and Consumer Sensing Applications

Chair: Vadim Issakov[1]
Co-Chair: Amelie Hagelauer[2]
[1]Otto-von-Guericke University Magdeburg, [2]University Bayreuth

Room: Beam

The amount of new applications based on millimeter-wave radar sensors is continuously growing. Driven by the demand for cost reduction, module size reduction, lower power consumption and complexity of usage for the end user, several trends can be observed recently. First, the operating frequencies keep on increasing, enabling integration of antenna arrays in package and on-chip. Secondly, the increasing level of integration enables advanced functionality. Finally, with the emerging applications operated from a battery, ultra-low-power operation is required.
In this workshop, we discuss these recent trends and give examples of radar systems at mm-wave frequencies providing system-level solutions. The first talk presents solution for wearable FMCW sensors at 60GHz with extreme hardness for thru-the-fire scenarios. Next, by means of advanced state machine, an ultra-low-power radar solution at 24GHz is shown for presence detection. Further, cost-reduction and system level optimization techniques towards software-defined radar are presented. Next, highly-integrated 3D sensing solution at 60GHz is discussed for collaborative robotics applications. Afterwards, challenges and solutions for realization of systems on chip and in package for FMCW radar above 300GHz and superstrate antennas are discussed. Finally, we present fully-integrated solutions for consumer and industrial sensing applications at 60GHz with antenna in package and 122GHz with antenna on chip.
In this workshop we have a good mixture of industry (Infineon, Staal Technologies, Inxpect, InnoSent, Uhnder) and academia (FAU Erlangen, TU Hamburg, Uni Magdeburg). As well, we have contributions from three different countries (The Netherlands, Germany and Italy) by industry experts and recognized speakers in the field of radar circuits and systems.

PROGRAMME

Design Considerations on Wearable Through-The-Fire Radar

Natalia Alexandrovna Antonyuk[1]
[1]Staal Technologies B.V.

Ultra-Low Power Radar Based Presence Detection

Fabian Lurz[1], Alexander Koelpin[2]
[1]Friedrich Alexander University of Erlangen-Nürnberg, [2]Technical University Hamburg (TUHH)

A System Perspective on State-Of-The-Art mm-Wave Radar Sensors

Markus Gardill[1]
[1]University of Würzburg

mm-Wave Radar-Based 3D Sensing for Collaborative Robotics

Aleksey Dyskin[1]
[1]Inxpect

Highly-Integrated Radar Transceiver at 320 GHz for Near-Field Sensing

Marco Dietz[1], Robert Weigel[1]
[1]Friedrich Alexander University of Erlangen-Nürnberg

Fully-Integrated System-In-Package Solutions for Industrial and Consumer Applications

Vadim Issakov[1], Mohamed Hamouda[2], Ismail Nasr[2]
[1]Otto-von-Guericke University Magdeburg, [2]Infineon Technologies

WEDNESDAY 08:30 – 17:50

S-04
EuMIC/
EuMC

Quantum Computing for Electrical Engineers

Chair: Fabio Sebastiano[1]
[1]Delft University of Technology/QuTech

Room: Fluor

Quantum computing promises to solve problems that are intractable even by the most powerful supercomputers. Progress in quantum computing has recently gained great attention from the media, as it is gaining momentum thanks to the involvement of both key industries and an ever-growing academic research community.
This short course aims at providing electrical engineers with the background knowledge to understand what a quantum computer is and how it works. Furthermore, it will show the current and future trends in quantum computing. At the same time, the fundamental role of electrical engineers in building such wonderful machines will be addressed, by stressing the need for electrical and microwave engineering to build a large-scale quantum computer.
The course consists of 7 talks from experts in the field, organized in three main themes: quantum-computing fundamentals, physical platforms for quantum processors, and electronic interfaces for quantum computers. The first two talks will introduce the basic notions of quantum computing and present relevant quantum algorithms. Next, we will dive into the most promising solid-state physical implementations of quantum processors, i.e. those based on the spin of electrons trapped in quantum dots (third talk) and those based on superconducting circuits (fourth talk). Finally, the requirements and the challenges for the implementation of the electronic interface for quantum processors will be discussed, both in terms of microwave engineering (fifth talk) and in terms of cryogenic integrated-circuit solutions (sixth and seventh talk).

PROGRAMME

What is Quantum Computing All About?

Carmen G. Almudever[1]
[1]Delft University of Technology/QuTech

Quantum Algorithms

Ronald de Wolf[1]
[1]QuSoft, CWI

Two Decades of Quantum Computation with Quantum Dots

Menno Veldhorst[1]
[1]QuTech

The Superconducting Transmon Qubit as a Nonlinear Microwave Resonator

Daniel Sank[1]
[1]Google

Microwave Engineering for Preparation, Control, and Readout of Quantum Processors

Marc Almendros[1]
[1]Keysight Technologies

Towards Scalable Control of Superconducting Quantum Processors

Joseph Bardin[1]
[1]University of Massachusetts Amherst/Google

A Scalable Integrated Microwave Signal Generator for Qubit Control: From Specifications to Cryo-CMOS Implementation and Qubit Testing

Masoud Babaie[1]
[1]Delft University of Technology

WEDNESDAY 08:30 – 12:30

S-08
EuMIC/
EuMC

High Power Amplification for Space Applications

Chair: Iain Davies[1]
Co-Chair: Natanael Ayllon[1]
[1]European Space Agency

Room: Spark

A one day short course introducing the important topic of High Power Amplification in space-borne environments. The aim of the workshop is to provide a general overview of solid-state power amplifiers (SSPAs) and travelling wave tube amplifiers (TWTAs), their architecture, component technologies, and use in space applications in the fields of Telecommunications, Navigation and Earth Observation. The course will outline the main drivers in designing SSPAs and TWTAs in terms of performance, and the provisions made to ensure the high level of reliability required in space. The space environment will be discussed, in relation to its influence on electronic components. The need for research and development at both architectural and technological levels will also be discussed, in order to deliver increased efficiency and output power whilst at the same time reducing volume, mass and cost for satellite applications. A view on market perspective and future trends will be given by a notable industry expert.

PROGRAMME

General Introduction to HPAs for Space Applications
Natanael Ayllon[1]
[1]European Space Agency

TWTA Architecture, Building Blocks & Technologies
Roberto Dionisio[1]
[1]European Space Agency

SSPA Architecture, Building Blocks & Technologies
Iain Davies[1]
[1]European Space Agency

Space Environment and Its Influence in Electronics
Cesar Boatella Polo[1]
[1]European Space Agency

Reliability Aspects of Space-Borne Amplifiers
Jouni Lätti[1]
[1]European Space Agency

Future Trends and Market Perspective
Jean-François Villemazet[1]
[1]Thales Alenia Space

WEDNESDAY 08:30 – 17:50

W-12
EuMIC/
EuMC

High-Efficiency Linear Power Amplifiers for High Bandwidth, High PAR Signals

Chair: Olof Bengtsson[1]
Co-Chair: Zoya Popovic[2]
[1]Ferdinand-Braun-Institut (FBH), [2]University of Colorado

Room: Juliana 2

Achieving power amplifiers (PAs) with high efficiency and good linearity is challenging if the amplified signals have wide instantaneous bandwidths (>100MHz) and high peak-to-average power ratios (PAPR > 10dB). Examples of such signals include multi-carrier concurrent signals, both closely and widely spaced, and band-limited noise-like signals, typical of 5G and other multi-carrier aggregated signal applications. This workshop focuses on current trends in achieving high efficiency when amplifying such signals at microwave and millimeter-wave carrier frequencies. The topics that are covered include PA architectures and design, such as Doherty, balanced and supply-modulated PAs, both analog and digital linearization techniques and how such amplifiers perform and are analyzed in systems such as massive MIMO. The workshop speakers are well established researchers in industry and academia, and come from Sweden, Germany, Spain, Portugal, China and the USA.

PROGRAMME

A Bandwidth Extension Technique for Power Amplifiers Employing Large PAPR Signals
Paul Saad[1]
[1]Ericsson

Doherty PA Solutions for Wideband Signals and Considerations for Improved DPD Linearizability
Joseph Staudinger[1]
[1]NXP Semiconductors

Energy-Efficient GaN PA MMIC for Massive MIMO
Wenhua Chen[1]
[1]Tsinghua University

Linearization of Wideband Transmitters for Multi-Band igh PAPR Signal Transmission
Siqi Wang[1], Wenhui Cao[1]
[1]Chalmers University of Technology

Simultaneous Linearity and Efficiency Improvements Using Broadband Supply Modulation
Maxwell Duffy[1], Gregor Lasser[2]
[1]Northrop Grumman, [2]University of Colorado

Efficiency Degradation in Concurrent-Band Power Amplifiers
José Carlos Pedro[1]
[1]Universidade de Aveiro

Multi-Band Doherty and Broadband Load-Modulated Balanced PAs for 5G
Anding Zhu[1]
[1]University College Dublin

Analog Linearization of High-Efficiency PAs for Broadband Signals
Taylor Barton[1], Zoya Popovic[1]
[1]University of Colorado

Discrete Level Supply Modulation with Large Dynamic Wideband Signals
Olof Bengtsson[1]
[1]Ferdinand-Braun-Institut (FBH)

WEDNESDAY 13:50 – 17:50

W-14
EuRAD

Automotive Radar Networks and Sensor Fusion

Chair: Christian Waldschmidt[1]
Co-Chair: Martin Vossiek[2]
[1]University of Ulm, [2]Friedrich Alexander University of Erlangen-Nürnberg

Room: Progress

Today's vehicles are typically equipped with a number of radars sensor and other sensors for driver assistance and more sophisticated functions. These sensors may be used to set up a network of radars in large variety of different approaches. Those sensors can be netted coherently or incoherently and on very different levels of the signal processing chain. All approaches lead to networks with very different properties. On higher signal processing layers, the radar data is fused with other sensors like video or lidar. The workshop will present fundamentals, concepts and practical examples of such networks and functions building on them.
The first two presentations discuss the fundamentals of radar networks at 77 GHz, whereas the later talks focus on applications and functions.

PROGRAMME

Concepts for Automotive Radar Networks
Benedikt Meinecke[1], Christian Waldschmidt[1]
[1]University of Ulm

Many Eyes See Better Than Just a Few - Novel Solutions, Challenges and Potential of Automotive Radar Networks
Marcel Hoffmann[1], Martin Vossiek[1], Mark Christmann[2], Peter Gulden[2]
[1]Friedrich Alexander University of Erlangen-Nürnberg, [2]Analog Devices/ Symeo GmbH

Loosely Coupled Automotive Radar Sensor Network
Tobias Schmid[1], Felix Müller[1], Martin Fink[1], Robert Korn[1], Jürgen Hasch[1]
[1]Robert Bosch GmbH

Vulnerable Road User Detection by Camera-Radar Fusion
Dariu Gavrila[1]
[1]Delft University of Technology

Pre-Processing and Neural Network Co-Design for Automotive Radar Perception
Jürgen Dickmann[1]
[1]Daimler AG

Platooning Application Using Connected Automation and Sensor Fusion
Clara Otero Perez[1], Gerardo Daalderop[1]
[1]NXP Semiconductors

THURSDAY 08:30 – 12:30

W-23
EuRAD

High Resolution Radar for Automotive

Chair: Feike Jansen[1]
Co-Chair: Christian Waldschmidt[2]
[1]NXP Semiconductors, [2]University of Ulm

Room: Progress

Automotive radars are a popular sensor technology to implement Advanced Driver Assistance Systems (ADAS) such as blind spot detection and automatic emergency braking (AEB) due to their robustness and adverse weather tolerance. At the same time, these radars fall short with respect to cameras and lidars in the field of direction of arrival resolution. Hence, the application of radar for heterogeneous sensor fusion and the application of artificial intelligence as found in highly automated driving applications is challenging.
In this workshop several ways to realize high resolution automotive radars based upon different approaches using either synthetic or real aperture concepts as well as various aspects of these radars regarding weather dependence, radar to radar interference mitigation and artificial intelligence will be presented.

PROGRAMME

Realizing High Resolution Radars
Feike Jansen[1], Francesco Laghezza[1]
[1]NXP Semiconductors

Effects and Compensation of Phase Errors in Automotive SAR
Reinhard Feger[1], Masoud Farhadi[1]
[1]Johannes Kepler University Linz

High-Resolution Imaging for Automotive Radars
Jianping Wang[1]
[1]Delft University of Technology

Artificial Intelligence in High-Resolution Radars – Challenges and Necessity
Martin Kunert[1]
[1]Robert Bosch GmbH

Let's get Real about Imaging Radar
Arunesh Roy[1]
[1]Uhnder

Classification of Threats and the Benefits of High Resolution
Noam Arkind[1]
[1]Arbe

THURSDAY 08:30 – 17:50

W-31
EuMC

5G and Beyond: Enabling RF Architectures and Technologies for Emerging Wireless Systems

Chair: Roberto Gómez-García[1]
Co-Chair: Xun Luo[2], Nuno Borges Carvalho[3]
[1]University of Alcalá, [2]University of Electronic Science and Technology of China, [3]Instituto de Telecomunicacões, Universidade de Aveiro

Room: Juliana Congress Room 1

Future wireless systems will require a paradigm shift in how their supporting transceiver modules will be configured to provide all the flexible functionalities required by them. Also, it is expected that upcoming 5G wireless networks, known as more than an extension to 4G, can be hybridized with other wireless applications, such as IoT, in co-integrated wireless-communications/sensing platforms. As a result, fully-renewed RF modules enabled by more-advanced RF subsystems and technologies will be required. In this workshop, novel solutions for the key RF constituent blocks of wireless-transceiver architectures in the context of 5G and beyond, complete modules, enabling technologies, and multi-functional platforms hybridizing 5G-communications/IoT-sensing applications are presented. In the first two talks, modern configurations of power amplifiers in the context of 5G and emerging wireless-communications systems will be covered. Research themes in this area include novel digital power amplifiers for polar and quadrature transmitter modules, advanced linearization techniques, and innovative Doherty IQ power amplifiers and their demonstration in complete phase-array-enabled transmitters with gain compensation in the millimeter-wave range. In the third presentation, main technological challenges involved in the realization of 5G wireless systems at the millimeter-wave range are addressed from a system-level viewpoint. Here, a 28 GHz front-end-module in SOI CMOS is characterized and evaluated for different modulations (e.g., 256 QAM and OFDM), as required by flexible wireless-communications modules. All-digital transceiver architectures based on FPGA implemenatitons and system solutions for all-digital radio-over-fiber testbeds in the context of 5G-and-beyond applications are expounded in the fourth and fifth talks. The topic of 5G-system characterization is further addressed in the sixth talk, where behavioral models of active antenna arrays consisting on active nonlinear elements in the context of 5G mMIMO systems are proposed, and the associated practical-laboratory tests for multi-sine excitations are conducted. In the last two talks, enabling technologies and novel architectures of 5G/IoT multi-functional platforms are presented. First, inkjet-/3D-printed antennas, interconnects, "smart" encapsulation and packages, RF electronics, microfluidics and sensors fabricated on glass, PET, paper and other flexible substrates are introduced as a system-level solution for advanced millimeter-wave modules for 5G+ communication, energy harvesting and sensing applications. Finally, as a recent research field, the potential of batteryless sensing based on wireless power transfer (WPT) and backscattering by recycling present RF power for 5G/IoT applications is discussed. Experimental proof-of-concept designs featuring advanced performance over the state-of-the-art solutions are shown for demonstration purposes.

PROGRAMME

Energy-Efficient PAs for 5G and Beyond

Wenhua Chen[1], Guansheng Lv[1], Xin Liu[1], Dehan Wang[1], Fadhel Ghannouchi[2]
[1]Tsinghua University, [2]University of Calgary

Wideband Microwave/mm-Wave Transmitter for 5G and Beyond

Xun Luo[1]
[1]University of Electronic Science and Technology of China

Design Challenges of mm-Wave Front-Ends for 5G and Beyond

Vadim Issakov[1]
[1]Otto-von-Guericke University Magdeburg

All-Digital Transceivers for 5G and Beyond Communications Systems

Arnaldo Oliveira[1]
[1]Universidade de Aveiro

Investigation of Beyond-5G Wireless Communication Systems Using an All-Digital Radio-Over-Fiber Testbed

Christian Fager[1]
[1]Chalmers University of Technology

Advanced Techniques for 5G System Characterization

Nuno Borges Carvalho[1]
[1]Universidade de Aveiro

Inkjet-/3D-/4D-Printed Wireless Ultra-Broadband Modules for 5G+, IoT, SmartAg and Smart Cities Applications

Manos M. Tentzeris[1]
[1]Georgia Institute of Technology

Batteryless Sensing for 5G/IoT Applications Based on WPT and Backscattering

Ke Wu[1]
[1]Ecole Polytechnique Montréal

THURSDAY 13:50 – 17:50

W-15
EuRAD

Recent Advances in Micro-Doppler Radar and its Applications

Chair: Lorenzo Cifola[1]
Co-Chair: Francesco Fioranelli[2]
[1]Thales NL, [2]Delft University of Technology

Room: Spark

The combination of machine learning techniques and radar-based sensing opens new research opportunities for a vast range of applications in the domain of automatic target recognition. Specifically, the intelligent use of radar micro-Doppler signatures has become an exciting area of research in fields such as automotive, human gestures and activities, unmanned aerial vehicles (drones), amongst others.
Based on the information provided by micro-Doppler signatures, several processing techniques have been developed, either based on available target models or on the definition and extraction of handcrafted features. However, these "model-driven" approaches have been very recently challenged by the explosion of methods based on artificial intelligence and deep learning, often inspired from work by the image and audio processing community.
Interesting research questions arise from the application of "data-driven" approaches to the problems of radar-based target classification. What is the best domain/format of radar data for classification in a given application? What is the best neural network architecture to work with radar data which are neither images nor speech or audio? How to get enough radar data to train deep neural networks and how to make their decision process fully explainable? And the list of outstanding research questions could continue.
To address some of these questions it is desirable to have an overview of the state of the art of available techniques and related results. This workshop will discuss recent outcomes from the research activities of the speakers in a wide and diverse range of applications, such as analysis and classification of human movements, gait, and activities indoor and outdoor; characterization of the signatures of small drones; exploitation of micro-Doppler information generated by multistatic/distributed radar sensing; generation of reliable synthetic data from a small set of experimental radar data.

PROGRAMME

Radar, Micro-Doppler, Models, Data: What is Driving Classification?

Lorenzo Cifola[1], Francesco Fioranelli[2]
[1]Thales NL, [2]Delft University of Technology

Analysis and Classification of Drones Based on Radar Micro-Doppler

Jacco de Wit[1]
[1]TNO

Multistatic C-UAV Micro-Doppler Analysis

Matthew Ritchie[1]
[1]UCL

The Challenge of Training Deep Neural Networks for RF Applications with Low Sample Support

Sevgi Zubeyde Gurbuz[1]
[1]The University of Alabama

FRIDAY 08:30 – 12:30

S-02
EuRAD

Cognitive Radar Signal Processing

Chair: Joseph R. Guerci[1]
Co-Chair: Augusto Aubry[2]
[1]Information Systems Laboratories San Diego, [2]University of Naples "Federico II"

Room: Expedition

Cognitive radar refers to an emerging signal processing paradigm which is envisioned as the core of the next generation of active surveillance systems. The key idea behind cognition is to take as much as possible inspiration from the human brain, as well as from the behaviour of other echolocating mammals, that continuously learn and react to stimulations from the surrounding environment according to four basic processes: perception-action-cycle, memory, attention, and intelligence. This short course is organized as follows.
In the first part, the cognitive radar architecture is introduced providing basic concepts and definitions as well as explaining the analogies with the biological counterpart. Hence, some notional examples revealing the potentiality of this paradigm to boost conventional radar systems are illustrated.
In the second part, advanced radar waveform design algorithms are presented. In particular, the focus will be on: A-techniques capable to mitigate undesired effects produced by signal-dependent interference in radar system; B-strategies that enable spectral compatibility with surrounding licensed emitters. In both cases, the key performance metric is detection probability and the environment awareness provided by the cognitive architecture plays a pivotal role.
In the third part, results on bio-inspired radar signal processing techniques are illustrated, focusing on advanced joint waveform and guidance control design techniques for target rendezvous.
Finally, recent results delivering space-frequency awareness to the surveillance system (as required by the perception-action-cycle) and based on 2-D spectrum sensing techniques are shown. Practical examples with Software-Defined-Radio (SDR) equipment are illustrated to complement the theoretical aspects of the tutorial.

PROGRAMME

Cognitive Radar Architecture

Joseph R. Guerci[1]
[1]Information Systems Laboratories San Diego

Advanced Radar Waveform Design Techniques

Augusto Aubry[1]
[1]University of Naples "Federico II"

Bio-Inspired Radar Systems

Alessio Balleri[1]
[1]Cranfield University

Spectrum Sensing Algorithms

Vincenzo Carotenuto[1]
[1]University of Naples "Federico II"

FRIDAY 08:30 – 12:30

W-21
EuMC

Recent Advances in Topologies, Technologies and Practical Realizations of Microwave Biosensors

Chair: Benjamin Potelon[1]
Co-Chair: Enrique Bronchalo[2]
[1]Université de Bretagne Occidentale, [2]Universidad Miguel Hernández de Elche

Room: Flash

The fast-growing emergence of IoT, together with the increased ability for systems to process high volumes of data (AI, Machine Learning, Big data...) has opened the way and enhanced the needs for a new generation of sensors. Indeed, the constant seek for continuous, live data has appealed a new paradigm where coping with a high volume of data is no longer a problem as long as those data are reliable. In this context, microwave sensors can usually exhibit interesting features such as non-invasiveness, continuous measuring, and of course the ability to track structural, chemical, mechanical or physical properties specifically linked to RF waves. This workshop proposes to focus on the recent advances on the design of microwave sensors from the topological, technological and practical realizations aspects, together with the benefits for various applications, including biomedical and industrial fields.

PROGRAMME

RF/Microwave Non-Invasive Blood Glucose Sensing: An Overview of the Limitations, Challenges & State-Of-The-Art

Volkan Turgul[1]
[1]University of Westminster

Strategies to Enhance the Sensitivity in Planar Microwave Sensors and Application to Biosensing

Ferran Martín[1], Paris Vélez[1], Jonathan Muñoz-Enano[1], Jan Coromina[1], Marta Gil[2]
[1]Universitat Autònoma de Barcelona, [2]Universidad Politécnica de Madrid

MEMS Based Sensors and Devices

Said Al-Sarawi[1]
[1]The University of Adelaide

Radio Frequency Sensors & Lab-On-Chip Technologies: New Opportunities for Biomedical Diagnosis

Arnaud Pothier[1]
[1]XLIM – Limoges University

Single and Coupled Microwave Resonators as Glucose Concentration Sensors

Carlos Gabriel Juan[1], Benjamin Potelon[2], Cédric Quendo[2], Enrique Bronchalo[1], José M. Sabater-Navarro[1]
[1]Universidad Miguel Hernández de Elche, [2]Université de Bretagne Occidentale

FRIDAY 08:30 – 12:30

W-30
EuMC

Recent Advances on Microwave Filters

Chair: Giuseppe Macchiarella[1]
Co-Chair: Cristiano Tomassoni[2]
[1]Politecnico di Milano, [2]University of Perugia

Room: Glow

Over the past decade, there has been a spectacular increase in demand for cellular communication and satellite-based services. This has been the singular reason in pushing the state-of-the-art of wireless systems to achieve even higher communication capacity within the constraints of the available frequency spectrum. Therefore, frequency allocations are regarded as a natural resource. Filters and multiplexing networks play a critical role in maximizing the effective use of the available bandwidth to achieve the highest capacity for a diverse range of traffic scenarios, and are deemed as critical elements of these communication systems.
This half-day workshop aims to provide the attendees with an overview of current trends in the development of high performances filters conceived for satellite and wireless (5G) applications.
The speakers will outline the application potentials, the design challenges and the proposed solutions, covering all the steps from the synthesis up to the technological implementation. This will allow the audience to explore in deep the opportunities offered by the presented solutions.

PROGRAMME

Advanced Design of Waveguide Filters with Transmission Zeros

Giuseppe Macchiarella[1]
[1]Politecnico di Milano

Miniaturization of High-Performance Filters

Cristiano Tomassoni[1]
[1]University of Perugia

Novel Topologies of Waveguide Filters for High Power Space Applications

Vicente Boria[1]
[1]Universitat Politecnica de Valencia

Modern Tunable Filtering Components with Multi-Functional and Multi-Configurable Capabilities

Roberto Gómez-García[1], Dimitra Psychogiou[2]
[1]University of Alcalá, [2]University of Colorado

FRIDAY 08:30 – 15:30

W-32
EuMIC/
EuMC

Practical Aspects of Running a Microwave Laboratory and How to Make Good Measurements Every Time

Chair: Frank E. van Vliet[1]
Co-Chair: Diogo Ribeiro[1]
[1]TNO

Room: BOR 2

This workshop addresses best practices when running a successful microwave laboratory: from regulatory compliance to the more practical side of performing accurate measurements.
The workshop will cover the accreditation experience from both the perspective of the laboratory manager and the accreditation official. The importance of understanding regulatory procedures and accurate record keeping will be covered as well.
Procedures that ensure that every microwave measurement is accurate are also key to the success of any microwave laboratory and will be an important focus of the workshop. The workshop presenters will outline the practical steps required to perform accurate and repeatable microwave measurements. For example, often the best way of avoiding time-consuming problems in microwave measurement setups is to employ good maintenance and usage practices to extend the life of connectors, cables and other microwave components. Even the simplest of procedures can eliminate many microwave-measurement pitfalls and help smooth the operation of your microwave laboratory.
This workshop will not only be based on the typical set of presentations, it will go beyond the theory, beyond the traditional examples in slides, and provide a practical and interactive component. "Hands-on" demonstrations will be offered to the extent possible.
Finally, the workshop will touch on changes in the analysis of uncertainties that will be required to support the future needs of the microwave industry as it evolves and touch on some new software tools designed to support these changes.

PROGRAMME

Practical Aspects of Running a Microwave Laboratory

Dylan Williams[1], Bart Schrijver[2]
[1]National Institute of Standards and Technology, [2]Keysight Technologies

VNAs, Scattering-Parameters and Calibrations

Jamie Lunn[1]
[1]Rohde & Schwarz

Power and Electrical-Phase Calibrations

Bart Schrijver[1]
[1]Keysight Technologies

Spectrum Analyzers and VSAs

Jon Martens[1]
[1]Anritsu

METAS VNA Tools

Michael Wollensack[1]
[1]Federal Institute of Metrology METAS

Microwave Uncertainty Framework

Dylan Williams[1]
[1]National Institute of Standards and Technology

FRIDAY 13:50 – 17:50

S-01
EuRAD

Introduction to MIMO Radar

Chair: Frank Robey[1]
Co-Chair: Vito Mecca[1], Daniel Rabideau[1]
[1]MIT Lincoln Laboratory

Room: Expedition

Recent advances in the technologies associated with phased array apertures, digital waveform generators, and signal processing have enabled a broad class of Multiple-Input Multiple-Output (MIMO) radar techniques. In the last decade and a half, the MIMO radar nomenclature has been applied to various signaling and processing techniques that employ multiple, independent radiating transmitter elements that work cooperatively with multiple, independent receiver elements. This tutorial is intended to provide an overview of the principles of MIMO radar with an emphasis on applications and beamforming techniques for phased array radar systems.
First, this tutorial will briefly review the history of developments in the fields of radar, communication and control theory that led to the emergence of the "MIMO radar" taxonomy in the early 2000's. An overview of MIMO radar will be provided covering the broad class of MIMO-enabling waveforms, comparisons with traditional single-input radar systems, and the various canonical forms of MIMO radar in the published literature. Second, this course will expand upon waveform design approaches for MIMO radars. A coherent MIMO radar signal model will be presented that illustrates the utility of spatio-temporal signal processing for phased array systems – including a posteriori transmit beamforming. Then, performance of MIMO radar systems will be explored in the areas of parameter estimation, track and search rates, and requirements and cost for hardware implementations. Finally, several examples of MIMO radar operation will be presented spanning pulsed-Doppler, airborne GMTI, automotive radar and high frequency over-the-horizon radar applications.

PROGRAMME

Introduction to MIMO Radar
Frank Robey[1], Vito Mecca[1], Daniel Rabideau[1]
[1]MIT Lincoln Laboratory

Rohde & Schwarz Tutorial Seminars and Technical Workshops

Date: Tuesday 12th, to Thursday 14th January 2021
Location: Juliana 4

FREE TO ATTEND
Due to the COVID-19 pandemic, this program is only preliminary. Final details are expected to be available from December 2020. For more information, details and registration: http://www.rohde-schwarz.com/eumw

ROHDE&SCHWARZ
Make ideas real

TUTORIAL SEMINARS – RF BASICS IN TEST AND MEASUREMENT

The Rohde & Schwarz seminars covering RF basics in test and measurement will familiarize you with the elementary aspects of signal generators, spectrum analyzers and network analyzers. You will learn how to benefit from the tremendous flexibility of our T&M equipment when designing RF and mmWave circuits.
The seminar on real-time spectrum analysis will introduce the methods for debugging RF and mmWave circuits in the time and frequency domains and demonstrates the great benefits for analysis of every mmWave engineer's complex circuitries.
Using vector network analyzers for component testing and applying various calibration techniques allows highly precise characterization of RF and mmWave components, which are necessary for mmWave designs and digital communications systems.

TUESDAY, 12TH JANUARY 2021

09:30 – 11:00	Fundamentals of signal generators and oscillators (YIG versus VCO)
11:15 – 12:45	Fundamentals of spectrum analysis

WEDNESDAY, 13TH JANUARY 2021

09:30 – 11:30	Introduction to digital signals and digital modulation
11:45 – 13:15	Real-time spectrum analysis embedded in advanced spectrum analyzers

THURSDAY, 14TH JANUARY 2021

09:30 – 10:30	Fundamentals of vector network analysis
10:45 – 12:15	Calibration in vector network analysis

TECHNICAL WORKSHOPS

TUESDAY, 12TH JANUARY 2021, 13:30 TO 16:15
Modern RF frontend design and testing
Workshop chair: Markus Lörner, Market Segment Manager RF & Microwave Components, Rohde & Schwarz

5G is real. The focus is now on improving the system and enhancing it to mmWave. This drives growing integration in components and the creation of more efficient designs to minimize form factor, improve energy efficiency and ultimately drive overall costs down. Multifunction RF components such as beamformers are used in 5G mmWave as well as in satellite communications and defense applications. The high density of RF frontends for massive MIMO systems calls for unprecedented energy efficiency in order to minimize the physical size while ensuring stable temperature conditions.
This workshop will provide an overview of the latest technologies and requirements of RF frontends, focusing on the topics of improved efficiency and enhanced integration. Experts from the test and measurement world and industry partners will provide solutions that meet demanding requirements.

WEDNESDAY, 13TH JANUARY, 2021, 13:30 TO 16:15
Millimeterwave and THz technology for 5G and beyond
Workshop chair: Dr. Taro Eichler, Market Segment Manager Wireless Communications, Rohde & Schwarz

Millimeterwave and THz technology are seen as key components for beyond 5G and 6G systems. The utilization of the radio spectrum between 30 GHz and 300 GHz is intended to resolve the spectrum crunch and to enable ultra-broadband mobile communications up to the terabit-class range. Since highly integrated frontends including array antennas will be implemented, advanced over-the-air testing methods with an extreme extended frequency range up to 500 GHz will become mandatory. Furthermore, the use of extremely wideband channels up to several GHz will become a challenge in terms of broadband signal generation and signal analyzers. This workshop gives an overview of recent developments in the area of broadband mmWave and THz communications systems with a special focus on radio channel and OTA measurements as well on hardware implementation issues.

MathWorks Hands-on Workshops

Date: Tuesday 12th, to Thursday 14th January 2021
Location: Juliana 3

FREE TO ATTEND
Please sign up to our workshops here: https://www.mathworks.com/EUMW-2020-workshops.html

ACCELERATE THE PACE OF YOUR ENGINEERING AND SCIENCE

Join one or more of the 90-minute MathWorks hands-on workshops on Tuesday, Wednesday, and Thursday (September 15, 16, 17) at the European Microwave Week. Topics include: using MATLAB® for designing and testing 5G and WLAN systems, antenna and antenna array design and optimization for radar applications, modeling RF propagation effects in urban scenarios, using Software Defined Radios (SDR) for rapid prototyping and over-the-air testing, plus lots more! These workshops do not require familiarity with MATLAB. Bring your own laptop to get a hands-on experience and rapidly get started under the supervision of MathWorks experts. . There will be 3 different session each day. Please sign up to our workshops here: https://www.mathworks.com/EUMW-2020-workshops.html
These workshops are free to attend for everyone who has registered for European Microwave Week.

Highlights
- 5G, LTE, WLAN, and Bluetooth Wireless Standards Made Easy
- AI Driven Antenna Optimization and Platform Integration
- RF Propagation and Ray Tracing in Urban Scenarios
- Modeling Tracking Scenarios and Simulating Radar Detections

TUESDAY, 12TH JANUARY 2021

10:00 – 11:30	5G, LTE, WLAN, and Bluetooth Wireless Standards Made Easy
13:00 – 14:30	Modeling the RF Frontend of a Wireless System
15:00 – 16:30	Masterclass: Testing Your Software Defined Radio Algorithm on Real Hardware

WEDNESDAY, 13TH JANUARY 2021

10:00 – 11:30	Antenna and Antenna Array Design and Prototyping Using MATLAB®
13:00 – 14:30	AI Driven Antenna Optimization and Platform Integration
15:00 – 16:30	RF Propagation and Ray Tracing

THURSDAY, 14TH JANUARY 2021

10:00 – 11:30	Introduction to Radar System Simulation
13:00 – 14:30	Modeling Tracking Scenarios and Simulating Radar Detections
15:00 – 16:30	Machine Learning & Deep Learning Applied to Radar Target Classification

Keysight PathWave Workshops

Date: Wednesday, 13th January 2021
Location: Juliana 1

FREE TO ATTEND
Register at http://www.keysight.com/find/eumw
The schedule and details are subject to change. The latest version can be downloaded at www.eumweek.com

PROGRAMME

TIME: 10:00 – 12:00

Modeling Non-Linear RF Design - Unifying Circuit Design with System Design

The evolving RF system requirements are pushing the use of Spreadsheet custom templates to their limits. At the same time, fragmented design flows for RF system and circuit design restrict the final validation options.

With PathWave Advanced Design System (ADS), you can easily design your circuits; with complex modulation schemes, it becomes even more important to verify your design against System specifications. PathWave System Design (formerly known as SystemVue) is a multi-domain modeling implementation and verification platform for electronic system-level (ESL) design. It allows system architects and algorithm developers to cross traditional baseband and RF boundaries and provides a verification platform for RF circuit designers to innovate the physical layer (PHY) of next generation wireless communications systems and to prevent costly hardware integration delays downstream.

In this workshop you will learn about:
- Extracting behavioral models from your circuit designs in the form of X-parameters and Fast Circuit Envelope (FCE) models and how to simulate them at the system level
- System level verification against golden standards using Virtual Test Benches (VTBs) in ADS
- How to linearize a Power Amplifier designed in ADS using the Digital Pre-Distortion (DPD) design capabilities in PathWave System Design

TIME: 13:00 – 15:00

Integrated Electromagnetic Analysis - Enabling PCB-Chip-Package Co-Design for RF & mm-Wave Applications

The level of integration of RF and mm-wave systems is increasing, which has an impact on the electrical properties and system parameters. Furthermore, RF applications are typically combined with non-RF digital sections such as CPU, DSP, control circuits and power distribution networks. As a result, it is insufficient to model chip, package and PCB separately, as unwanted coupling effect of both RF and high-speed digital signals may not be captured.

During this workshop we will present a complete chip-package co-design flow, which allows improvement of RF performance and power efficiency. By designing concurrently, silicon, package and system can be optimized and validated with fewer iterations before tape-out. This flow has been validated on GlobalFoundries' 22FDX process which targets mm-Wave designs.

ADS enables EM-circuit analysis of any selected portion of the PCB to identify and fix sources of interference before building hardware board turns. We will show an integrated Electromagnetic (EM) solution, RFPro, with automatic net, ground and component extractions from an imported ODB++ layout.

IHP Workshop: "High Performance SiGe BiCMOS Technology Platform for leading edge RF and Photonic ICs"

Date: Thursday, 14th January 2021
Location: Juliana 2

FREE TO ATTEND
For further information and to register for this workshop please email:
Anna Sojka-Piotrowska: sojka@ihp-microelectronics.com

FAMILIARISE YOURSELF WITH IHP'S TECHNOLOGIES

The Workshop delivers firsthand information and opportunities about IHP's technologies, services and integrated circuits. IHP's offerings are very suitable for highly demanding applications such as wireless and broadband communication, medical technology, aerospace, mobility, wireless security and industrial automation.

PROGRAMME

09:30 – 09:40 Welcome and Introduction – R.F. Scholz

09:40 – 10:10 MM-Wave Packaging and Heterogeneous Integration – M. Wietstruck
In this talk, the latest developments for mm-wave packaging and heterogeneous integration at IHP will be presented: BiCMOS embedded Through-Silicon Vias (TSV), wafer-level interconnection technologies and a novel wafer-level packaging technology.

10:10 – 10:40 Next generation THz SiGe-BiCMOS technology and future perspectives - tbd
Recently IHP demonstrated first results for a SiGe-BiCMOS technology featuring transit frequencies fT and maximum oscillation frequencies fmax both exeeding 0.5 THz. Status and future perspective of these developments will be discussed.

10:40 – 11:10 Overview on MPW offerings and Process Design Kit features – R.F. Scholz
IHP offers research partners and customers access to its powerful cutting edge SiGe:C BiCMOS technologies e.g.: Integrated HBTs with cut-off frequencies of up to 500 GHz, Through Silicon Vias, Localized Backside Etching

11:10 – 11:40 Space evaluation of two BiCMOS technologies SGB25RH and SG13RH – J. Kroel
SGB25RH is already fully evaluated against ESCC standards and the technology is EPPL listed. The evaluation of SG13RH supported by the ESA component group consists of different activities and this overview gives an overall status of the progress.

11:40 – 12:10 IP portfolio and customized IP block offerings via IHP Solutions – M. Petri
Through IHP Solutions, customers have access to the whole range of IHP's IP portfolio e.g.: building blocks, cores, integrated analog devices, complex digital processors, wireless sensor networks, embedded security or application software solutions.

12:10 – 12:20 Introduction Demonstrators: SRS Radar, UWB Localization, Broadband SDR, 5G – R.F. Scholz

12:20 – 13:30 Lunch & Demo Session

EuMW MicroApps 2020

Date: Tuesday 12th, to Thursday 14th January 2021
Location: MicroApps Theatre, Exhibition Hall

Free Admission with Exhibition and Conference Badges

TAKE 20 MINUTES TO LEARN SOMETHING NEW

Welcome to the tenth annual European Microwave Week (EuMW) Microwave Application Seminars (MicroApps), sponsored by Rohde & Schwarz and Horizon House. MicroApps will be held from Tuesday 12th – Thursday 14th January 2021 in the MicroApps Theatre, which is located within the exhibition floor, making it a convenient stop while attending EuMW.

MicroApps are 20-minute exhibitor technical presentations that provide an opportunity for EuMW attendees to experience state-of-the-art applications, products, design techniques, and processes of interest to the RF and microwave community.

2020 MicroApps highlights include:
- Keynote talks by known experts in the RF/microwave industry
- Industry workshops
- A variety of practical application topics describing novel products and processes.

Once finalized, a complete agenda will be posted on www.eumweek.com and published in the official EuMW Show Guide. Additional printed copies will also be available on site at the EuMW registration desks.

MicroApps admission is free for both exhibition-only and conference badges. Also included is a complimentary web download of the papers presented and bottled water.

We look forward to seeing you at EuMW 2020 in the MicroApps Theatre.

EXHIBITOR WORKSHOP MATRIX

Room		
TUESDAY 12TH JANUARY 2021		
Juliana 3	**10:00 – 16:30** **MathWorks**	
Juliana 4	**09:30 – 12:45** **Rohde & Schwarz Tutorial Seminars**	**13:30 – 16:15** **Rohde & Schwarz Workshops**
WEDNESDAY 13TH JANUARY 2021		
Juliana 1	**10:00 – 12:00** **Keysight Technologies Workshops**	**13:00 – 15:00** **Keysight Technologies Workshops**
Juliana 3	**10:00 – 16:30** **MathWorks**	
Juliana 4	**09:30 – 13:15** **Rohde & Schwarz Tutorial Seminars**	**13:30 – 16:15** **Rohde & Schwarz Workshops**
THURSDAY 14TH JANUARY 2021		
Juliana 2	**09:30 – 13:30** **IHP**	
Juliana 3	**10:00 – 16:30** **MathWorks**	
Juliana 4	**09:30 – 12:15** **Rohde & Schwarz Tutorial Seminars**	

SUNDAY

Room	08:30 – 10:10	10:50 – 12:30	13:50 – 15:30	16:10 – 17:50	EVENING PROGRAMME
Mission 1	**W-03** High Performance GaN MMICs				
Mission 2	**W-17** Advanced RF Technologies for 5G				
Quest	**W-29** Recent Advances in Additive Manufacturing of Microwave Components				
Auditorium	**S-03** Fundamentals of Microwave PA Design				
Expedition	**W-11** Integrated Doherty PAs for Cellular and mmWave Applications				
Flash	**W-27** Wireless Power Transmission Recent Research Advances		**W-02** Advanced Measurement Techniques for Next Generation Communication Systems		
Spark	**W-06** Sub-mmWave On-Wafer Measurements				

MONDAY

Room	08:30 – 10:10	10:50 – 12:30	13:50 – 15:30	16:10 – 17:50	EVENING PROGRAMME
Mission 1	**EuMIC02** D-Band to H-Band Amplifiers		**EuMIC05** ICs for mmWave Beamforming Systems	**EuMIC08** ICs for Communication and Sensing	
Mission 2	**EuMIC03** GaN MMIC Power Amplifiers		**EuMIC06** Advances in mmWave and High Power Technologies	**EuMIC09** Advanced Solutions for Integrated Power Amplifiers	
Quest	**EuMIC04** Receivers and LNAs		**EuMIC07** Oscillators and Switches	**EuMIC10** Nonlinear Modelling	
Expedition	**W-28** Microwave Wearable Circuits and Systems for Biomedical Applications				
Polar		**EuMIC01** EuMIC Opening			
Auditorium	**W-13** Advanced Applications of In-Band Full-Duplex Technology		**Technology in Context** Philosophical Lecture	**S-05** Multibeam Antennas and Beamforming Networks	
Spark	**W-08** Antenna/Modules in Package for mmWave for 5G			**W-10** From Enabling GaN Technology to High-Performing Space-Borne SSPAs at mmWave	
Flash	**S-07** From Device Characterisation to Amplifier Design: Advanced Large Signal Measuring, Fast and Accurate Modelling, and Reliable Designing			**S-10** Intuitive Microwave Filter Design with EM Simulation	
Glow	**W-18** Measurements at mmWave and Terahertz Frequencies of Three Measurement Quantities: S-Parameters, Power, and Complex Permittivity of Dielectric Materials				
Beam	**W-07** High-Power Microwave Industrial Applications				
Off-site					**Automotive Forum Networking Dinner** 18:30 - 22:00
Off-site					**EuMIC Get-Together** 18.30 - 21.00

EuMW EuMC EuRAD EuMIC Student Activity EuMIC/EuMC EuMC/EuRAD

TUESDAY

Room	08:30 – 10:10	10:50 – 12:30		13:50 – 15:30	16:10 – 17:50	EVENING PROGRAMME
Mission 1	**EuMIC11** Transceiver and Transmitter ICs		**EuMIC13** Foundry Panel	**EuMC07** Wireless Communication Systems	**EuMC14** Microwave and mmWave Systems	
Mission 2	**EuMC01** Power Amplifiers for Sub 6 GHz Application			**EuMC08** Power Amplifiers Based on III-V & CMOS Technologies for 5G	**EuMC15** Doherty and Load Modulated Power Amplifier Structures	
Quest	**EuMIC/EuMC01** Silicon Integrated Sub-mmWave Circuits			**EuMC09** Terahertz Electronic Devices	**EuMC16** Terahertz Photonic Devices and System	
Expedition	**EuMIC12** Design and Characterisation Techniques			**EuMC10** MIMO and 5G Antennas	**EuMC17** Phased and Transmit Arrays	
Polar				**EuMIC14** 1-Minute Poster Pitch (13:50 - 14:10)	**EuMIC16** EuMIC Closing Session	
Auditorium	**Automotive Forum** Automotive Radar: Waveforms, Architectures, AI and Interference		**Technology in Context** Philosophical Lecture	**Automotive Forum** Automotive Radar: Waveforms, Architectures, AI and Interference		
Spark	**EuMC02** Array Antennas			**EuMC11** Waveguide and Horn Antennas	**EuMC18** 5G Antenna Systems	
Flash	**EuMC03** Advanced Packaging Components and Techniques			**EuMC12** Advanced Packaging Solutions for mmWave Applications	**EuMC19** 3D-Printing Technologies	
Glow	**EuMC04** Theoretical and Computational Electromagnetics			**EuMC13** Numerical Methods in Microwave Technology	**EuMC20** Modelling of Field Radiation and Scattering	
Beam	**Student School** Build Your Own Radar: Instruction			**W-25** Advanced mmWave Radar System Solutions for Industrial and Consumer Sensing Applications		
Media arena	**EuMC05** 1-Minute Poster Pitch (09:40 - 10:10)		**Women in Microwaves** Lunch Lecture	**Career Platform** How to Stand Out in a Job Application	**Women in Microwaves** Panel Discussion	
Fluor					**Teaching Microwaves** Increase Your Microwave Lecturing Skills	
Round control		**Career Platform** Career Lounge: Meet Jobs, Build Careers				
Transitzone B			**Automotive Forum** Lunch			
Transitzone C		**Student School** Build Your Own Radar: Hands-On Experience				
loopbrug	**Career Platform** Company Wall and Job Wall					
Beatrix		**Opening of the European Microwave Week** EuMC/EuMW Opening				
Juliana 2	**W-05** Digital Predistortion for 5G MIMO Wireless Transmitters					
Hall 1			**EuMC06** Interactive Poster Session	**EuMIC15** Interactive Poster Session		
Hall 1	**Student Design Competition** Detect a Drone / Build (a part of) an Amplifier					
Off-site				**Women in Microwaves** Utrecht City Tour		**EuMW Welcome Reception** 18.30 - 22.00

EuMW EuMC EuRAD EuMIC Student Activity EuMIC/EuMC EuMC/EuRAD

WEDNESDAY

Room	08:30 – 10:10	10:50 – 12:30		13:50 – 15:30	16:10 – 17:50	EVENING PROGRAMME
Progress				**W-14** Automotive Radar Networks and Sensor Fusion		
Mission 1		**EuRAD02** Dual Use & Waveform Design		**EuRAD04** Doppler Processing Techniques for Low Reflectivity Targets	**EuRAD06** Emerging & Industrial Applications	
Mission 2	**EuMC21** Special Antenna Systems	**EuMC27** [Focussed Session] Emerging Microwave Technology: Asia-Pacific		**EuMC33** Advances on RF Power Amplifier Behavioural Modelling	**EuMC39** Solid State High Power Amplifiers for Satellite and Radar Applications	
Quest		**EuRAD03** Design and Calibration Concepts for Advanced Radar Systems		**EuRAD05** Radar Circuits and Systems	**EuRAD07** Radar Scenario Simulations	
Expedition	**EuMC22** Novel Circuits Solutions for Energy Transfer in the Near-Field and Far-Field	**EuMC28** Novel Wireless Power Transfer and Energy Harvesting Systems		**EuMC34** Recent Advances in RFID and IoT Sensors	**EuMC40** [Focussed Session] Emerging Antenna Technologies for RFID	
Polar	**EuRAD01** EuRAD Opening Session					
Auditorium	**EuMC23** [Focussed Session] Innovative Antennas for Cubesat Platforms	**DSS Forum** Space Situational Awareness	**DSS Forum** Strategy Analytics Lunch	**DSS Forum** Space Situational Awareness		**DSS Forum** Cocktail Reception
Spark	**S-08** High Power Amplification for Space Applications			**EuMC35** Integrated Antennas	**EuMC41** SATCOM and mmWave Antennas	
Flash	**EuMC24** Additive Manufacturing and Emerging Materials for mmWave Applications	**EuMC29** Reconfigurable Planar Passive Components		**EuMC36** Transmission Lines and Passive Components	**EuMC42** Planar Power Dividers/ Combiners	
Glow		**EuMC30** Non-Planar Filters		**EuMC37** Non-Planar Filters and Devices	**EuMC43** Non-Planar Devices and Systems	
Beam	**EuMC25** Metamaterials for Circuits and Sensors	**EuMC31** Frequency Selective Surfaces, Reflectors and Metamaterial Antennas		**EuMC38** Metasurfaces and FSSs Applications	**EuMC44** [Special Session] Silicon-Based Ka-Band Massive MIMO Systems	
Media arena	**EuMC26** 1-Minute Poster Pitch (09:40 - 10:10)	**Career Platform** [Special Session] Industry Market and Professional Opportunites	**IEEE Young Professionals**	**Career Platform** Startup Panel		
Fluor	**S-04** Quantum Computing for Electrical Engineers					
Shuttle		**IEEE Young Professionals**				
Round control		**Career Platform** Career Lounge: Meet Jobs, Build Careers				
loopbrug	**Career Platform** Company Wall and Job Wall					
Juliana 2	**W-12** High-Efficiency Linear Power Amplifiers for High Bandwidth, High PAR Signals					
Hall 1	**Student Design Competition** Detect a Drone / Build (a part of) an Amplifier)		**EuMC32** Interactive Poster Session	**Student Design Competition** Detect a Drone / Build (a part of) an Amplifier		
Off-site						**Microwave Nightfever** 20.00 - 24.00

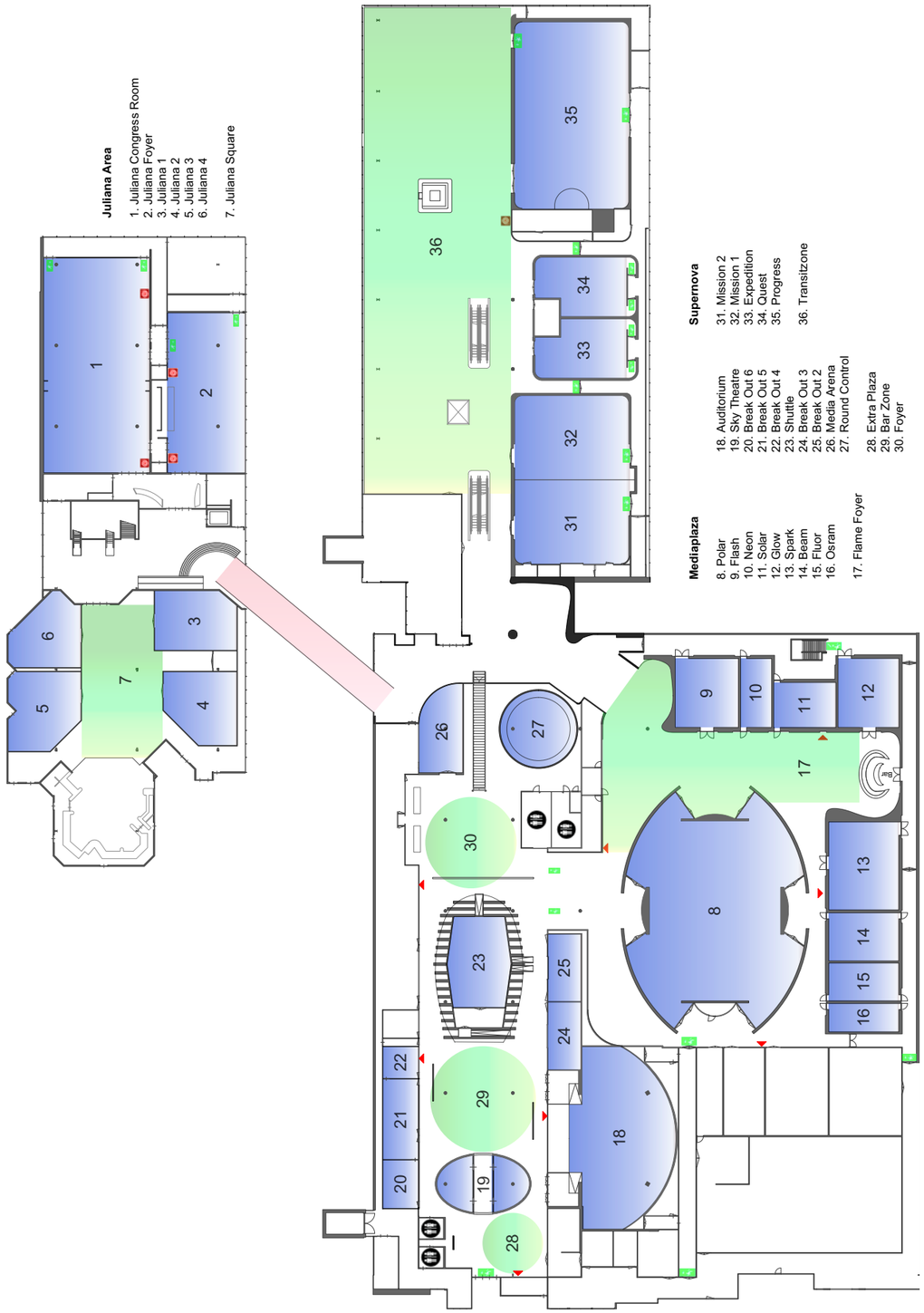
THURSDAY

Room	08:30 – 10:10	10:50 – 12:30		13:50 – 15:30	16:10 – 17:50	EVENING PROGRAMME
Progress	**W-23** High Resolution Radar for Automotive					
Mission 1	**EuRAD08** Object Classification in Automotive Radars	**EuRAD12** [Focussed Session] Radar Interference Cancellation		**EuRAD16** Automotive		
Mission 2	**EuRAD09** Defence Applications	**EuRAD13** [Special Session] Radar and Electronic Warfare		**EuRAD17** Advanced Techniques and Innovative Array Configurations for DoA		
Quest	**EuRAD10** SAR Processing	**EuRAD14** Surveillance and SAR		**EuRAD18** SAR Applications		
Expedition	**EuMC/EuRAD01** Radar Receivers and Front-Ends	**EuMC49** Front-End and Active Module		**EuMC54** Low Noise Amplifier and Phased Array Module		
Polar					**Closing of the European Microwave Week** EuMC/EuMW Closing and Awards Ceremony	
Auditorium	**EuMC45** [Special Session] Focus Day: Array Antennas for Radio Astronomy	**EuMC/EuRAD02** [Special Session] Focus Day: Active Array Antennas for Space	**Technology in Context** Philosophical Lecture	**EuMC/EuRAD03** [Special Session] Focus Day: Active Array Antennas for Defence		**HAM Radio Social** 18.00 - 21.00
Spark	**EuMC46** Advanced Planar Filter Principles and Technologies	**EuMC50** Compact Planar Filtering Devices		**W-15** Recent Advances in Micro-Doppler Radar and its Applications		
Flash	**EuMC47** Dielectric Measurements	**EuMC51** Calibration and Characterisation Techniques		**EuMC55** Antenna Characterisation Techniques		
Glow	**EuMC48** Microwave Monitoring and Sensing of Biomedical Parameters	**EuMC52** Biological Microwave Effects and Imaging Techniques		**EuMC56** [Focussed Session] Electromagnetics in Biomedical Applications		
Beam	**Tom Brazil Doctoral School of Microwaves** The Route to 5G: Design of mmWave Active Array Systems, from RFIC to Signal Processing					
Media arena	**EuRAD11** 1-Minute Poster Pitch (09:40 - 10:10)	**EuMC53** 1-Minute Poster Pitch (12:00 - 12:30)		**EuMC57** In Recognition: Prof.Dr. A.T. de Hoop		
Round control	**Career Platform** Career Lounge: Meet Jobs, Build Careers					
BOR 6	**Career Platform** Job Dating					
loopbrug	**Career Platform** Company Wall and Job Wall					
Juliana Congress Room 1	**W-31** 5G and Beyond: Enabling RF Architectures and Technologies for Emerging Wireless Systems					
Hall 1			**EuRAD15** Interactive Poster session	**EuMC58** Interactive Poster Session		

EuMW EuMC EuRAD EuMIC Student Activity EuMIC/EuMC EuMC/EuRAD

FRIDAY

Room	08:30 – 10:10	10:50 – 12:30		13:50 – 15:30	16:10 – 17:50	EVENING PROGRAMME
Progress				**EuRAD25** Closing Session		
Mission 1	**EuRAD19** MIMO Radar	**EuRAD22** Automotive Radar MIMO Processing				
Mission 2	**EuRAD20** Passive Radars	**EuRAD23** Target Characterisation with Radar				
Quest	**EuRAD21** New Radar Concepts	**EuRAD24** [Special Session] Civilian Radar Research and Development in China				
Expedition	**S-02** Cognitive Radar Signal Processing			**S-01** Introduction to MIMO Radar		
Auditorium	**5G Forum** 5G: From Technology to Business		**Technology in Context** Philosophical Lecture	**5G Forum** 5G: From Technology to Business		
Flash	**W-21** Recent Advances in Topologies, Technologies and Practical Realizations of Microwave Sensors					
Glow	**W-30** Recent Advances on Microwave Filters					
BOR 2	**W-32** Practical Aspects of Running a Microwave Laboratory and How to Make Good Measurements Every Time					
Transitzone A			**EuRAD** Seated Lunch			
Transitzone B			**5G Forum and WS/SC** Seated Lunch			



Route naar Jaarbeurs met de auto of vanaf station Utrecht Centraal

- Taxi
- Bus
- Sneltram
- EHBO
- Geldautomaat
- Pers
- Informatie
- Fietsenstalling
- Oplaadpunt
- Parkeren mindervaliden
- Looproute
- Restaurant

Event & Exhibition Centre
Hal 1 t/m 4 en 7 t/m 12
Speys

Eerste verdieping:
Croesezaal
Julianazalen (Hal 5)
Media Plaza
Supernova

Beatrixgebouw
Beatrix Theater
Expozaal
Jaarbeurs MeetUp
Kantoren Jaarbeurs
Trade Mart
Zeyn

Jaarbeurs
Jaarbeursplein | 3521 AL Utrecht
jaarbeurs.nl

Parkeren en navigeren
Bekijk de plattegrond om te beoordelen op welk parkeerterrein je het beste kunt parkeren.

JAARBEURS
attract - engage - accelerate

Exhibitor List 2020

A: ACST GmbH · AdTech Ceramics · AFT Microwave GmbH · AGC · AGC-NELCO Europe SA · AINFO Inc. · AIRMEMS · Alfred Tronser GmbH · ALPHA - RLH · Altair Engineering GmbH · AMCAD Engineering · American Standard Circuits, Inc. · American Technical Ceramics Corp. (ATC) · Ampleon · Analog Devices GmbH · Anyarc (Kunshan) Technology Co., Ltd · API Tech · AR Europe Ltd · Arralis · Artech House Books · ASB Inc. · ATEM · Atlantic Microwave Ltd · Auriga PIV-Tech · AVX Corp.

B: BAE Systems Surface Ships Ltd · Bits&-Chips · Bruco IC · BSC Filters Ltd · bsw TestSystems & Consulting BV

C: Cadence · China Electronics Technology Instruments Co., Ltd (CETC) · Cicor Group · CISTEME · Cobham Electrical and Electronic Equipment · Coilcraft · COMSOL BV · Copper Mountain Technologies · CPE Italia SpA

D: DICONEX - DELTA OHM · Ditom Microwave Inc. · Dow-Key Microwave · dSPACE GmbH · DYCONEX AG

E: ECA Group · EDI CON China · Electronic Specifier Ltd · Elektor · Elite RF · ERZIA Technologies S.L. · ETL Systems · European Microwave Week 2021 · Everything RF

F: Farran Technology Ltd · Filtronic Broadband Limited · Focus Microwaves Inc. · Focusimple Electronics Co., Ltd · FormFactor Inc. · Fraunhofer FHR · Fraunhofer IAF · Fuzhou Micable Electronic Technology Co., Ltd

G: Gapwaves · Greenray Industries

H: Hangzhou Freqcontrol Electronic Technology Ltd · hf-Praxis · High Frequency Electronics · Holzworth Instrumentation · Huber + Suhner AG · Hytem

I: IHP GmbH · IMST GmbH · iNOVEOS · Institut d'Electronique, de Microeléctronique et de Nanotechnologies (IEMN) · Intech Microwaves S.R.L. · Isola GmbH

J: JQL Technologies Corporation

K: K&L Microwave, Inc · Keysight Technologies · Knowles Precision Devices · KOA Europe GmbH · KOSTECSYS Co., Ltd · Kuhne Electronic GmbH

L: LPKF Laser & Electronics AG · Lancaster University Engineering Department

M: Mathworks B.V. · Maury Microwave Corp. · Mesuro Limited · METDA Corp · Mician GmbH · Micro Harmonics Corporation · Micro Systems Engineering GmbH · Micro Systems Technologies Management AG (MST) · Microsanj LLC · Microwave Engineering Europe · Microwave Journal · Microwave Products Group · Microwave Systems JSC · Microwaves and RF · Milliwave Silicon Solutions Inc. · Milliway Microelectronics · MISOTECH · Mitron Inc · Mouser Electronics · MPI Corporation · MRC Gigacomp GmbH & Co. KG · MTR S.R.L. · MUEGGE GmbH · Murata Software Co., Ltd

N: NI · NSI-MI Technologies · NXP Semiconductors

O: OMMIC

P: Pasquali Microwave Systems SRL · Pickering Interfaces Ltd · Pico Technology Ltd · Planar Monolithics Industries Inc · Plexsa Manufacturing · Pole Zero · Prâna R&D · Pure Pro Technology Co., Ltd

Q: Quartzcom AG

R: Remcom Inc. · Research Fab Microelectronics Germany (FMD) · RF MORECOM · RF-Lambda Europe GmbH · Rflight Communication Electronic Co., Ltd · RFMW Europe Ltd · Rogers Corporation · Rohde & Schwarz GmbH & Co. KG · Rosenberger Hochfrequenztechnik GmbH & Co. KG

S: SARAS Technology Ltd · Schmid & Partner Engineering AG · Schott AG · Shenzhen Superlink Technology Co., Ltd · Siglent Technologies Germany GmbH · Signal Integrity Journal · Smiths Interconnect - Hypertac SA · Southwest Microwave · SpaceForest · SPINNER GmbH · STACEM · Stratedge Corporation · Sumitomo Electric Europe Ltd · Sumitomo Electric Industries · Sungsan Electronics & Communications Co., Ltd · Suzhou Astroniks Electronic Technology Co., Ltd

T: Tech-X Corporation · Teledyne Technologies · Telemeter Electronic GmbH · TEMSTRON Co., Ltd · TEMWELL Corp · TICRA · Times Microwave Systems · TMD Technologies Ltd · TNO Defence, Safety and Security · Trilight Microwave AB + Microwave Systems · Tronser, Inc. · Tusk IC nv

U: UIY Inc. · United Monolithic Semiconductors SAS

V: Varioprint AG · Vectawave · Ventec International Group · VIA Electronic GmbH · Virginia Diodes Inc. · Vishay Electronic GmbH · VTT

W: W.L. Gore & Associates GmbH · WAVEPIA Co., Ltd · Wavice Inc. · Wevercomm Co., Ltd · WIN Semiconductors Corp · WIPL-D d.o.o. · Withwave Co., Ltd · Wolfspeed, A Cree Company · Wuerth Elektronik eiSos GmbH & Co. KG

X: XLIM - UMR CNRS 7252 - Université de Limoges

Y: Yole Développement

Z: Zhejiang Wazam New Materials Co., Ltd · Zhongshan Fragrant Mountain Microwave Co., Ltd

v1.0 Release date: 13 September 2020

Layout and Typesetting: otani.de