

1

Special EuMC Session on the 20th anniversary of the European Microwave Week

## The evolution of the EuMW and EuMA

Roberto Sorrentino



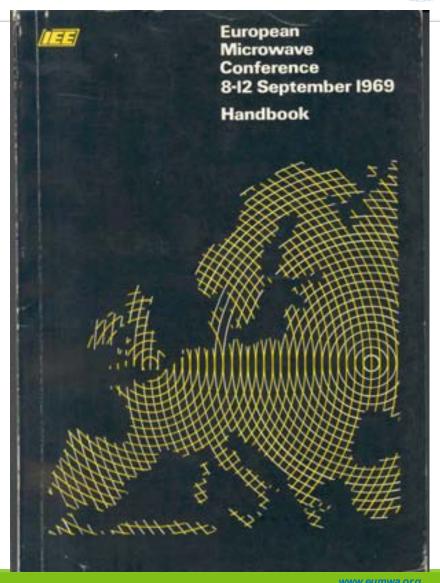
## It all started in ... 1969

#### 1969 European Microwave Conference

8-12 September 1969

Sponsored by

The Institution of Electrical Engineers' Electronics Division in association with The Institution of Electronic and Radio Engineers, and the Institute of Electrical and Electronics Engineers (Region 8) in collaboration with the Group on Microwave Theory and Techniques.



## The EuMC: 1969-1997 Eu/M



3

- 1. 1969 London
- 2. 1971 Stockholm
- 3. 1973 Brussels
- 4. 1974 Montreux
- 5. 1975 Hamburg
- 6. 1976 Rome
- 7. 1977 Copenaghen
- 8. 1978 Paris
- 9. 1979 Brighton
- 10.1980 Warsawa
- 11.1981 Amsterdam
- 12.1982 Helsinki
- 13.1983 Nurenberg

- 14.1984 Liège
- 15.1985 Paris
- 16.1986 Dublin
- 17.1987 Roma
- 18,1988 Stockholm
- 19.1989 London
- 20.1990 Budapest
- 21.1991 Stuttgart
- 22.1992 Helsinki
- 23.1993 Madrid
- 24.1994 Cannes
- 25.1995 Bologna
- 26.1996 Prague
- 27.1997 Jerusalem

## until in 1998 came... ...the first European Microwave Week



4



#### 5

## This was a good start but

the survival of EuMW was not so obvious:

- Management Committee of the EuMW had no legal status
- Financial reserves were just around 40k€ (the profit from EuMW 1998)
- Need to keep low registration fees, particularly for students.
- Unsatisfactory behaviour of the PCO (Professional Conf. Org.), no transparency, not good performance in many details

The foundation of a legal association (EuMA) was instrumental for the survival of EuMW

### The EuMC/EuMW in the EuMA years: 1998-2018



6

- 1998 Amsterdam
- 1999 Munich
- 2000 Paris
- 2001 London
- 2002 Milano
- 2003 Munich
- 2004 Amsterdam
- 2005 Paris
- 2006 Manchester
- 2007 Munich
- 2008 Amsterdam
- 2009 Rome
- 2010 Paris

- 2011 Manchester
- 2012 Amsterdam
- 2013 Nuremberg
- 2014 Rome
- 2015 Paris
- 2016 London
- 2017 Nuremberg
- 2018 Madrid
- 2019 Paris
- 2020 Utrecht
- 2021 London
- 2022 Rome
- 2023.....

### **Evolution of EuMA**



1998 - • EuMA foundation: International non profit organization with the scope of "promoting European microwaves..."

**Governing bodies:** 

- General Meeting (later: Assembly): 16 members
- Board of Directors: 6 members, (1 appointed by MTT)
- Chairman (then President): R. Sorrentino until 2009

**2003 -** Towards a renewed EuMA

2004 -

- New GA Constitution (14 Groups of Countries, 30 members)
- Individual EuMA Membership introduced
- DVD Archive (1969-2003)
- Proceedings of the EuMA (2004-2007, then IJMWT 2009-...)
- Distinguished Service Award
- Grants (>30) to support participation in EuMW

**2006** - Own offices in Louvain-la-Neuve

2007 -

- Agreement with APMC
- Industrial Liaison Committee

### Evolution of EuMA



- 2008 • Outstanding Career Award
- 8 2010 • W. Heinrich elected EuMA President
  - Topical Groups
  - **2012 •** European Courses on Microwave (EuCoM)
    - EuRaMIG initiative as EuMA Topical Group
  - **2015 •** Sister Society Agreement with IEEE MTT-S
    - MoU with EurAAP
  - **2017 •** Young Professional Round Table started
  - 2018 • Pioneer Award
    - White Paper "For a strong & competitive European wireless technologies ecosystem"
  - **2019 •** F. Vanden Bogaart elected EuMA President
    - European Microwave Conf. in Central Europe (EuMCE)

## General Assembly Constitution 2003

The General Meeting (GM) of the European Microwave Association is the highest governing body of the Association.

2003 constitution: 24 members, 13 ex-officio, 11 ordinary members representing (groups) of Countries.

1. Board of Directors	(Chairman + 5 members - 1 appointed by IEEE MTT):	6 members
2. Founder members	R. Sorrentino, L. Ligthart and A. Vander Vorst, A. Madjar, H. Meinel, S. Nightingale	3 members
3. IEEE Region 8 rep.	Modelski	1 member
4. EuMW Chairmen	Past, present, next	3 members
Total		13 members (maximum 16 if 1. does not include any of 2.)

1 2	France, Monaco Germany	7	Albania, Bulgaria, Czech Republic, Slovakia, Hungary, Romania, Moldova
3 4	Italy, San Marino, Vatican City United Kingdom, Gibraltar, Malta	8	Estonia, Latvia, Lithuania, Poland, Ukraine
5	Belgium, The Netherlands, Luxembourg, Irek	9	Croatia, Cyprus, Greece, Slovenia, Yugoslavia, Israel, Turkey
6	6 Denmark, Faroes, Finland, Greenland, Icelan Norway, Sweden		Russia, Belarus
			Spain, Portugal, Andorra, Austria, Switzerland,
			Liechtenstein



10

## Greetings European Microwave Association

Roberto Sorrentino EuMA President (1998-2009)





EU// Association

To the members of the General Assembly of the European Microwave Association

Perugia, May 1st 2004

On May 1st, the European Union has been enlarged from 15 to 25 members. In this historical day I would like to send my best greetings to all of you and, particularly, to those living in the ten new countries. I am confident that the EU will grow prosperous and peaceful and, as I have already written to you last year, that the EuMA can play its role by strengthening the links among European countries and beyond, in the spirit of a peaceful cooperation among all peoples.

		No of
Code	Countries	members
1	France, Monaco	32
2	Germany	33
3	Italy, San Marino, Vatican City	38
4	United Kingdom, Ireland, Gibraltar, Malta	23
5	Belgium, The Netherlands, Luxembourg	19
6	Iceland, Norway, Sweden,	12
7	Finland, Denmark, Greenland, Faroes	11
8	Bulgaria, Czech Republic, Slovakia, Hungary, Romania	10
9	Poland, Estonia, Latvia, Lithuania	33
10	Ukraine, Moldova, Georgia	25
	Croatia, Cyprus, Greece, Albania, Slovenia, Serbia and Montenegro, Bosnia-Herzegovna, Fyr Macedonia,	
11	Israel, Turkey	18
12	Russia, Belarus	19
13	Austria, Switzerland, Liechtenstein	5
14	Spain, Portugal, Andorra	8
15	North America	12
16	Central and South America	0
17	Africa	6
18	Asia-Pacific	9
	Total	313

I take this opportunity to inform you that, as a result of opening the Association to general membership, the Eu/MA presently consists of a total of 313 members, 27 of which live outside Europe, as quoted in the Table. This is a significant and very encouraging result for the success and future developments of the Eu/MA.

I would like to remind you that 2004 membership is free and still open until 9 August 2004 (deadline for early registration to EuMW 2004). After 9 August, 2005 membership will be open at the fees of 20€ (10€ for students). I therefore recommend you to urge microwave scientists and engineers in your country to join EuMA using the attached form. The first issue of the EuMA Newsletter has been sent out in January; the second issue will be distributed in the

next few days. The DVD archive is being completed and will be made available in October during the next European Microwave Week (<a href="https://www.europeanwazoo4.com">www.europeanwazoo4.com</a>).

I look forward to meeting you in Amsterdam for participating together in a new exciting EuMW.

Roberto Sorrentino President EuMA

## **New Groups of Countries in the General Assembly**

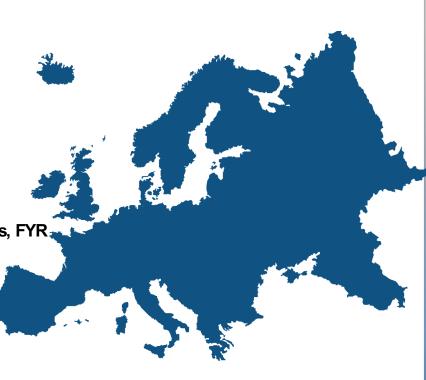
- 1 France\*\*, Monaco
- 2 Germany\*\*
- 3 Italy\*\*, San Marino, Vatican City
- 4 United Kingdom\*, Ireland\*, Gibraltar, Malta
- 5 Belgium\*, The Netherlands\*, Luxembourg
- 6 Iceland, Norway\*, Sweden\*
- 7 Denmark\*, Faroe Islands, Finland\*, Greenland
- Bulgaria\*, Czech Republic\*, Hungary\*, Romania, Slovakia
- 9 Estonia, Latvia, Lithuania, Poland\*
- 10 Armenia, Azerbaijan, Georgia, Moldova, Ukraine\*
- Albania, Bosnia and Herzegovina, Croatia\*, Cyprus, FYR Macedonia, Montenegro, Greece\*, Israel\*, Serbia\*, Slovenia\*, Turkey\*
- 12 Belarus, Russia\*
- 13 Austria\*, Liechtenstein, Switzerland\*
- 14 Andorra, Portugal\*, Spain\*
- 15 North America
- 16 Asia-Pacific
- 17 Africa and Middle East countries
- 18 Central & South America

## The 18 EuMA Geographical Groups Represented in the General Assembly (2018)

**206**pean Microwave Association

12

- 1 France\*\*, Monaco
- 2 Germany\*\*
- 3 Italy\*\*, San Marino, Vatican City
- 4 United Kingdom\*, Ireland\*, Gibraltar, Malta
- 5 Belgium\*, The Netherlands\*, Luxembourg
- 6 Iceland, Norway\*, Sweden\*
- 7 Denmark\*, Faroe Islands, Finland\*, Greenland
- Bulgaria\*, Czech Republic\*, Hungary\*, Romania, Slovakia
- 9 Estonia, Latvia, Lithuania, Poland\*
- 10 Armenia, Azerbaijan, Georgia, Moldova, Ukraine\*
- 11 Albania, Bosnia and Herzegovina, Croatia\*, Cyprus, FYR Macedonia, Montenegro, Greece\*, Israel\*, Serbia\*, Slovenia\*, Turkey\*
- 12 Belarus, Russia\*
- 13 Austria\*, Liechtenstein, Switzerland\*
- 14 Andorra, Portugal\*, Spain\*
- 15 North America
- 16 Asia-Pacific
- 17 Africa and Middle East countries
- 18 Central & South America





#### EuMA Membership 2004-2017





## Proceedings of the EuMA (2004-2007)

Editor

Prof. Robert Weigel
University of Erlangen-Nuremberg, Germany

Managing Editor

Prof. Roberto Sorrentino University of Perugia, Italy

Editorial Board

Dr. Petteri Alinikula Nokia Research Center, Finland

Prof. Andreas C. Cangellaris University of Illinois at Urbana-Champaian, USA

Dr. Jean-Louis Cazaux
Alcatel Alenia Space France

Prof. Mohammad Essaaidi Abdelmalek Essaaidi University. Morocco

Dr. Kenji Itoh

Mitsubishi Electric Corporation, Japan

Dr. Yinggang Li

Ericsson Research, Sweden

Prof. Jozef Modelski Warsaw University of Technology, Poland

Dr. Steve Nightingale ERA Technology LTD., U.K.

Prof. Vittorio Rizzoli University of Bologna, Italy

Prof. Magdalena Salazar-Palma Universidad Politecnica de Madrid, Spain

EDIZIONI

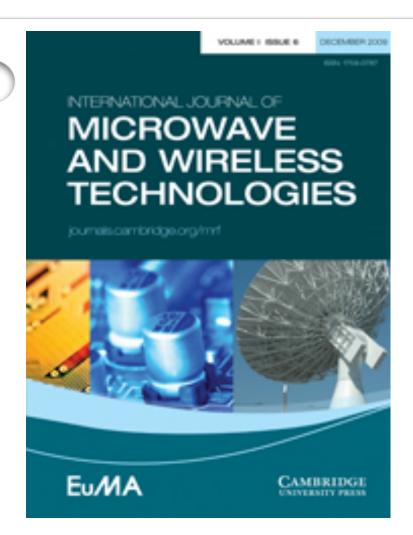




## International Journal of Microwave and Wireless Technologies

European Microwave Association

15



VOLUME 10 ISSUE 5/6

JUNE 2018

#### INTERNATIONAL JOURNAL OF

#### **MICROWAVE AND WIRELESS TECHNOLOGIES**

Special Issue: EuMW 2017 Special Issue

Design and demonstration of acoustically optimized, fully-printed, BST MIM varactors for high power

Guest Editors: Ingmar Kallfass, Martin Vossiek, and Matthias A. Hein

#### **CONTENTS**

GUEST EDITORIAL Buest Editorial – EuMW Special Issue ngmar Kallfass, Martin Vossiek and Matthias A. Hein	519	
RESEARCH PAPERS Comparative study of envelope models for hybrid ime- and frequency-domain simulation of raveling-wave tubes Classification of the properties	521	
Slow-wave coplanar waveguides based on inductive and capacitive loading and application to compact and harmonic suppressed power splitters francisco Aznar-Ballesta, Jordi Selga, Paris Vélez, ymando Fernández-Prieto, Jan Coromina, Jordi Bonache and Ferran Martin	530	
Radiometric accuracy and stability of sentinel-1A Jetermined using point targets (ersten Schmidt, Núria Tous Ramon and Marco Schwerdt	538	
KIT coaxial gyrotron development: from ITER toward DEMO		
S. Ruess, K. A. Avramidis, M. Fuchs, G. Gantenbein, 2. Ioannidis, S. Illy, J. Jin, P. C. Kalaria, T. Kobarg, Gr. Pagonakis, T. Ruess, T. Rzesnicki, M. Schmid, 4. Thumm, J. Weggen, A. Zein and J. Jelonnek	547	
Scanning microwave microscopy of buried CMOS nterconnect lines with nanometer resolution fin Jin, Kuanchen Xiong, Roderick Marstell, kilcholas C. Strandwitz, James C. M. Hwang, Marco Farina, kexander Görttz, Matthiss Wietstruck and Mehmet Kaynak	556	
A 216-256 GHz fully differential frequency multiplier-by-8 chain with 0 dBm output power M.H. Eissa, A. Malignaggi, M. Ko, K. Schmalz, J. Borngräber, A.C. Ulusoy and D. Kissinger	562	
Analysis of multipath and DOA detection using a fully colarimetric automotive radar ristan Visentin, Jürgen Hasch and Thomas Zwick	570	
Automotive antenna diversity system for satellite adio with high phase accuracy in Iow SNR-scenarios Simon Senega, Ali Nassar and Stefan Lindenmeier	578	
A 219-266 GHz LO-tunable direct-conversion IQ eceiver module in a SiGe HBT technology P. Rodriguez Vazquez, J. Grzyb, N. Sarmah, B. Heinemann and U.R. Pfeiffer	587	
Multi-functional D-band I/Q modulator/demodulator MMICs in SiGe BiCMOS technology Sona Carpenter, Zhongxia Simon He and Herbert Zirath	596	Almudena Suarez
A multiport vector network analyzer with high-precision and realtime capabilities for brain maging and stroke detection sebastian Poltschak, Markus Freilinger, Reinhard Feger, horicas Stelzer, Abouzar Hamidipour, Tommy Henriksson, Jarkus Hopfer, Ramon Planas and Serguel Semenov	605	Editor in Chief
ow-current cathode spatial harmonic magnetrons: unalysis and realization based on metamaterial oaded slow wave structures		75-97 CHZ LTCC antenna 16 an automotive miniature radar frontend Frank Sickinger, Ernst Weissbrodt and Martin Vossiek 729

amplifiers for future 5G communication

Felix Rautschke, Stefan May, Sebastian Drews,

**Evolution of EuMA 9** 

### EuMA Distinguished Award Medal

European Microwave Association



## Professor Gardiol receiving his Award Secretion



### 2006-7: EuMA structure and staff

- EuMA office in Louvain la Neuve
- Annemie Van Nieuwerburgh Headquarters Assistant
  - EuMA membership
  - EuMA website



## 2018: EuMA Headquarters



## Agreement with APMC (2007)

European Microwave Association

- 25 % of the contributions to EuMW come from the AP region
  - Exchange program of invited speakers has been set up



#### Room 2

# EuMC23 Special Session Devoted to Asia-Pacific Microwave Conference

Chair: Roberto Sorrentino, Univ. di

Perugia

Co-Chair: Wolfgang Menzel, Univ. Ulm

### **Industrial Liaison Committee (2007)**



- Provides a forum to link the activities of the EuMA to industry and exhibitors
- Consists of senior members of industrial companies
- Enhance mutual interaction and promote the involvement of industrial partners
- Headed up by an industrial BoD member



22

## Greetings European Microwave Association

Wolfgang Heinrich Eu*MA* President (2010-2018)



## Young Professional Round Table

23

- Working on the future EuMA: Young professionals round table
  - 10 young colleagues to develop their view on how EuMA should like in the future
  - Agenda developed by the group, no guidelines by BoD or EuMA
  - First activities planned
    - Internship award to provide opportunities for students to spent 3 months at institute/company
    - EuMA digital presence







White Paper on role and importance of microwave/wireless field for European Economy issued in July 2018

#### Whitepaper

For a strong & competitive European wireless technologies ecosystem

**July 2018** 



25

# Incoming EuMA President (2019-21)



THREE DAYS

ONE CONFERENCE

ONE EXHIBITION

THE NEW EUROPEAN
MICROWAVE CONFERENCE
WITH EXHIBITION IN
CENTRAL EUROPE



### CALL FOR PAPERS

PRAGUE CONGRESS CENTRE CZECH REPUBLIC

13TH - 15TH MAY 2019

- · A Three Day International Event
- · A European Microwave Conference dedicated to Central Europe
- · An International Exhibition for the Central European Market
- Associated Workshops











#### **CALL FOR PAPERS: Submit preliminary papers**

#### EuMCE 2019, Prague

European Microwave Conference in Central Europe Prague Congress Centre, Czech Republic 13th - 15th May 2019

You're invited to be part of a new European Microwave Conference in Central Europe (from the organisers of the European Microwave Week).

#### The 1st European Microwave Conference in Central Europe (EuMCE)

#### About EuMCE

The European Microwave Association (EuMA) is launching the European Microwave Conference in Central Europe, with associated Workshops and an Exhibition. EuMCE is a new series of events, modelled on European Microwave Week that is to complement the existing conferences in the region. It will be held every two years, alternating with MIKON and visiting the major cities of Central Europe. The first EuMCE will be held in Prague on 13-15 May 2019.

The aim of EuMCE is to better serve the microwave community in the Central Europe region and promote related microwave activities. Thanks to the associated Exhibition, which will attract companies not only from Central Europe but also from the rest of the world, the microwave industry will be an essential part of this new event, alongside academia and research centres.



EuMCE will provide an international forum where researchers, scientists and industrialists will have the opportunity to report and discuss on the latest advances in all areas of microwave theory, techniques and technology, with applications in communications, industry, science, medicine, etc. with the emphasis on activities specifically developed in and relevant to Central Europe.

The high technical quality of the conference will be ensured through peer-reviewed paper selection. Workshops and Short Courses will also be organized focusing on specific advanced topics of special interest. Grants will be provided to promote student participation.

#### **ADDRESSES**

#### General Chair:

Jan Vrba

Czech Technical University in Prague, Faculty of Electrical Engineering Dept. of Electromagnetic Field Email: vrba@fel.cvut.cz

#### IMPORTANT DATES:

25th January 2019: 4th March 2019: 2nd April 2019:

Deadline for submission of papers Notification of acceptance Submission of final papers

#### nline at www.eumce.com by 25th January 2019

#### SUBMISSION OF PRELIMINARY PAPERS AND GENERAL INSTRUCTIONS FOR AUTHORS

Authors are requested to submit a 4 page preliminary paper in the standard conference proceedings layout. A template can be downloaded from the EuMCE website: www.eumce.com. The paper must be uploaded in pdf format. The maximum file size is 3 MB. It is essential to emphasize the novel aspects of your paper. One author information form per paper must be completed at the EuMCE website when uploading the paper.

The deadline for submission of preliminary papers is 25th January 2019. Late submissions cannot be accepted. Each preliminary paper will be reviewed by the Technical Programme Committee (TPC). Authors will be notified on the status of their submission by 4th March 2019. The final digest paper will be required by 2nd April 2019. Authors of accepted papers will find instructions for publication and presentation on the EuMCE website. Authors are responsible for obtaining publication approval by their employer or sponsor prior to submission. Papers must be written in English and formatted in the standard conference proceedings layout on A4 paper. Word or LaTeX templates can be downloaded from www.eumce.com.

#### THE EUMCE CONFERENCE

#### Papers will be solicited describing the latest original research results in the following areas:

- · Active circuits and devices
- · Microwave passive circuits and components
- · Electromagnetic theory
- · Filters and multiplexers
- · Guided wave structures
- · Scattering, propagation, EM field theory and CAD
- Measurement techniques
- · Solid-state circuits and devices
- · MEMS, ferrites, ferroelectric, SAW, BAW
- · Packaging and interconnects
- · Sub-millimeter waves, photonics and optics
- · Planar antennas
- · Array antennas and beam-forming networks
- · Smart and reconfigurable antennas
- · Broadband and multi-band antennas
- · Terahertz technology
- Navigation and localization
- · Radar, sensing, and microwave systems
- · Ultra-wideband technology and Systems
- · Metamaterials, FSSs and EM bandgap structures
- · Wireless power transfer and RFID
- · Communication and microwave systems
- · Microwave industrial and medical applications
- Wireless system technologies including IoT
- · Other relevant and emerging topics



#### THE EUMCE EXHIBITION:

To find out about stand options and costs, contact: Richard Vaughan International Sales Manager Tel: +44 20 7596 8742 email: rvaughan@horizonhouse.co.uk

Horizon House Publications, 16 Sussex Street, London SWIV 4RW, UK



#### THE CITY OF PRAGUE



The venue of the meeting will be the Prague Congress Centre, located near to the Old Town of Prague, a UNESCO World Heritage site.

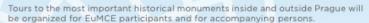
EuMCE will be a great opportunity to celebrate the 15th anniversary of the

EuMCE will be a great opportunity to celebrate the 15th anniversary of the accession of several Central European countries (Poland, Slovakia, Hungary, Slovenia, Estonia, Latvia, Lithuania and the Czech Republic) into the European Union in May 2004.



Prague is a beautiful, historical city with a very busy lifestyle and culture. There are numerous theatres, museums and other outstanding historical monuments and buildings. Most world renowned is Prague Castle (https://www.hrad.cz/en/prague-castle-for-visitors), alongside Charles Bridge, Old Town Square, Wenceslas Square and many other historical sites. Each evening there are several concerts in different historical buildings to choose from. More detailed information about Prague can be found at http://www.praguecityline.com.







Images courtesy of Prague City Tourism www.praguecitytourism.cz

#### PRAGUE CONGRESS CENTRE, CZECH REPUBLIC

The Prague Congress Center is the largest congress centre in the Czech Republic. In addition to major scientific, medical and pharmaceutical congresses and conferences, political meetings, festivals, exhibitions and, last but not least, cultural events of all kinds are held thanks to its great variability. Its advantage is its proximity to the city centre, breath-taking views and municipal transportation accessibility.

The Prague Congress Centre is adjacent to the Vyšehrad station on Line C of the Prague underground railway network, providing convenient access by public transport from the city's airport and all major rail and bus stations. It is adjacent to the North-South Prague City Expressway.

Maps, timetables, fares and route planning are available at www.dpp.cz/ en/. For further information on planning your journey, see also Václav Havel Airport www.prg.aero/en and Czech Railways (ĐD) www.cd.cz/en/.









### **Evolution of EuMW**



28

1998 - First EuMW as a EuMA event including

- EuMC
- GAAS (with GAAS Association)
- ECWT (co-sponsored with MTT).
- Exhibition
- Contract with Miller Freeman (then CMP)
- 2003 Horizon House replaced CMP as PCO
- 2004 EuRAD added to EuMW
- **2006 -** GAAS became EuMIC (new agreement with GAAS Association)
- **2007** ECWT became EuWiT (100% owned by EuMA)

### **Evolution of EuMW**



29

- **2008 -** Student Challenge and Women in Engineering
- **2010 -** Defence and Security Forum
- **2011 -** EuWiT absorbed within EuMC
- 2013 Industrial Career Platform
- 2014 Handover meetings formally established
- 2016 EuMW total attendance first time exceeds 5000
- **2017 -** New Conference Software (Converia) replacing TPMS

### **EuMW Best Paper Prizes**



EuMA awards every year a total of 7 Prizes, for the best contributed papers of the EuMW. Some are dedicated as Young Engineer Prizes (YEP):

- EuMC Prize 5,000 €
- YEP EuMC 2,000 € (x2)
- EuMIC Prize 3,000 €
- YEP EuMIC 2,000 €
- EuRAD Prize 3,000 €
- YEP EuRAD 2,000 €

## Certificate of the EuMC Microwave Prize (2003)

31

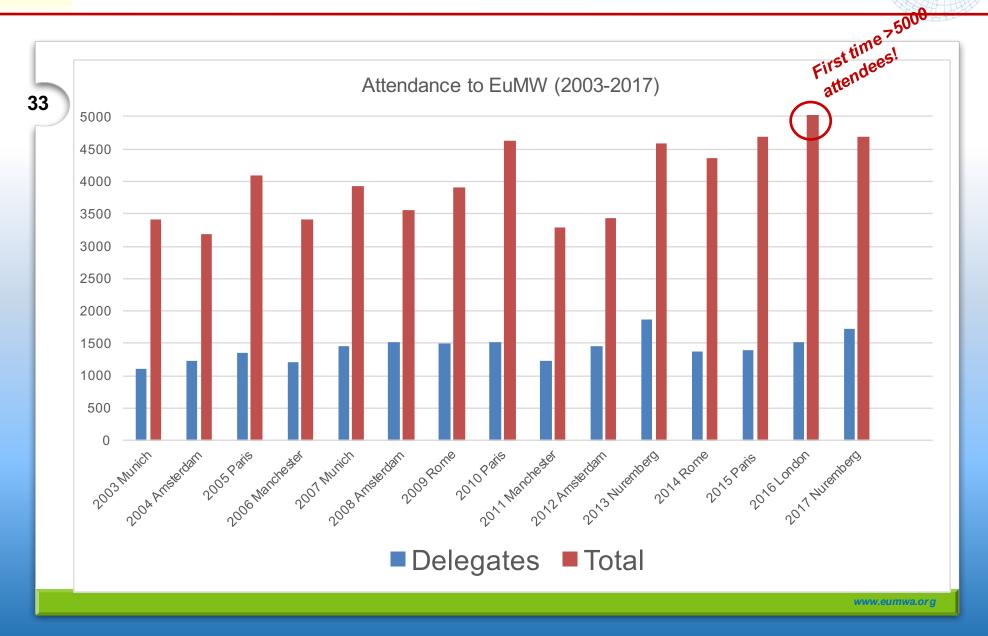
## A Young Engineer receiving his YEP European (Paris 2005)



### Attendance to EuMW



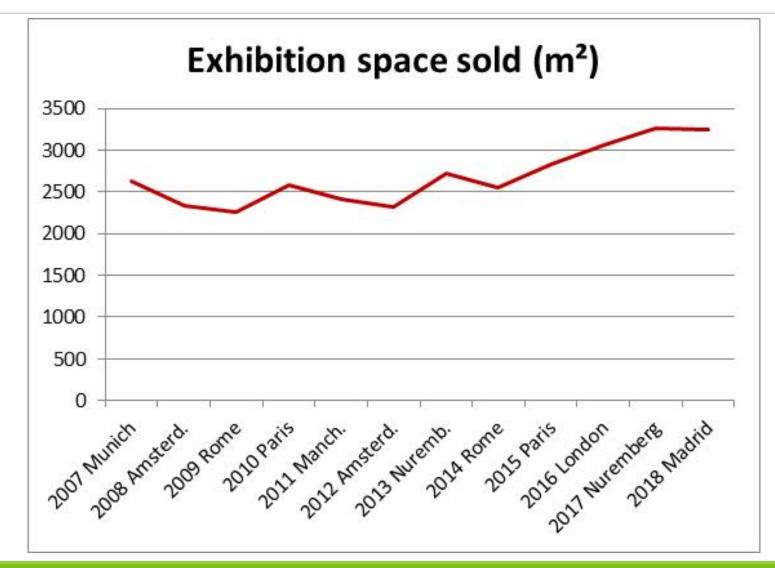
European Microwave Association













35

### Conclusions

- EuMW and EuMA: two parallel extremely successful initiatives
- EuMW has rapidly become a reference event for the microwave community worldwide
- EuMA has developed numerous initiatives besides EuMW to support the microwave community
- Reasons for success:
  - Combination of Conference +Exhibition
  - Dedication and spirit of friendship among the founders



## Closing the first EuMW, 20 years ago..... Can you recognize the founders? (one is missing)





37

## Thank you for your kind attention!