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## EDITORIAL

This issue invites John Gerling, President of Gerling Applied Engineering Inc, to write his personal impressions of the 2nd Global Congress on Microwave Energy Applications (2GCMEA) which was held in Long Beach, California during 22-28 July 2012. John is a member of the Microwave Working Group which together with MRS organised this event.

The Newsletter wishes to thank Mr Bernie Krieger, CEO of Cobber Electronics and President of the Microwave Working Group, for his guidance which culminated in producing an excellent venue of plenary lectures, invited talks and a full programme spanning many topics of Radio frequency and microwave energy use in industry. Special

thanks are also due to Dr Rebecca (Becky) Schulz, of Corning Inc and Conference Chair for the 2GCMEA, for her endless efforts regarding the logistics and organisation of this quadrennial event. We look forward to Cartagena being our host for the 2016 venue of the 3GCMEA.

The Afterthought in this issue is presented by Juan Monzó-Cabrera, General Secretary of AMPERE. In this occasion it deals with microwave technology trends within telecommunication services.

Ricky Metaxas  
EUG St John's College  
Cambridge

UK

## 2<sup>ND</sup> GLOBAL CONGRESS ON MICROWAVE ENERGY APPLICATIONS



by **John F Gerling**  
President of Gerling Applied Engineering Inc.,  
Modesto, CA 95358-0816  
USA

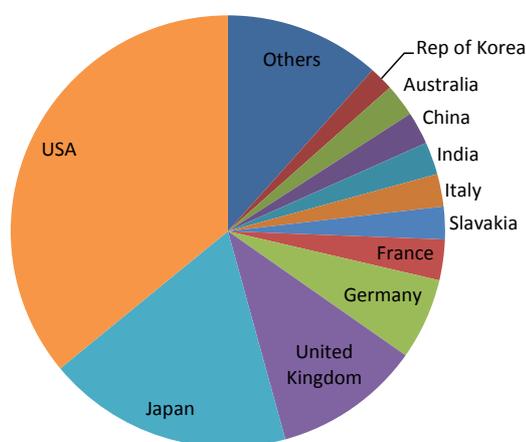
Late Friday afternoon, August 1, 2008, I was finishing packing and making final preparations before leaving home for a 2-hour drive to the airport. Final destination: Lake Biwa, Japan, specifically the Otsu Prince Hotel as venue for the First World Congress on Microwave Energy Applications. Although confident all was done and ready, I went through my check-off list one more time just for good measure: plane tickets – check; GCMEA file folder – check; toothbrush – check; passport – uh oh, where's my passport? I keep it always in the same pocket

in my briefcase, never before having had to verify its presence prior to departure. This time not only was it not there, I could not find it anywhere in the house! Having no other choice I reluctantly accepted this painful twist of fate and began making calls and sending emails to cancel flight, hotel and conference bookings, and also to arrange a stand-in for the talk I was looking forward to give.

Although I missed the first of what we hope will be a long series of international conferences, reports of its success indicated the bar had been set quite high for the 2nd Global Congress of Microwave Energy Applications. Indeed, a tremendous effort had been made to live up to the expectations. With administrative support provided by the Materials Research Society (MRS) and the Microwave Working Group as host society, Dr. Rebecca L Schulz did an outstanding job of planning and organizing as Congress Chair and Technical Program Chair. During initial



planning the attendance was anticipated to be 300, partly based on the turn-out at Lake Biwa. But entirely unanticipated was the global economic downturn which many in our small community felt was an important factor in their decision not to attend. Not to be discouraged, pre-event registrations approached the break-even point as last minute budget trimming became a clear necessity. Total attendance was 164 delegates from 24 countries..



**Figure 1.** 164 delegates from 24 countries attended 2GCM EA

Notwithstanding the greater Los Angeles area's legendary traffic congestion, reaching the Congress venue at the Long Beach Hilton was an easy shuttle hop from LAX. The fabulous and much envied California weather simply could not have been better! A brisk walk to the dozens of nearby fine restaurants and sidewalk cafes quickly became the exercise of choice for many attendees, and with the multitude of visitor attractions throughout the local area (e.g. Getty Museum, Universal Studios, Disneyland) there was no shortage of activities to keep the family occupied. For myself and a few others, the hotel's close proximity to a network of paved bicycle paths provided a perfect alternate to the hotel exercise room.

The conference began bright and early on Monday morning with parallel short courses, one focusing on microwave chemistry and

polymer processing and the other covering basic fundamentals and advanced general topics. Tuesday's technical sessions began with two very well received invited plenary talks by Clark Gellings of the Electric Power Research Institute (EPRI) and George Wicks of Savannah River National Laboratory.



**Figure 2.** Hilton Long Beach & Executive Meeting Center

Gellings emphasized strategies for developing technologies to meet the global consumer demand for electricity, while Wicks presented a detailed review of cutting edge microwave applications in energy, waste remediation, medicine and national security. Special presentations by invited speakers also included AC (Ricky) Metaxas of the UK (3D modeling of gas discharges), VRK Murthy of India (Role of microwave sintering on dielectric material characteristics) and M Sato of Japan (Thermodynamics of non-thermal effects).



**Figure 3.** Clark Gellings of EPRI delivering the opening plenary talk



The Congress technical program consisted of parallel sessions, each hosted by one of the five MAJIC societies and highlighted with panel discussions each day. On Tuesday the Japan Society of Electromagnetic Wave Energy Applications (JEMEA) with a series of talks on Green Processing, followed on Wednesday by a special session hosted by the International Microwave Power Institute (IMPI) and presented by the US Department of Energy. The China and India groups collaborated on the Thursday panel discussion while the Association for Microwave Power in Europe for Research and Education (AMPERE) closed out the Congress with theirs on Friday. Throughout the Congress a series of poster sessions held in the exhibition area conveniently allowed attendees in-depth conversations with the authors. Exhibitors included Alter (Italy), CoberMuegge (USA), Gerling Applied Engineering (USA), Nihon Spindle (Japan), PepsiCo (USA), PSC (USA), Richardson Electronics (USA), Sairem (France), S-Team (Slovakia), US Dept of Energy (USA) and Vötsch (Germany).



**Figure 4.** Panel discussion hosted by the Japan Society of Electromagnetic Wave Energy Applications (JEMEA)

The anticipated highlight of the Congress came on Thursday evening with the banquet dinner aboard the *RMS Queen Mary*, a stunningly beautiful luxury ocean liner launched in 1934 at a shipyard in Scotland. After a storied career and eventual retirement in 1967, she was permanently moored in Long Beach and converted to a hotel and tourist attraction. Dinner for Congress attendees and guests was held in 1<sup>st</sup> Class Smoking Room,

described at the time as “expensive vulgarity” for its Art Deco design intended to appeal to the ship’s well to do passengers.



**Figure 5.** Vadim Yakovlev confers with poster author Kirill Rybakov



**Figure 6.** Industry pioneer John E Gerling explains the use of a device on display



**Figure 7.** 1<sup>st</sup> Class Smoking Room aboard the RMS Queen Mary.



**Figure 8.** The magnificent RMS Queen Mary resting quietly in Long Beach

Guests were treated to a pleasant (if not somewhat austere) buffet style dinner, during which a “magical” performance by our own Edward Ripley left us all wondering if we would each find a shilling hidden behind our ears. And last but certainly not least, Masters of Ceremony Jon Binner and Robert Schiffmann capped off the evening by recognizing the outstanding accomplishments of several members of our community:

- Ricky Metaxas Pioneer Award – Robert Schiffmann
- Rustum Roy Innovator Award – Motoyasu Sato
- Lifetime Achievement Award – Ricky Metaxas
- 1<sup>st</sup> Place Student Poster – Keita Uchihiro, “The Relativity of Substrate and Solvent on Microwave Assisted Organic Reaction”
- 2nd Place Student Poster - Raghunath Thridandapani, “Development of Microwave Dilatometer for Constructing Master Sintering Curves”

Indeed, most seemed to agree that 2GCMEA was an event not to have been missed. Reconnecting with associates and colleagues made the trip to Long Beach well worth the effort. We are all looking forward to a repeat in 2016 when the Universidad Politecnica de Cartagena in southern Spain hosts the 3GCMEA under the direction of Prof Juan Monzo and his colleagues.



**Figure 9.** Edward “believe it or not” Ripley rapping in character



**Figure 10.** M/C Jon Binner directs as Ricky Metaxas presents The Ricky Metaxas Pioneer Award to Bob Schiffmann



**Figure 11.** The friendliest group of Congress organizers ever!

By the way, some three years after having misplaced it I finally found my passport in a file folder on my desk. Hopefully four years from now I’ll have cleaned my desk.



## GRANTS AWARDS FOR ATTENDING THE 2GCMEA CONFERENCE

AMPERE management committee have awarded two student grants for attending the 2GCMEA conference held in Long Beach (USA) to Mr. Francisco J. Clemente-Fernández from

Universidad Politécnica de Cartagena (Spain) and Mr. Yehuda Meir from Tel Aviv University (Israel).

## EVENTS

### **IMPI**

Fall Short Course entitled:  
"Designing Products with a Purpose: The Microwave as an Innovation Platform"  
October 23-25, 2012 at the Radisson Plaza Hotel  
Minneapolis, MN, USA

For more information contact  
Molly Poisant  
Executive Director  
[molly.poisant@impi.org](mailto:molly.poisant@impi.org)

### **HOTPOT: END OF PROJECT CONFERENCE AT TWO CENTRES, FRANCE AND UK**

"Food and Poverty"

Tuesday 22nd January 2013

**Institu Polytechnique LaSalle Beauvais, France**

Guest Speaker: Martin Hirsch, President de L'Agence du Service Civique

and

Wednesday 23rd January 2013

**Old Ship Hotel Brighton, UK**

Guest Speakers:

Martin Caraher, Professor of Food and Health Policy, City University London, UK  
Greg Hooper, Campden and Chorleywood Food Research Association, UK  
Jennipher Marshall-Jenkinson, Chairman Microwave Technology Association UK

For registration visit  
[m.hoare@brighton.ac.uk](mailto:m.hoare@brighton.ac.uk)

Hotpot is a partnership project between LaSalle and Brighton selected under the

European Cross-border Cooperation Programme INTERREG IV A France (Channel) – England and co-funded by the European Development Fund (ERDF)

### **PIERS 2013**

33rd Progress in Electromagnetics Research Symposium (PIERS)

Taipei, Taiwan, March 25-28, 2013

The submission deadline of one-page abstract is October 20, 2012.

On-Line-Submission via web page is strongly recommended.

[http://www.piers.org/piers2013Taipei/submit/submit\\_new.php](http://www.piers.org/piers2013Taipei/submit/submit_new.php)  
<http://piers.org>

### **HES-13**

First announcement and Call for Papers  
HES -13 Heating by Electromagnetic Sources  
May 21 - 24, 2013

Padova (Italy)

For more information visit [www.hes13.org](http://www.hes13.org)  
or e-mail Fabrizio Dughiero or Michele Forzan at [hes13@dii.unipd.it](mailto:hes13@dii.unipd.it)

### **Microwave and Flow Chemistry Conference 2013**

Enabling Technologies for Discovery, Process and manufacturing

20-23 July 2013

Silverado Resort and Spa

Napa Valley California

United States

For more information contact Emma Scarlett at [www.zingconferences.com](http://www.zingconferences.com) or visit:

[www.zingconferences.com/index.cfm?page=conference&intConferenceID=112](http://www.zingconferences.com/index.cfm?page=conference&intConferenceID=112)



### **14<sup>th</sup> International AMPERE Conference 2013**

The 14th International AMPERE conference on Microwave and High Frequency Heating will be staged at National Centre for Industrial Microwave Processing which is based at Nottingham University, UK. The conference will be held during 16-19 September 2013. As with previous conferences in the series the first day will be dedicated to staging short course(s). Details

will be published online in due course [www.ampereurope.org](http://www.ampereurope.org)

### **EHE2013**

The next International Conference on Electromagnetic Fields, Health and Environment, will be held in Porto, Portugal, from 19th to 21st September, 2013.

For more information browse at: <http://www.apdee.org/index.php?pageid=1578>

## **AN AFTERTHOUGHT: MICROWAVE TRENDS IN COMMUNICATIONS**

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Wireless technologies are changing our world and our behaviour at such a speed that it is very difficult to keep updated and follow the technology changes. Basically, smartphones and tablets have been the telecommunication devices most sold during the last two years and it seems that this trend will continue during the next few years.

It is clear that all these wireless devices will need broadband capacity and reduced dimensions and, therefore, all associated microwave circuits will have to accomplish very strict broadband and bit rates specifications with reduced dimensions. Monolithic Microwave Integrated Circuits (MMICs) are right now the best option to accomplish these strict specifications and ensure repeatability.

In parallel, the fiber-optic networks also carry very high information rates and microwave transducers will be necessary to convert data from optical to electrical domain and vice versa. Again, MMICs seem to be very well suited for this task.

Metamaterials also arise as a new tool for obtaining new electromagnetic applications. For instance, scientists at Duke University's

Pratt School of Engineering have validated the first working two-dimensional "invisibility cloak". *The cloak deflects microwave beams so they flow around a "hidden" object inside with little distortion, making it appear almost as if nothing were there at all.* This seems to be very promising for obtaining very low radar cross section signatures for military vehicles and ships.

Microwave harvesting seems to be an interesting alternative for biasing low power devices such as autonomous wireless sensors; especially in big cities where high microwave power density values can be found regardless of the weather conditions.

Microwave wireless sensor tags could be a future application of Internet in the next IPV6 protocol. With this version, many objects could be identified and therefore located within the web. Nowadays, however those tags are still too big to be useful for this purpose.

The continuous development of new communication applications and services and the need of broader bandwidths might put pressure on ISM frequencies and therefore, a strong defense of our frequency space would be necessary in the near future.



## **AMPERE DISCLAIMER**

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Hopefully, these new applications and services will be allocated in higher frequencies.

**Juan Monzó-Cabrera**  
**General Secretary of AMPERE**

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**Readers are therefore advised to consult experts before acting on any information contained in this Newsletter**

**Association of Microwave Power in Europe for Research and Education (AMPERE Europe)**