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Trends in RF and Microwave Heating

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In memoriam: Professor Nguyen Tran (1943-2025) – an outstanding scientist and engineer in the microwave application area

It is with deep sadness that we announce the passing of Prof. Nguyen Tran, an admired lecturer, research leader, mentor, and friend, who dedicated his life to knowledge, creativity, and the people around him.

Born in 1943 in Vietnam, Nguyen Tran emigrated to Australia, where he graduated from Adelaide University, received a PhD degree, and became a professor. For more than four decades, Prof Tran was a cornerstone of the academic community at Deakin University, RMIT, and Swinburne universities in Australia, where he served as a lecturer and research lead.

Prof N. Tran has been working as a scientist and engineer in a wide range of electromagnetic field applications and has brought significant income to Microwave and RF Engineering, Antenna and Propagation, Microwave Technology, Electronics and Communication Engineering, Satellite Communication, and Antenna Design. He was a Member of AMPERE, IMPI, IEEE, Electric Energy Society of Australia, and other professional organisations, and has had a significant impact on the activity of these associations. After retirement, he developed "Mind Control Yoga", a system of science-based yoga and meditation. This work created practices that integrate scientific principles to achieve specific mind-body effects, focusing on aspects like attention, regulation, and stress relief. He published a book, "Mind Control Through Breath Regulation", which has found readers all over the world.

Known for his brilliantly creative mind, he approached every challenge with originality and rigor, inspiring generations of students and colleagues. His work was not only marked by intellectual excellence but also by his eccentric humour and infectious laughter, which made even the most complex ideas feel approachable. To those who knew him personally, Nguyen Tran was far more than an academic. He was a dependable friend, a generous mentor, and a guiding light. Always willing to help, he gave freely of his time and wisdom, shaping the lives and careers of countless students. His sense of humour and quirky personality made him unforgettable, while his dedication and hard work earned him the deepest respect.

For 45 years, he was not only a supervisor and lecturer but also a true companion in the journey of learning and life. His legacy lives on in the minds he sharpened, the research he advanced, and the friendships he nurtured.

Nguyen Tran was a devoted family man. He shared his life with Fay Tran, an accomplished English teacher, and together they raised three children. Our heartfelt condolences are extended to his beloved wife, Fay, his children, grandchildren, and all his family, friends, former colleagues, and students.

Nguyen Tran's impact will be felt for generations to come. He will be remembered with gratitude, admiration, and affection by all who had the privilege of knowing him.

Deeply missed
Grigori Torgovnikov

I have many fond memories of Nguyen during our countless meetings at IMPI, World Congress (the predecessor to the GCMEA) and AMPERE.

I recollect when he invited Bob Schiffmann and myself to the University in Melbourne to take part in a seminar he organised. After the seminar we all drove from Melbourne to Sydney for another meeting and took it in turns to drive the 876 km between the two cities. When it was my turn to drive, with Nguyen sitting in the passenger seat, as we approached the outskirts of Sydney, I became aware every now and then of a disconcerting noise coming from the right-hand part of the engine. Nguyen seemed worried, as was Bob, and every now and then as the noise became louder Nguyen would murmur something like “I had this problem before, so we better soon investigate”. I became suspicious and suddenly turned towards Nguyen who could not suppress his laughter anymore. He was creating the noise by banging the side of his door with his knuckles! That was typical of the playful Nguyen, who was no doubt encouraged by Bob, conspiring to play a ruse against me.

Nguyen was a fitness fanatic. At the AMPERE conference in Fermo in 1997 he would join Margaret in a late afternoon swim 2 or 3 times around the long island facing Fermo’s sandy beach. On another occasion when he came to stay with us in Cambridge, I suggested that we go to the local leisure centre for exercise and a swim. He insisted on jogging there and back even though it was 5 km away and would not join me in my car.

Indeed, these were many such fond memories of Nguyen who I looked at as a friend as well as a very eminent colleague.

RIP
Ricky Metaxas

Organizing a conference day dedicated to microwave industrial applications

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The 20th edition of the AMPERE Conference is now over and so is the Industry Day. It was a great event and a great success – says the feedback received. But…

1. How and why did it happen?

Both the Industry Day and the Medical & Biological Applications session[1] dedicated to Nevio Tosoratti were new additions to this year's program.

The idea for the Industry Day 2.0[2] emerged at the end of the 19th AMPERE conference in Cardiff in 2023. I personally loved the Cardiff conference – as a scientist (what is left of it anyway), I always enjoy hearing about microwave research and the advances disclosed at such events. However, I felt that something was missing: a more robust link between academia, equipment manufacturers, and businesses. This became particularly apparent at the end of the conference when the exhibitors started packing up their stands and we said our goodbyes, knowing that we would most likely see each other again at the next AMPERE conference.

Setting aside any competition among historical AMPERE exhibitors such as Leanfa, MKS, Muegge and Sairem, we started a friendly discussion about maintaining closer contact and leveraging AMPERE conferences to better benefit the participants and the exhibitors without whom organising such conferences would be very difficult.

Francesco Garuti (Alter/MKS), Marco Fiore (Muegge Group/Leanfa), Markus Dingeldein (Muegge Group), David Vennin (Sairem), Jean-Paul Bernard (MIS Company and one of the AMPERE's Industry link) and I, we all agreed on the spot that the Industry Day (ID) was a good idea and that we were willing to organise it. We also briefly discussed the format of the day: one session dedicated to microwave industrial heating applications and another to microwave industrial plasma applications. And who better to help organise this than John Bows (PepsiCo) and Philippe Bergonzo (Seki Diamond)? The ID TEAM was now complete!

As we parted from Cardiff, we had a plan that was pitched to the AMPERE2025 local organisers - Cristina Leonelli and Paolo Veronesi, as well as to the AMPERE President - Georgios Dimitrakis at our first online meeting on 16 February 2024. All thumbs up by the end of the meeting!

From that day on, we held e-meetings every two months on a Friday afternoon when everyone else around us was perhaps in weekend mode. We managed to avoid complicated agendas and business travel (and holidays), and the plan gradually came together. Who says *All beginnings are hard* when the TEAM works like clockwork?

As we agreed that the primary aim of the ID was to showcase real end-user solutions and provide proof that microwaves are being used by the industry, as well as encouraging dialogue between researchers, equipment manufacturers, and end-user companies, we created an organisational chart (see Annex 1) to convince end-users to participate. We even considered introducing an award, the Scale-Up Award, which would be given to an ID speaker based on audience voting.

[1] Co-organised by Prof. Li Wu, Sichuan University, PRC, Prof. Christopher Brace, University of Wisconsin-Madison, USA, Prof. Punit Prakash, George Washington University, USA, Prof. Marta Cavagnaro, Università La Sapienza, Rome, Italy and Marco Fiore, Leanfa/Muegge Group, Ruvo di Puglia, Italy.

[2] I organised the first Industry Day at AMPERE 2011 in Toulouse. It was a half-day event and as far as I remember, it was also well received by participants.

The Industry Day TEAM at the Gala Dinner. From left to right: Paolo Veronesi, Li Wu (co-organiser of the Biomedical session), Marilena Radoiu, Markus Dingeldein, Philippe Bergonzo, Marco Fiore, David Vennin, John Bows, Francesco Garuti (credit to J.P. Bernard).

2. D-Day structure

The ID was organised as a one-day event with two main sessions:

- Industrial Microwave Heating with 7 speakers – John Bows (PepsiCo, UK), Rudy Tops (Tops Foods, Belgium), Luca Perregrini (Endeavour, Italy), Alexander Feigl (Krones AG); Alberto Lazzaretti (Gr3n SA, Switzerland), Michele Pagotto (SMC Group Srl, Spresiano TV, Italy), and Christian Bianchi (UNOX, Italy).
- Industrial Microwave Plasma with 4 speakers – Mathé van Stralen (Prysmian, Netherlands), John Ciraldo (Washington Diamond Advanced Materials, USA), Jayam Sonani (Diamond Elements Pvt Ltd, India), and Hildegard Sung-Spitzl (iPlas Innovative Plasma Systems GmbH, Germany).

Three plenary lectures were given:

- Prof. Georgios Stefanidis of the National Technical University of Athens kicked off the ID with a lecture on how microwaves can contribute to the intensification of the processes of chemical reactors (and how much the chemical industry needs these changes!).

- In less than 40 minutes, Dr. Philippe Bergonzo of Seki Diamond Systems – Cornes Technologies USA taught the audience about how lab-grown diamonds are obtained using microwave plasma (and how shiny they are!) and explained why industries need them.
- Prof. Chris Dodds of the University of Nottingham, UK, lectured on mega-scale industries and provided insight into what microwave equipment manufacturers are expected to produce in order to help these industries reduce their carbon footprint.

A Panel Discussion including all the Plenary & Industry Day speakers was then moderated by AMPERE's President, Prof. Georgios Dimitrakis together with AMPERE2025 co-organiser, Prof. Paolo Veronesi.

The Panel Discussion. From left to right: Mathé van Stralen, Philippe Bergonzo, John Bows, Hildegard Sung-Spitzl, Georgios Stefanidis, Jayam Sonani, Chris Dodds, Michele Pagotto, Alberto Lazzaretti (credit to DIGILABS, Italy).

At the end of the animated discussions, the winner of the Scale-up Award was announced (Paolo, thank you for the clever app!).

Alexander Feigl of Krones AG won over the audience with the quality of his presentation and the industrial readiness of Krones' equipment for PET bottle manufacturing. Last but not least, the ID was crowned with four 10-minute talks about the emergent applications of microwaves as a fully electrified technology. The speakers were Alberto Pascual (Instituto Tecnológico de Aragón, Spain); Renaat Van Geel (MEAM, Belgium); Paolo Veronesi (Department of Engineering "Enzo Ferrari", University of Modena and Reggio Emilia, Italy); and Marilena Radoiu (Microwave Technologies Consulting, France).

The Scale-up Award winner, Alexander Feigl (right) with Marco Fiore and Marilena Radoiu (credit to DIGILABS, Italy).

3. What did we learn? What will we do differently?

To mark the 40th anniversary of the Association for Microwave Power, Education and Research in Europe (AMPERE), and the 20th AMPERE conference, we wanted to showcase the industrial applications of microwaves for heating and plasma. Industry Day 2.0 was an important milestone in demonstrating this.

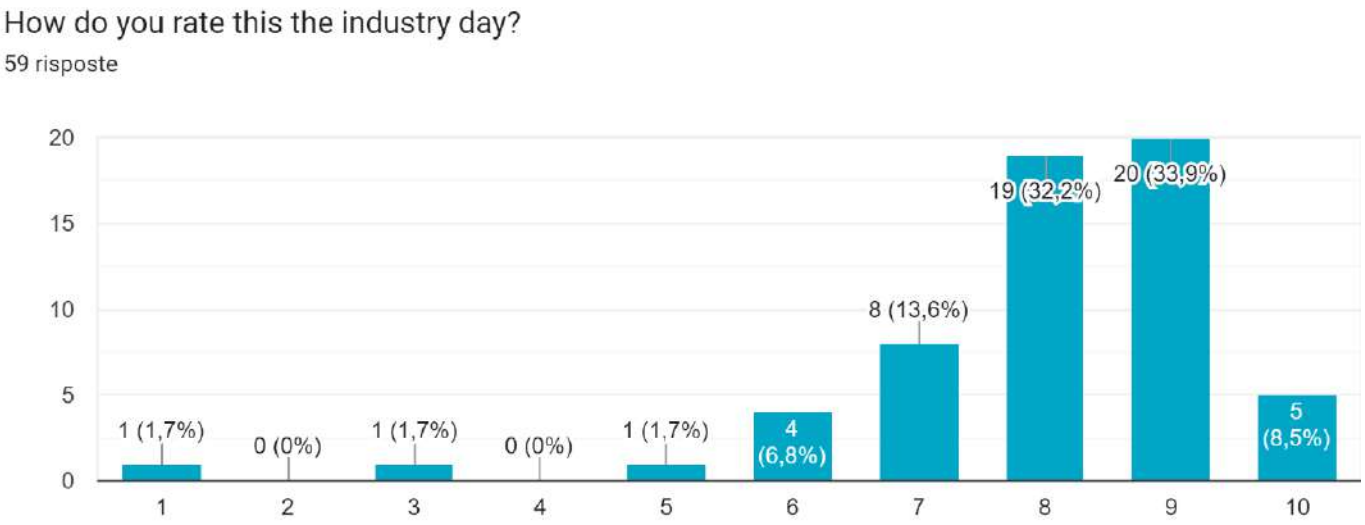
Although the final programme was rather dense (much denser than we had anticipated three - four months before the conference), and that we experienced some delays and that we ran out of time (but hey, we were in Italy!), we managed to adapt on the spot and generally speaking, to make a good impression.

We learned that it is not easy to bring industry representatives among us – the issue of confidentiality is well acknowledged – but when they do attend, they add a lot of value to our conference and provide satisfaction for everyone involved with the technology. I am personally very grateful for their attendance and involvement, their time and the quality of their presentations! THANK YOU!

We also learned that organising this kind of event (an event inside another event – Cristina Leonelli said) requires a lot of time, a very enthusiastic and innovative (dream) team as well as plans A, and B and C and even plan N. Clearly, a different organisation to that of the general conference is required.

Effective communication is the key, after all!

Shall we do it again in 2027?



Results of the Industry Day satisfaction survey (credit to P. Veronesi).

Group photo of the Industry Day audience & participants (credit to DIGILABS, Italy).

Annex 1. A chart for organising the Industry Day

1. Only end users are admitted. This means they must have an application at industrial scale, including plasma CVD of diamond.

2. The industry day is organised on one dedicated day with no other sessions running in parallel.

3. End users will give a 15-minute presentation. They are asked not to reveal any confidential information, but rather to talk about the process of scaling up from the initial idea to the industrial process, including how long it took, how difficult it was, why microwaves were used, whether IP was filed, etc.

4. End users are asked not to publicise their presentations and are given the right to refuse any questions from the audience that may be considered confidential.
5. End users will be asked not to publicly disclose or thank their equipment manufacturer (e.g., 'Thank you, Muegge, for the generators…').
6. The Industry Day's will have two chairs (Marilena Radoiu & Philippe Bergonzo at AMPERE2025).
7. A one-hour panel discussion will be organised at the end of the Industry Day oral presentations. All Industry Day speakers and the three keynote speakers are invited to participate, but are under no obligation to do so.
8. A Scale-up Award to be given at the end of the panel discussion, and the audience will be asked to vote using an app. Instruction for voting distributed directly inside the conference room on the morning and during the Industry Day.
9. To end the Industry Day, a few very short presentations (10 minutes each) are scheduled after the panel discussion in the 'Emergent Applications' category.
10. A get-together buffet party ends up the day.

Personal reflections of AMPERE25

A.C. (Ricky) Metaxas

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The 20th in the series of AMPERE conferences was held in Bari, Italy during 15 to 18 Sept 2025.

Prior to the start of the conference a welcome party was held at the splendid restaurant 44 Gatti in downtown near the polytechnic.

Welcome party at the 44 Gatti restaurant.

The venue was the magnificent Villa Romanazzi Carducci Conference Centre comprising a large lecture theatre holding up to 250 persons supported by three smaller lecture rooms enabling four parallel sessions covering the many diverse topics.

View of the venue.

The plenary sessions were all held in the large lecture theatre starting on Tuesday by a talk from Christopher Brace about microwave ablation

describing the advances in cancer therapy using both RF and microwave energy. It was followed by Sandra Costanzo describing the multifarious microwave technologies for sensing and diagnostics.

The large lecture theatre (1/2).

The large lecture theatre (2/2).

Coffee break.

After a brief coffee break the participants had the option to remain in the main lecture theatre where three sessions on Medical and Biological Applications concluded the first day. In parallel delegates could proceed to the other three smaller rooms where sessions on Chemistry/Biochemistry and Processing, Dielectric and Material Processing, Biomass and Waste Processing, Material Interactions and Plasma Phenomena and Processing took place.

Switching from the various sessions it was interesting to note that the delegates were evenly split between these smaller rooms. Each session started with a keynote lecture and a nice gesture by the organisers was to present each plenary and keynote speaker with a certificate signed by the conference chairman, Prof. Paolo Veronesi, as a token of appreciation for their efforts.

The exhibitors area.

A unique feature of AMPERE25 was the decision to dedicate the whole of Wednesday to an "Industry Day" without any other topic being aired. This will be described in this Issue by Dr Marilena Radoiu the principal prime mover behind this initiative.

Thursday reverted once again to a similar format to that of the first day starting with two plenary sessions. The first was presented by Prof Satoshi Horikoshi who focused on Solid state Generators as Enablers of the Next Generation of Microwave Applications. The talk started with solid state transistors of a few Watts influencing the growth of plants to describing the potential of far larger applications not necessarily replacing the high power magnetron but working alongside it. It was embarrassing to me when Satoshi ended his talk showing a video of myself singing well known Italian songs such as "O sole mio" and "Volare" accompanied by the very accomplished guitarist Antonino Rizzuti which was recorded at a dinner hosted by Cristina Leonelli for short course lecturers the Sunday preceding AMPERE25. Recovering from the initial shock and influenced by the increasing murmur and clapping of the audience I stood up and bowed encouraging even louder cheers.

Some delegates remained in this lecture theatre to attend to sessions on Biomass and Waste Processing and Measurements and Metrology while the other parallel sessions focussed on Process Intensification and Food Processing, Industrial Equipment and scale up, EM Modelling and Numerical Techniques, Design of Applicators and Components, Material Interaction and Measurements and Metrology concentrating on THZ and Millimetre Wave Applications. The Posters were well displayed in an adjacent courtyard next to the main lecture theatre and were well attended.

The Posters session.

The Gala Dinner was held at Masseria Cariello Nuovo a 17th century country House located approximately 25 km from Villa Ramanazzi. Being in Italy we were "en plein air" under a cloudless sky with tables of ten people spaced around a magnificent courtyard. We were greeted by the spectacle of a band playing Italian songs along with a traditional dance group and individual kiosks offering little pre-dinner snacks. Drinks of prosecco, beer and refreshments were on offer as well as a variety of Italian hors d'oeuvres such as bruschetta, antipasto, prosciutto, mozzarella, cheeses or fried cheese curds which were crispy on the outside and gooey on the inside.

The hors d'oeuvres were continuously being placed at the tables while we were entertained by the band. After an hour or so the delicious aromas of barbecued food wafted from various corners of the courtyard. Sausages, pork and a variety of other meats completed the meal.

The Gala Dinner (1/2).

The Gala Dinner (2/2).

It was then time for the Awards Ceremony which was conducted by the President who asked the AMPERE25 Chair Prof. Paolo Veronesi to present various student awards. These were as follows:

- BEST POSTER award (700 euros):
  - Carmen van Poelgeest, Faculty of Engineering, University of Nottingham, Nottingham, UK
- BEST ORAL presentations:
  - First PRIZE (1000 euros): Lucas Briest, Institute of Process Engineering, Otto-von-Guericke-University Magdeburg, Germany
  - Second PRIZE (800 euros): Ryo Ishibashi, School of Engineering, The University of Tokyo, Tokyo, Japan
  - Third PRIZE (500 euro): Parvathi Vasudevan, Department of Materials, Loughborough University, Loughborough, UK

- Travel grants (500 euros) were awarded to:

- Muhammad Usman Azam, Cardiff University, Cardiff, UK
- Marco Di Cristofano, Department of Information Engineering, Electronics and Telecommunication, Sapienza University of Rome, Rome, Italy
- Aleksandra Sierakowska-Byczek, Faculty of Chemical Engineering and Technology, Cracow University of Technology, Cracow, Poland.

The Awards Ceremony.

Finally, the president together with Dr Metaxas presented the following AMPERE25 awards:

- The Fellowship was bestowed on our Treasurer Koen van Reusel who has conducted so adroitly the transition of our operations to France and has liaised with the appropriate authorities in Paris making sure that our Statutes are kept in order.
- The recipient of the coveted AMPERE Medal was Prof Jose Manuel Catala-Civera the Director of Itaca Institute in Valencia alas in absentia. Due to unforeseen circumstances Jose could not be with us so the Medal was received by his colleague Felipe Peñaranda Foix.
- The Ricky Metaxas Young Researcher award was offered to Dr Cecilia Mortalò, who is affiliated with the Institute of Condensed Matter Chemistry and Technologies for Energy (ICMATE), National Research Council, Padova, Italy.

The Chair was then offered speciality pens with the AMPERE Logo to a number of persons who contributed to the organisation of AMPERE25, not least Cristina Leonelli and representatives from the Polytechnic University of Bari and of Digilabs the Technical Secretariat. I also received such a pen in recognition of my continuous support and for attending every single one of these biennial venues.

Koen van Reusel awarded with the AMPERE Fellowship.

Dr. Cecilia Mortalò awarded with the Ricky Metaxas Young Researcher award.

Cutting the cake.

The evening wound down by a magnificent display of rock and roll and disco dancing while I was given the honour of the first cut of the splendid cake celebrating 40 years of AMPERE.

As the President reminded us it was a double celebration as 20 years ago we were in Modena and it was 40 years since the inaugural conference at St John's College, Cambridge.

The overall consensus of AMPERE25 was that it was run extremely well with everything going according to plan: the coffee breaks accompanied by an assortment of cakes, the dinner at the Tabula Rasa for the short course lecturers and the dinner at the 44 Gatti for all participants as well as the lovely lunches at the garden of Villa Ramanazzi. An evening walk exploring interesting aspects of the city of Bari was also enjoyed by all.

AMPERE President with the local organizing committee.

Poster Sessions were well attended displaying a variety of topics in our field of activity. Of course it is worth pointing out that the excellent weather averaging of 26ºC and uninterrupted sun helped enormously. For all concerned there was also swimming pool for a quick dip and some relaxation.

In September 2027 we will meet again for the 21st conference in the series hosted by Prof Georgios Stephanidis and his colleagues of the Polytechnic in Athens. The conference venue will be the Zappeion complex which is a magnificent looking building next to the National Gardens in the heart of Athens. In 1869, the Greek Parliament allocated 80,000 square metres of public land between the Palace Gardens and the ancient Temple of Olympian Zeus, and also passed a law on 30 November 1869, "for the building works of the Olympic Games", as the Zappeion was the first building to be erected specifically for the revival of the Olympic Games in the modern era.

See You in 2027.

A selection of the hundreds of photos taken by our colleague Vladimir Bilik are shown below:

Conference site.

Scientific sessions (1/3).

Scientific sessions (2/3).

Scientific sessions (3/3).

Exhibition (1/2).

Exhibition (2/2).

Coffee break (1/8).

Coffee break (2/8).

Coffee break (3/8).

Coffee break (4/8).

Coffee break (5/8).

Coffee break (6/8).

Coffee break (7/8).

Coffee break (8/8).

Bari old town tour (1/4).

Bari old town tour (2/4).

Bari old town tour (3/4).

Bari old town tour (4/4).

Take a drink (1/9).

Take a drink (2/9).

Take a drink (3/9).

Take a drink (4/9).

Take a drink (5/9).

Take a drink (6/9).

Take a drink (7/9).

Take a drink (8/9).

Take a drink (9/9).

“The industrialists”.

Gala Dinner (1/13).

Gala Dinner (2/13).

Gala Dinner (3/13).

Gala Dinner (4/13).

Gala Dinner (5/13).

Gala Dinner (6/13).

Gala Dinner (7/13).

Gala Dinner (8/13).

Gala Dinner (9/13).

Gala Dinner (10/13).

Gala Dinner (11/13).

Gala Dinner (12/13).

Gala Dinner (13/13).

About AMPERE Newsletter

AMPERE Newsletter is published by AMPERE, a European non-profit association devoted to the promotion of microwave and RF heating techniques for research and industrial applications (http://www.ampereeurope.org).

New structure of the AMPERE Newsletter

At a management meeting during AMPERE23 it was decided that in view of the introduction of the new scientific Journal entitled "European Journal of Microwave Energy" supported by CUP, no technical papers will be published in future Issues of the Newsletter. Instead, AMPERE welcomes submissions for short bios on individuals, articles, research proposals, projects, briefs as well as news.

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