



AMPERE Newsletter

Trends in RF and Microwave Heating

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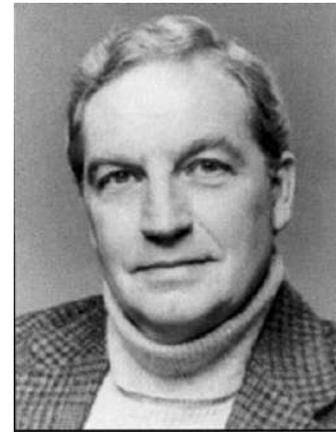
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In this Issue:

Page

Obituary and Recollections for Bob Schiffmann	1
Report on AMPERE 2021: A virtual conference inspired by Gothenburg Birgitta Raaholt, Per Olof Hedekvist	9
Report on AMPERE 2021 panel discussion on microwave education and teaching: how to attract students when anybody can become an influencer? Per Olof Hedekvist	12
Report on the XIX International UIE Congress on evolution and new trends in electrothermal processes Koen Van Reusel, Vadim V. Yakovlev	13
Ricky's Afterthought: Which generation do you belong to? A.C. Metaxas	17
Job offers	19
AMPERE-Newsletter's Editorial Information	20

Obituary and Recollections for Bob Schiffmann



Bob Schiffmann

It is with great sadness that this AMPERE Newsletter reports the death of microwaves legend Bob Schiffmann, occurred on the last September 4th.

We report below an obituary by our Editorial Board, followed by recollections from colleagues that new Bob well over the past 50 years.

The statement issued by the IMPI Board of Governors on Sept 6, 2021 announcing the death of IMPI President Bob Schiffmann can be found at https://impi.org/wp-content/uploads/2021/09/President-Bob-Schiffmann_Final.pdf

Dr. Roberto Rosa

Editor in Chief, Department of Sciences and
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and Reggio Emilia, Italy

Robert (Bob) Schiffmann, the President of IMPI, passed away on September 4, 2021. Bob was involved in microwave and RF activities for nearly 60 years, until his last days. As a physical chemist, educated in Columbia and Purdue universities, Bob's career included R&D and consultation activities, and legal services as an expert witness. Bob held 28 US patents and was the co-author of several books. Bob chaired over twenty international conferences, and led many international courses on various aspects of microwave and RF processing technologies.

Mr. Schiffmann was widely recognized for his professional contributions. He was a Fellow of IMPI; the first recipient of the Metaxas Microwave-Pioneer Award (for his work in microwave power

applications for industrial and consumer applications); a laureate of the AMPERE Gold Medal (for lifetime achievements in microwave technology); and an Honorary Professor of the Kunming University of Science and Technology in China.

Besides his own professional activities, Bob voluntarily contributed to the microwave-heating associations in the US, Europe, and Asia, and he was widely recognized as a senior leader by these professional communities worldwide. Bob served as the President of IMPI in several periods (for 22 years in total). To his last term as IMPI's President, Bob was called more than a decade ago in order to rescue the organization from a severe managerial and professional crisis then. Despite the slim chances, Bob had successfully recovered the organization by his devoted leadership efforts. He reorganized the hired staff, created new income sources, balanced the deep financial deficit, and paid all the organization's debts (including those considered as totally lost by the creditors). Furthermore, in this period Bob has merged new technological sections into IMPI, such as the solid-state energy branch. In addition, he established fruitful collegial relations with other (seemingly competing) associations worldwide, including AMPERE. The present renaissance of microwave and RF processing technologies, and of their professional-association networking worldwide, is very much attributed to Bob's wise and friendly leadership.

Bob Schiffmann will be remembered not only as a pioneer of microwave technologies, and as a professional and organizational leader, but also as a kind and decent person who loved people and was warmheartedly respected by his colleagues worldwide.

For more reading: "An interview with Mr. Bob Schiffmann – IMPI's President," AMPERE Newsletter, Issue 95, March 12, 2018, Page 33 <https://www.ampereurope.org/issue-95/>

AMPERE Newsletter Editorial Board

Farewell to a dear friend and colleague

On Sept 6 the microwave heating community at large was stunned by the announcement by the IMPI Board of Governors that Bob Schiffmann had passed away following the recurrence of an aggressive cancer.

Many of our readers will not be aware that in the 1970's IMPI organised three of their Symposia in Europe. The first was in 1973 at Loughborough University, UK and it was at that Symposium that I first came across Bob. He had just been elected President of IMPI. He was wearing a large fur coat and I remember he was striding up and down the hall before the election took place ready to take the mantle of what was seen at the time as the only major organization which dealt with the topic of microwave heating. It soon became evident that he was a trend setter as regards all aspects of microwave heating as well as an inventor and entrepreneur. He was pivotal within IMPI and on a number of occasions he was asked to assist in steering the organisation on a path of recovery. He was also very supportive of AMPERE and a founding member.

I have many fond recollections not least the day we spent at his cabin at the Catskills mountains in Upstate New York in 1978 with his children and Stan Stuchly or the memorable dinner with Bob and Marilyn and the Kriegers at the rooftop restaurant of our hotel during the 2015 AMPERE meeting at Krakow. With Bernie and Bob on opposite camps politically the conversation produced vigorous arguments albeit at the end ending with a smile and toasting the future.

He and I kept in touch for over 45 years and the past few years we would often email each other, exchanging views about science and matters

pertaining to industrial applications. He was very generous with his time and advice always ready to assist.

He will be sorely missed and our thoughts are with his wife Marilyn and the family.

Ricky Metaxas

I think I first met Bob at the first conference I ever attended in 1989 (AMPERE, Arnhem, NL) and certainly at IMPI conferences from the early 1990s. Once you met Bob, you cannot un-meet him! In an instant, Bob was this larger-than-life character who you never forgot, and looked forward to meeting again.

In my early career, Bob came across as quite scary (to me!), a force of nature, never afraid to ask questions and challenge literally any presenter. But in casual / social settings, Bob was always delightful and full of neverending stories from his early development work in the 1960's to more recent court room dramas as an expert witness in microwave injury work. Bob should have written a book about his microwave stories!

Bob consulted for me on various research projects over the last 30 years. His vast experience of product and process success and failures was always insightful and very useful. And Bob's network and connections must be second to none, they helped me out more than once.

I last met Bob in person at the 2019 AMPERE conference in Valencia, I was lucky enough to share a table with Bob at the gala dinner along with other microwave giants (Ricky, Bernie, John Gerling), the conference highlight for me! Most recently at the virtual 2021 IMPI conference, Bob was the same dynamic leader as when I first met him 30 years ago. I really cannot believe Bob has left us, I will miss him greatly. My sincerest condolences to Bob's family and friends.

John Bows

My first encounter with Bob would have been at the Microwave Congress held in Sydney, in 2002, which was my first experience at an international conference. I presented a paper from my PhD, which was based on rapid microwave heating of green timber to burst the wood cells, followed by solar drying of the timber. Bob seemed to think this was a

good idea. I soon discovered that one of his pet peeves was using microwave energy to dry materials. He thought it used far too much energy.

I continued to encounter Bob at further conferences in the US and at AMPERE Conferences. I quickly concluded that Bob did not suffer fools, but was very supportive of people with new and sensible ideas for microwave applications. In 2015, I was asked to become a Board Member for IMPI, which, along with being an unexpected honour, allowed me to know Bob much better. He was willing to place trust in others. On two occasions (2015 and again in 2017) he asked me to deputise for him at the Chinese National Microwave Conferences. I also observed this trust with others as well.

He was at the helm of IMPI for quite some time and by combining his enormous energy with that of Ms Molly Poissant, they have steered IMPI back to being a vibrant association. He will be greatly missed. He was passionate about microwaves and their applications. He seemed to enjoy learning new things, although his knowledge was extensive, and from my perspective he was a great mentor and friend. We will miss him.

Graham Brodie

I am devastated to hear the sad news of Mr. Bob Schiffmann's passing. Bob was IMPI's trusted President and showed excellent leadership skills through Microwave Working Group as well. Every time I see him, I could receive his encouragement over the research development. I shall miss him always as one of the research fellows. I hope he rest in peace forever.

Yoshio Nikawa

I probably first met Bob back in the early 1990s, though it could easily have been earlier. Bob was one of those people who, once you have got to know them, it really feels as if you have known them all of your life.

In many ways, he was a larger-than-life character; always smiling, always cheerful, always happy to share his knowledge, his experience and his remembrances. He came from an unconventional background, having been a ballet dancer in his youth (I've seen the pictures that line the staircase of his brownstone house in New York), but rapidly

became, I believe, the most sought-after consultant in the field of microwaves, both for cooking and other industrial applications. He was also insatiably curious, often asking not only more questions than anyone else in a room, but usually the most perceptive as well.

My best memory of him, however, is his willingness to join in any fun going, which included choreographing and then participating in a dance routine as entertainment for the delegates attending the AMPERE conference being held in Bayreuth, Germany, in 2001. Although I typically only got to see Bob once or twice a year at microwave conferences, I will still miss him a lot; the world is that little bit smaller a place now.

Jon Binner



From right to left, Bob Schiffmann, Monika Willert-Porada, Jane Binner and Jon Binner entertaining the AMPERE 2001 delegates in Bayreuth, Germany.

I first met Bob in the summer of 2010 at the IMPI Symposium in Denver, Colorado. Right from the start, it was clear to me that Bob was something special. He was a natural leader and had an uncanny way of making newcomers feel welcome. He took a chance on me when he asked me to become the Executive Director of IMPI, and over the next 11 years, I soaked up as much as I could from him both professionally and personally.

Early on, I learned how to stay on Bob's good side: ensure a copy of the NY Times was delivered to his hotel room at our annual events! I have so many wonderful memories over the years: the dinners with Bob and Marilyn, the advice he would share with my sons when he visited Richmond,

Virginia each year, the work calls interrupted so he could tell me about the wildlife he spotted outside his lab in the Catskills, and the times his dictation device would accidentally swap out what he intended to write with some foul language! Bob never took himself too seriously; he gave freely of his time and was one of the kindest people I have ever known.

Bob loved leading IMPI and he often marveled at how lucky he was to spend his life working alongside so many talented and good people. The last true “work email” I received from Bob before his illness was titled “IMPI’s Future.” As we navigate how to move forward without Bob at the helm, we’ll look to his words, and the example he set for all of us. In the end, IMPI was his legacy. We’ll continue the work - he wouldn’t want it any other way.

Molly Poisant

Executive Director, IMPI

Here are a few of my special memories with Bob:

It was 1979, the place Monaco. Bob, Ken, Percy and other senior members were waiting the arrival of Wayne Tinga, President of IMPI. Then, to our surprise, on his arrival he gave us some startling news. During his flight over he received a message from a Christian Hierarchy to relinquish his Presidency of IMPI. This he did and Bob Dechero took over!

Then, following the Symposium, we spent a few days together getting to know each other, with Bob at the wheel of a 4-seater VW driving through the streets of Monaco and trying to understand Wayne's predicament [photo below shows the four of us].

Soon after all the proceedings had finished, Bob was elected the Presidency of IMPI. Over the next 25 years Bob and I became very good friends with collective knowledge in the microwave arena. I would help him with microwave measurement activities and techniques and he would bombard me with theory. He would travel many times to our lab facilities in Orlando and latterly in Nashville and I with trips to Bob's homes in New York and the Catskills.

One very funny incident at one of the IMPI Symposiums was when many members would play with a yellow rubber duck in the hotel's pool and

whoever won the silly game got the Rubber Ducky Award! Fun times.



From left to right, Percy Giles, Wayne Tinga, Ken Eke and Bob Schiffmann

We soon learnt that we had one thing in common. Maybe not too many people know that Bob in his younger days was a ballet dancer and I was a Latin American dancer. With my business in England, Bob was invited on a popular British television series to explain the workings of the microwave oven and its safety. He also involved himself with the electrical transmission authorities in the UK, known as ATL and BEAB.

Bob and I then decided it would be useful to the Microwave community to jointly combine our technical knowledge into a video format with us both presenting our knowledge and accomplishments over the years.

As our health waned, we would FaceTime each other often and, just before his passing, Bob told me his condition was terminal and was giving up his Presidency of IMPI. I was shocked and saddened – I will miss my friend yet he led such a rewarding life...

With my deep affection,

Ken Eke

On a quiet afternoon of a Sunday of early September (September 5th), members of International Microwave Power Institute (IMPI) Board of Governors received an email from IMPI Executive Director Ms. Molly Poisant that shocked us all: IMPI President Bob Schiffman passed away after suffering

from a short illness. This news has saddened everyone associated with IMPI.

I got to know Bob after joining IMPI in 1996. But my close association with him started in 2009 when I served as IMPI President. While diving deep into the busyness of the organization as the new president, I soon realized that IMPI was in a very bad financial condition. It had accumulated a large debt with an increasing deficit in yearly operation. The financial burden badly influenced the functioning of the organization and jeopardized the future of the Journal of Microwave Power and Electromagnetic Energy (JMPEE). I also realized that the reasons why IMPI had gotten into this situation were so complicated that I, a university faculty member, did not have time and business experience to address them.



Bob Schiffmann (2nd from right in front row) with Tang's students and research associates of Washington State University at 2012 IMPI Annual Meeting in Providence, USA.

At the annual meeting, I informed Bob about the situation and talked Bob into running for IMPI's president in 2010. I could not think of anyone else to save IMPI and JMPEE. Having a deep love for IMPI, Bob took the challenge. Over the first several months as the new IMPI President in 2010, he and Molly spent hundreds of hours diagnosing problems and making difficult decisions. Those efforts paved the path for IMPI to gradually move out of the financial hole. Under his leadership, IMPI organized several industry sponsored symposia and workshops per year, in addition to annual meetings. IMPI contracted to Taylor & Francis as publisher of JMPEE and appointed Dr. Juan Aguilar as editor. It has now evolved into a healthy organization with close to 30 corporate members. JMPEE has also become a successful professional journal with rising impact

factor. It is fair to say that Bob indeed saved IMPI and JMPEE. He will be deeply missed as a passionate leader, mentor, and friend by all who have been involved in IMPI and benefited from its activities. He will also be missed by the food industry as a most sought-after expert on food safety related to microwave heating.

Juming Tang

Bob Schiffmann had been both a mentor and friend almost from our first meeting several decades ago. His profound sense of integrity helped me navigate some very rough terrain during my early days with IMPI, while his sense of rationalism always helped me make sense of the absurdities and keep things in perspective.

Bob's sense of humor was always present to liven a conference session or dinner party. I was always captivated by his multitude of stories about projects that were either highly successful or dismal failures.

Our small community will miss Bob but the contributions he made for the benefit of us all will live for eternity.

John Gerling

I met Bob for the first time at his home. It was in February 2004. The input of UIE to a next IMPI conference was the purpose of our meeting. We were sitting at the table in his living room, and notwithstanding the professional purpose of our discussion, the atmosphere was relaxed, joyful, amicable, but also very to-the-point.

Since that time, I met Bob at regular intervals of AMPERE conferences. These meetings made it time and again clear that the "living room" atmosphere on that day of February 2004 was perfectly linked to Bob's personality: relaxed, joyful, amicable, but always very to-the-point.

At the occasion of a conference in Spain – it was very hot that summer in Spain! – Bob confided to me that he enjoyed taking some siesta after lunch and having an afternoon coffee on the balcony of his hotel room. Elegance and "*savoir vivre*" can be added to the aforementioned characteristics of Bob indeed!

I will remember Bob smiling, dancing, joking, and always patiently but confidently waiting

for some upcoming wonder, in microwaves, in science, in music, in art, in conversation, in ...

Goodbye, Bob, your patience will not be in vain!

Koen Van Reusel
 UIE General Secretary

Very sad to hear: I heard the sad news today for first time. I have very good memories from meetings with Bob and also his wife Marilyn.

I met Bob the first time during the Orlando Int MW Congress 1996. Marlies met Marilyn and all the other wives like also Margret during the 1st Ampere congress at Valencia 1999 - during the companion tour program all the wives had a great time. From that time, we met Bob more regularly and a friendship developed not based only on our interest in microwaves. We not only met during Ampere congresses, also in Kunming 2011 & Otsu (GCMEA) JP 2008.

Further we once met with Bob & Marilyn in front of their door in NY in 2014. The last time it was at Valencia 2019. The last email he said "Let's hope for another meeting soon...".

A great guy left the stage but he is still in our hearts.

Carpe diem

Peter Pueschner



Bob Schiffmann with Peter Pueschner



Bob Schiffmann with Peter Pueschner

As Past President of AMPERE I do remember all our talks, on line or on the phone, to put together the different souls of our small MW and RF community. His vision was indeed inclusive and his mind was open to innovation and the young generation. Together we managed to recover the JMPEE, to get organized for 2GCMEA in Long Beach and to start the organization for 4GCMEA in Chengdu.

Many memories come to my mind when thinking of Bob, who I recall supporting AMPERE during the OGA when trying to give some advice for improving the economic situation of the Association. A man with a great personality when dealing with electroheat, management of the association and even during the social events with his fondness for dancing and good food.

Undoubtedly we will miss him and his positive attitude towards life and his job as well as the future of our community.

Cristina Leonelli

I first met Bob Schiffmann in person almost two decades ago, in one of the major int'l conferences. Bob stopped by my poster, quickly focused on the main points, and gently asked a series of challenging questions. This fruitful discussion reflected to me the wide experience and deep intuitive understanding of Bob in microwave processing.

Years later, I had ended my editorial role in IMPI, shortly before Bob was elected President. IMPI suffered a severe managerial crisis at this time, and I must admit that, though I knew Bob as a fine person and a microwave expert, I had doubts that he (or anybody else) can rescue IMPI. Against all odds, Bob successfully did it. In his friendly, honest, and

yet decisive manner, Bob emerged then as a true leader.

Over the years, I occasionally met Bob and Marilyn in microwave conferences worldwide, and we had also maintained some e-mail contacts. In my view, Bob was not only “Mr. Microwave”, but also “a man of the people”, in both aspects of his friendly and pleasant attitude towards other people (including luckily us) and also by his generous leadership that confined together our microwave communities worldwide. I am glad at least that AMPERE has timely honored Bob Schiffmann also during his life time, as for instance by the very-well deserved Gold Medal awarded to him in 2019, which in retrospect celebrated Bob’s generous life-time contribution to our field.

Eli Jerby

Je veux dire que Marie-Claude et moi-même avons été très peiné d’apprendre que Bob avait déjà fini sa vie sur cette terre mais qu’il nous laisse mille souvenirs d’un homme merveilleux et attentionné. Sa famille quitta une Europe en folie et traversa l’Atlantique sur le Normandie le 24 Aout 39, Bob devait avoir trois ou quatre ans.

En Amérique, il eut un cursus scolaire et universitaire scientifique auquel il ajouta la danse. Il a peut-être espéré en faire son job et toute sa vie il en a gardé l’art d’arrondir les angles et de ne jamais blessé ou heurté un interlocuteur.

Il avait aussi le grand désir de rester libre au point d’inventer son propre travail: il y avait chez lui, dans sa maison, un assortiment de fours microonde domestiques et il est ainsi devenu un conseil industriel renommé en packaging alimentaire.

Il savait aussi qu’il fallait sans cesse assurer sa publicité d’où la création de l’IMPI et du C.A.S, Cooking Appliance System, noyau très actif de l’IMPI qu’il a présidé pendant de nombreuses années.

En France, le programme de production d’électricité nucléaire nécessitait de développer aussi les applications industrielles, microonde-HF mais aussi induction, pompe à chaleur et de nombreuses autres. L’IMPI intéressait EDF pour participer à l’organisation, en France, d’un colloque sur les microondes dans l’industrie et nous sommes partis rencontrer Bob aux US: de la discussion naquit l’idée

d’organiser, en France, un colloque annuel de l’IMPI qui s’était toujours tenu aux US. Ce fut le colloque de Monaco en 78.

Bob et plusieurs de ses compatriotes présentèrent des communications. Le colloque de Monaco donna naissance à l’association AMPERE. Bo est revenu en France à la demande d’un Industriel du boitage aluminium. L’utilisation de contenants aluminium dans les fours microonde domestiques se faisait avec beaucoup de difficultés parce qu’il y avait quelque fois des arcs et parce que les fabricants de fours étaient réticents et faisaient de la contre publicité. Dans sa conférence, Bob insista sur la physique du chauffage microonde et sur la migration dans l’aliment de certains constituants des barquettes en plastique; la conférence fut suivie d’un goûter tout microonde-aluminium autour duquel chacun put interroger l’orateur. Et la question ne se posa plus: par sa technicité multidisciplinaire et son calme, Bob avait désamorcé la dispute.

Nous nous sommes encore revus longuement au cours de la réunion AMPERE à Oradéa. Nous nous étions donné rendez-vous à Budapest et avons visité la ville et ses restes romains avant de rejoindre Oradea en voiture. Nous étions aussi avec Bernie et nos épouses et nous avons un peu refait le monde amicalement.

Avec la disparition de Bob, nous pleurons un ami très cher.

Serge Lefevre

When I first met Bob, it was clear to me that he was a kind of an elder statesman in our community. He was understandably a man who was admired and held in high regards.

As the years passed, I got to know him better as we worked together with the International Microwave Power Institute (IMPI), it was apparent why. Bob was a living encyclopedia of microwaves. Not only did he have a vast and extensive knowledge of RF and microwave, but also a genuine passion to share it through his teaching and mentoring. He was until the very end, the guiding light and cornerstone of IMPI. His legacy will live on through the institute.

I will miss his quick wit, perspective, sense of humor, and his zest for life. He has left a mark that

will not soon be forgotten. Bob was a gentleman, a scholar, an inspiration, and a friend.

John Mastela

Everyone who knew Bob Schiffmann knew him in a personal way. He was the kind of individual who resonated differently with different people. Despite our primarily professional acquaintance, I was privileged to catch glimpses of a number of Bob's incarnations. Still, first and foremost, he was an enthusiastic engineer and a legendary expert in microwave power technology. He was in the public eye for so many years, his status as one of the pioneers of the field and one of its founding fathers comes as no surprise.

It is remarkable how far from his native Manhattan his robust reputation extended. In 2011, I was lucky to be with Bob in a group of several invitees at a national microwave conference in southwestern China. For the convenience of hundreds of local engineers and technicians, the event was held in Chinese, and, given the remote location and the dominance of the native language, it was easy to assume that the local professional life would be quite removed from the rest of the world. However, it turned out that everyone knew Bob Schiffmann; everyone knew about his work, about his status, about his multifaceted expertise.

To go back even further: when I was working on my Ph.D. Thesis (in the early to mid-1980s), I was a frequent visitor to the State Public Scientific and Technical Library in Moscow. Located downtown, two blocks from the Bolshoi Theater and three blocks from the Kremlin, the library had not only a full collection of the Journal of Microwave Power and EM Energy, but also many issues of the semi-commercial IMPI magazine Microwave World from the 1970s and 1980s. I was an avid reader of that magazine, in which Bob regularly ran ads for his consulting business and periodically published review articles on various subjects. Those reviews were published with large photos of Bob, so when several years later, in 1992, I arrived at the reception of my first IMPI Symposium (held on a riverboat in Chicago), I recognized him immediately, as though I had known him my whole life.

Bob had a wide range of interests aside from microwave power engineering. He was deeply

immersed in important social and political movements; fly fishing in his beloved Catskills was one of his most enduring hobbies. Yet, more than anything, I knew him as a passionate music lover. He and his wife Marilyn were dedicated patrons of the Metropolitan Opera (located at a 20-minute walking distance from their home on West 88th Street). When I started following this illustrious theater's productions about a decade ago, Bob became a precious source of stories about notable Met productions and curious occurrences in and around the theater. From the passionate, deeply emotional way in which he delivered those stories, it was clear that music was truly in his heart.

We were usually synchronous in our opinions about Met staging, but we didn't converge in our takes on the latest production of Wagner's Ring. This was probably the only thing in the realm of the arts on which we were not on the same page, and, regrettably, in the several years since the Met premiere, I never had the chance to talk to him about it in depth and figure out what exactly Bob did not like about that production (which I considered outstanding). I will never know this now but will always think about it. In this way, he will never stop pushing me to further reflect on music and the arts. Bob will be deeply missed as a highly respected and deeply experienced colleague as well as a truly remarkable human being.

Vadim V. Yakovlev

It is with great sadness that AMPERE has received the news of Bob Schiffmann's death. Bob has been a pioneer in our community, he was among the very first researchers to recognise the potential benefits of microwave and radiofrequency energy in the processing of materials and for that purpose has worked tirelessly to create a community of likeminded researchers.

He was a founding member of AMPERE and president of IMPI until his death. His vision it was inclusive and always welcomed new people and ideas.

Bob will be greatly missed but his legacy will remain and serve as an example to all of us.

George Dimitrakis
AMPERE President

Report on AMPERE 2021: a virtual conference inspired by Gothenburg

Birgitta Raaholt and Per Olof Hedekvist,

Conference Chair and Co-chair

RISE, Research Institutes of Sweden

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The planning of the 18th International Conference on Microwave and High-Frequency Applications started already when we arrived back from Valencia and AMPERE 2019. We made reservations of conference venue, hotel rooms, restaurants, and networking events. Gothenburg is a nice city for visitors, and we were happy to let you experience some of the best parts of Sweden. The planning and organization of the conference was performed by RISE, Research Institutes of Sweden, with support from Chalmers University of Technology and the AMPERE organization.

When 2020 threw a wet blanket of pandemic with travel restrictions and social distancing, we followed the progress of vaccines with interest, hoping that the world would recover before the conference dates. We made the decision early that the conference would be 100% either physical or virtual, and finally, we had to make the tough decision of changing the event to fully digital.

All planning had to be remade and new solutions for each part of the meeting. In agreement with the management committee, we also agreed that even though all presentations are broadcasted, nothing is recorded, as would have been the case in

a physical meeting. Thus, also recognizing that it is not uncommon for presenters to show data, pictures and results not open for distribution to an uncontrolled audience.

The meeting was still operated live in the time zone of central Europe (UTC+2h) requesting speakers to connect from all over the world, partly at awkward times of day. This made the conference to something different from all the previous ones, but it also moved us to the first meeting of the future. We are getting used to video-calls and online meetings, and we will manage to adapt to this as well.

Even though the venue was in cyberspace, we tried to get a feeling of Gothenburg. The meeting rooms were called Cod, Mackerel and Herring rooms and the Flounder auditorium, all typical fish from the west coast of Sweden. Furthermore, the program had a focus based on Gothenburg strengths in microwave technologies, such as food processing, automotive and communication, but also Medtech and pharmaceuticals. The education in Microwave electronics and development at Chalmers is also at a world leading level. With RISE, who also serves as the National Metrology Institute of Sweden, as local organizers we also highlighted the topics of

metrology. Quality of measured data, traceability and uncertainty calculations are increasingly important as technology moves towards the limits of physics.

The conference started on Monday with two parallel sessions entitled Modelling Workshop and Short Course. The structure is adopted from previous conferences, but half of the program was delivered by scientists not previously participating in Ampere meetings. Together with some of our experienced and reliable teachers they made both sessions interesting and insightful.

The technical conference of Ampere2021 was a well-planned combination of plenary / keynote presentations, technical presentation in up to three parallel sessions, and one panel discussion each day. The invited presenters of the plenaries included topics from THz technologies, additive manufacturing, and chemistry to Medtech and agriculture. In collaboration with EuMA, a plenary talk focused on the loss of competence when technology is outsourced.

The planning of the panel discussions / debates was preceded by an effort to find both interesting topics and suitable panelists. All three topics on industrialization, education, and frequency allocations, resulted in intensive and engaging discussions which filled one hour each with inspiring and creative perspectives.

The most difficult issue was on how to solve the improvised 'meet and greet' always appearing at the end of each day. We did not find zoom, with organized breakout rooms, really to solve the problem. The choice fell on the online social interaction tool gather.town. After registering and

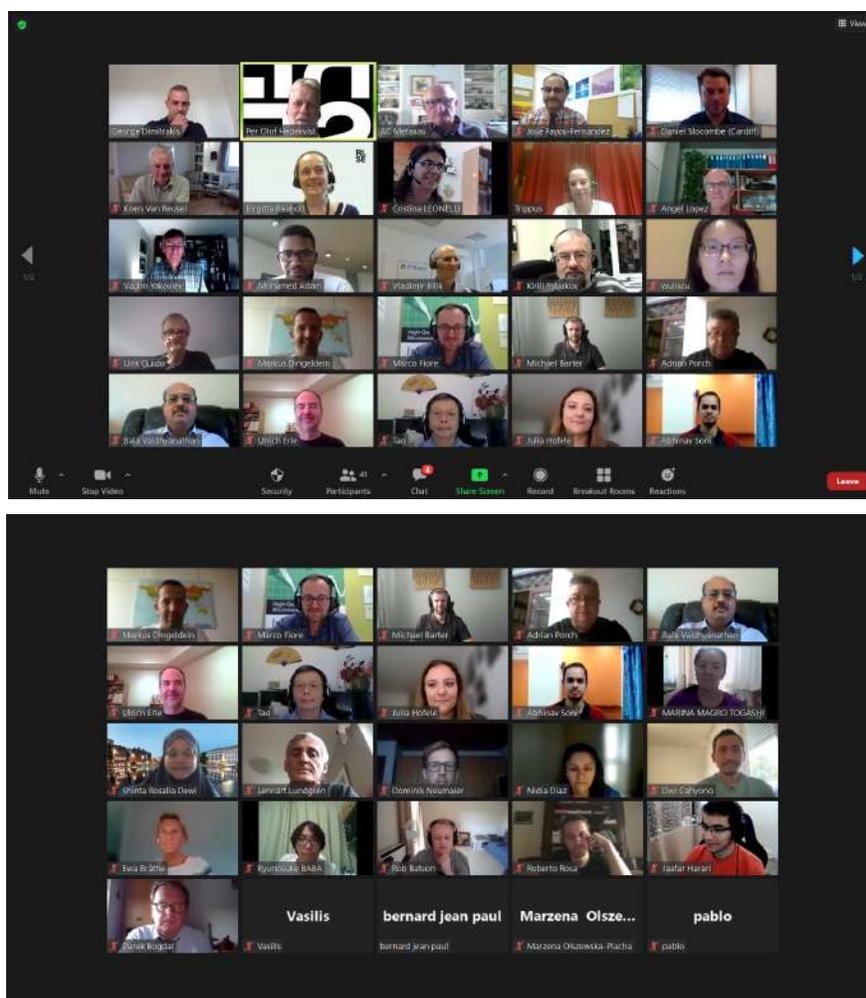
creating a small figurine / avatar the participants could walk around in a virtual castle and talk to the avatars in their close vicinity. This platform was open for interaction during the duration of the conference, but it was mainly during the breaks when the small, improvised groups were formed, and we had a chance to touch base with old acquaintances as well as getting to know new ones.



The graphic interface of the gather.town online social interaction tool

On Wednesday evening, we also invited to a presentation by a Swedish photographer, who combined the show on amazing photos of the Scandinavian nature and wildlife with descriptions of his equipment and photography techniques.

It is our impression that most participants enjoyed the AMPERE 2021 conference even though we only could interact digitally. Now it is two years to the next Ampere conference and we really hope to meet in person in Cardiff 2023.



Two different screenshots showing some of the participants to the virtual OGA

About the authors



Birgitta Wäppling Raaholt, affiliated with RISE Research Institutes of Sweden, is the area leader of Advanced Thermal Processing, including the Microwave/RF and Infrared (IR) Processing of Foods at RISE Agrifood and Bioscience. Birgitta holds a PhD degree in Electromagnetics and Microwave Processing and has an educational background including a Licentiate of Engineering degree in Microwave Technology and Electromagnetics, and an M.Sc. degree in Engineering Physics from the Chalmers University of Technology, Gothenburg, Sweden. She has extensive work experience in international industrial and academic projects. Her research interests are within e.g. applications of electromagnetics, combined microwave-convective-IR processing of high-quality foods, microwave and IR process intensification, modelling, design and optimization of microwave heating processes as well as dielectric measurement methodologies. Other research interests involve food processing technologies and sustainable food

production systems. She has worked for more than 20 years in the development of innovative technologies for microwave processing of foods for a wide range of applications as well as for other types of food applications. Dr. Raaholt is a member of professional associations, including the Association for Microwave Power, Education and Research in Europe (AMPERE) and the Microwave Road www.microwaveroad.se.



Per Olof Hedekvist is a senior scientist at RISE Research Institutes of Sweden. He did his PhD in Photonics on nonlinearities fiber optic communication and continued working on semiconductor optical amplifiers and on optical properties in Microwave Photonics. Presently he works as deputy NMI director in Sweden, concentrating on Metrology, measurement uncertainty and data quality. He teaches classes in measurement uncertainty and in ISO 9001 and ISO 17025.

Report on AMPERE 2021 Panel discussion on Microwave education and teaching: how to attract students when anybody can become an influencer?

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Screenshot showing the participants to the AMPERE 2021 Panel discussion

This was the title of the second panel discussion on AMPERE2021. It was intended to raise some eyebrows, but also start the discussion from an important issue – how can we handle the technical and scientific development in a world where possible desirable careers have changed.

Or is this a problem? I pursued the title based on my experience that the number of freshman students in EE on my Alma Mater have decreased from 200 when I started to less than 100 today. But how about the rest of the world? Is this a local phenomenon? The panel was manned by professors and lecturers from different countries, and they could share their teaching ideas and student experience. The panel consisted of:

- Assoc. Prof. Ulf Johannsen, TU Eindhoven
- Prof. Petrie Meyer, Stellenbosch University
- Dr. Carlos Mendes da Costa Junior, TU Eindhoven
- Prof. Cristina Leonelli, Univ. Modena
- Associate Professor Andreas Fhager, Chalmers
- Dr Daniel Slocombe, University of Cardiff
- Felipe Peñaranda, Technical Univ. Valencia
- Myself as moderator.

The panel discussion commenced with their thoughts on educational activities, with a present focus on how they handled teaching during a pandemic lock-down, and how the experiences from this can be used also in the future. It is apparent that the difference between countries is substantial. The tasks span from emphasizing the final results as an

aim during the program, to the balancing between teaching both well-educated students with low enthusiasm for science together with highly enthusiastic students with less previous education. All agreed that the stimulated engagement of students meeting in person under the right circumstances is a status worth returning to.

During the pandemic, several classes has been recorded while online, and these recorded lectures can be used for a flipped-classroom routine, where students must watch the lecture in advance, and the physical meeting is then used for discussions and questions. To offer these recorded lectures online for free is also a channel to raise interest for the topic, that can be harvested by offering more advanced classes at the university.

Microwave teaching is best if a combination of theory and practice is applied, but laboratory exercises have been difficult to manage. A low cost VNA equipment was proposed as a solution, not for any high-performance analysis but as a tool for the students to practice on from home and to perform the exercises. The ever-important experimental practice could then be solved. An important conclusion was also stated. It should not be a choice between being an engineer or an influencer – we need more engineers who are influencers! The panel discussion was in collaboration with the European Microwave Association, EuMA.

About the author: see previous page.

Report on the XIXth International UIE Congress on Evolution and New Trends in Electrothermal Processes

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The XIXth International UIE Congress took place from 1 to 3 September 2021 in Pilsen (Czech Republic).

The history of International UIE Congresses is over 80 years long. The first event took place in La Haye, the Netherlands, in 1936. Then, World War II interrupted all scientific meetings in Europe, so that the second Congress took place only in 1947, symbolically at the same place. Since that year, a series of 16 events of this kind were organized worldwide in 3–6-year intervals. The last ones took

place in Durban (South Africa) in 2004, Krakow (Poland) in 2008, St. Petersburg (Russia) in 2012, and Hannover (Germany) in 2017.

This year, the Czech Committee of Electroheat and the University of West Bohemia acted as the local organizer for the XIXth International UIE Congress. The XIXth Edition, as sub-titled, was devoted to Evolution and New Trends in Electrothermal Processes and sponsored, among others, by AMPERE.



UIE 2021 Congress – on-site participants.



UIE 2021 Congress – the opening session.

During the two days of the conference the subsequent densely packed sessions covered a broad range of electrotechnologies in thermal processing: induction heating, microwave, arc furnace, laser, and hot plasma. Perfectly in line with the mission of UIE “to make electricity applications happen”, these techniques were considered from different perspectives, including industrial applications, the

future of industrial thermal processes, experimental results, modelling, and safety aspects.

For the first time in its history, UIE used a hybrid format for the conference: on-line (16 participants) and on-site (38 participants). In-person attendees came from 11 countries (Europe and the USA). Thanks to the excellent technical support from the West Bohemia University, this hybrid

format worked in a nearly perfect way for live and online presenters as well as for the audience.

Besides 15 poster presentations, there were 40 talks running in parallel sessions distributed over one day and half. The time for each presentation had to be limited to 15 minutes. This was somewhat tough, but it turned out to be an excellent exercise in making your point succinctly and adequately by conforming to the concise style of communication in today's world.



UIE 2021 Congress – in the oral and poster sessions.

As usual for the UIE Congresses, a PhD course was organized and held prior to the conference. This year, 9 very motivated PhD students, coming from Germany, Russia, France, Italy and Latvia, participated in the high-level course. They were very attentive students in class and later formed a joyful squad at the highly appreciated social events of the congress!



UIE 2021 PhD Intensive Course – Ph.D. students in a classroom and at the closing ceremony

For the regular on-site participants, the Congress was a long-expected opportunity to meet in person thanks to slightly relaxed COVID-19 travel and meeting restrictions. The social interactions were not limited to the question time during the sessions. The extraordinary quality of the historical conference centre Secese of the Pilsner Urquell Brewery facilitated amicable exchange.

Thanks to the excellent organization by the Czech Committee of Electroheat and the University of West Bohemia, the XIXth International UIE Congress rightly took its place of honour in the aforementioned list of previous UIE Congresses. The event was very motivating for the participants and paved the way to the next UIE meetings.

At the closing session it was announced that the XXth International UIE Congress scheduled for

October 2024 will be held in Nice and organized by the Ecole des Mines de Paris.



UIE 2021 Congress – the social program included a masterclass in Pilsner pouring

About the authors



Koen Van Reusel received the degree of Master of Electrical Engineering from the KU Leuven (Belgium) in 1985, and the degree of Doctor of Engineering from the KU Leuven in 2010. Since 1992 he is at LABORELEC (Belgium), a technical competence center in energy processes and energy use.

As senior expert he is member of the Power Networks Department. His current focus is on electrification of industrial thermal processes, lightning protection in wind turbines, and measuring the effects of electromagnetic fields from a human health perspective. He is visiting professor at the KU Leuven, where he teaches “Electromagnetic Processing of Materials” and “Power Quality”. Koen Van Reusel is Member of the Management Committee of AMPERE, the Association for Microwave Power in Europe for Research and Education;

General Secretary to UIE, the International Union for Electricity applications; Member of the Board of Directors of FISUEL, the International Federation for the Safety of the Electricity Users; and Member of the International Electrotechnical Committee n° 27 “Industrial Electroheating and Electromagnetic Processing of Materials”.



Vadim Yakovlev is an Associate Research Professor in the Department of Mathematical Sciences, Worcester Polytechnic Institute (WPI), Worcester, MA, USA. He is a head of the Industrial Microwave Modeling Group, which he formed in 1999 as a division of the WPI’s Center for

Industrial Mathematics and Statistics. Dr. Yakovlev received his Ph.D. degree in Radio Physics from the Institute of Radio Engineering and Electronics of the Russian Academy of Sciences, Moscow, Russia in 1991. His current research interests include multiphysics modeling, microwave power engineering, microwave imaging, and machine-learning optimization. He has authored nearly 200 papers in journals and conference proceedings. Funding for his research came from the US NSF, US DOE, AFRL, AFOSR, and EADS (currently Airbus Group). Dr. Yakovlev is a Fellow of International Microwave Power Institute (IMPI), a Senior Member of IEEE, a member of AMPERE. From 2010 to 2020, he was a member and Subcommittee Chair of the IEEE MTT-S International Microwave Symposium’s Technical Paper Review Committee. In 2013, he served as Chair of the Technical Program Committee for the 47th IMPI Microwave Power Symposium. He is the Founder of a series of international interdisciplinary seminars, Computer Modeling in Microwave Power Engineering held annually from 2000 to 2017. In 2007, he was a Guest Editor for the Special Issue on Modeling in Microwave Power Engineering of the Journal of Microwave Power and Electromagnetic Energy.

Ricky's Afterthought:**Which Generation do you belong to?****A.C. (Ricky) Metaxas**Life Fellow St John's College Cambridge UK
Email: acm33@cam.ac.uk

I was browsing through a newspaper article when a headline caught my eye relating to Gen X. I asked myself what could this curious phrase mean? So I carried out a bit of research and found a very interesting table (reported hereafter) showing the names and dates assigned to each Generation. It should be stressed that there is an overlap between the generations and the years designating the beginning and ending of the births are approximate and could deviate by a few years.

• Lost generation	1880-1915
• Interbellum generation	1910-1913
• Greatest generation	1919-1924
• Silent generation	1925-1945
• Baby boomers	1946-1964
• Gen X	1965-1979
• Xennials	1975-1985
• Millennials, Gen Y, Gen Next	1980-1994
• iGen, Gen Z	1995-2012
• Gen Alpha	2013-2025

Obviously in the **Lost Generation** we include those born before or close to World War I and many must have fought and lain down their lives on the Western Front. Those who were born during the **Interbellum Generation** were too young to experience the horrors of World War I and were adolescent in the roaring twenties epitomised by the **Follies Bergère** located in the 9th *arrondissement* where, in 1926, Josephine Baker danced in a very *avant garde* skirt causing a mild sensation. That generation went on to perhaps fight in the Spanish Civil War and World War II but before then they experienced the spectacular Wall Street crash when thousands lost fortunes followed by many years of austerity and poverty. Such misery was also felt by

those born during the **Greatest Generation** and indeed many in their twenties went on to enlist in the armies of Europe and beyond. It was indeed during that generation that those born in the silent generation engaged on research and develop one of the most important discoveries of the century, the cavity magnetron, which not only played a significant role in the development of radar but also paved the way to what we have spent our lives devoted to: microwave heating.

We now come to the **Silent Generation**, the generation I belong to, many of whom may have experienced the tail end of World War II and a few from European countries may have participated in the Korean and Suez wars. This generation is the cohort to whom the British Prime Minister Harold McMillan told “you have never had it so good”. Home owners mushroomed as the standard of living was rising and jobs were plentiful. In fact life was getting better due to the Marshall Plan which in effect was aid given to Europe by the USA in order to recover from the devastation left behind by World War II. One must bear in mind however that the UK's contribution of this aid was finally repaid to the USA during Generation Z. People born in the silent generation became aware of the Iron curtain to which Winston Churchill referred in a speech homing in on the separation of the Soviet Union and its satellite countries from Western Europe. Indeed in 1961 the East German Government built the wall cutting off East Berliners from the West.

Two more significant milestones emerged during this period: the discovery of the transistor at Bell Labs (1947) and the DNA (1953) at Cambridge aided considerably by the crystallographic work of Rosalind Franklin at Kings College London.

The birth rate during the **Baby Boomers** increased dramatically and this cohort experienced

different worldwide events and circumstances. These were the offspring of a more affluent generation sending their kids to universities, having more and more material goods and generally enjoying increased freedom holidaying in sunny destinations such as Italy, Spain and Greece. They were, however, starting to face a counterculture and at the same time confronted by the rise of the drug problem. During this period we see of course the emergence of **IMPI** from scientists and engineers who were born in the Silent Generation. At the same time we see the emergence of a new wave of entrepreneurs, some having dropped out of universities, such as Steve Jobs, Steve Wozniak and Bill Gates who dominated the personal computer world in the years to come. We also experienced the student riots in France of 1968 culminating in 10million workers on strike.

The **Baby Boomers** is superseded by **Generation X** when the offspring of the **Silent Generation** were born. During Gen X we experienced the world upheaval caused by the oil crisis of 1973 and 1979 when the price per barrel was increased substantially to \$36 and \$63 respectively. This resulted in huge shortages in the USA, Canada, Western Europe New Zealand and Australia following by the interruption of oil supplies from the Middle East.

I am not sure why we need two generations from 1970 to 1994 entitled, **Xennials** and **Millennials**. From our perspective of course this is a pivotal period because we see the emergence of **AMPERE** as a stand-alone entity born out of the inability of us researchers in Europe to attend the annual IMPI Symposium held in the USA. There was a short period when the IMPI Symposium alternated in the sequence USA, Canada, Europe with notable venues in Europe being Loughborough University, UK (1973), Leuven, Belgium (1976) and Nice, France (1979). These days the Symposium is held exclusively in the USA. During this period we should note the fall of the Berlin Wall, the split of the Soviet Union into Russia and its surrounding countries and incidences like the dot com crisis and

the devastation caused by 9/11. We must not forget either the emergence of the bible, no not the Gutenberg one published in the 15th century, but the yellow book published in 1983 and termed the bible for researchers working on microwave heating!

Throughout the new millennium increasing concerns were voiced about the state of the planet due to global warming. Initially people were reluctant to be convinced that this was a real threat or even just scaremongering. However, it took a young Swedish environmental activist, Greta Thunberg, born during **Generation Z** to convince government leaders to act on the real problem of global warming. She was able first to convince many, including her parents to reduce their total footprint (that is the total greenhouse emissions). The pending COP26 summit, taking place during **Generation Alpha**, will endeavour to bring together governments and convinced them to move towards the goals of the Paris agreement and the UN Convention on Climate Change. It is these two final generations, **Z** and **Alpha** that will bear the full brunt of the Climate problem should we not continue relentlessly towards a cleaner future. Also during these two generations we note the problems in Syria and surrounding countries which has caused mass migration to Turkey and Greece and then, if lucky, to Europe which has exacerbated the problem of accommodating such a mass of people of all ethnicities.

Some European parallels are illuminating, such as the **Generation 500** in Greece depicting those highly qualified youngsters who cannot find a proper job and are either temping or accepting manual work resulting in the anti-austerity movement culminating in the 2010 strikes. In Spain there are those called the **Mileuristas**, that is, people earning 1000 Euros per month. In Portugal there are those referred to as the Scraping-by Generation or **Geração Rascal**. In France they are known as the **Génération Précaire** while in Italy they are the **Generation of the 1000 Euros**.

So let me ask you again, to which generation do you belong to?

Job offers



POST-DOCTORAL position for a R&D collaboration project between SAIREM and ONIRIS France

PROJECT INFO

Title: Industrial Development of Optimized Microwave Applicators Dedicated to Microwave Treatment of Powders and Dry Granular Media

Acronym: DIAMOND

Project leader: Prof. Sébastien Curet-Ploquin, teacher-researcher Laboratory: GEPEA, UMR CNRS 6144, ONIRIS Site de la Géraudière, rue de la Géraudière, CS 82225, 44322 Nantes Cedex 3

Industrial partner: SAIREM - 82 Rue Elisée Reclus, 69150 Décines-Charpieu

Project start date: January 2022

Project duration: 24 months

Funding: France Relance, SAIREM

Location: 20% of the time at ONIRIS (Nantes), 80% at SAIREM (Décines-Charpieu)

WORK DESCRIPTION

This project consists in implementing an effective collaboration between researchers of the joint research unit GEPEA at ONIRIS and the company SAIREM so as to develop new approaches based on electrotechnologies to optimize thermal treatments of granular matrices (mainly powders and divided solids). The project concerns the industrial development of optimized microwave applicators dedicated to microwave treatment of powders and dry granular media. To achieve these objectives, it is necessary to develop knowledge on the interactions of microwaves with granular materials and the resulting heat dissipation within the medium depending on the effective dielectric properties of the matrices. The homogeneous heat transfer within the granular material is the key factor for the design of efficient microwave equipment. This scientific project involves a multi-physics approach (granular material physics, electromagnetism, heat transfer) for which a multi-scale study based on modeling and validation aspects at laboratory and industrial scales is necessary. The project is thus strongly oriented towards the development and industrialization of microwave cavities optimized from the physical characteristics of the granular matrices to be treated.

DESIRED PROFILE

PhD (graduated between 2019 and 2021) in process engineering, thermal, energetics. Experience in the field of microwave heat treatment and mastery of a multiphysics modeling software (e.g. COMSOL®, CST Microwave Studio) would be highly appreciated. Skills and Qualifications Basic knowledge of wave/matter interactions. Specific MO/HF training provided internally. Strong interest for processes in the food industry. Great scientific curiosity. Organizational skills. Rigor. Good interpersonal skills, sense of service (internal/external). Good command of technical English required (read/written).

CONTACT

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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>).

Call for Papers

AMPERE Newsletter welcomes submissions of articles, briefs and news on topics of interest for the RF-and-microwave heating community worldwide, including:

- Research briefs and discovery reports.
- Review articles on R&D trends and thematic issues.
- Technology-transfer and commercialization.
- Safety, RFI, and regulatory aspects.
- Technological and market forecasts.
- Comments, views, and visions.
- Interviews with leading innovators and experts.
- New projects, openings and hiring opportunities.
- Tutorials and technical notes.
- Social, cultural and historical aspects.
- Economical and practical considerations.
- Upcoming events, new books and papers.

AMPERE Newsletter is an ISSN registered periodical publication hence its articles are citable as references. However, the Newsletter's publication criteria may differ from that of common scientific Journals by its acceptance (and even encouragement) of news in more premature stages of on-going efforts.

We believe that this seemingly less-rigorous editorial approach is essential in order to accelerate the circulation of ideas, discoveries, and contemporary studies among the AMPERE community worldwide. It may hopefully enrich our common knowledge and hence exciting new ideas, findings and developments.

Please send your submission (or any question, comment or suggestion in this regard) to the Editor in Chief in the e-mail address below.

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