

THE WAVE



The newsletter publication of the International Microwave Power Institute
July 2023 – Special Symposium Edition



Over 120 Gather in Denver, Colorado for IMPI 57 Symposium

One hundred and twenty-one (121) attendees from sixteen countries (16) gathered at the Curtis Hotel in downtown Denver, Colorado last month for the 57th Annual Microwave Power Symposium (IMPI 57). A total of forty-eight presentations, including three keynote addresses and eight invited papers, two short courses, and two panels, rounded out the 3-day event.

Dr. Candice Ellison of the USDA-ARS, served as the Technical Program Committee Chair. Dr. Ellison was assisted by Vice Chair, Dr. B. Reeja Jayan of Carnegie Mellon University.

Till Sickert, of the Karlsruhe Institute of Technology (Germany) was awarded the Best Oral Presentation and Camille Williams of Worcester Polytechnic Institute (USA) was recognized for Best Poster Presentation, in the Student Competition. Isabel Kalinke, of the Technical University of Munich (Germany) and Jack Molles, University of Colorado – Boulder (USA), each received Honorable Mentions.

Over a third of the attendees participated in the pre-Symposium Short courses on Dielectric Material Processing and Solid State/RF Applications: Case Studies and Demonstration. IMPI 57 opened with an Exhibitor Showcase and Welcome Reception. A record twenty (20) Exhibitors participated in the event: Muegge GmbH, Richardson Electronics 3DRFE Corp, Ampleon, CPC, Crescend Technologies, Leanfa, Microwave Amps Limited, Microwave Techniques, Mini-Circuits, MKS, Odyssey Technical Solutions, pinkRF, PSC, QWED, SAIREM, the Solid-State RF Energy Section, Stellant, Trumpf and Wave PIA.

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Cover Photo from left: Student Competition Winners, Sickert, Williams, Kalinke and Molles featured in photos with IMPI 57 Technical Program Chair Dr. Candice Ellison & President, John F. Gerling

IMPI 57 Symposium Continued

Dr. Christina Wildfire of the National Energy Technology Laboratory and Dr. Olli Tarvainen, of the UK Science and Technology Facilities Council (STFC), Rutherford Appleton Laboratory and ISIS Neutron and Muon Source, provided the Keynote Addresses on Wednesday. A full day of concurrent presentations, including a Special Spotlight Session on Accelerators, poster and exhibitor sessions, and networking functions concluded in the late afternoon with the IMPI Business Meeting. Just shy of 100 attendees and guests took part in the Group Dinner at the Wynkoop Brewing Company on Wednesday evening.

Thursday opened with a Keynote address by Mr. Michael Wolf, Founder of *The Spoon*, Creator of Smart Kitchen Summit and Creator of the CES Food Tech Conference. Concurrent sessions resumed for the day until the attendees gathered for a panel discussion on Emerging Technologies and the Closing Ceremony & Awards. It was announced that IMPI 58 will take place at the Hyatt Regency Reston in suburban Washington, D.C., from May 29-31, 2024. See page 8 for more details.

IMPI 57 would not have been possible without the leadership of TPC Chair Ellison and Vice Chair, Jayan. IMPI also wishes to thank the Members of The Technical Program Committee, Organizers of the Special Sessions, speakers, attendees and our Platinum Sponsor: Muegge Gerling.



Top row from left: Keynote Speakers Wildfire, Tarvainen and Wolf delivering addresses and receiving a plaque from their Session Chair; Accelerator Spotlight Panel, Emerging Technologies Spotlight Panel, Muegge Booth, Welcome Reception, Plenary Session Room.

PRESIDENT'S MESSAGE

The dust has settled, and the numbers are in! For IMPI 57, that is. Apart from the unfortunate experiences of a few unlucky attendees caught in yet another nightmarish weather-induced airline-amplified travel calamity while departing Denver (I was one!), we had one of the most successful annual Microwave Power Symposia in recent memory. Not just financially but functionally as well. Many thanks to those who participated in the post-event survey! Responses were overwhelmingly positive and expressed praise across the board for a job well done. I particularly enjoyed our venue at The Curtis and my room on the

“Scary Movie” (13th) floor. Many survey respondents offered excellent suggestions for future events as well, which we will definitely consider in our planning for IMPI 58, which is already underway.

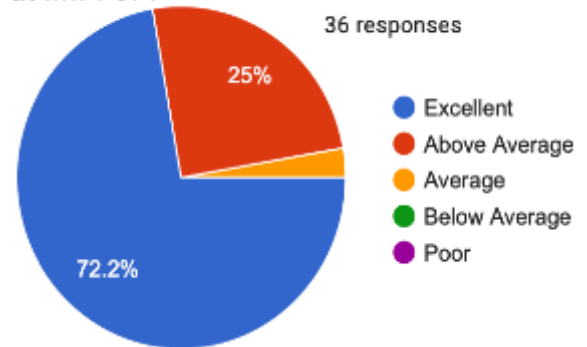
Speaking of surveys, partly in preparation for one of our IMPI 57 keynote talks (Mike Wolf's on Digital Cooking) we conducted a survey of microwave heating technologists on the topic of solid-state RF cooking. As many of you well know, solid state RF technologies are already making a huge impact on industrial microwave processing. What is not so clear is when or even if solid state RF will become mainstream for commercial and consumer microwave cooking. Two manufacturers, ITW and Miele, have already broken the ice by introducing products (IBEX and Dialog) for commercial sale. Will there be more? The majority of respondents seem to believe so. It won't be easy as they point out, cost being the strongest deterrent to other manufacturers that might otherwise want to jump on the bandwagon. As technologists the respondents also offered a few insightful comments on how to not only ensure market acceptance of solid-state microwave ovens but create market demand. IMPI members are welcome to obtain a summary of the full survey results by contacting [Molly Poisant](#), IMPI Executive Director.

My next opportunity to see friends and associates in the microwave/RF community will be in Cardiff, UK, this coming September for the 19th International Conference on Microwave and High-Frequency Applications: [AMPERE 2023](#). Cardiff and surrounding Wales countryside are rich in historical attractions dating as early as 4000 B.C., notably the many castles and cathedrals to satisfy my appetite for early English art and architecture. My wife Sally and I are looking forward to spending a few extra days touring. Come join us!

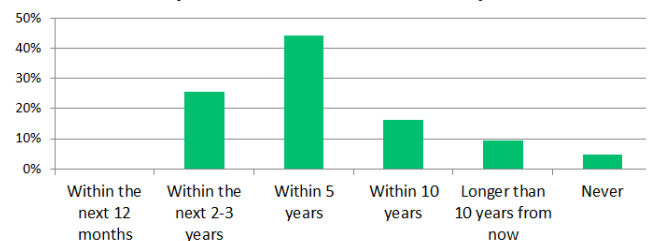


*John F. Gerling
President, IMPI*

Overall, how would you rate your experience at IMPI 57?



Solid state RF cooking is not widely available today. When do you believe it will be more widely available?



Welcome to IMPI's Newest Corporate Member!



IMPI's Fall Seminar

October 3-5, 2023

Richardson Electronics & The Hotel Baker

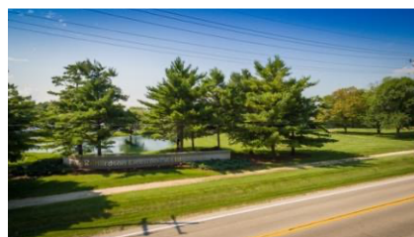
Suburban Chicago, IL, USA



IMPI's Fall Seminar will include a Tour and Welcome Reception at Richardson Electronics, a multi-hour Mw/RF Technology Fundamentals Workshop, a series of lectures on various Mw/RF/Solid State Applications and numerous networking opportunities!

Mw/RF Technology Workshop: For those with limited knowledge of Mw/RF technologies, this Workshop will begin with a series of lectures covering fundamentals of electromagnetic fields, interactions with materials, and the basics of generating, transmitting and applying microwave power. Course content will provide essential background material for subsequent presentations on common and emerging applications of Mw/RF energy, including a special focus on consumer foods, food engineering and food processing.

Who Should Attend: The Microwave/RF Technology Fundamentals Workshop is intended for engineers, scientists, educators, and others having a technical background who are interested in microwave and radio frequency (Mw/RF) technologies and their use in consumer, commercial, industrial, scientific and medical applications. Course content will benefit anyone new to Mw/RF applications as well as seasoned professionals seeking a greater understanding for problem solving or process improvement.



Register by August 15th for Early Bird Rates!

IMPI Members: \$675

Non-Members: \$775

Student Members: \$300

Student Non-Members: \$400

The Hotel Baker has a limited # of rooms available for \$154 call +1-630-584-2100 and ask for the IMPI/Richardson rate.



Dr. Ulrich Erle Inducted as Fellow of IMPI; Voting Board Members and Executive Board Elected at Annual General Membership Meeting

Originally Published July 7, 2023, on [IMPI.org](https://www.impi.org) - The International Microwave Power Institute (IMPI), the leading scientific organization dedicated to connecting the global microwave and RF energy community, is pleased to announce several major developments out of their Annual General Membership Meeting last week in Denver, Colorado, USA. The meeting was held at the Curtis Hotel, in conjunction with the Institute's 57th Annual Microwave Power Symposium (IMPI 57).

Dr. Ulrich Erle of Nestle R&D in Solon, Ohio was inducted as the 37th Fellow of the Institute on June 28th. Erle attended his first IMPI Symposium in Denver during the summer of 1995. He became an active member in 2009, has served as a Voting Member of the Board of Governors since 2016, was Co-chair of the IMPI 49 and IMPI 50 Symposia, and has routinely served as a Session Chair, Technical Program Committee Member, Student Competition Judge and Fall Seminar Planning Committee Member. The Fellow Nominating Committee, chaired by IMPI Fellows, Dr. Juan Aguilar of the University of Nuevo Leon and Dr. Juming Tang of Washington State University, nominated Erle following an extensive review process.

When presenting the nomination to the Board, Tang and Aguilar stated, *“This recommendation recognizes Dr. Erle’s leadership and contributions to IMPI [outlined above]... We also recognize his contributions in advancing microwave heating knowledge (through publications of books and journal articles) and practices (through patent inventions) in the food industry, and his active mentorship of young engineers working on projects related to microwave heating.”*

Letters of recommendation, provided by Dr. Klaus Werner, Chairman of IMPI’s Solid State RF Energy Section and President of pinkRF, and Dr. Raymond L. Boxman, Professor Emeritus of Tel Aviv University, cited Erle’s contributions to the field over the past twenty years, which include over 16 patents. The letters describe Erle as someone who is a *“genuine, open and curious scientist with an enormous amount of relevant knowledge and true attention to detail.”* Dr. Erle, is *“very active and an extremely competent contributor to the organization and management of IMPI activities,”* and that he has, *“clearly demonstrated leadership, innovation and creativity in this field.”* The Board of Governors was unanimous in their decision to bestow the Institute’s highest honor to Erle.

The IMPI membership also elected four Voting Board Members. Mr. Benjamin Ballart of SAIREM, who previously served as a Corresponding Board Member, will join the Voting Board alongside newly re-elected Voting Board Members: Dr. Sean McKeown of Graphic Packaging International, Mr. John F. Gerling of Gerling Consulting, and Mr. Roger Williams of 3DRFE Corp. Voting Board Members serve a three-year term. Dr. B. Reeja Jayan of Carnegie Mellon also joined the Board as a Corresponding Board Member. The full Board of Governors list can be [found here](#).



Photos from top: Dr. Juming Tang, Dr. Ulrich Erle, Dr. Juan Aguilar and Mr. John F. Gerling (IMPI Fellows) and to left: IMPI Board of Governors in Denver.



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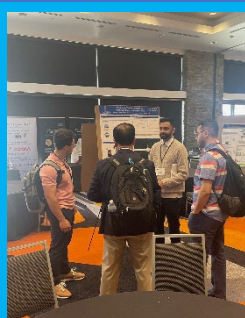
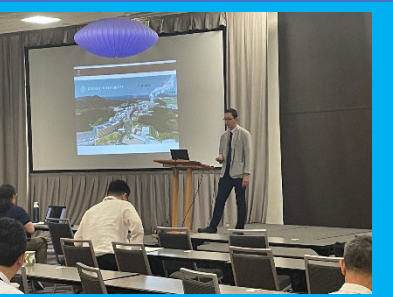
MUEGGE brings technical expertise and extensive application competence in the development, production and implementation of high-power microwave technology and provides unique solutions for your technical challenges.

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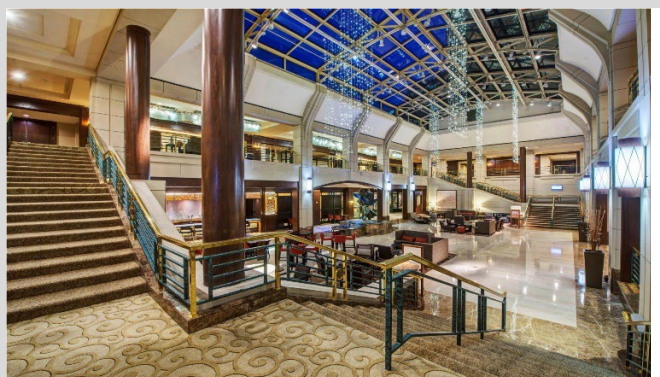
www.muegge-group.com
info@muegge.de

IMPI 57 SYMPOSIUM PHOTOS



IMPI 58 to be Held in Washington, D.C. in Late May of 2024, Led by Jayan and Bruce

IMPI is excited to announce that the **58th Annual Microwave Power Symposium (IMPI 58)** is returning to suburban Washington, DC for the first time since 2009. The IMPI 58 Symposium will take place, May 29-31, 2024 at the Hyatt Regency Reston, twenty miles west of Washington and six miles from Dulles International Airport. Dr. B. Reeja Jayan, of Carnegie Mellon University, will serve as Technical Program Committee Chair and Dr. Ralph W. Bruce, of RWBruce Associates, LLC, and formerly of Vanderbilt University will serve as the Vice Chair. The Call for Papers for IMPI 58 will be released in early September 2023. Watch [this page](#) for updates. Learn more about Jayan and Bruce's [vision for IMPI 58 in the press release here](#).



Photos from top left: Dr. Reeja Jayan, Dr. Ralph Bruce, the atrium of the Hyatt Regency Reston and Reston Town Center

Xu Zhou, of Washington State University, is the Recipient of Inagural Robert F. Schiffmann Memorial Scholarship

Congratulations to Xu Zhou on being named the first recipient of the Robert F. Schiffmann Memorial Scholarship. Zhou received a one-time \$500 scholarship that was funded by donations from the IMPI community and the Schiffmann family.

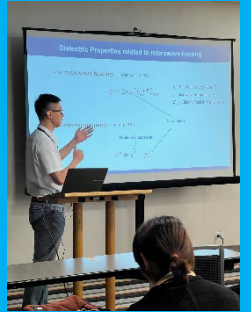
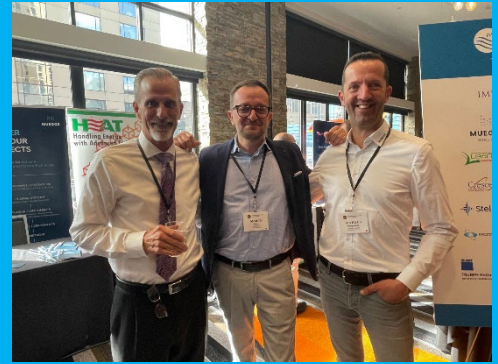
In a LinkedIn post earlier this week, Zhou shared this photo of himself receiving the award from IMPI President, John F. Gerling, and stated he was both “excited and humbled.”

The Schiffmann Memorial Scholarship was established by IMPI in June of 2022 to honor the legacy of IMPI’s long-serving President, following his death in September of 2021. Those wishing to contribute to the fund [may do so here](#). The Schiffmann family has generously agreed to match all contributions for five years.

The application for the 2024 Award will be announced on IMPI.org in January.



IMPI 57 SYMPOSIUM PHOTOS



JMPEE – Volume 57, Issue 3 Released

Editor's message: Valorising the experimental material presented in the data notes

Juan Antonio Aguilar Garib

Electromagnetic interference shielding effectiveness and microwave absorption performance of plaster mortars containing metal waste chips in X-band frequency range

Niyazi Ugur Kockal, Kayhan Ates, Tolga Zica Kocaer, and Sukru Ozen

Effect of seasonal variation in Dielectric properties of Ground water from Vadodara region

Deepak Gadani, Foram Modi, and Vipinchandra Rana

Study on the microwave heating temperature uniformity of an intelligent synergistic mode stirrer

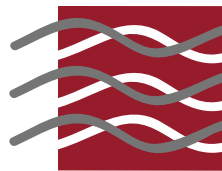
Biao Yang, Feiyun Peng, Cheng Cheng, Zhaogang Wu, and Hongbin Huang

Process parameters of microwave heating-assisted vacuum evaporation of tomato juice: quality, energy consumption, exergy performance, and kinetic processing

Hosain Darvishi, Taher Sofizadeh, Jalal Khodaie, Nasser Behroozi-Khazaei, and Mahmoud Koushesh Saba

Effect of the microwave and thermosonic vacuum concentration methods on quality parameters of hibiscus (*Hibiscus sabdariffa* L.) extract and mathematical modeling of concentration

Cüneyt Dincer, Timur Tongur, and Taner Erkaymaz.



IMPI SOLID STATE RF ENERGY SECTION

IMPI's Solid State RF Energy Section had a large presence at the IMPI 57 Symposium in Denver. The team hosted a [Short Course](#) and live demonstration on Tuesday, June 27th with over 30 attendees and also had an Exhibit Booth at the conference for the duration. On Thursday, June 29th, the Section hosted a table during the luncheon to further discuss the Microwave Markup Language (MML). A Business Meeting for all Section Members and prospective members is being planned, virtually, for later this Fall. For more details on how to become involved with the SSRFE Section, please [contact IMPI's Administrator, Alicia Standridge](#).



MEMBER NEWS

Stellant Systems Appoints Arthur Gharakhanian as Chief Financial Officer

Dr. Eric F. Brown, a Principal Research Scientist at Conagra and IMPI Board member was interviewed by The New York Times food writer Priya Krishna about consumer microwave history and future possibilities earlier this year. The interview was background for the article “For Perfectly Cooked Rice Every Time, Try Your Microwave,” which was published online at nytimes.com on February 21, 2023. The article proposes that the best way to cook rice is in the microwave oven since it heats more evenly than a stovetop.

CALENDAR OF EVENTS

IMPI’s Fall Seminar will take place October 3-5, 2023, at Richardson Electronics and the Hotel Baker (outside of Chicago, IL). More info [here](#).

Dr. Pranjali Muley of NETL is IMPI’s New Webinar Coordinator! She’s working on the 3-Part Fall Webinar Series and updates will be [posted here](#).

IMPI 58 Symposium: May 29-31, 2024, outside of Washington, DC.

Stay up to date with all IMPI activities via our [Calendar of Events](#).

PARTNER EVENTS

AMPERE 2023: September 11-14, 2023, in Cardiff, UK. More details [here](#)

The Spoon is hosting an AI Food Summit, October 25, 2023, in Alameda, California. More details [here](#)

IMS 2024: June 16-21, 2024, in Washington, DC. More details [here](#).

5GCMEA: July 22-25, 2024, at Kyushu University in Fukuoka, Japan. [Call for Abstracts Now Open!](#)

IMPI
PO BOX 1140
MECHANICSVILLE, VA 23111
info@impi.org



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