IMPI's 57TH ANNUAL MICROWAVE POWER SYMPOSIUM (IMPI 57)

June 27-29, 2023

The Curtis Hotel
Denver, Colorado, USA

Register today at www.IMPI.org

Presented by the
International Microwave Power Institute

PO Box 1140, Mechanicsville, VA 23111 | Email: info@impi.org

www.impi.org

IMPI's 57TH ANNUAL MICROWAVE POWER SYMPOSIUM (IMPI 57)

IMPI 57 is your opportunity to connect to and learn from the premier microwave power experts from around the world!

The Symposium

Join us in Denver, Colorado for the 57th Annual Microwave Power Symposium (IMPI 57). The program offers topics for everyone interested in learning about the latest developments in microwave power science and technology. This in-person multi-day event will bring together researchers, technologists and engineers from across the globe, to network and learn. We will share the latest findings on microwave and radio frequency power systems for non-communication applications, including, plasma, chemical and material processing, solid-state, accelerators, food processing, biological applications and more!

Host City, Venue and Accommodations

Located in the heart of downtown Denver, just twenty-five minutes from Denver International Airport, The Curtis — a Doubletree by Hilton Hotel — is like no other hotel experience you've ever experienced. Art, playful surprises and themed rooms bursting with personality are around every corner. From superior amenities and delectable dining to the perfect downtown location, The Curtis Hotel has everything you need for a one-of-a-kind stay in the Mile High City.

Denver, best known for its breathtaking landscape and outdoor adventures, offers visitors unique art, culture, food, music and sports experiences. Situated in the Rocky Mountain region, Denver is considered one of the most walkable cities in America.

IMPI 57 attendees may book their room directly here to receive the $219 special group rate. In-room and meeting space wifi is included; taxes are additional.

Special Events

There are several optional special events that registrants can add on during the registration process:

- Short Course I: Dielectric Material Properties Measurement
- Short Course II: Solid State RF Applications: Case Studies and Demonstration
- Group Dinner
- Spouse/Guest Program

IMPI's 57TH ANNUAL MICROWAVE POWER SYMPOSIUM (IMPI 57)

SCHEDULE OF EVENTS

*****Exact times/days of presentations are subject to change*****

TUESDAY, JUNE 27, 2023

8:00am - 11:45am **SHORT COURSE I: DIELECTRIC MATERIAL PROPERTIES MEASUREMENT**

11:45am - 12:15pm **LUNCH ON OWN**

12:15pm - 4:00pm **SHORT COURSE II: SOLID STATE RF APPLICATIONS: CASE STUDIES AND DEMONSTRATION**

4:00pm - 5:30pm **EXHIBITOR SHOWCASE**
Fifteen-minute presentations/demonstrations at exhibition booths.

- Muegge GmbH (Germany)
- Richardson Electronics (USA)
- Microwave Techniques (USA)
- Leanfa (Italy)
- Odyssey Technical Solutions (USA)
- pinkRF (Netherlands)
- Mini-Circuits (USA)
- Ampleon (USA)
- CrescendRF (USA)
- Solid State RF Energy Section
- QWED (Poland)
- Stellant Systems (USA)
- SAIREM (France)
- MKS (Italy)
- Microwave Amps Limited (UK)
- PSC (USA)
- TRUMPF Hüttinger GmbH + Co (Germany)
- WAVEPIA (Republic of Korea)
- 3DRFE Corporation (USA)

5:30pm - 7:00pm **WELCOME RECEPTION** *(Posters and Exhibits Open)*

WEDNESDAY, JUNE 28, 2023

8:00am - 9:00am **PLENARY SESSION**

WELCOME & INTRODUCTIONS
Candice Ellison, USDA-ARS
B. Reeja Jayan, Carnegie Mellon University
John F. Gerling, Gerling Consulting & President, IMPI

KEYNOTE ADDRESS: *Decarbonizing the Chemical Industry with Microwaves: Advantages, Challenges, and Opportunities for the Future*
Christina Wildfire
Center for Microwave Chemistry, Reaction Engineering Team, National Energy Technology Laboratory, Morgantown, WV, USA

WEDNESDAY, JUNE 28, 2023 CONTINUED

9:00am - 9:10am **POSTER FLASH SESSION**

9:10am - 9:15am **BREAK TO MOVE BETWEEN CONCURRENT SESSIONS**

9:15am - 10:25am **CONCURRENT SESSIONS**

SESSION A: CHEMISTRY / CATALYSIS I

INVITED: Approaches to the Theory and Applications of Microwave-Controlled Chemical Reactions
Shuntaro Tsubaki
Kyushu University, Fukuoka, Japan

Plasma-Enhanced Chemical Looping Ammonia Synthesis
Sean Brown[1], Brandon Robinson[1], Fanglin Che[2] and Jianli Hu[1]
[1]Department of Chemical and Biomedical Engineering, Benjamin M. Statler College of Engineering and Mineral Resources, West Virginia University, Morgantown, WV, USA
[2]Department of Chemical Engineering, University of Massachusetts Lowell, Lowell, MA, USA

Microwave Catalytic Technology Application in Plastic Wastes Upcycling
Yuxin Wang, Vishal Tuli, Kaushal Parmar, Thang Luong and Jianli Hu
West Virginia University, Morgantown, WV, USA

SESSION B: EQUIPMENT & MICROWAVE TECHNOLOGY

INVITED: Industry Practices for Preventing Hazardous Exposure to Microwave Leakage: Are They Adequate?
John F. Gerling
Gerling Consulting, Inc., Gilroy, CA, USA

The Magnetron: A High-Performance, Cost-Effective, Time-Proven Solution for Microwave Power
Michael S. Worthington, John Cipolla and Todd Hansen
Stellant Systems, Williamsport, PA, USA

Microwave Technologies Enable the FirstWave of Breakthroughs in Aseptic Processing of Foods and Beverages
Michael Druga[1] and Josip Simunovic[2]
[1]SinnovaTek, Inc., Raleigh, NC, USA
[2]North Carolina State University, Raleigh, NC, USA

10:25am - 10:40am **COFFEE BREAK**

10:40am - 12:10pm

CONCURRENT SESSIONS

SESSION A: CHEMISTRY / CATALYSIS II

INVITED: Activation of Stable Molecules by Microwave and Microwave Plasma
John Hu, Yuxin Wang, Brandon Robinson, Changle Jiang, Sean Brown, Alazar Araia and Ashley Caiola
Department of Chemical & Biomedical Engineering, West Virginia University, USA

Microwave Heterogeneous Catalysis for Boosting Electron Transfer Reactions
Fuminao Kishimoto[1], Shuntaro Tsubaki[2] and Yuji Wada[3]
[1]The University of Tokyo, Tokyo, Japan
[2]Kyushu University, Fukuoka, Japan
[3]Tokyo Institute of Technology, Tokyo, Japan

Pyrolysis Oil Composition from Microwave Co-Pyrolysis of Switchgrass and Plastic Waste
Candice Ellison and Charles A. Mullen
USDA-ARS, Eastern Regional Research Center, Wyndmoor, PA, USA

Microwave Co-Gasification of Mixed Plastics and Biomass for Hydrogen Production
Ashraf Abedin[1, 2], Xinwei Bai[1, 2], Mark Smith[1] and Pranjali Muley[1, 2]
[1]National Energy Technology Laboratory, Morgantown, WV, USA
[2]NETL Support Contractor, Morgantown, WV, USA

SESSION B: FOOD TECHNOLOGIES I / MODELING

Integrated Multiphysics-Modeling and Machine-learning Approach in Optimizing Microwaveable Food Product Geometry
Ran Yang and Jiajia Chen
University of Tennessee, Knoxville, TN, USA

Temperature Uniformity of Frozen Pork with Various Combinations of Fat and Lean Portions Tempered in Radio Frequency
Xiangqing Chen, Feng Li and Yang Jiao
Research Center of Food Thermal Processing Technologies, College of Food Science and Technology, Shanghai Ocean University, Shanghai, China

Why do Microwaves Heat Oil Faster than Water?
Xu Zhou[1], Shuang Zhang[1], Zhongwei Tang[1], Pawan Takhar[2], Patrick Pedrow[3], Shyam Sablani[1] and Juming Tang[1]
[1]Department of Biological Systems Engineering, Washington State University, Pullman, WA, USA
[2]Department of Food Science and Human Nutrition, University of Illinois, Urbana-Champaign, IL, USA
[3]School of Electrical Engineering and Computer Science, Washington State University, Pullman, WA, USA

WEDNESDAY, JUNE 28,2023 CONTINUED

12:10pm - 12:55pm **NETWORKING LUNCHEON** *(Posters & Exhibits Open)*

12:55pm - 1:55pm **POSTER & EXHIBITOR SESSION**

1:55pm - 2:40pm **PLENARY SESSION**

KEYNOTE ADDRESS: ***Microwave Ion Sources for Particle Accelerator Applications***
Olli Tarvainen
UK Research and Innovation, Science and Technology Facilities Council, Rutherford Appleton Laboratory, ISIS Neutron and Muon Source, Harwell Campus, Didcot, United Kingdom

2:40pm - 3:40pm **CONCURRENT SESSIONS**

INVITED SPOTLIGHT SESSION: ACCELERATORS I

Overview of H^- Radio Frequency Ion Sources for Particle Accelerators
Robert F. Welton and Baoxi Han
Spallation Neutron Source, Oak Ridge National Laboratory, Oak Ridge, TN, USA

Introduction to RF Particle Accelerators and Their RF Systems
Alan Letchford
STFC Rutherford Appleton Laboratory, Didcot, UK

Introduction to Microwave Driven Particle Accelerators
Sami Gamal-Eldin Tantawi
Stanford University, Stanford, CA, USA

SESSION B: SOLID STATE APPLICATIONS I

MW-SSPGs as Enablers for Electrified Industrial Processing
Vasileios Ramopoulos[1], Gerd Hintz[2], Carsten Winnewisser[2] and Roland Heilig[1]
[1]TRUMPF Hüttinger GmbH + Co. KG, Stutensee, Germany
[2]TRUMPF Hüttinger GmbH + Co. KG, Freiburg, Germany

Solid-State Microwave Technology for Nano-Agrochemicals Development
Marco Fiore[1], Nicola Di Modugno[1], Maria Michela Dell'Anna[2] and Giuseppe Ciccarella[3,4]
[1]LEANFA Srl, Ruvo di Puglia, Italy
[2]DICATECh, Politecnico di Bari, Bari, Italy
[3]Biological and Environmental Sciences Department University of Salento, Lecce, Italy
[4]Institute of Nanotechnology, CNR Nanotec, Lecce, Italy

Biomass-Related Reactions with Solid-State Microwave Technology: Thermodynamics, Kinetics and Optimisation of the Applied Electric Field
Alisa Doroshenko[1] and Ben Ballart[2]
[1]SAIREM, Décines-Charpieu, France
[2]SAIREM, Atlanta, USA

3:40pm - 3:55pm **COFFEE BREAK**

3:55pm - 4:35pm **CONCURRENT SESSIONS**

SESSION A: ACCELERATORS II

Design Aspects for Solid State Power Amplifier in Particle Accelerators
Marcus Lau[1], Yannick Schneider[1], Mario Hauser[2], Jens Weber[2], Martin Beyer[2], Thomas Schmidt[2], Saptarshi Mitra[1], Jakub Sejdak[3] and Roland Heilig[2]
[1]TRUMPF Hüttinger GmbH + Co. KG, Freiburg i. Br., Germany
[2]TRUMPF Hüttinger GmbH + Co. KG, Stutensee, Germany
[3]TRUMPF Hüttinger Sp. z o.o., Zielonka, Poland

RF Power Optimization in Plasma and Accelerator Applications
Jacob Sturgis, Henry Fries and Henry Downs
Microwave Techniques LLC, Gorham, ME, USA

SESSION B: BIOLOGICAL APPLICATIONS

Changes in Molecular Composition and Functional Properties of Plant Proteins Subjected to Radio Frequency Based Thermal Treatment
Prem Prakash Das[1], Aarti Bhagwat[1], Caishuang Xu[1], Yuping Lu[1], Praiya Asavajaru[1], Darrin Klassen[1], Derek Dee[2], Nandhakishore Rajagopalan[1, 3] and Anusha Samaranayaka[1]
[1]National Research Council of Canada, Saskatoon, Canada
[2]University of British Columbia, Vancouver, Canada
[3]University of Saskatchewan, Saskatoon, Canada

Solar Far Infrared-Induced Growth of Plants is Due to Non-thermal Effect of Infrared to Radio Frequency Electromagnetic Energy: Verification by Quantum Chemistry Molecular Modeling (DFT/MM)
Shozo Yanagida[1,2] and Takeko Matsumura[2]
[1]Osaka University, Ibaraki, Japan
[2]Minerva Light Laboratory, Kyoto, Japan

4:35pm - 5:15pm **IMPI BUSINESS MEETING** *(Open to all current and potential IMPI members)*

6:30pm - 9:00pm **GROUP DINNER AT LOCAL RESTAURANT** *(Optional: additional fee applies)*

IMPI's 57TH ANNUAL MICROWAVE POWER SYMPOSIUM (IMPI 57)

SCHEDULE OF EVENTS

THURSDAY, JUNE 29, 2023

8:00am - 8:05am **ANNOUNCEMENTS**

8:05am - 9:20am **PLENARY SESSION**

KEYNOTE ADDRESS: *Unleashing the Digital Cooking Revolution*
Mike Wolf
The Spoon, CES Food Tech Conference & Smart Kitchen Summit, USA

INVITED: How Microwaves are Solving the Challenges of Foodservice and Home Cooking
Matt Rigney
Panasonic Food Service, New Jersey, USA

9:20am - 10:20am **CONCURRENT SESSIONS**

SESSION A: SOLID STATE II (FOOD APPLICATIONS)

Potentials of Solid-State Microwave Generators in Microwave-Assisted Freeze Drying
Isabel Kalinke and Petra Foerst
Technical University Munich, TUM School of Life Sciences, Food Process Engineering, Munich, Germany

Microwave-Assisted Freeze-Drying of Tylose Gel through Real-Time Frequency Modulation
Till Sickert, Xiaoqi Zhou and Volker Gaukel
Karlsruhe Institute of Technology, Institute of Process Engineering in Life Sciences, Food Process Engineering, Karlsruhe, Germany

On Boiling an Egg with a Solid-State Microwave Cooking System
Pablo Santón and Klaus Werner
pinkRF B.V., Nijmegen, Netherlands

SESSION B: CHEMISTRY III

Effect of Fe_3O_4 Grain size on Microwave Pyrolysis of Cellulose
Hiroyuki Tamiya[1], Juro Yagi[2], Keisuke Mukai[2] and Sadatsug Takayama[3]
[1]Graduate School of Energy Science, Kyoto University, Uji, Kyoto, Japan
[2]Institute of Advanced Energy, Kyoto University, Gokasho, Uji, Kyoto, Japan
[3]National Institute for Fusion Science, National Institutes of Natural Sciences, Toki, Gifu, Japan

Experimental Study of Microwave Heating in Mixed Waste Materials
Jack A. Molles, Megan C. Robinson and Zoya Popovic
University of Colorado, Boulder, CO, USA

Microwave Assisted Catalytic Pyrolysis of Cedar Wood for Chemical Production
Chen Qu[1], Juan Tao[2] and Haruo Kawamoto[1]
[1]Graduate School of Energy Science, Kyoto University, Kyoto, Japan
[2]School of Life and Science, Jiangxi Science and Technology Normal University, Nanchang, China

10:20am - 10:35am **COFFEE BREAK**

10:35am - 12:05pm **CONCURRENT SESSIONS**

SESSION A: PLASMA I

INVITED: Sustainable Applications of Microwave Plasma Sources
Robert Mueller, Klaus-Martin Baumgaertner, Markus Dingeldein, Moritz Gorath and Jens Hofmann
Muegge GmbH, Reichelsheim (Odenwald), Germany

Atmospheric 915 MHz 100 kW Microwave Plasma Torch for Gas Treatment
Louis Latrasse, Fadi Zoubian, Nicolas Renaut and Bertrand Depagneux
SAIREM SAS, Décines-Charpieu – France

Characterization of Microwave Plasma in Electromagnetic Modeling for Processing Applications
Camille E. Williams and Vadim V. Yakovlev
Center for Industrial Mathematics and Statistics, Department of Mathematical Sciences, Worcester Polytechnic Institute, Worcester, MA, USA

SESSION B: MATERIAL CHARACTERIZATION AND SENSING

INVITED: Modelling of Measurement Scenarios to Determine the Dielectric Properties of Spherically Shaped Semi-Conducting Microwave Absorption Ceramic Objects
Birgitta Wäppling Raaholt
RISE Research Institutes of Sweden, Göteborg, Sweden

Microwave Characterization of Liquids with Resonant Methods
Bartlomiej Salski[1], Marzena Olszewska-Placha[2] and Piotr Czekala[1]
[1]Warsaw University of Technology, Warsaw, Poland
[2]QWED Sp. z o.o., Warsaw, Poland

THURSDAY, JUNE 29, 2023 CONTINUED

Development of a High-Precision Microwave Calorimeter for Thermal Analysis
Juan R. Sánchez, José D. Gutiérrez-Cano, Pedro J. Plaza-González, Felipe L. Penaranda-Foix and José M. Catalá-Civera
ITACA Institute, Universitat Politècnica de València, Camino de Vera,Valencia, Spain

Novel Microwave Moisture Sensor for In-Shell Nuts and Grains
Samir Trabelsi[1], Sakol Julrat[2] and Micah A. Lewis[1]
[1]Quality and Safety Assessment Research Unit, U.S. National Poultry Research Center, USDA-ARS, Athens, GA, USA
[2]Formerly Postdoctoral Research Scholar, USDA-ARS Participant, ORISE, USNPRC, Athens, GA, USA

12:05pm - 12:40pm **NETWORKING LUNCHEON** *(Posters and Exhibits Open)*

12:40pm - 1:40pm **POSTER & EXHIBITOR SESSION**

1:40pm - 2:00pm **SPECIAL PRESENTATION: IMS & AMPERE**

2:00pm - 3:00pm **CONCURRENT SESSIONS**

SESSION A: PLASMA II

Microwave Apparatus for Annealing of Atomic Layer Deposition (ALD) Films using Microwave Energy
Mohammad Kamarehi, Ilya Pokidov, Ken Trenholm, Joe Desjardins and Fedir Teplyuk
MKS Instruments / P&RGS, Wilmington, USA

Large-Area Plasma Surfaces Created with Distributed Microwave Plasma Sources
Fadi Zoubian, Nicolas Renaut and Louis Latrasse
SAIREM SAS, Décines-Charpieu – France

A Plasma-Based Absorptive Topology for Frequency Selective Protections
Sandeep N. Ramesh, Krushna K. Varikuntla and Abbas Semnani
The University of Toledo, Toledo, Ohio, USA

SESSION B: FOOD TECHNOLOGIES II

On the Improvement of the Radio Frequency Equipment for In-Shell Egg Pasteurization
Daniela Bermudez-Aguirre, Joseph Sites and Brendan A. Niemira
USDA ARS Eastern Regional Research Center, Wyndmoor, PA, USA

Study on Radio Frequency Drying and Roasting Germinated Peanuts
Su-Der Chen and Hsin-Chen Chou
Department of Food Science, National Ilan University, Yilin City, Taiwan

Microwave Pasteurization of Ready Meals
Alexandre Thillier[1], Ana Caroline Frabetti[1], Ben Ballart[2] and Sylvain Tissier[1]
[1]SAIREM, Décines-Charpieu, France
[2]SAIREM, Atlanta, USA

3:00pm- 3:50pm **EMERGING TECHNOLOGIES SPOTLIGHT SESSION**

A panel featuring small businesses and startups based on microwave and RF technologies.

Confirmed panelists:

TRANSFORM MATERIALS
Nathan Ashcraft
VP Research & Development

SinnovaTek
Michael Druga
President and CEO

NUIONIC TECHNOLOGIES
Jim Tranquilla
President and CTO

3:50pm - 4:00pm **AWARDS & CLOSING REMARKS**

4:00pm **SYMPOSIUM CONCLUDES**

Climate Change May be Driven by Solar Microwaves and Radio Waves – Molecular Modeling (DFT/MM) Study
Shozo Yanagida[1,2] and Takeko Matsumura[2]
[1]*Osaka University, Ibaraki, Japan*
[2]*Minerva Light Laboratory, Kyoto, Japan*

Characterization and Visualization of Structural Formation of Lossy or Semi-Conducting Materials during Microwave-Convective Processing Determined by Sub-Second In-Situ Synchrotron X-ray Microtomography – Potential Applications
Birgitta Wäppling Raaholt
RISE Research Institutes of Sweden, Göteborg, Sweden

Producing CO2-Free Hydrogen via Microwave-Driven Methane Pyrolysis
Fawaz Khan[1,2], Mehran Dadsetan[2], Mehdi Salakhi[2], Erin R. Bobicki[1,3], and Murray Thomson[1,2]
[1]*Aurora Hydrogen, Edmonton, Alberta, Canada*
[2]*University of Toronto, Toronto, Canada*
[3]*University of Alberta, Edmonton, Canada*

IMPI's 57th Annual Microwave Power Symposium (IMPI 57)

Keynote Addresses

Christina Wildfire
Lead for Center for Microwave Chemistry, Reaction Engineering Team
National Energy Technology Laboratory

"Decarbonizing the Chemical Industry with Microwaves: Advantages, Challenges, and Opportunities for the Future"

With the increasing commitment to reduce CO2 emissions from the chemical sector, there is a growing opportunity for non-traditional pathways for heating, catalytic reactions, and process design. The use of electromagnetic energy for both process heat and chemical reactions has been a growing field in the last 10 years. It has significant advantages by being a fully electric process, provides volumetric heating, and faster response rates allowing for more flexible designs. Each of these advantages play a part in decarbonization and can provide a future roadmap for smaller-scale distributed power and chemical production with a greatly reduced CO2 footprint. There have been great advancements in the fundamental understanding of how electromagnetic fields interact with complex materials, and the unique field intensification benefits that microwaves can provide. While there have been large leaps in both experimental and modeling of these non-equilibrium phenomenon, there are still roadblocks to the technologies use in the chemical sector. NETL has established the center of microwave chemistry (CMC) to help bridge the gap between academia and industry. The center serves as a collaboration point for fundamental research and practical application of the technology for scale-up and process integration. Dr. Wildfire will discuss the infrastructure of the CMC, current research areas, and the DOE's roadmap for the use of non-traditional energy methods for decarbonization.

Olli Tarvainen
Ion Source Physicist
UK Science and Technology Facilities Council (STFC)
Rutherford Appleton Laboratory
ISIS Neutron and Muon Source

"Microwave Ion Sources for Particle Accelerator Applications"

The talk presents an introduction to microwave ion sources used throughout the world for particle accelerator applications. Two operational ion source types, high-current 2.45 GHz proton sources and high charge-state 6.4-28 GHz electron cyclotron resonance heavy ion sources are discussed in detail. The emphasis of the talk is on the microwave systems of these plasma ion sources. Future directions of the ion source R&D towards higher frequencies, and the anticipated requirements of their microwave systems are identified.

KEYNOTE ADDRESSES

Michael Wolf
Founder of *The Spoon*, Creator of Smart Kitchen Summit and Creator of the CES Food Tech Conference

"Unleashing the Digital Cooking Revolution"

The kitchen presents a tantalizing conundrum; no place in our homes is riper for disruption but also more resistant to change for a whole host of reasons.

Experts often say that the critical decision factors for consumers regarding food are taste, price, value, and health. However, we can add two more interlocking considerations: the method of production and the return on our time spent creating food through cooking. Over half of adults say they like to cook, but because of our busy lives and fear of failure, most of us often follow the path of least resistance in getting that meal on the plate.

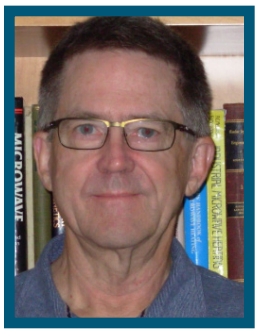
But what if technology could make the act of cooking easier and achieve better results? That's been the holy grail of the cooking technology industry, and yet despite billions of dollars in investment in new approaches over the past half-century, we've seen only incremental improvement and a few mild success stories to show for it.

In this talk, Michael Wolf will explore the evolution of the cooking technology industry, detail what has worked and the reasons for it, and how the industry still has a massive opportunity to create the technology-powered kitchen of the future.

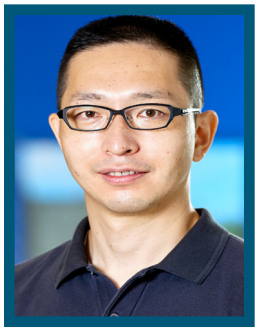
IMPI's
57TH ANNUAL MICROWAVE
POWER SYMPOSIUM (IMPI 57)

INVITED SPEAKERS

John Hu
Department of Chemical & Biomedical Engineering, Morgantown, WV, USA



John F. Gerling
Gerling Consulting, Inc., Gilroy, CA, USA



Shuntaro Tsubaki
Kyushu University, Fukuoka, Japan

Matt Rigney
Panasonic Food Service, Newark, NJ, USA

Birgitta Raaholt
RISE Research Institutes of Sweden, Göteborg, Sweden

Robert Mueller
Muegge GmbH, Reichelsheim (Odenwald), Germany

SPOTLIGHT SESSION INVITED SPEAKERS

Robert F. Welton
Spallation Neutron Source, Oak Ridge National Laboratory, Oak Ridge, TN, USA

Alan Letchford
STFC Rutherford Appleton Laboratory, Didcot, UK

Sami Gamal-Eldin Tantawi
Stanford University, Stanford, CA, USA

SPECIAL THANKS

Special thanks to the IMPI 57 Technical Program Committee for their dedication to this Symposium:

Chairs
Candice Ellison, USDA-ARS, USA, Chair
B. Reeja Jayan, Carnegie Mellon University, USA, Vice-Chair

Members
Eleanor Binner, University of Nottingham, UK
Raymond Boxman, Tel Aviv University, Israel
Graham Brodie, James Cook University, Australia
José Manuel Catalá-Civera, Instituto ITACA, Universitat Politècnica de València, Spain
Ulrich Erle, Nestle R&D, USA
Yang Jiao, Shanghai Ocean University, China
Marzena Olszewska-Placha, QWED, Poland
Zoya Popovic, University of Colorado Boulder, USA
Marilena Radoiu, Microwave Technologies Consulting, France
Vaidhy Vaidhyanathan, Loughborough University, UK
Klaus Werner, pinkRF B.V., Netherlands
Vadim Yakovlev, Worcester Polytechnic Institute, USA

Organizers of Special Sessions
Eric Brown, Conagra Brands, USA
Jiajia Chen, University of Tennessee, USA
Zane Cohick, Air Force Research Laboratory, USA
Daniel Slocombe, Cardiff University, UK
Robert Welton, Oak Ridge National Laboratory, USA

IMPI's 57TH ANNUAL MICROWAVE POWER SYMPOSIUM (IMPI 57)

REGISTRATION

Please mail this completed form with payment to:
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Name: _____

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SYMPOSIUM *(Circle one)*	Regular Registration
Professional/Corporate IMPI Member	$775
Professional Non-Member	$875
Student IMPI Member	$495
Student Non-Member	$595

Registration Fee Includes: *Attendance at all in-person sessions from Tuesday, June 27, 2023 at 4:00pm through Thursday, June 29th at 4:00pm, Welcome Reception, two continental breakfasts, three coffee breaks, two networking luncheons, exhibition hall access, online access and access to conference Proceedings.*

ADD-ONS *(Optional)*

- ❍ **Short Course 1: Dielectric Material Properties Measurement** $275 IMPI Member/$325 Non-Member
- ❍ **SHORT COURSE II: Solid State RF Applications: Case Studies and Demonstration:** $275 IMPI Member/$325 Non-Member
- ❍ **Group Dinner at local restaurant:** $50

Registration fee: $_____

Add-ons: $_____

Membership fee: $_____

TOTAL DUE: $_____

MEMBERSHIP

Not a member? Join IMPI now and save significantly on registration:

- ❍ **Professional Membership:** $220
- ❍ **Student Membership** *(Valid Student ID required)***:** $50
- ❍ **Corporate Membership:** $2,500

PAYMENT

- ❍ **Check enclosed** *(Make check payable to IMPI)*
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IMPI's 57th Annual Microwave Power Symposium (IMPI 57)

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There are a limited number of Sponsorship Packages and Exhibition Booths available for IMPI 57. Those interested should contact Molly Poisant, Executive Director of IMPI, as soon as possible, at molly.poisant@impi.org

IMPI's 57TH ANNUAL MICROWAVE POWER SYMPOSIUM (IMPI 57)

REGISTER TODAY AT WWW.IMPI.ORG | SEE YOU IN DENVER!

Questions or Comments?
Please contact the IMPI office at:

info@impi.org
International Microwave Power Institute
PO Box 1140, Mechanicsville, VA 23111