



IMPI's

58TH ANNUAL MICROWAVE POWER SYMPOSIUM (IMPI 58)

May 29-31, 2024

Hyatt Regency Reston
Suburban Washington, D.C., 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 58 is your opportunity to connect to and learn from the premier microwave power experts from around the world!

THE SYMPOSIUM

Join us outside of Washington, D.C., for the 58th Annual Microwave Power Symposium (IMPI 58). 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 industrial, plasma, chemical and material processing, solid-state, terahertz, food technologies, biological applications and more!

HOST CITY, VENUE AND ACCOMMODATIONS

The Hyatt Regency Reston, located six miles from Dulles International Airport (IAD), will be the ideal setting for IMPI's growing Symposium. Anchored twenty miles west of Washington, D.C., the Hyatt sits on a recently completed metro rail line that runs from IAD to Washington, D.C., and is part of the acclaimed Reston Town Center, a walkable town square which boasts over 35 retailers, 50 restaurants, a cinema and plentiful outdoor spaces.

IMPI 58 attendees may [book their room directly here](#) to receive the \$239 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:** [MW 101: Microwave and Radio Frequency \(Mw/RF\) Technology](#)
- **Short Course II:** [Solid-State, RF Energy & Machine Learning Applications: Case Studies & Demonstration](#)
- **Group Dinner** at Local Restaurant
- **Spouse/Guest Program:** [Learn more here](#)

Exact times/days of presentations are subject to change

WEDNESDAY, MAY 29, 2024

8:00am - 11:45am **SHORT COURSE I: MW 101: MICROWAVE AND RADIO FREQUENCY (MW/RF) TECHNOLOGY** ([Learn More](#). Optional; Additional Fee Applies)

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

12:15pm - 4:00pm **SHORT COURSE II: SOLID-STATE, RF ENERGY & MACHINE LEARNING APPLICATIONS: CASE STUDIES & DEMONSTRATION** ([Learn More](#). Optional; Additional Fee Applies)

4:00pm - 5:15pm **EXHIBITOR SHOWCASE**
Fifteen-minute presentations/demonstrations at exhibition booths.

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

5:15pm - 6:30pm **WELCOME RECEPTION** (*Posters and Exhibits Open*)

6:30pm **DINNER ON OWN**
[There are dozens of restaurants in the Reston Town Center.](#) Reservations are recommended.

THURSDAY, MAY 30, 2024

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

8:00am - 8:15am **WELCOME & INTRODUCTIONS**
B. Reeja Jayan, Carnegie Mellon University
Ralph Bruce, RWBruce Associates, Inc./ Vanderbilt University (formerly)
John F. Gerling, Gerling Consulting & President, IMPI



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SCHEDULE OF EVENTS

THURSDAY, MAY 30, 2024 CONTINUED

8:15am - 9:00am

KEYNOTE ADDRESS: *Microwaves in Chemical Industry: Scale up Challenges and Modeling Approaches*

Pranjali Muley

Center for Microwave Chemistry, National Energy Technology Laboratory
Morgantown, WV, USA

PLENARY SESSION: BIO MEDICAL & BIO ENGINEERING

INVITED: *Microwave Technology for Solid Waste Treatment and Aerosol Disinfection*

Roger Ruan¹, Leilei Dai¹, Yuchuan Wang¹, Suman Lata¹, Juer Liu¹, Yanling Cheng²,
Xiangyang Lin³, and Hanwu Lei⁴

¹Department of Bioproducts and Biosystems Engineering and Center for Biorefining,
University of Minnesota, St. Paul, MN, USA

²Biochemical Engineering College, Beijing Union University, Beijing, P.R. China

³College of Biological Science and Engineering, Fuzhou University, Fuzhou, Fujian, P.R. China

⁴Biological Systems Engineering, Washington State University, Tri-Cities Campus,
Richland, WA, USA

Decontamination of Wheat Grains by Continuous Flow Microwave System

David Vennin¹, Ana Caroline Frabetti¹, Alexandre Thillier¹, Ben Ballart², YoonKi Hong²
and Sylvain Tissier¹

¹SAIREM, Decines Charpieu, France

²SAIREM Corporation, Peachtree Corners, Georgia, United States

Solid-state Microwave Technology for Pathogenic Tissue Ablation

Marco Fiore, Fabio Lobascio, Nicola Di Modugno, Tommaso De Nicolo and Cristian
Bruno

LEANFA Srl, Ruvo di Puglia, Italy

10:10am - 10:20am

POSTER FLASH SESSION

10:20am - 10:35am

COFFEE BREAK

10:35am - 11:55am

CONCURRENT SESSIONS

SESSION A: CHEMISTRY & PLASMA

Boosting Reverse Water Gas Shift Reaction over Microwave-excited Metal Cations in Zeolite Nanocavity

Ryo Ishibashi, Fuminao Kishimoto and Kazuhiro Takanabe
University of Tokyo, Tokyo, Japan



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SCHEDULE OF EVENTS

Generator Power Combining Comparisons for Microwave Driven Methane Pyrolysis

Brent Leier, Fawaz Khan, Amin Solouki, Francois van der Merwe and Erin Bobicki
Aurora Hydrogen, Edmonton, AB, Canada

Development of a Field Deployable Microwave Assisted Pyrolysis System

Mohan Jacob¹, Scarlett Allende¹, Muhammad Adeel Aafar¹, Christie Denmead², Adam Packer³, Mitchel Day², Hayden Hartley² and Graham Brodie¹

¹James Cook University, Townsville, Australia

²Cubic Corporation, Townsville, Australia

³TEi Services Pty Ltd, Townsville, Australia

Investigation of the Capabilities of a 5.8 GHz Microwave Plasma Source for Microchip Decapsulation

Amandine Guissart, Jens Hofmann, Joachim Schneider, Robert Mueller, Markus Dingeldein, and Klaus-Martin Baumgaertner
Muegge GmbH, Reichelsheim (Odenwald), Germany

SESSION B: FOOD TECHNOLOGIES

Developing a Solid-state Powered Heating Cavity in Microwave-assisted Pasteurization System (MAPS)

Xu Zhou, Zhongwei Tang, Patrick Pedrow and Juming Tang
Washington State University, Pullman, USA

Effect of Radio Frequency Based Thermal Processing on the Volatile Flavour Chemistry of Peas

Praiya Asavajaru¹, Aarti Bhagwat¹, Darrin Klassen¹, Li Liu¹, Yuping Lu¹, Peng Gao¹, Allaoua Achouri², Mélanie Pitre², Lamia L'Hocine² and Nandhakishore Rajagopalan^{1,3}

¹National Research Council of Canada, Saskatoon, Canada

²Agriculture and Agri-Food Canada, Saint-Hyacinthe, Canada

³University of Saskatchewan, Saskatoon, Canada

Microwave Drying of Potatoes: Predicting the Heat and Mass Transfer using a Hybrid Mixture Theory-based Unsaturated Transport Model Coupled with Maxwell's Equations

Yash Shah and Pawan S. Takhar
University of Illinois Urbana-Champaign, Urbana, USA

Comparing Solid-state Microwave and Conventional Baking Methods: A Study on Madeira Cake

Fabrizio Dughiero and Anna Maria Cavazzini
University of Padua, Padova, Italy

11:55am - 12:45pm

NETWORKING LUNCHEON (Posters & Exhibits Open)

12:45pm - 1:45pm

POSTER & EXHIBITOR SESSION

THURSDAY, MAY 30, 2024 CONTINUED

1:45pm - 3:20pm

SPECIAL SESSION: INDUSTRIAL APPLICATIONS / MICROWAVE WORKING GROUP SESSION

OPENING REMARKS:

Jean-Paul Bernard

Microwave Industrial Solutions, France

Microwave-assisted Combustion of Biological Material

Robert Mueller¹, Klaus-Martin Baumgaertner¹, Markus Dingeldein¹, Amandine Guissart¹, Jens Hofmann¹, Joachim Schneider¹ and Andrew Charles Dorn²

¹Muegge GmbH, Reichelsheim (Odenwald), Germany

²Neo Joule B.V., Maasbracht, The Netherlands

Industrial Development of Microwave Applicators Dedicated to the Treatment of Powders and Granular Media

Ana Caroline Frabetti^{1,2}, Tristan Garnault¹, Hugo Curto¹, Alexandre Thillier¹, Lionel Boillereaux², Olivier Rouaud² and Sébastien Curet²

¹SAIREM, Décines-Charpieu, France

²Oniris, Nantes Université, CNRS, GEPEA, Nantes, France

Advanced Dual-level Pulse Generators in Nanosecond Range at 2.45 GHz

Vasileios Ramopoulos and Gerd Hintz

TRUMPF Hüttinger GmbH + Co. KG, Freiburg, Germany

Breakthroughs in Solid-State RF Power Generation for Industrial, Scientific, and Medical Frontiers

Houssem Schuick, Patrick Valk and Coen Centen

Ampleon, Nijmegen, Netherlands

3:20pm - 3:35pm

COFFEE BREAK

3:35pm - 4:55pm

CONCURRENT SESSIONS

SESSION A: SOLID STATE I & MICROWAVE EQUIPMENT

Innovations in High Power GaN Solid-State Microwave Generators for Heating and Plasma Generation Applications

Grace E. Cho and Samuel Cho

RFHIC Corporation, Gwacheon, South Korea

Innovative RF Transistors: Pioneering Next-Gen Solid-State Microwave Ovens

Patrick Valk and Coen Centen

Ampleon, Nijmegen, Netherlands

Practical, Real-World Efficiency Comparison Between L-Band Magnetron and SSPA Microwave Sources

Adam Jones

Crescent Technologies, Glendale Heights, IL, USA



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SCHEDULE OF EVENTS

On the Design and Realization of a "Flameless Bunsen Burner"

Pablo Santón and Klaus Werner
pinkRF B.V., Nijmegen, The Netherlands

An Integrated Single Mode Microwave Applicator Cavity Combiner

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

SESSION B: DIELECTRIC PROPERTIES & DRYING / MATERIAL SCIENCE I

Comparison between Microwave and Hot-air Drying Methods for Herbs

YoonKi Hong¹, Ben Ballart¹, Alexander Thillier², Ana Caroline Frabetti² and Sylvain Tissier²

¹SAIREM Corporation, Peachtree Corners, Georgia, United States

²SAIREM, Decines-Charpieu, France

Electromagnetic Monitoring of the Drying of In-shell Macadamia Nuts

Raymond L. Boxman
Tel Aviv University & Clear Wave Limited, Tel Aviv, Israel

Microwave Dielectric Properties of Sugarcane Juice

Samir Trabelsi¹ and Paul White²

¹USDA-ARS-USNPRC, Athens, GA, USA

²USDA-ARS-Sugarcane Research Unit, Houma, LA, USA

Predicting Hotspot Generation from Local Electric-field Enhancement during Microwave Sintering

Bashu Aman¹, Pranjali Muley² and B. Reesha-Jayan¹

¹Carnegie Mellon University, Pittsburgh, USA

²National Energy Technology Laboratory, Morgantown, USA

Synthesis of Entropy Stabilized Oxides using Electromagnetic Radio Frequency Technique

Agni Kumar Biswal, Ankush Nandi and Aniruddh Vashisth
Department of Mechanical Engineering, University of Washington, Seattle, WA, United States

4:55pm - 5:30pm

IMPI BUSINESS MEETING

Open to all current and potential Members. Voting Board Elections, Officer Reports, Award of the R.F. Schiffmann Memorial Scholarship

6:30pm - 9:00pm

GROUP DINNER AT LOCAL RESTAURANT

Registration Required – Additional Fee Applies

FRIDAY, MAY 31, 2024

8:00am - 8:15am

ANNOUNCEMENTS

8:15am - 9:00am

PLENARY SESSION

KEYNOTE ADDRESS: Microwave & RF Process Solutions to Deliver Positive Food Choices for Consumers

John R. Bows

PepsiCo R&D, Leicester, United Kingdom

9:00am - 10:20am

CONCURRENT SESSIONS

SESSION A: MODELING

Multiphysics Modeling of Microwave Heating Behavior in Particulate Beds

Candice Ellison, Charles Mullen and Yaseen Elkasabi

USDA-ARS, Eastern Regional Research Center, Wyndmoor, PA, USA

Optimal Defect-Layer Positions in Thin Electromagnetic Energy Absorbers

Zachary W. Adams, Konrad Gomez-Haibach, Burt S. Tilley, and Vadim V. Yakovlev

Center for Industrial Mathematics and Statistics, Department of Mathematical Sciences, Worcester Polytechnic Institute, Worcester, MA, USA

A Panoramic View of Temperature and Field Distributions of the Structured Catalyst Under Microwave Irradiation Using Experimental and Modeling Approaches

Xinwei Bai^{1,2}; Pranjali Muley^{1,2}; Juddha Thapa^{1,2}; Benjamin T. Chorpening¹ and Daniel J. Haynes¹

¹National Energy Technology Laboratory, Morgantown, WV, USA

²NETL Support Contractor, Morgantown, WV, USA

Performance Enhancement of a 915 MHz 100 kW Atmospheric Microwave Plasma Torch for Gas Treatment through CFD Modeling and Optimization

Benjamin Ballart², Youcef Fermi¹, Fadi Zoubian¹, Nicolas Renaut¹, Bertrand Depagneux¹ and Louis Latrasse¹

¹SAIREM, Décines-Charpieu, France

²SAIREM Corporation, Peachtree Corners, Georgia, United States

SESSION B: INDUSTRIAL PROCESS EQUIPMENT

915 MHz Industrial Magnetron: 60 Years Later

Michael S. Worthington, John Cipolla, Mitch McCleod and Hugh Shultz

Stellant Systems, Williamsport, PA, USA

Tuning Considerations for Microwave Heating Systems

Jacob Sturgis, Henry Downs and Henry Fries

Microwave Techniques, Gorham, Maine, USA



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SCHEDULE OF EVENTS

A Complementary Relative-phase Strategy to Improve Heating Performance in a Dual-port Solid-state Microwave System

Arjun Ghimire and Jiajia Chen

Department of Food Science, The University of Tennessee, Knoxville, Tennessee, USA

10:20am - 10:45am

COFFEE BREAK

10:45am - 12:15pm

CONCURRENT SESSIONS

SESSION A: INDUSTRIAL APPLICATIONS - MATERIAL SCIENCE II

INVITED: Demonstrating In-situ Tools to Study the Non-equilibrium Phenomena Underlying Microwave-assisted Nanomaterials Synthesis

Morgan Chen¹, Sanjit Ghose² and B. Reeja-Jayan¹

¹Carnegie Mellon University, Pittsburgh, USA

²Brookhaven National Laboratory, Upton, USA

In situ XRD Analysis of Microwave-enhanced Catalytic Pyrolysis of Lignocellulose by a Perovskite Oxides

Shuntaro Tsubaki¹, Shunsuke Ota¹, Noriyuki Igura¹, Takashi Nakamura², Jun

Fukushima³, Ken-ichi Kimijima⁴, Masao Kimura⁴, Wang-Jae Chun⁴

¹Kyushu University, Fukuoka, Japan

²Tohoku University, Sendai, Japan

³High Energy Accelerator Research Organization, Tsukuba, Japan

⁴International Christian University, Tokyo, Japan

Energy Efficient Processing of Carbon Fiber Composites using Radio Frequency Heating

Aniruddh Vashisth

Department of Mechanical Engineering, University of Washington, Seattle, WA, USA

Detailed Insights into Microwave Assisted Ammonia Synthesis based on Thermodynamic Equilibrium

Fuminao Kishimoto, Takuya Suguro, William Movick and Kazuhiro Takanabe

The University of Tokyo, Tokyo, Japan

SESSION B: SOLID STATE II

Identification of Turntable Function in Solid-state Microwave Heating Processes with Shifting Frequencies

Ran Yang and Jiajia Chen

Department of Food Science, University of Tennessee, Knoxville, TN, USA

Development of a Real-time Dynamic Complementary Relative Phase Shifting Strategy for Dual-port Solid-state Microwave Heating Process

Arjun Ghimire and Jiajia Chen

Department of Food Science, The University of Tennessee, Knoxville, Tennessee, USA

FRIDAY, MAY 31, 2024 CONTINUED

12:15pm - 1:00pm **NETWORKING LUNCHEON** (*Posters and Exhibits Open*)

1:00pm - 2:00pm **POSTER & EXHIBITOR SESSION**

2:00pm - 3:05pm **SPECIAL SESSION: TERAHERTZ TECHNOLOGY**

OPENING REMARKS:

Raymond Boxman

Tel Aviv University & Clear Wave Limited, Tel Aviv, Israel

INVITED: Novel W-Band Complex Permittivity Measurement Apparatus for Extreme Temperature Conditions

Cesar A. Nieves¹, Jiping Cheng², Samuel C. Schaub¹, Anthony E. Baros¹, Brad W. Hoff¹, Michael T. Lanagan², Dinesh Agarwal² and Zane W. Cohick¹

¹*Air Force Research Laboratory, Albuquerque, NM, USA*

²*The Pennsylvania State University, University Park, PA, USA*

GHz and THz Characterization of Novel Ultra-Low Temperature Co fired Ceramic Materials for Emerging Technologies

Marzena Olszewska-Placha¹, Beata Synkiewicz-Musialska² and Jobin Varghese³

¹*QWED Sp. z o.o., Warsaw, Poland*

²*Lukasiewicz-Institute of Microelectronics and Photonics, Krakow, Poland*

³*Fraunhofer IKTS, Dresden, Germany*

3:05pm- 3:55pm **SPOTLIGHT PANEL: OPPORTUNITIES FOR YOUNG PROFESSIONALS**

Moderator: B. Reeja Jayan, Carnegie Mellon University

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

4:00pm **SYMPOSIUM CONCLUDES**

Microwave Pasteurization of Low-pH Product

Ana Caroline Frabetti¹, Alexandre Thillier¹, Ben Ballart², YoonKi Hong² and Sylvain Tissier¹

¹SAIREM, Décines-Charpieu, France

²SAIREM Corporation, Peachtree Corners, Georgia, United States

Compression after Impact of Radiofrequency Healed Carbon Fiber-vitrimer Composites Ankush Nandi,

Agni Kumar Biswal and Aniruddh Vashisth

Department of Mechanical Engineering, University of Washington, Seattle, WA, USA

Radio Frequency Combined Air Drying of Squid: Drying Kinetics and Quality Analysis

Feilong Zhang, Feng Li and Yang Jiao

College of Food Science and Technology, Shanghai Ocean University, Shanghai, China



Pranjali Muley

Center for Microwave Chemistry, National Energy Technology Laboratory
Morgantown, WV, USA

Microwaves in Chemical Industry: Scale up Challenges and Modeling Approaches

Chemical industry utilizes 30% of all energy and is responsible for 17% of the carbon emissions. Chemical industry is also listed as one of the difficult industries to electrify. Microwave heating can offer a route to electrify process heat by providing targeted heating. Microwave heating also offers improved energy efficiency and product selectivity for catalytic reactions. Rapid heating

reduces processing times and energy demands and increases possibility of incorporating intermittent renewable energy as and when available.

Despite these advantages, chemical industries have been slow to adopt microwave technology as heating solution. Primary challenges in adoption include limited scalability demonstrations, in-situ temperature measurement challenges, and limited understanding of microwave-material interactions for best design approaches.

This talk will focus on scale up challenges and approaches for adoption of microwave technology in chemical industry and discuss the role of numerical modeling. Talk will also brush up on NETL's role in pushing technologies out of the lab and into the field.



John R. Bows

PepsiCo R&D Fellow
Leicester, United Kingdom

Microwave & RF Process Solutions to Deliver Positive Food Choices for Consumers

Food manufacturers are increasingly faced with regulatory, competitive and strategic challenges to increase healthier food choices for consumers. Front-of-pack labelling systems such as: Guideline Daily Amount, Traffic Lights, Nutri-Score, and positive enforcement logos; regulatory frameworks like the UK "High Fat Salt & Sugar" (HFSS); publicly declared strategic business

commitments (e.g. PepsiCo pep+), and the ongoing Ultra Processed Food debate (e.g. promoting NOVA classifications) have driven renewed interest in non-traditional food processing technologies to deliver more healthier food options.

Industrial microwave food processing has found limited success outside notable exceptions (bacon cooking, tempering, and many small scale installations of vacuum microwave drying, pasta and vegetable drying, and a handful of pasteurisation and sterilisation systems). Historically, disrupting incumbent, well understood and highly cost optimized technologies (such as frying, hot air, extrusion, retorting, pressure expansion) has been very challenging.

This talk will review several microwave & RF process development projects aimed at delivering positive food choices for consumers (e.g. nutrient-retentive, consumer-credible ingredient claims, lower fat/salt/sugar) and some of the challenges commercialising such processes from the perspective of large food manufacturers, and outlook for the future.



Roger Ruan

*Department of Bioproducts and Biosystems Engineering and Center for Biorefining,
University of Minnesota, St. Paul, MN, USA*



Morgan Chen

Carnegie Mellon University, Pittsburgh, PA, USA



Cesar A. Nieves

Air Force Research Laboratory, Albuquerque, NM, USA

Special thanks to the IMPI 58 Technical Program Committee for their dedication to this Symposium:

Chairs

B. Reeja Jayan, Carnegie Mellon University, USA, Chair

Ralph W. Bruce, RW Bruce Associates, LLC, formerly Vanderbilt University, USA, Vice-Chair

Members

Eleanor Binner, University of Nottingham, UK

Erin Bobicki, Aurora Hydrogen, Canada

Graham Brodie, James Cook University, Australia

José Manuel Catalá-Civera, Instituto ITACA, Universitat Politècnica de València, Spain

Candice Ellison, USDA-ARS, USA

Ulrich Erle, Nestle R&D, USA

Yang Jiao, Shanghai Ocean University, China

Pranjali Muley, National Energy Technology Laboratory, USA

Marzena Olszewska-Placha, QWED, Poland

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

Raymond Boxman, Tel Aviv University, Israel

Eric Brown, Conagra Brands, USA

Jiajia Chen, University of Tennessee -Knoxville, USA

Zane Cohick, Air Force Research Laboratory, USA

Aniruddh Vashisth, University of Washington - Seattle, USA

Robert Welton, Oak Ridge National Laboratory, USA

REGISTRATION

Please mail this completed form with payment to:

International Microwave Power Institute

PO Box 1140, Mechanicsville, VA 23111

Or register online at www.IMPI.org

Name: _____

Title: _____

Company: _____

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Country: _____ Phone: _____ Email: _____

SYMPOSIUM (Circle one)

	Early Bird (Until Mar. 31)	Regular Registration
Professional/Corporate IMPI Member	\$675	\$775
Professional Non-Member	\$775	\$875
Student IMPI Member	\$445	\$495
Student Non-Member	\$545	\$595

Registration Fee Includes: Attendance at all in-person sessions from 4:00pm on Wednesday, May 29th through 4:00pm on Friday, May 31st, Welcome Reception, two continental breakfasts, three coffee breaks, two networking luncheons, exhibition hall access, online access to the conference Proceedings.

ADD-ONS (Optional)

- ☐ **SHORT COURSE I: MW 101: Microwave and Radio Frequency (Mw/RF) Technology** - \$275 IMPI Member/\$325 Non-Member
- ☐ **SHORT COURSE II: Solid-State, RF Energy & Machine Learning Applications: Case Studies & Demonstration** - \$275 IMPI Member/\$325 Non-Member
- ☐ **Group Dinner at local restaurant:** \$65/each

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

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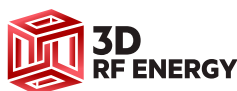
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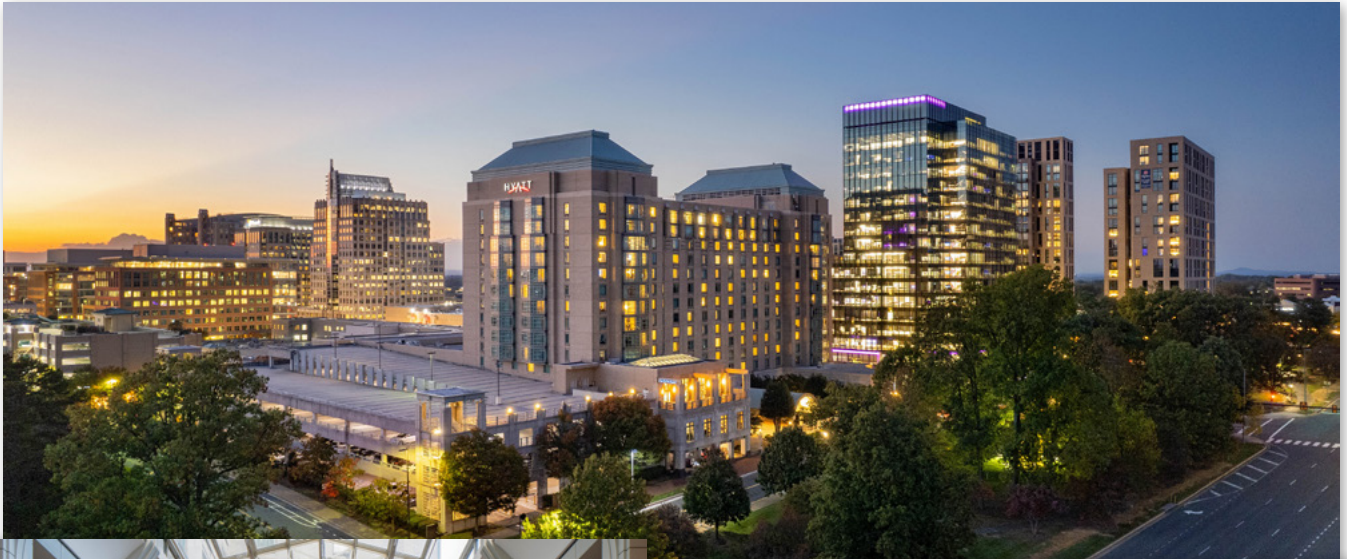


There are a limited number of Sponsorship Packages and Exhibition Booths available for IMPI 58. Those interested should contact Molly Poisant, Executive Director of IMPI, as soon as possible, at molly.poisant@impi.org



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Questions or Comments?
Please contact the IMPI office at:

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