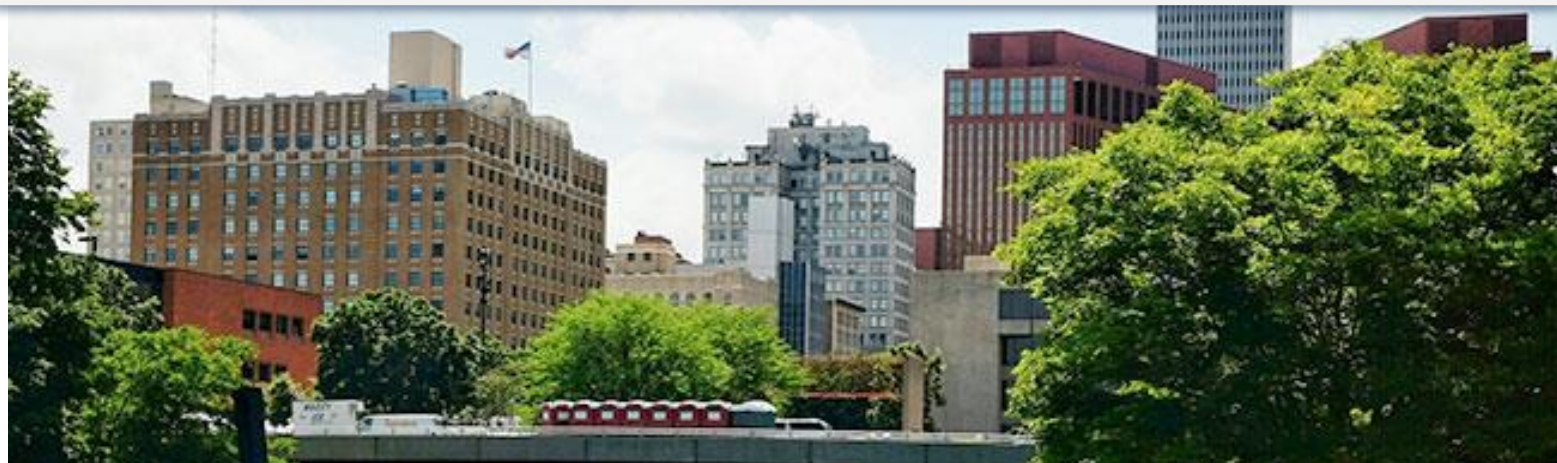


# THE WAVE



The newsletter publication of the International Microwave Power Institute  
October 2017



## “The Changing Landscape of the Microwavable Food Market” Fall Short Course to be held in Omaha

In just under 3 weeks, industry professionals will gather in Omaha, Nebraska, USA for IMPI’s Fall Short Course, [“The Changing Landscape of the Microwavable Food Market.”](#)

Hosted by IMPI and sponsored by Conagra Brands, the Fall Short Course will run from October 24<sup>th</sup>-26<sup>th</sup>. It offers a pre-short course on “Microwaves 101: The Fundamentals of Microwave Heating” taught by IMPI President, Bob Schiffmann. A Welcome Reception at Brickway Brewery in Old Market will be held the evening of October 24<sup>th</sup>.

The Fall Short Course will feature two keynote presentations. Larry Levin, Executive Vice President of Consumer & Shopper Marketing with IRI Worldwide will speaker on “*The Connected Consumer.*” David Luttenberger, Global Packaging Director of Mintel will focus on “*Packaging Solutions vs. Disruptions.*”

There are a series of speakers who will explore topics such as consumer trends and behaviors, regulatory landscape, food safety, validation, risk assessment, food safety, combating microwave myths and the role Solid-State will play in the food industry. The full Schedule of Events can be [viewed here.](#) [Registration](#) is open.

## Call for Papers - 52<sup>nd</sup> Annual Microwave Power Symposium

The Call for Papers for the 52<sup>nd</sup> Annual Microwave Power Symposium (IMPI 52) is now available for [download](#). IMPI 52 will take place June 26-28, 2018 at the Hilton Hotel in Long Beach, California, USA.

IMPI 52 will bring together researchers, technologists, engineers and industry professionals from across the globe to share the latest research and developments in microwave and radio frequency power applications, including food technology, industrial, solid state, chemical, plasma, material processing and new emerging technologies.

The Spotlight Session for IMPI 52 will focus on Industrial Microwave and RF Applications.

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## PRESIDENTS MESSAGE

One of the most momentous events in science and humanity was celebrated on September 5, 2017, the 40th anniversary of the launching of Voyager 1. Interestingly, Voyager 2 was launched two weeks prior to that on August 20. Both of these interstellar probes were launched for up-close study of the outer planets, Saturn, Jupiter, Uranus and Neptune; to learn about their atmospheres, magnetospheres, and the other properties of these giant planets, and their satellites. The results have been astonishing, as summarized on the NASA website:

- Discovery of 22 new satellites: 3 at Jupiter, 3 at Saturn, 10 at Uranus, 6 at Neptune
- Discovery of Jupiter's rings, and additional information about the rings of Saturn, Uranus and Neptune
- Discovery of Uranian and Neptunian magnetospheres
- Discovery of active volcanism on Io, and active geiserlike structures on Triton
- Discovery of auroral zones on Jupiter, Saturn and Neptune

For years, Saturn was believed to have 18 natural moons, and now we know that it has an astonishing 62 moons. What is, perhaps, even more astonishing is this was accomplished with all the computing power that you have in the little fob attached your keychain that you used to lock and unlock your car doors.

In 2012, Voyager 1 left the heliosphere, that section of space in which the pressure from the sun's wind of particles and its magnetic field overcomes the outside pressure from the rarefied gas that permeates the rest of our galaxy, making it the first man-made object to depart the solar system, and it is now wandering through dark interstellar space. Voyager 1 is also the spacecraft that has attached to it a golden CD that contains information about the location of the earth, photographs of people and the earth, music, speech, and much more, so that should some alien civilization encounter this spacecraft, it is possible that they can learn all about us and our civilization. Obviously a true long shot, but then the universe is expected to go on for many billions of years, so it can happen.

What about Voyager 2? While Voyager 1 focused its attention upon Saturn and Jupiter, Voyager 2 also photographed those planets, but then received permission to continue this study and photograph Uranus and Neptune, sending back photographs of incredible detail. Today it is over 10.7 billion miles from Earth, still in the heliosphere, but expected eventually enter into deep space. There is a wonderful PBS documentary covering all this: "The Farthest: Voyager in Space". I urge you to stream it

An article, "How Civilization Started", in the September 18, 2017 issue of the New Yorker, concerning science and technology, stated, "For much of human history ... technology had nothing to do with science. Many of our most significant inventions are pure tools, with no scientific method behind them. Wheels and wells, cranks and mills and gears and ship's masts, clocks and rudders and crop rotation... None historically had any connection to what we think of today in science". I don't agree, perhaps none was conceived and developed using the scientific method, but all had something to do with science, only humans didn't know it at that time. (The Oxford Dictionaries Online defines the scientific method as "a method that has characterized natural science since the 17th century" – Wikipedia.) Whether it is science, technology, engineering, or plain tinkering, it is all a result of curiosity, ingenuity, the thirst for knowledge, or serendipity, so it has taken humans from the discovery and control of fire all the way through the Voyagers, and today's incredible advances in computers, medical technology, all areas of engineering and technology.

*Continued on Next Page*

## PRESIDENTS MESSAGE CONTINUED

In the microwave world we are seeing it with the application of computer modeling to microwave systems, and the rapidly growing field of solid-state applications. It is all a very exciting time to be involved in our field and we at IMPI are doing our best to keep you informed and up-to-date. Be sure to be part of our events and products, and let us know what else we should be doing, and what else is going on that we can pass on to our members.

A reminder, the IMPI Fall Short Course will be held on the Conagra campus in Omaha from October 24 to 26, 2017. Hope to see you ther.

Bob

## IMPI 52 – Call for Papers Continued

**Why Long Beach?** Often referred to as an “urban waterfront playground,” Long Beach is a thriving city on the Pacific Ocean. There are multiple attractions within 5 minutes of the hotel, including the Aquarium of the Pacific, restaurants, harbors, marinas and of course, the beach! Within an hour drive, you can explore the fabulous worlds of Universal Studios, Hollywood, Disneyland, and every other major Southern California attraction. The Long Beach airport is only a 20-minute drive and the Los Angeles International Airport is a short 35-minutes from the hotel.

### FUNDAMENTALS AND INDUSTRIAL APPLICATIONS TOPICS

- Biomedical & Medical Applications
- Dielectric and other Material Properties
- Industrial High Power Equipment and Process Control
- Microwave Assisted Chemistry
- Microwave Plasma
- Modeling, CAD and Optimization
- New (Non-Communication) Microwave Technologies
- Process Intensification with Microwaves and RF
- Solid State Microwave Technology
- Microwave Applications in the Mining Industry
- Material Handling and Scale Up

### FOOD SCIENCE AND TECHNOLOGY TOPICS

- Biological Applications
- Industrial RF & Microwave
- Processing of Food
- Microbiological Testing
- Microwavable Packaging
- Microwave Ovens: Design, Standards, Safety
- Product Validation
- Food & Agriculture
- Nutrition
- Trends in Microwave Cooking

[VIEW THE FULL CALL FOR PAPERS HERE!](#)

**Student Competition:** Students are encouraged to participate in IMPI 52. We offer a discounted registration rate and hotel rate for students. All students are eligible to compete in our Student Competition where winners for best Oral and Poster presentations are awarded a cash prize, certificate and one year membership in IMPI.

**Leadership:** The Technical Program Chairmen for IMPI 52 are Dr. Graham Brodie of the University of Melbourne and Dr. Ric Gonzalez of Conagra Brands. The Food Science & Technology Program Committee Chairman is Dr. Ulrich Erle of Nestle.



# LONG BEACH, CALIFORNIA

Site of IMPI's 52nd Annual Microwave Power Symposium (IMPI 52)

June 26-28, 2018



## CALENDAR OF EVENTS

**SmarterWorld RF Energy Summit**, October 17, 2017 - Erding, Germany. Hosted by Dr. Klaus Werner, Executive Director of RF Energy Alliance and Heinz Arnold, Editor in Chief of SmarterWorld/Markt&Technik. Registration and program details available at: <http://www.rf-energy-summit.com/>

**“The Changing Landscape of the Microwavable Food Market” Fall Short Course**, Conagra Brands Campus, October 24-26, 2017. Hosted by IMPI and sponsored by Conagra Brands. More details at <http://www.impi.org/>

**IMPI Fall 2017 Webinar Series on Industrial Microwave and RF Processing** (November 9<sup>th</sup> and December 14<sup>th</sup> 2017 from 11am-12pm EST)

This two-part webinar series will introduce the application of microwave and RF systems for the industrial processing of materials. Part 1 will describe the equipment utilized by both of these heating modalities, and the uniqueness of each. Part 2 will focus upon how these heating systems are applied in industry, their unusual heating properties and how these are best applied. IMPI Webinars are FREE for all members. Registration details at [www.impi.org/events](http://www.impi.org/events)

**52<sup>nd</sup> Annual Microwave Power Symposium (IMPI 52)** The Hilton Hotel, Long Beach, California, USA, June 26-28, 2018. Call for Papers [available here](#).

## NEWS FROM AROUND THE WEB

Countertop Microwave Market 2017-2021: [Trends, Technology and Opportunities](#)

[New Wireless Pacemaker](#) is Powered by Microwaves

Revealed: The foods you NEVER knew you could [cook in the microwave](#)

NXP® Partners with Midea for [New Smart Kitchen Appliance](#)

Microwave Oven Market [Emerging Trends and New Technologies](#) Research 2017 to 2022

## Measuring the Dielectric Properties of Granular Materials – a free service for IMPI members:

A team within the Metallurgical and Engineering Faculty of Kunming University of Science and Technology, Kunming China, under the Direction of Prof. Jinhui Peng, is establishing a Global Testing Center for High-Temperature Dielectric Properties of Materials, and has offered IMPI members an opportunity to have their own materials tested, from room temperature to 1400°, at no cost to IMPI members. A description of the technology and contact information [are given in the attached link](#).

# THE JOURNAL OF MICROWAVE POWER & ELECTROMAGNETIC ENERGY (JMPEE)

Volume 51, Issue 3 of the Journal of Microwave Power and Electromagnetic Energy is now available for viewing. All IMPI members receive complimentary access to JMPEE. If you require assistance accessing your subscription please email: [admin@impi.org](mailto:admin@impi.org)

## **Editor's message: Harvesting and wireless power transmission**

*Juan Antonio Aguilar-Garib*

## **Microwave-assisted extraction as a method of improving the quality of wines**

*Livia Bandici, Simona Ioana Vicaș, Alin Cristian Teușdea, Gheorghe Emil Bandici, and Dorin Popa*

## **Quality of beans (*Phaseolus vulgaris* L.) after postharvest microwave treatments**

*Maria Elena Sosa-Morales, Mariana Aguilar-Morales, Abel Cerón-García, Aurelio Lopez-Malo, and Roberto Rojas-Laguna*

## **Open-ended Voltage Multipliers for Wireless Transmission of Electric Power**

*Louis Wy Liu, Abhishek Kandwal, Zoya Eremenko, and Qingfeng Zhang*

## **Microwave assisted heating: Innovative use in hydrolytic forced degradation of selected drugs**

*Priti Mehta and Prutha Patel*

## **Study on antenna radiation electric field and coupling of microwave heating asphalt mixtures**

*Tongsheng Sun and Zhou Xu*

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