

# GLOBAL CONGRESS ON MICROWAVE ENERGY APPLICATIONS

GCMEA 2008  
MAJIC 1<sup>ST</sup>

## PROCEEDINGS

**August 4-8, 2008**

Otsu Prince Hotel, Lake Biwa, Otsu, Japan

*"The New Flame for Humanity"*

Organized by MAJIC;  
International Federation of Associations in the Field of  
Microwave and RF Power Engineering

Japan Society of Electromagnetic Wave Energy Applications  
(JEMEA, Japan)

Association for Microwave Power in Europe for Research and Education  
(AMPERE, Europe)

Microwave Working Group  
(MWG, USA)

International Microwave Power Institute  
(IMPI, USA)

Chinese Microwave Society

Sponsored by JEMEA



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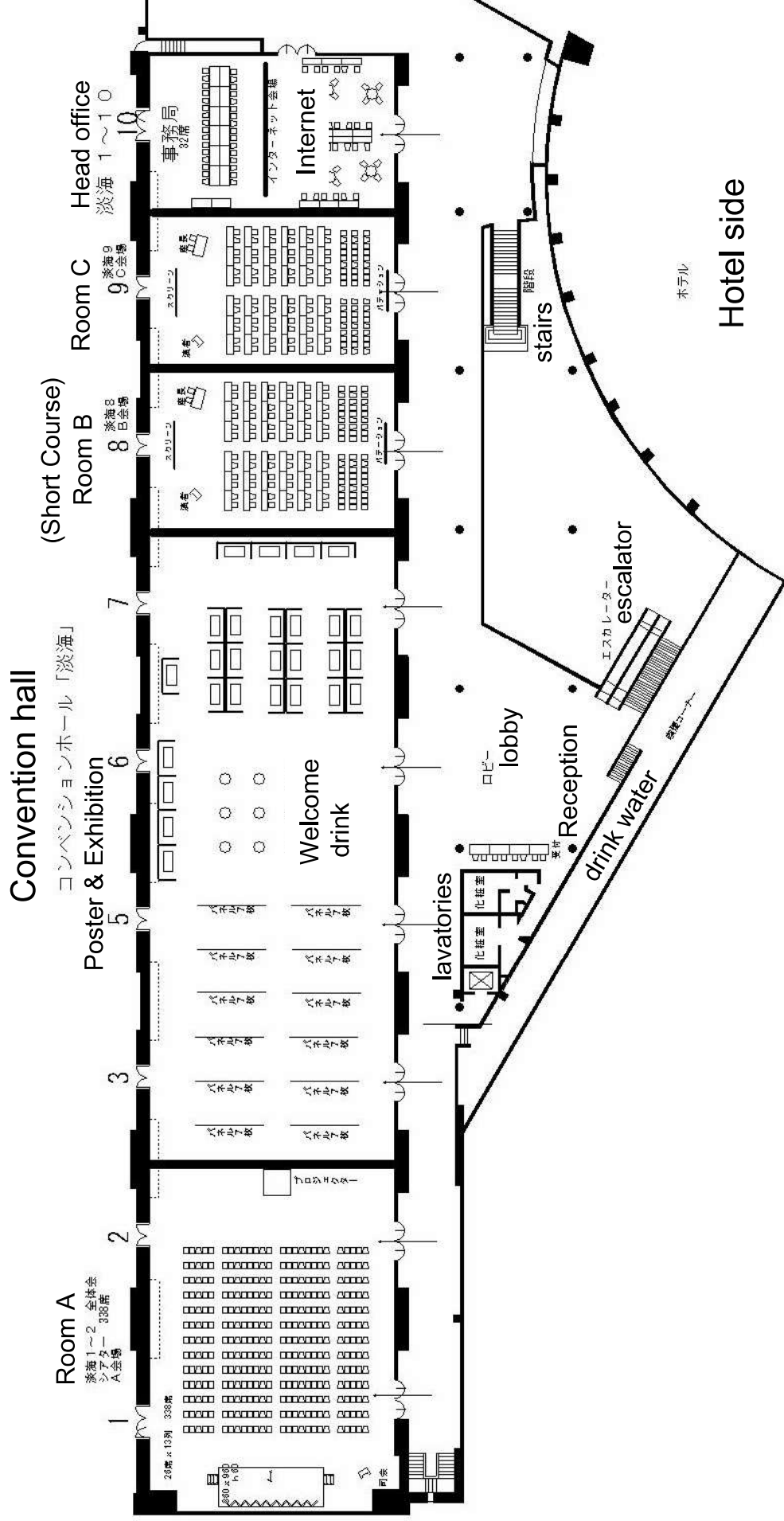
*Supported by*  
Grant-in-Aids for Scientific Research  
(MEXT Prime Area Research Project No.465, FY 2006 - 2010)  
“Science and Technology for Microwave-Induced, thermally Non-Equilibrium Reaction Fields”

*Supported by*  
Shiga Prefecture Biwako Visitors Bureau

CONFERENCE-AT-A-GLANCE

Aug 4, Mon				Aug 5, Tue				Aug 6, Wed				Aug 7, Thu				Aug 8, Fri			
8:00				8:00	Registration			8:00	Registration			8:00	Registration			8:00	Registration		
8:30				8:30	Opening			8:30	Plenary AMPERE			8:30	Plenary JEMEA			8:30	O2	O4	
9:00				9:00	Break			9:00	Plenary AMPERE			9:00	Plenary JEMEA			9:00	Break		
9:30				9:30	Plenary MWG & IMPI			9:30	Plenary AMPERE			9:30	Plenary JEMEA			9:30	Material Processing (9)	System and Applications	
10:00				10:00	Plenary MWG & IMPI			10:00	Plenary AMPERE			10:00	Plenary JEMEA			10:00	Break		
10:30				10:30	Plenary MWG & IMPI			10:30	Plenary AMPERE			10:30	Plenary JEMEA			10:30	O2	O5	
11:00				11:00	Plenary MWG & IMPI			11:00	Plenary AMPERE			11:00	Plenary JEMEA			11:00	Break		
11:30	Short Course I			11:30	Plenary MWG & IMPI			11:30	O1	O7	O3	11:30	O2	O7	O3	11:30	Material Processing (10)	Theory and Measurements (3)	
12:00				12:00				12:00	Chemical Synthesis (3)	Other Related Topics (1)	Biological Applications (3)	12:00	Material Processing (5)	Other Related Topics (2)	Biological Applications (4)	12:00	Break		
12:30	Lunch			12:30	Lunch			12:30	Lunch			12:30	Lunch			12:30	O6	O5	
13:00				13:00				13:00	Lunch			13:00	Lunch			13:00	Industrial Applications (4)	Theory and Measurements (4)	
13:30	Short Course II			13:30	O1	O2	O3	13:30	O2	O1	O3	13:30	O2	O1	O6	13:30	Closing		
14:00				14:00	Chemical Synthesis (1)	Material Processing (1)	Biological, Medical and Environmental Applications (1)	14:00	Material Processing (3)	Chemical Synthesis (4)	Biological, Medical and Environmental Applications (4)	14:00	Material Processing (6)	Chemical Synthesis (6)	Industrial Applications (1)				
14:30	Short Course III			14:30				14:30				14:30				14:30			
15:00	Break			15:00	Break			15:00	Break			15:00	Break			15:00			
15:30	Short Course IV			15:30	O1	O2	O3	15:30	O2	O1	O5	15:30	O2	O1	O6	15:30			
16:00				16:00	Chemical Synthesis (2)	Material Processing (2)	Biological, Medical and Environmental Applications (2)	16:00	Material Processing (4)	Chemical Synthesis (5)	Theory and Measurements (1)	16:00	Material Processing (7)	Chemical Synthesis (7)	Industrial Applications (2)	16:00			
16:30	Short Course V			16:30	Poster (even #)			16:30	Poster (odd #)			16:30	Break			16:30			
17:00				17:00	Poster (even #)			17:00	Poster (odd #)			17:00	O2	O5	O6	17:00			
17:30				17:30				17:30				17:30	Material Processing (8)	Theory and Measurements (2)	Industrial Applications (3)	17:30			
18:00				18:00	Break	Workshop I		18:00				18:00	Break			18:00			
18:30				18:30	Workshop I			18:30				18:30	Break			18:30			
19:00				19:00				19:00				19:00	Break			19:00			
19:30				19:30				19:30				19:30	Official Dinner			19:30			
20:00				20:00				20:00				20:00	Official Dinner			20:00			
20:30				20:30				20:30				20:30	Official Dinner			20:30			
21:00				21:00	Welcome Drink			21:00				21:00	Official Dinner			21:00			
21:30				21:30				21:30				21:30	Official Dinner			21:30			

# Conference room Map



# 2008 Global Congress on Microwave Energy Applications Proceedings

August 4-8, 2008

Otsu Prince Hotel, Lake Biwa, Otsu, Japan

Organized by MAJIC; International Federation of Associations in the Field of  
Microwave and RF Power Engineering

Microwave Working Group (MWG, USA)

Association for Microwave Power in Europe for Research and Education  
(AMPERE, Europe)

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## **Greetings from the Conference Chair**

It is a great pleasure and honor to extend a warm welcome to all delegates from many countries and different regions who are attending 2008 Global Congress on Microwave Energy Applications, subsequently referred to as the GCMEA 2008 / MAJIC 1<sup>st</sup>, held in Otsu, Japan. This first international conference is cooperatively organized by International Federation of Associations in the Field of Microwave and RF Power Engineering (MAJIC), composed of Microwave Working Group (MWG, USA), Association for Microwave Power in Europe for Research and Education (AMPERE, Europe), Japan Society of Electromagnetic Wave Energy Applications (JEMEA, Japan), International Microwave Power institute (IMPI, USA) and Chinese Microwave Society, and sponsored by JEMEA.

GCMEA is deepen cooperative relationships between engineers and scientists in aspects of fields of applications of RF, microwave and shorter wave research and development. This will particularly promote interchange of ideas among members not only from MAJIC but also workers of other regions from all around the world.

The microwave technologies, as one of the most brilliant achievements of the human in the 20<sup>th</sup> century, are becoming more and more important in human life. The application of microwave technology gave benefit to the human in many ways. I sincerely hope that the technologies presented at this GCMEA 2008 / MAJIC 1<sup>st</sup>, will contribute to the fields of RF, microwave and shorter wave energy application technologies as the enabling force for realizing the affluent society. In addition, we can anticipate new roles in solving problems relating to energy and the environment.

I would like to express our sincere appreciation to all the committee members and the many other people who have made such great efforts to set-up this conference. Most important of all, however, we express our sincere appreciation for your attendance as a delegate to the conference.



Yoshio Nikawa  
Conference Chair  
President of JEMEA  
Professor of Kokushikan University

## Welcome to GCMEA 2008 / MAJIC 1<sup>st</sup>

On behalf of the Steering Committee, I welcome you to the Global Congress on Microwave Energy Applications 2008 / MAJIC 1<sup>st</sup> (GCMEA 2008 / MAJIC 1st), which will be held in Otsu city in Shiga prefecture Japan, on August 4 through 8, 2008. GCMEA 2008 / MAJIC 1st has been planned and organized since 2004. After the successful 4<sup>th</sup> World Congress held in Texas, the committees coming from USA, Europe and Japan got the idea that the larger scale world conference shall be held on bridging more and more the science and technology in the field of microwave applications.

The progress on research and technology in recent years are going to make it clear the mechanism of microwave heating that is principally different in the conventional heating depending on the hot thermal energy produced by the burning of carbon / carbon hydrate. It is the qualitative upgrading from “What can we do with microwave?” to “Why can we do by microwave?”.

Now the Microwave becomes *the new flame for humanity* that will solve the problems on the world economy against the rapid increasing of energy and resource prices in the short range and shall help for to save the earth and humanity from the waste of natural resources in the long term projects by its rapidly and lower temperature reactions with materials.

It is our great pleasure that the city of Otsu in Shiga prefecture was selected among the several candidacies for the 1<sup>st</sup> world congress, as the Shiga Prefecture is in the leading edge for saving the environment in Japan and one of the world leaders for keeping the inland water from the environmental pollutions.

The short course will be held on August 4 for the introductory education to the high power microwave applications to the scientist and engineers. The world congress will open from August 5 to 8 consisting of three plenary discussions, oral and poster presentations, two workshops and twenty-three industry exhibitions.

We are deeply appreciating to all the participants and companies to hold the congress. We also will give our heartfelt gratitude to the financial support by Shiga Prefecture Government and Ministry of Education, Culture, Sports, Science and Technology of Japan through the Grant in aid for scientific research program and related societies.

We believe all the participants will have fruitful discussions and latest knowledge for microwave applications through the presentations and exhibitions on the congress. And please enjoy the summer life on Lake Biwa by swimming and boarding on sail and fishing boats, etc..



Motoyasu SATO

Steering Committee Chair

Vice-President of JEMEA

Professor of National Institute for Fusion Science Japan

## **GCMEA 2008 / MAJIC 1<sup>st</sup> Committee Officers**

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### **Local Executive Committee**

Member of local executive committee will be requested in proportion to the progress of congress preparation.

## **Secretariat**

### **General Secretariat (JEMEA)**

c/o Prof. Nikawa

E-mail: [office@jemea.org](mailto:office@jemea.org) / <http://www.jemea.org/>

### **Local Secretariat (NIFS)**

c/o Prof. Sato

Proactive Inc.

Promena Kobe 16F, 1-8-1 Higashi-kawasaki-cho, Chuo-ku, Kobe, Hyogo, Japan

TEL: +81-78-366-5050 / FAX: +81-78-366-5051

To the contributors and participants:

I would show my pleasure to have completed programming a large number of the scientific and engineering presentations related to microwave techniques and would express my sincere thanks to all the members executing the related works for their many efforts.

The total number of the presentations scheduled in the program is 279, including the 15 keynote lectures and workshop presentations, the 134 oral presentations and the 100 poster presentations. The numbers of the presentations categorized to the seven topics were 57 for “Chemical Synthesis”, 64 for “Material Processing”, 33 for “Bio, Medical and Environment”, 9 for “System and Applications”, 25 for “Theory and Measurements”, 29 for “Industrial Applications” and 17 for “Other Related Topics”. Furthermore, we would be happy to have the presentations from the worldwide institutions: Australia 4, Brazil 2, Canada 4, China 12, France 1, Germany 14, India 6, Israel 3, Italy 4, Japan 115, Korea 7, Mauritius 1, Poland 2, Romania 8, Russia 8, Spain 5, Swiss 2, Thailand 2, UK 15, USA 19.

The plenary sessions were organized by AMPERE, Chinese Microwave Society, IMPI, JEMEA, MWG, and related societies. The lecturers were selected from USA (3 lecturers), Japan (6), Germany (2), Spain (1), France (1), and Italy (1), depending on their subjects. The two workshops were planned and inserted to the program: Workshop I: MEXT Prime Area Research Project and Workshop II: Millimeter-wave and THz Technologies.

I acted as the head of the local technical program committee and directed the collection of the presentations and their programming. Now I would hand over the baton to Prof. Jerby for publishing the presentations in Journal of Microwave Power and Electromagnetic Energy.

I am looking forward to seeing you at Biwa.

A handwritten signature in cursive script, reading "Yuji Wada".

Yuji Wada

Chair of the Technical Program Committee  
(Local)

July 14, 2008

## PROGRAM of GCMEA 2008 - MAJIC 1st

August 5, 2008

### Lobby (Entrance Hall)

8:00 - Registration  
9:00 - Exhibition  
16:20 - 17:30 Poster Side Discussion (even number posters)

### Room A

#### 8:30 - 9:00 Opening Ceremony

Chair : Yoshio Nikawa, JEMEA, *Kokushikan University*

Greetings by

Dr. Yukiko Kada, *Governor of Shiga Prefecture, Japan*  
Professor Shozo Yanagida, JEMEA, *Osaka University, Japan*  
Professor Elias De los Reyes, AMPERE, *Universidad Politecnica de Valencia, Spain*  
Mr. Bernard Krieger, MWG, *Cober Electronics Inc., USA*  
Ms. Kimberly D. Thies, IMPI, *USA*

#### 9:20 - 12:20 Plenary Session by MWG & IMPI

Session Title: "A Global Perspective on Microwave Technology in the 21st Century"

Organizer: Bernard Krieger, *Cober Electronics Inc., USA*

Session Chairs: David Clark, *Virginia Tech. University, USA*

Robert F. Schiffmann, *R.F. Schiffmann Associates, Inc., USA*

Keynote Speakers and Talk Outlines

#### K1-1MI Keynote

"The Business of Industrial Microwave Technology in the 21st Century"

Bernard Krieger, *Cober Electronics Inc., USA*

As the President of the Microwave Working Group, whose mission is "to bridge science and engineering to applications"; an initiator of the GCMEA Conference; and a founder and CEO of Cober Electronics; and a businessman, Mr. Krieger discusses his unique perspective on the opportunities for microwave technology in the 21<sup>st</sup> century.

#### K1-2MI Keynote

"High Temperature Microwave Applications"

Motoyasu Sato, Motohiko Tanaka, Sadatsugu Takayama, Akihiko Matsubara, Nobuyuki Nishi, Dinesh Agrawal, *National Institute for Fusion Science, Japan*, *\*Institute for Molecular Science*, *\*\*Material Research Institute of Pennsylvania State University*

Chair of the organizing Committee of GCMEA 2008: High Temperature Microwave Applications: will present the microwave processing by the principle of microwave field coupling and will explain the future industries by the application of microwave.

#### K1-3MI Keynote

"Microwave and Combined Heating of Materials - Thermodynamic and Other Fundamentals Behind the Technology"

Monika Willert-Porada, *University of Bayreuth, Germany*

Recent progress in microwave assisted hybrid heating: Examples of different hybrid heating systems and processes are described, which enable full

## Program

exploitation of the benefits of volumetric or selective heating by microwave radiation.

### **K1-4MI** Keynote

“Efficient Syntheses of Organic and Nanomaterials Using Microwaves”

Rajender Singh Varma, *United States Environmental Protection Agency, USA*

Here is great potential for microwave chemistry in the 21<sup>st</sup> century. Synthesis of such materials will be exemplified using benign reagents and environmentally-friendly reaction media.

### **K1-5MI** Keynote

“US Development of Single Mode 915MHz Microwave Sterilization Technology for Packaged Foods”

Juming Tang, *Washington State University, USA*

President of International Microwave Power Institute: US Development of Single Mode 915 MHz Microwave Sterilization Technology for Packaged Foods: he will provide an overview of a university, government and industrial joint effort in advancing novel thermal processing technologies for military and civilian foods in 21<sup>st</sup> Century.

## **13:20 – 14:40      Chemical Synthesis [1]   nano-materials**

**Chair:** Cristina Leonelli, *University of Modena and Reggio Emilia, Italy*

### **O1-01** (A-01: August 5, 13:20 - 13:40)

“Microwave-Assisted Synthesis of Nanomaterials and Nanocomposites”, Mallikarjuna N. Nadagouda, Rajender Singh Varma, *United States Environmental Protection Agency, USA*

### **O1-06** (A-02: August 5, 13:40 - 14:00)

“Microwave-assisted Synthesis of Monodispersed Nickel Nanoparticles Using Complex of Nickel Formate with Long-Chain Amine Ligands”, Tomohisa Yamauchi<sup>1)</sup>, Yasunori Tsukahara<sup>1)</sup>, Tetsuo Sakamoto<sup>2)</sup>, Takumi Kono<sup>2)</sup>, Makoto Yasuda<sup>1)</sup>, Akio Baba<sup>1)</sup>, Yuji Wada<sup>3)</sup>, *1) Osaka University, Japan, 2) Nippon Steel Chemical Co., Ltd, Japan, 3) Tokyo Institute of Technology, Japan*

### **O1-03** (A-03: August 5, 14:00 - 14:20)

“Morphology-Controlled Growth of ZnO Nanostructures Using Microwave Irradiation”, Seungho Cho, Seung-Ho Jung, Kun-Hong Lee, *Pohang University of Science and Technology, Korea*

### **O1-05** (A-04: August 5, 14:20 - 14:40)

“Microwave Assisted Gel Combustion Synthesis of Nanocrystalline  $\alpha$ -Alumina”, V. Sridhar<sup>1)</sup>, B. S. Gowrishankar<sup>2)</sup>, L. N. Satapathy<sup>3)</sup>, *1) New Horizon College of Engineering, India, 2) Siddaganga Institute of Technology, India, 3) Ceramic Technological Institute, India*

## **15:00 – 16:20      Chemical Synthesis [2]   nano-materials**

**Chair:** Hideko Koshima, *Ehime University, Japan*

### **O1-04** (A-05: August 5, 15:00 - 15:20)

“Electrical Conductivity of Microwave Heated Polyaniline Nanotubes and Possible Mechanism of Microwave Absorption by Materials”, Takahiro Murai, Ryo Fukasawa, Tohru Muraoka, Hiroyuki Takauchi, Yasuo Gotoh, Tokihiro Takizawa, Takehiro Matsuse, *Shinshu University, Japan*

### **O1-02** (A-06: August 5, 15:20 - 15:40)

“Development of Facile Synthetic Methods of Carbon Nanotubes and Nanocapsules by Using a Domestic Microwave Oven”, Kazuchika Ohta, Yusaku Takagaki, Masahiro Shimizu, Tokihiro Takizawa, Takehiro Matsuse, *Shinshu University, Japan*

**O1-07** (A-07: August 5, 15:40 - 16:00)

“Microwave Special Effect ‘Nonequilibrium Local Heating’ - Its Evidence in the Heterogeneous System by in situ Raman Scattering Measurements and Application for Chemical Reaction of Nanomaterials”, Yasunori Tsukahara<sup>1)</sup>, Tomohisa Yamauchi<sup>1)</sup>, Ayano Higashi<sup>1)</sup>, Tadashi Kawamoto<sup>1)</sup>, Yuji Wada<sup>1,2)</sup>, 1) *Osaka University, Japan*, 2) *Tokyo Tec., Japan*

**O1-08** (A-08: August 5, 16:00 - 16:20)

“Homogeneous Crystal Growth in Microwave-Assisted Hydrothermal Synthesis of Inorganic Compounds”, Antonino Rizzuti<sup>1)</sup>, Anna Corradi<sup>1)</sup>, Cristina Leonelli<sup>1)</sup>, Tadeusz Chudoba<sup>2)</sup>, Tomasz Strachowski<sup>2)</sup>, Agnieszka Opalinska<sup>2)</sup>, Witold Lojkowski<sup>2)</sup>, 1) *University of Modena and Reggio Emilia, Italy*, 2) *Institute of High Pressure Research, Polish Academy of Science, Poland*

**Room B**

**13:20 – 14:40**      **Materials Processing [1]   nano-materials, inorganic materials**

**Chair:** Noboru Yoshikawa, *Tohoku University, Japan*

**O2-01** (B-01: August 5, 13:20 - 13:40)

“Microwave Assisted Sintering of Nanostructured YSZ Ceramics”, Jon Binner, Bala Vaidhyanathan, Anish Paul, *Loughborough University, UK*

**O2-02** (B-02: August 5, 13:40 - 14:00)

“Decorations of Multi Walled Carbon Nano Tubes with Iron Oxide Nano Particles Synthesized by Power Controlled Microwave Heating”, Ryo Fukasawa, Takahiro Murai, Hiroki Taniguchi, Tokihiro Takizawa, Masanori Miyashita, Shogo Mori, Takehiro Matsuse, *Shinshu University, Japan*

**O2-03** (B-03: August 5, 14:00 - 14:20)

“Synthesis of Visible-Light-Active TiO<sub>2</sub> Photocatalyst by Microwave Carbon-Modification”, Taro Sonobe, Jaturong Jitputti, Kan Hachiya, Tomohiko Mitani, Naoki Shinohara, Susumu Yoshikawa, *Kyoto University, Japan*

**O2-04** (B-04: August 5, 14:20 - 14:40)

“Rapid Alloy Formation of Silicon with Germanium in Microwave Field Using Single Mode Cavity”, Dinesh Agrawal<sup>1)</sup>, Dinesh Dube<sup>2)</sup>, Fu Ming<sup>3)</sup>, Jiping Cheng<sup>1)</sup>, Rustum Roy<sup>1)</sup>, 1) *Penn State University, USA*, 2) *Indian Institute of Technology, India*, 3) *Huazhong University of Science & Technology, China*

**15:00 – 16:20**      **Materials Processing [2]   ceramics**

**Chair:** Yukio Makino, *Osaka University, Japan*

**O2-05** (B-05: August 5, 15:00 - 15:20)

“Numerical Study of Microwave Heating of Highly Conducting Particles Arranged in a Regular Lattice”, Maxim Ignatenko<sup>1)</sup>, Motoharu Suzuki<sup>2)</sup>, Motohiko Tanaka<sup>1)</sup>, Masashi Yamashiro<sup>3)</sup>, Motoyasu Sato<sup>1)</sup>, 1) *National Institute for Fusion Science, Japan*, 2) *Takasago Industry Co., Japan*, 3) *Nihon University, Japan*

**O2-06** (B-06: August 5, 15:20 - 15:40)

“Plastic Deformation of Ultra-Fine Alumina Ceramics under Microwave Heating”, S. V. Egorov<sup>1)</sup>, A. G. Ereemeev<sup>1)</sup>, I. V. Plotnikov<sup>1)</sup>, A. A. Sorokin<sup>1)</sup>, Yu. V. Bykov<sup>1)</sup>, V. N. Chuvil'deev<sup>2)</sup>, M. Yu. Gryaznov<sup>2)</sup>, S. V. Shotin<sup>2)</sup>, 1) *Institute of Applied Physics of the Russian Academy of Sciences, Russia*, 2) *Nizhny Novgorod State University, Russia*

## Program

### **O2-07** (B-07: August 5, 15:40 - 16:00)

“Near Net Sintering of Zero Expansion-Pore Free Ceramics by Microwave”, Motoyasu Sato<sup>1)</sup>, Ryuichi Akiyama<sup>1)</sup>, Sadatsugu Takayama<sup>1)</sup>, Akihiro Matsubara<sup>1)</sup>, Masanori Ie<sup>2)</sup>, Hiroshi Akiyama<sup>2)</sup>, Hiroyuki Mastuo<sup>3)</sup>, Mabito Iguchi<sup>3)</sup>, 1) *National Institute for Fusion Science, Japan*, 2) *National Astronomical Observatory Japan, Japan*, 3) *Nippon Ceratec Co. Ltd, Japan*

### **O2-08** (B-08: August 5, 16:00 - 16:20)

“Microwave Assisted Drying of High Voltage Electrical Ceramic Components”, L N Satapathy<sup>1)</sup>, Sushil Chandra<sup>2)</sup>, S Vijaya Kumar<sup>1)</sup>, G Swaminathan<sup>1)</sup>, 1) *Ceramic Technological Institute, India*, 2) *Electro Porcelains Division, India*

### **18:00 - 20:00 Workshop I: Science and Technology of Microwave-Induced, Thermally Non-Equilibrium Reaction Fields (MEXT Prime Area Research Project, FY 2006 - 2010)**

Organizer: Motoyasu Sato, *National Institute for Fusion Science, Japan*

Session Chairs: Noboru Yoshikawa, *Tohoku University, Japan*

Motohiko Tanaka, *National Institute for Fusion Science, Japan*

Coordinator of Panel Discussion: Shoji Miyake, *Kinki University, Japan*

This workshop will be held with short presentations and panel discussion after the Keynote Lecture by Professor Agrawal.

### **WSI-K1** Keynote (18:05 - 18:15)

“Full Sintering of Powder-Metal Bodies in a Microwave Field”, Dinesh Agrawal, *Pennsylvania State University, USA*

Main Keywords: thermal non-equilibrium, in-situ analysis, micro scale, metal powder heating, heating mechanism, effects of electromagnetic field, chemical reaction

Presenters and Panelists: Each panelist will present topics of interest for five minutes.

First half: Theory & Mechanism, Chair: Noboru Yoshikawa, *Tohoku University*

Motohiko Tanaka, *National Institute for Fusion Science*, Hirotugu Takizawa, *Tohoku University*, Yukio Makino, *Osaka University*, Motoyasu Sato, *National Institute for Fusion Science*, Hideoki Fukushima, *Toyota Central R&D Labs., Inc.*, Shokichi Ohuchi, *Kyushu Institute of Technology*

Latter half: Analysis & Applications, Chair: Motohiko Tanaka, *National Institute for Fusion Science*

Noboru Yoshikawa, *Tohoku University*, Dmitri V Louzguine-Luzgin, *Tohoku University*, Kazuhiro Nagata, *Tokyo Institute of Technology*, Saburo Sano, *National Institute of Advanced Industrial Science and Technology*, Sadatsugu Takayama, *National Institute for Fusion Science*, Kazuchika Ohta, *Shinshu University*, Masaharu Tsuji, *Kyushu University*, Atsushi Ashida, *Osaka Prefecture University*, Motohide Matsuda, *Okayama University*

**This workshop is opened for all attendance of GCMEA 2008.**

## Room C

### **13:20 – 14:40 Biological, Medical and Environmental Applications [1] food**

**Chair:** Joho Robinson, *Univ. of Nottingham, UK*

### **O3-01** (C-01: August 5, 13:20 - 14:00)

“Dielectric Spectroscopy Study for Developing an In Line Control of COD Desalting Process”, R. De los Reyes, A.

Andrés, P. Fito, E. De los Reyes, *Universidad Politecnica de Valencia, Spain*

**O3-02** (C-02: August 5, 14:00 - 14:20)

“Sterilization of Salmon with Alfredo Sauce in Polymeric Trays Using a 915-MHz Single-Mode Microwave System”, Juming Tang, Frank Liu, Zhongwei Tang, Galina Mikhaylenko, Hyung-Jung Chung, Ram Pandit, *Washington State University, USA*

**O3-03** (C-03: August 5, 14:20 - 14:40)

“Estimation of Dielectric Properties and Their Influence on Microwave Heating of Food Products”, Sebastien Curet, Olivier Rouaud, Lionel Boillereaux, *GEPEA (UMR CNRS 6144), ENITIAA, France*

**O3-04** (C-04: August 5, 14:40 - 15:00)

“Dielectric Spectroscopy Study to Analyze the Changes of Water and Salt Distribution on Desalted Cod”, R. De los Reyes, E. De los Reyes, A. Andrés, P. Fito, *Universidad Politecnica de Valencia, Spain*

**15:00 – 16:20 Biological, Medical and Environmental Applications [2] environment**

**Chair:** Ruth De los Reyes, *Universidad Politecnica de Valencia, Spain*

**O3-05** (C-05: August 5, 15:00 - 15:20)

“Microwave Assisted Hydrogen Production by an Integrated Biomass Gasification/Sponge Iron Process”, Thorsten Gerdes, Monika Willert-Porada, *University of Bayreuth, Germany*

**O3-06** (C-06: August 5, 15:20 - 15:40)

“Microwave-Assisted Heterogeneous Catalyzed Process for Biodiesel Production”, Armando T. Quitain, Dewoowoogen P. Baclayon, Tsukasa Chikata, Shunsaku Katoh, *Research Institute for Solvothermal Technology, Japan*

**O3-07** (C-07: August 5, 15:40 - 16:00)

“Microwave Treatment of Oil-Contaminated Drill Cuttings”, John Robinson, Sam Kingman, Colin Snape, Richelieu Barranco, Hui Shang, *University of Nottingham, UK*

**O3-08** (C-08: August 5, 16:00 - 16:20)

“Novel Environmental Remediation Techniques with a Microwave Discharge Electrodeless Lamp (MDEL)”, Satoshi Horikoshi<sup>1)</sup>, Masahiko Abe<sup>1)</sup>, Masatsugu Kajitani<sup>2)</sup>, Nick Serpone<sup>3)</sup>, *1) Tokyo University of Science, Japan, 2) Sophia University, Japan, 3) Universita di Pavia, Italy*

**August 6, 2008**

**Lobby (Entrance Hall)**

**8:20 -                   Registration**  
**8:30 -                   Exhibition**  
**16:20 - 17:30       Poster Side Discussion (odd number posters)**

**Room A**

**8:30 - 11:00           Plenary Session by AMPERE**  
Organizer: Jon Binner, *Loughborough University, UK*

**K2-1A   Keynote   8:30 - 9:25**  
“Plenary Talk on ‘State of the Art’ of Microwave Research in Europe”, Elias de los Reyes, *Universidad Politecnica de Valencia, Spain*

**K2-2A   Keynote   9:25 - 9:50**  
“New Food-Based Application”, Jean-Paul Bernard, *SAIREM S. A., France*

**K2-3A   Keynote   10:10 - 10:35**  
“New French/Italian Connection that has Led to a New Series of Meetings”, Cristina Leonelli, *University of Modena and Reggio Emilia, Italy*

**K2-4A   Keynote   10:35 - 11:00**  
“German Uses of Microwaves”, Lambert E. Feher, *Forschungszentrum Karlsruhe, Germany*

**11:20 - 12:20       Chemical Synthesis [3]**  
**Chair:** Yasunori Tsukahara, *Osaka University, Japan*

**01-13   (A-09: August 6, 11:20 - 11:40)**  
“Development of Precise Microwave Reactor with Semiconductor Microwave Source and Focused Elliptic Reaction Chamber, and Its Application to Rapid Synthesis of Various Functional Materials”, Takeko Matsumura-Inoue<sup>1)</sup>, Takao Fukuoka<sup>2)</sup>, Nobuo Mayama<sup>3)</sup>, *1) Minerva Light Laboratory L.L.C., Japan, 2) JST CREATE Kyoto Pref., Japan, 3) CHRONIX Co. TOKYO, Japan*

**01-10   (A-10: August 6, 11:40 - 12:00)**  
"Study on Dry Reaction Mechanism under Microwave Irradiation", Zhongdong Liu<sup>1)</sup>, Jianhui Chen<sup>1)</sup>, Xiaolong Lv<sup>2)</sup>, Junhui Ou<sup>3)</sup>, Xiaoyun Li<sup>4)</sup>, Peng Liu<sup>5)</sup>, John F Kennedy<sup>6)</sup>, *1) Henan University of Technology, China, 2) Tianjin University of Science and Technology, 3) Meidi Group Corporation, China., 4) University of Electronic Science and Technology, China, 5) Huanan University of Science and Technology, China, 6) The University of Birmingham, UK*

**01-11   (A-11: August 6, 12:00 - 12:20)**  
“Chiral Control of Asymmetric Reductions by Circularly Polarized Microwaves”, Takahiro Itoh, Kenichi Imaeda, Kaname Tsutsumiuchi, Yoshio Itomi, Sataro Yamaguchi, *Chubu University, Japan*

**13:20 – 14:40       Materials Processing [3]   ceramics**  
**Chair:** Takehiro Matsuse, *Shinshu University, Japan*

**O2-09** (A-12: August 6, 13:20 - 13:40)

“Evidence for the Microwave Effect During the Hybrid Sintering of ZnO”, Jon Binner, Karl Hossbach, Bala Vaidyanathan, *Loughborough University, UK*

**O2-10** (A-13: August 6, 13:40 - 14:00)

“Microwave Heating of Metal Powder/Soda-lime Glass Mixture”, Noboru Yoshikawa<sup>1)</sup>, Haichuan Wang<sup>2)</sup>, Ken-ichi Mashiko<sup>1)</sup>, Shoji Taniguchi<sup>1)</sup>, *1) Tohoku University, Japan, 2) Anhui University of Technology*

**O2-11** (A-14: August 6, 14:00 - 14:20)

“Microwave Assisted (Mass) Processing of Metal-Ceramic Composites”, Dinesh Agrawal<sup>1)</sup>, Prashant Karandikar<sup>2)</sup>, Jiping Cheng<sup>1)</sup>, Michael Aghajanian<sup>2)</sup>, *1) Pennsylvania State University, USA, 2) MCubed Technologies, Inc. USA*

**O2-14** (A-15: August 6, 14:20 - 14:40)

“Microwave Heating Characteristics of Metallic Powders by Single-Mode Cavity Separated in E and H Fields”, Hideoki Fukushima<sup>1)</sup>, Motoyasu Sato<sup>2)</sup>, *1) Toyota Central R&D Labs., Inc., Japan, 2) National Institute for Fusion Science, Japan*

**15:00 – 16:20 Materials Processing [4] metal**

**Chair:** Guido Link, *Forschungszentrum Karlsruhe, Germany*

**O2-12** (A-16: August 6, 15:00 - 15:20)

“Influence of Mineralogy and Texture on Microwave-Induced Weakening of Ores”, Aled Jones, S. Plint, Sam Kingman, *University of Nottingham, UK*

**O2-13** (A-17: August 6, 15:20 - 15:40)

“Increased Coal Grindability as a Result of Microwave Treatment at Economic Energy Inputs”, Sam Kingman, Chris Dodds, Tao Wu, Edward Lester, *University of Nottingham, UK*

**O2-15** (A-18: August 6, 15:40 - 16:00)

“Microwave Sintering of Aluminum Alloys”, Padmavathi Chandran<sup>1)</sup>, Dinesh Agrawal<sup>2)</sup>, Anish Upadhyaya<sup>1)</sup>, *1) Materials and Metallurgical Engineering, IIT Kanpur, India, 2) The Pennsylvania State University, USA*

**O2-16** (A-19: August 6, 16:00 - 16:20)

“Fabrication of Ni-Nb-Sn Metallic Glassy Alloy Powder and Its Microwave-Induced Sintering Behavior”, Guoqiang Xie<sup>1)</sup>, Song Li<sup>1)</sup>, Dmitri V Louzguine-Luzgin<sup>1)</sup>, Ziping Cao<sup>1)</sup>, Noboru Yoshikawa<sup>1)</sup>, Motoyasu Sato<sup>2)</sup>, Akihisa Inoue<sup>1)</sup>, *1) Tohoku University, Japan, 2) National Institute for Fusion Science, Japan*

**Room B**

**11:20 – 12:20 Other Related Topics [1]**

**Chair:** Nguyen Tran, *MPC, Australia*

**O7-01** (B-09: August 6, 11:20 - 11:40)

“ ‘Arcing’ in Microwave Heating Systems: A Time for New Safety Mechanisms, Standards and Regulations”, John M. Osepchuk, *Full Spectrum Consulting, USA*

**O7-02** (B-10: August 6, 11:40 - 12:00)

“Energy Dissipation in Metamaterial”, Yoshio Nikawa, *Kokushikan University, Japan*

## Program

**O7-03** (B-11: August 6, 12:00 - 12:20)

“Air Heating System Utilizing Microwave Susceptor Ceramic Materials”, Daniela M. Iordache<sup>1)</sup>, Dumitru I. Niculae<sup>2)</sup>, 1) *Energy Research and Modernising Institute - ICEMENERG S.A., Romania*, 2) *FITPOL S.R.L. Company, Romania*

**13:20 - 14:40**      **Chemical Synthesis [4]**

**Chair:** Rajender Singh Varma, *United States Environmental Protection Agency, USA*

**O1-12** (B-12: August 6, 13:20 - 13:40)

“The Development of a 30kW/2450MHz, 500L Volume High Pressure Microwave Chemical Processing System”, Tian-Ren Ji, Yu Ji, Shu-Chang Wang, *Chengdu Newman-Hueray Microwave Tech. Co., Ltd, China*

**O1-09** (B-13: August 6, 13:40 - 14:00)

“Microwave Enhanced Recovery of Carbon Fibers”, Chris Dodds, Sam Kingman, Edward Lester, Stephen Pickering, *University of Nottingham, UK*

**O1-14** (B-14: August 6, 14:00 - 14:20)

“The Methods of Increasing Energy Efficiency by Irradiation of Electromagnetic Wave in High Intensity which Agrees the Absorption Wavelength of Material”, Kazuhito Kono, Buhei Kono, *Shozen Co.ltd, Japan*

**O1-15** (B-15: August 6, 14:20 - 14:40)

“Design of Microwave Applicators, for Supercritical and Near Critical Liquid Generation, and High Pressure Microwave Chemistry”, Georgios Dimitrakakis, Edward Lester, Samuel Kingman, Tao Fang, Martyn Poliakoff, Michael George, Ian Harrison, Jose Manuel Gonzalez-Gonzalez, *University of Nottingham, UK*

**15:00 - 16:20**      **Chemical Synthesis [5]**

**Chair:** Takeko Matsumura-Inoue, *Minerva Light Laboratory L.L.C., Japan*

**O1-16** (B-16: August 6, 15:00 - 15:20)

Foaming Polyurethanes under Microwave Irradiation”, Aleksander F. Prociak, Michal Lason, *Cracow University of Technology, Poland*

**O1-17** (B-17: August 6, 15:20 - 15:40)

“Practical Study of Nonthermal Microwave Effects Applying to Oligosaccharide Synthesis”, Hiroki Shimizu<sup>1)</sup>, Takahiko Matsushita<sup>1)</sup>, Shin-Ichiro Nishimura<sup>2)</sup>, 1) *National Institute of Advanced Industrial Science and Technology (AIST), Japan*, 2) *Hokkaido University, Japan*

**O1-18** (B-18: August 6, 15:40 - 16:00)

“Microwave-Assisted Synthesis of N-[1-pyridin-2ylethylidene]propylamine-palladium Diacetate Complex Covalently Anchored on Glass Beads”, Mauro Iannelli, Fabio Bergamelli, *Milestone s.r.l., Italy*

**O1-19** (B-19: August 6, 16:00 - 16:20)

“Microwave Effect on Decomposition of Organic Peroxides”, Noriaki Miyake, Hiroshi Yamamoto, Kazuhiko Yamada, *Asahi Glass Co., Japan*

## Room C

**11:20 – 12:20**      **Biological, Medical and Environmental Applications [3]    environment**

**Chair:** Thorsten Gerdes, *University of Bayreuth, Germany*

**O3-09** (C-09: August 6, 11:20 - 11:40)

“Microwave-Assisted Headspace (MAP-HS) of Fresh and Dried Matrices”, Jacqueline M. R. Belanger, J. R. Jocelyn Pare, Fulvia N. Sánchez L, Maria de Jesus Alfaro A, *Environment Canada, Canada*

**O3-10** (C-10: August 6, 11:40 - 12:00)

“Microwave Pyrolysis of Organic Wastes”, John Robinson, Sam Kingman, Colin Snape, Richelieu Barranco, *University of Nottingham, UK*

**O3-11** (C-11: August 6, 12:00 - 12:20)

“Microwave-Accelerated Basic Hydrolysis of PET”, Kazutoshi Ikenaga, Takashi Sekine, Yoshino Ogasawara, Yasuhiro Hirano, Hirotaka Oyama, *Sojo University, Japan*

**13:20 – 14:40 Biological, Medical and Environmental Applications [4] wood, environment**

**Chair:** Kazutoshi Ikenaga, *Sojo University, Japan*

**O3-12** (C-12: August 6, 13:20 - 13:40)

“Investigations into the Key Mechanisms Responsible for the Strength Loss Associated with the Microwave Treatment of Timber”, Leigh R. Aitken, *Swinburne University, Australia*

**O3-13** (C-13: August 6, 13:40 - 14:00)

“Microwave Wood Modification for Timber Surface for Preservative Treatment”, Krisdianto Sugiyanto, Grigory Torgovnikov, Peter Vinden, *The University of Melbourne, Australia*

**O3-14** (C-14: August 6, 14:00 - 14:20)

“Microwave Plasma Technology for PFC Emissions Control”, Marilena Radoiu, *Edwards Ltd., UK*

**O3-15** (C-15: August 6, 14:20 - 14:40)

“Charge Measurement in De-chlorination Process of PCBs by Microwave Irradiation”, Koji Amano<sup>1)</sup>, Koichi Itoh<sup>1)</sup>, Akiko Kumada<sup>2)</sup>, Yuji Morimoto<sup>2)</sup>, Kunihiko Hidaka<sup>2)</sup>, *1) Tokyo Electric Power Company, Japan, 2) The University of Tokyo, Japan*

**15:00 – 16:20 Theory and Measurements [1]**

**Chair:** Lambert E. Feher, *Forschungszentrum Karlsruhe, Germany*

**O5-01** (C-16: August 6, 15:00 - 15:20)

“Phase Transformations and Pore Structure Evolution in Nanostructured Alumina under Variable-Power Microwave Heating”, Kirill I. Rybakov<sup>1)</sup>, Anatoly G. Ereemeev<sup>1)</sup>, Sergei V. Egorov<sup>1)</sup>, Yury V. Bykov<sup>1)</sup>, Ingrid Otto<sup>2)</sup>, Zeljko Pajkic<sup>2)</sup>, Monika Willert-Porada<sup>2)</sup>, *1) Institute of Applied Physics of the Russian Academy of Sciences, Russia, 2) Universitat Bayreuth, Bayreuth, Germany*

**O5-02** (C-17: August 6, 15:20 - 15:40)

“Theoretical Studies of Microwave Heating of Liquid and Solid Matters”, Motohiko Tanaka<sup>1)</sup>, Hirohiko Kono<sup>2)</sup>, Koji Maruyama<sup>3)</sup>, Maxim Ignatenko<sup>1)</sup>, Motoyasu Sato<sup>1)</sup>, *1) National Institute for Fusion Science, Japan, 2) Tohoku University, Japan, 3) RIKEN, Japan*

**O5-03** (C-18: August 6, 15:40 - 16:00)

“Modeling of Microwave Heating of Metallic Powders”, V. D. Buchelnikov<sup>1)</sup>, D. V. Louzguine-Luzgin<sup>2)</sup>, N. Yoshikawa<sup>2)</sup>, M. Sato<sup>3)</sup>, A. P. Anzulevich<sup>1)</sup>, I. V. Bychkov<sup>1)</sup>, A. Inoue<sup>2)</sup>, *1) Chelyabinsk State University, Russia, 2) Tohoku University, Japan, 3) National Institute for Fusion Science, Japan*

## Program

**O5-04** (C-19: August 6, 16:00 - 16:20)

“Numerical Study of a Chemical Reaction in Aqueous Medium under Microwave Heating”, Roddy Lollchund, Shailendra Oree, *University of Mauritius, Mauritius*

## August 7, 2008

### Lobby (Entrance Hall)

8:20 - Registration

8:30 - Exhibition

### Room A

8:30 - 11:00 Plenary Session by JEMEA

Organizers: Yuji Wada, *Tokyo Institute of Technology, Japan*

Motoyasu Sato, *National Institute for Fusion Science, Japan*

**K3-1J** Keynote

“Microwave Energy Absorption in Artificial Dielectric Material and Metamaterial”, Yoshio Nikawa, *Kokushikan University, Japan*

**K3-2J** Keynote

“Classification of Special Effects of MW Observed in Chemistry and their Potential in Application to Industrial Processes”, Yuji Wada, *Tokyo Institute of Technology, Japan*

**K3-3J** Keynote

“Synthesis of Advanced Inorganic Materials under Non-equilibrium Reaction Field Induced by Microwave Irradiation”, Hirotsugu Takizawa, *Tohoku Univ., Japan*

**K3-4J** Keynote

“Microwave Processing and its Applications to the Future Automobile”, Hideoki Fukushima, *Toyota Central R&D Labs., Inc., Japan*

**K3-5J** Keynote

“Innovation of Iron making by Microwave Heating”, Kazuhiro Nagata, *Tokyo Institute of Technology, Japan*

11:20 - 12:20 System and Applications

Chair: Seitaro Mitsudo, *University of Fukui, Japan*

**O4-01** (A-20: August 7, 11:20 - 11:40)

“Novel Methods to Investigate Microwave Specific Effects”, Guido Link<sup>1)</sup>, Stefan Heissler<sup>1)</sup>, Werner Faubel<sup>1)</sup>, Peter Weidler<sup>1)</sup>, Simone Miksch<sup>1)</sup>, Manfred Thumm<sup>2)</sup>, *1) Forschungszentrum Karlsruhe, Germany, 2) University of Karlsruhe, Germany*

**O4-02** (A-21: August 7, 11:40 – 12:00)

“Observation of Micro-scale Surface Temperature Distribution based on the Thermal Radiation Spectrum due to Microwave Material Heating”, Akihiro Matsubara<sup>1)</sup>, Shigeki Okajima<sup>1)</sup>, Sadatsugu Takayama<sup>2)</sup>, Katsumi Ida<sup>2)</sup>, Motoyasu Sato<sup>2)</sup>, *1) Chubu University, Japan, 2) National Institute for Fusion Science, Japan*

**O4-03** (A-22: August 7, 12:00 - 12:20)

“Thin and Flexible Antenna for Microwave Application”, Masashi Nishioka, Yoshio Nikawa, *Kokushikan Univ., Japan*

**13:20 – 14:40            Materials Processing [5]    metal**

**Chair:** Dinesh Agrawal, *Pennsylvania State University, USA*

**O2-40    (A23: August 7, 13:20 – 13:40)**

“Shape-Dependent Evolution of Au@Ag Core-Shell Nanocrystals by PVP-Assisted N,N-dimethylformamide Reduction”, Masaharu Tsuji<sup>1)</sup>, Ryoichi Matsuo<sup>1)</sup>, Peng Jiang<sup>2)</sup>, Nobuhiro Miyamae<sup>1)</sup>, Daisuke Ueyama<sup>1)</sup>, Michiko Nishio<sup>1)</sup>, Sachie Hikino<sup>1)</sup>, Hisayo Kumagae<sup>1)</sup>, Khairul Sozana Nor Kamarudin<sup>3)</sup>, Xin-Ling Tang<sup>1)</sup>, *1) Kyushu University, Japan, 2) National Center for Nanoscience and Technology, China, 3) Universiti Teknologi Malaysia, Malaysia*

**O2-17    (A-24: August 7, 13:40 - 14:00)**

“Rapid Microwave Assisted Sintering of Silver Conductive Thick Films for Display Panels”, Seongjin Hwang<sup>1)</sup>, Hyungsun Kim<sup>1)</sup>, Paolo Veronesi<sup>2)</sup>, Cristina Leonelli<sup>2)</sup>, *1) Inha Universtiy, Korea, 2) University of Modena and Reggio Emilia, Modena, Italy*

**O2-18    (A-25: August 7, 14:00 - 14:20)**

“Phase Transformation of Microwave Heated Crystalline Metallic-Metalloid Powders”, Song Li<sup>1)</sup>, Guoqiang Xie<sup>1)</sup>, Dmitri V Louzguine-Luzgin<sup>1)</sup>, Ziping Cao<sup>1)</sup>, Noboru Yoshikawa<sup>1)</sup>, Motoyasu Sato<sup>2)</sup>, Akihisa Inoue<sup>1)</sup>, *1) Tohoku University, Japan, 2) National Institute for Fusion Science, Japan*

**O2-19    (A-26: August 7, 14:20 - 14:40)**

“Duplex Microwave Irradiation System for Metallic Materials Processing”, Masami Taguchi<sup>1)</sup>, Kazutaka Okamoto<sup>1)</sup>, Noboru Baba<sup>1)</sup>, Masumi Kuga<sup>2)</sup>, Tomokatsu Oguro<sup>2)</sup>, Toshio Ogura<sup>2)</sup>, *1) Hitachi, Ltd., Japan, 2) Hitachi Kyowa Engineering Co., Ltd., Japan*

**15:00 – 16:20            Materials Processing [6]    metal, ceramics**

**Chair:** Miyuki Hayashi, *Tokyo Institute of Technology, Japan*

**O2-20    (A-27: August 7, 15:00 - 15:20)**

“Sintering Advances in Consolidating W Based Alloys”, Avijit Mondal<sup>1)</sup>, Anish Upadhyaya<sup>1)</sup>, Dinesh Agrawal<sup>2)</sup>, *1) Indian institute of Technology, India, 2) The Pennsylvania State University, USA*

**O2-21    (A-28: August 7, 15:20 - 15:40)**

“Microwave Heating of Metallic Powders in a Multimode and a Single Mode Applicator”, Song Li<sup>1)</sup>, Guoqiang Xie<sup>1)</sup>, Dmitri V Louzguine-Luzgin<sup>1)</sup>, Ziping Cao<sup>1)</sup>, Noboru Yoshikawa<sup>1)</sup>, Motoyasu Sato<sup>2)</sup>, Akihisa Inoue<sup>1)</sup>, *1) Tohoku University, Japan, 2) National Institute for Fusion Science, Japan*

**O2-22    (A-29: August 7, 15:40 - 16:00)**

“A Model Approach on Diffusion Behavior of Cr<sup>3+</sup> Ion in Cr<sub>2</sub>O<sub>3</sub>-Added Alumina under Millimeter-Wave Radiation”, Yukio Makino<sup>1)</sup>, Toshiyuki Ueno<sup>2)</sup>, Saburo Sano<sup>3)</sup>, Shoji Miyake<sup>4)</sup>, *1) Osaka University, Japan, 2) Shimane Institute for Industrial Technology, Japan, 3) National Institute of Advanced Industrial Science and Technology (AIST), Japan, 4) Kinki University, Japan*

**O2-23    (A-30: August 7, 16:00 - 16:20)**

“Microwave Treatment of Metallic Glassy Powders”, Dmitri V. Louzguine-Luzgin<sup>1)</sup>, S. Li<sup>1)</sup>, G. Q. Xie<sup>1)</sup>, A Inoue<sup>1)</sup>, N Yoshikawa<sup>1)</sup>, M Sato<sup>2)</sup>, *1) Tohoku University, Japan, 2) National Institute for Fusion Science, Japan*

**16:40 – 18:00            Materials Processing [7]    metal, iron making**

**Chair:** Chenguang Bai, *Chongqing University, China*

**O2-24** (A-31: August 7, 16:40 - 17:00)

“Dependence of Microwave Heating Behavior on the Thickness of Metal Thin Films”, Ziping Cao, Noboru Yoshikawa, Shoji Taniguchi, *Tohoku University, Japan*

**O2-25** (A-32: August 7, 17:00 - 17:20)

“Who Says You Can't Microwave a Fork?” Microwave Metal Processing”, Edward Bolling Ripley, *Member of MWG, USA*

**O2-26** (A-33: August 7, 17:20 - 17:40)

“Effects of Electric and Magnetic Fields on Microwave Induced Carbothermic Reduction of Magnetite-Graphite Mixtures”, Miyuki Hayashi, Keiji Takagi, Kazuhiro Nagata, *Tokyo Institute of Technology, Japan*

**O2-27** (A-34: August 7, 17:40 - 18:00)

“Microwave versus Conventional Hydrothermal Reaction of Blast Furnace Slag”, Soon-Jae Tae, Kazuki Morita, *The University of Tokyo, Japan*

**Room B**

**11:20 – 12:20 Other Related Topics [2]**

**Chair:** Vadim V. Yakovlev, *Worcester Polytechnic Institute, USA*

**O7-04** (B-20: August 7, 11:20 - 11:40)

“Hybrid Microwave Heating Systems and Processes for Advanced Materials Engineering”, Monika Willert-Porada, *University of Bayreuth, Germany*

**O7-05** (B-21: August 7, 11:40 - 12:00)

“Lab-Scale System for Microwave and Plasma Experiments”, Nguyen Tran, *MPC, Australia*

**O7-06** (B-22: August 7, 12:00 - 12:20)

“Utilization of the Thermal Effect Produced by the Microwave Susceptor Ceramic Materials for Water Heating”, Daniela M. Iordache<sup>1)</sup>, Dumitru I. Niculae<sup>2)</sup>, *1) Energy Research and Modernising Institute, Romania, 2) FITPOL S.R.L. Company, Romania*

**13:20 - 14:40 Chemical Synthesis [6]**

**Chair:** Samuel Kingman, *University of Nottingham, UK*

**O1-20** (B-23: August 7, 13:20 - 13:40)

“Utilization of 5.8 GHz Microwaves in Organic Syntheses”, Satoshi Horikoshi<sup>1)</sup>, Masahiko Abe<sup>1)</sup>, Masatsugu Kajitani<sup>2)</sup>, Nick Serpoe<sup>3)</sup>, *1) Tokyo University of Science, Japan, 2) Sophia University, Japan, 3) Universita di Pavia, Italy*

**O1-21** (B-24: August 7, 13:40 - 14:00)

“Recycling of Polymeric Materials under Microwave Irradiation”, Dariusz Bogdal, Jan Pielichowski, *Cracow University of Technology, Poland*

**O1-22** (B-25: August 7, 14:00 - 14:20)

“Microwave-Assisted Organic Synthesis Using Benign Reaction Media and Reagents”, Vivek Polshettiwar, Rajender Singh Varma, *United States Environmental Protection Agency, USA*

## Program

**O1-23** (B-26: August 7, 14:20 - 14:40)

“Microwave Processing of Waterborne Polyurethane Coatings on Glass”, Chris Y. Fang, I-Kang Chen, Hoi Kwan Lee, Carlo G. Pantano, *Pennsylvania State University, USA*

**15:00 – 16:20**      **Chemical Synthesis [7]**

**Chair:** Dariusz Bogdal, *Cracow University of Technology, Poland*

**O1-24** (B-27: August 7, 15:00 - 15:20)

“Acceleration Mechanism in the Solvent-Free Synthesis of Heterocyclic Compounds”, Hideko Koshima<sup>1)</sup>, Kyoko Takechi<sup>1)</sup>, Asami Ikeda<sup>1)</sup>, Takaaki Suematsu<sup>2)</sup>, 1) *Ehime University, Japan*, 2) *Hitachi Plant Technologies, Ltd., Japan*

**O1-25** (B-28: August 7, 15:20 - 15:40)

“The Influence of Microwave Heating on the Initiation Steps of Free Radical Polymerisation Reactions”, John Robinson, Alastair Smith, Ed Lester, Sam Kingman, Kris Thurecht, Derek Irvine, *University of Nottingham, UK*

**O1-26** (B-29: August 7, 15:40 - 16:00)

“Microwave Assisted Transesterification of Vegetable Oil to Prepare Biodiesel with Acidified Ionic Liquid”, Zhou Liu, Changyuan Tao, Da-gui Sun, Jun Du, Baizhan Li, *Chongqing University, China*

**O1-27** (B-30: August 7, 16:00 - 16:20)

“Dielectric Relaxation of Monoalkyl Ethers of Polyethylene Glycol at Microwave Frequencies”, Yoko Yamada Pittini<sup>1)</sup>, Dana Daneshvari<sup>2)</sup>, R. Pittini<sup>3)</sup>, Sebastien Vaucher<sup>1)</sup>, Hans Leuenberger<sup>2)</sup>, 1) *EMPA, Swiss*, 2) *University of Basel, Swiss*, 3) *Institute for Innovation in Industrial Pharmacy, Swiss*

**16:40 – 18:00**      **Theory and Measurements [2]**

**Chair:** Kirill I. Rybakov, *Institute of Applied Physics of the Russian Academy of Sciences, Russia*

**O5-05** (B-31: August 7, 16:40 - 17:00)

“Microwave Plasma Simulation - Using Scientific Models to Build New Technologies”, Christian Hunyar, Eberhard Rauchle, Matthias Graf, Lukas Alberts, Rudolf Emmerich, Mathias Kaiser, Klaus-Dieter, *Fraunhofer-Institute for Chemical Technology (ICT), Germany*

**O5-06** (B-32: August 7, 17:00 - 17:20)

“A Neural Network Technique for Reconstruction of 2-D Complex Permittivity Profiles of Materials in Waveguide Systems”, Alexander V. Brovko<sup>2)</sup>, Ethan K. Murphy<sup>1)</sup>, Vadim V. Yakovlev<sup>1)</sup>, 1) *Worcester Polytechnic Institute, USA*, 2) *Saratov State Technical University, Russia*

**O5-15** (B-33: August 7, 17:20 - 17:40)

“Microwave Absorption Behavior of Metal Powders at Elevated Temperature”, Saburo Sano<sup>1)</sup>, Yasumasa Takao<sup>1)</sup>, Shoji Kawakami<sup>1)</sup>, Akihiro Tsuzuki<sup>1)</sup>, Sadatsugu Takayama<sup>2)</sup>, Motoyasu Sato<sup>2)</sup>, Yukio Makino<sup>3)</sup>, 1) *National Institute of Advanced Industrial Science and Technology, Japan*, 2) *National Institute for Fusion Science, Japan*, 3) *Osaka University, Japan*

**O5-08** (B-34: August 7, 17:40 - 18:00)

“The Quantum Nature of Microwave Heating, Processing and Effects in Discussion with Classical Electrodynamics”, Lambert E. Feher, *Reserch Center Karlsruhe, Germany*

## Room C

**11:20 – 12:20      Biological, Medical and Environmental Applications [5]    environment, health**

**Chair:** J. Belanger, *Environment Canada, Canada*

**O3-16      (C-20: August 7, 11:20 - 11:40)**

“Hybrid Technology with Microwaves, Electron Beams and Catalysts for VOCs Removal”, Ioan Calinescu<sup>1)</sup>, Daniel Ighigeanu<sup>2)</sup>, Diana Martin<sup>2)</sup>, Constantin Matei<sup>2)</sup>, Adrian Trifan<sup>1)</sup>, 1) *University Polytechnic of Bucharest, Romania*, 2) *National Institute for Lasers, Plasma and Radiation Physics, Romania*

**O3-17      (C-21: August 7, 11:40 - 12:00)**

“High Power Sub-THz Gyrotron FU CW II for Application to DNP/NMR for Protein Research”, Toshitaka Idehara<sup>1)</sup>, Isamu Ogawa<sup>1)</sup>, Shinichiro Kobayashi<sup>1)</sup>, Mitsuru Toda<sup>1)</sup>, Seitaro Mitsudo<sup>1)</sup>, Teruo Saito<sup>1)</sup>, Hiroki Takahashi<sup>2)</sup>, Toshimichi Fujiwara<sup>2)</sup>, 1) *University of Fukui, Japan*, 2) *Osaka University, Japan*

**O3-18      (C-22: August 7, 12:00 - 12:20)**

“Injuries Caused by Microwave Ovens”, Robert F. Schiffmann, *R.F. Schiffmann Associates, Inc., USA*

**13:20 – 14:40      Industrial Applications [1]    wood**

**Chair:** Juming Tang, *Washington State University, USA*

**O6-01      (C-23: August 7, 13:20 - 13:40)**

“Main Aspects of Microwave Wood Modification Applicable to the Timber Industry”, Grigory Torgovnikov, Peter Vinden, *University of Melbourne, Australia*

**O6-02      (C-24: August 7, 13:40 - 14:00)**

“Study on a Microwave Irradiation Cavity for Pretreatment of Ethanol Production from Woody Biomass”, Hiroaki Suzuki<sup>1)</sup>, Tomohiko Mitani<sup>1)</sup>, Naoki Shinohara<sup>1)</sup>, Masahumi Oyadomari<sup>1)</sup>, Takashi Watanabe<sup>1)</sup>, Takahiko Tsumiya<sup>2)</sup>, Hisayuki Sego<sup>2)</sup>, 1) *Kyoto University, Japan*, 2) *Japan Chemical Engineering & Machinery Co., Ltd., Japan*

**O6-03      (C-25: August 7, 14:00 - 14:20)**

“Establishment of the Safety Areas to Wood Disinfestation by Microwaves”, Angela Tatiana Zona, Juan Vicente Balbastre, Luis Nuno, Elias de los Reyes, Oneira Calderon, *Polytechnic University of Valencia, Spain*

**O6-04      (C-26: August 7, 14:20 - 14:40)**

“Procedure to Exterminate Woodworm in Wood Timbers by Microwave-Power Application”, Angela Tatiana Zona, Juan Vicente Balbastre, Luis Nuno, Elias de los Reyes, Oneira Calderon, Eva Perez, Maria Victoria Vivancos, *Polytechnic University of Valencia, Spain*

**15:00 – 16:20      Industrial Applications [2]    cooking**

**Chair:** Grigory Torgovnikov, *The University of Melbourne, Australia*

**O6-05      (C-27: August 7, 15:00 - 15:20)**

“Ceramic Composites for Microwave Grilling and Speed Cooking”, Thomas E. Quantrille, *Advanced Composite Materials, LLC, USA*

**O6-06      (C-28: August 7, 15:20 - 15:40)**

“Microwave Assisted Process Intensification in Large Scale Fluidized Beds”, Thorsten Gerdes<sup>1)</sup>, Monika Willert-Porada<sup>1)</sup>, Achim Schmidt<sup>2)</sup>, Nicola Anastasijevic<sup>3)</sup>, Matthias Runkel<sup>3)</sup>, 1) *University of Bayreuth, Germany*, 2) *InVerTec, Institut für Innovative Verfahrenstechnik, Germany*, 3) *Outotec GmbH, Germany*

## Program

**O6-07** (C-29: August 7, 15:40 - 16:00)

“Industrial Microwave Heated Fluid Injector”, Sebastijan Stanculovic<sup>1)</sup>, Lambert Feher<sup>1)</sup>, Manfred Thumm<sup>2)</sup>, 1) *Research Center Karlsruhe, Institute for Pulsed Power and Microwave Technology, Germany*, 2) *University of Karlsruhe, Germany*

**O6-09** (C-30: August 7, 16:00 - 16:20)

“Microwave De-/Anti-icing Using the MIDAS-Technology”, Lambert Feher, Thomas Seitz, Volker Nuss, *Research Center Karlsruhe, Germany*

**16:40 – 18:00 Industrial Applications [3]**

**Chair:** Masahiro Suzuki, *Japan Atomic Energy Agency, Japan*

**O6-08** (C-31: August 7, 16:40 - 17:00)

“Microwave Treatment of Hydrocarbon Contaminated Soils”, John Robinson, Sam Kingman, Colin Snape, Richelieu Barranco, Hui Shang, *University of Nottingham, UK*

**O6-10** (C-32: August 7, 17:00 - 17:20)

“Design and Numerical Simulation of a High-Efficiency Microwave Applicator for the Industrial Processing of Non-Absorbing Materials via Microwave Susceptors”, Jacqueline M. R. Belanger<sup>1)</sup>, J. R. Jocelyn Pare<sup>1)</sup>, Ankam Bhaskar<sup>1)</sup>, Craig Fairbridge<sup>2)</sup>, Jean-Francois Rochas<sup>3)</sup>, 1) *Environment Canada, Canada*, 2) *Natural Resources Canada, Canada*, 3) *CETIAT, Canada*

**O6-16** (C-33: August 7, 17:20 - 17:40)

“Miniature Transistor-Based Microwave Drill”, Ohad Mela<sup>1)</sup>, Eli Jerby<sup>2)</sup>, 1) *Tel Aviv University, Israel*, 2) *Scilense Microwave Ltd., Israel*

**O6-12** (C-34: August 7, 17:40 - 18:00)

“Pulsed Microwave Source for Drying of High Voltage Porcelain Insulators with Large Section Thicknesses”, G Swaminathan<sup>1)</sup>, S. Vijaya Kumar<sup>1)</sup>, K. P. Ray<sup>2)</sup>, Rajesh Rangari<sup>2)</sup>, Vijay sarode<sup>2)</sup>, 1) *Bharat Heavy Electricals Limited, India*, 2) *Society for Applied Microwave Electronics Engineering and Research, India*

**Official Dinner 19:00 - 21:30**

**Awarding ceremony**

## August 8, 2008

### Lobby (Entrance Hall)

**8:20 - Registration**

**8:30 - Exhibition**

### Room A

**8:30 – 9:50 Materials Processing [8] iron making, reduction of oxide**

**Chair:** D. V. Louzguine-Luzgin, *Tohoku University, Japan*

**O2-28** (A-35: August 8, 8:30 - 8:50)

“Carbothermal Reduction of Magnetite by Microwave Irradiation”, Kotaro Ishizaki<sup>1)</sup>, Kazuhiro Nagata<sup>2)</sup>, *1) EMPA Swiss Federal Laboratories for Materials Science and Technology, Swiss, 2) Tokyo Institute of Technology, Japan*

**O2-29** (A-36: August 8, 8:50 - 9:10)

“Kinetics of Carbothermic Reduction of Magnetite Powder Mixed with Graphite Heated by Microwave”, Kazuhiro Nagata, Keita Kodama, Miyuki Hayashi, *Tokyo Institute of Technology, Japan*

**O2-30** (A-37: August 8, 9:10 - 9:30)

“Carbon-Thermal Reduction of Polymetallic Minerals with Microwave Assistance”, Guibao Qiu, Chenguang Bai, Liangying Wen, Feng Xia, Xuwei Lv, *Chongqing University, China*

**O2-31** (A-38: August 8, 9:30 - 9:50)

“Fireballs Ejected from Solids and Liquids by Localized Microwaves”, Eli Jerby<sup>1)</sup>, A. Golts<sup>1)</sup>, Y. Shamir<sup>1)</sup>, V. Dikhtyar<sup>1)</sup>, J. B. A. Mitchell<sup>2)</sup>, J. L. LeGarrec<sup>2)</sup>, T. Narayanan<sup>3)</sup>, M. Sztucki<sup>3)</sup>, N. Eliaz<sup>1)</sup>, D. Ashkenazi<sup>1)</sup>, Z. Barkay<sup>1)</sup>, *1) Tel Aviv University, Israel, 2) Universite de Rennes, France, 3) European Synchrotron Radiation Facility, France, 4) Wolfson Applied Materials Research Center, Israel*

**10:10 - 11:30 Materials Processing [9]**

**Chair:** Motohide Matsuda, *Okayama University, Japan*

**O2-32** (A-39: August 8, 10:10 - 10:30)

“Study of Thermo Behavior of Ammonium Polyorthovanadate (APV) under Microwave Irradiation”, Chenguang Bai<sup>1)</sup>, Renlong Liu<sup>1)</sup>, Guibao Qiu<sup>1)</sup>, Liangying Wen<sup>1)</sup>, Yiping Zhou<sup>2)</sup>, Baiyun Gao<sup>2)</sup>, *1) Chongqing University, China, 2) Panzhihua Iron and Steel (Group) Company, China*

**O2-33** (A-40: August 8, 10:30 - 10:50)

“The Potential for Rapid Microwave Coke Making Using Microwave Energy”, Maria Mediero-Munoyerro, Chris Dodds, Sam Kingman, Edward Lester, *University of Nottingham, UK*

**O2-34** (A-41: August 8, 10:50 - 11:10)

“Influence of the Secondary Phase Component on Microwave Sintering Process”, Masaki Yasuoka, Takashi Shirai, Koji Watari, *National Institute of Advanced Industrial Science and Technology (AIST), Japan*

**O2-35** (A-42: August 8, 11:10 - 11:30)

“A Point-Contact Microwave Applicator for Local Doping in Silicon”, Eliahu Jerby, Pavel Livshits, Abraham Shahadi, Vladimir Dikhtyar, Alexandra Inberg, *Tel Aviv University, Israel*

## Program

### 11:50 - 13:10      **Materials Processing [10]**

**Chair:** Eli Jerby, *Tel Aviv University, Israel*

#### **O2-36**      (A-43: August 8, 11:50 - 12:10)

“Microwave Co-Heating of YSZ Electrolyte Film and NiO-YSZ Composite Substrate”, Motohide Matsuda, Hironori Kawasaki, Michihiro Miyake, *Okayama University, Japan*

#### **O2-37**      (A-44: August 8, 12:10 - 12:30)

“On Microwave Selective Heating of Multi Phase Materials”, Noboru Yoshikawa<sup>1)</sup>, Yoshio Tokuyama<sup>2)</sup>, Yan Chen<sup>3)</sup>, Shoji Taniguchi<sup>1)</sup>, *1) Tohoku University, Japan, 2) M & T Co. Ltd., Japan, 3) Anhui University of Technology, Japan*

#### **O2-38**      (A-45: August 8, 12:30 - 12:50)

“Formation of Nano-Domains by Microscopic Thermal Non-Equilibrium Generated in GHz High Frequency Microwave Field”, Motoyasu Sato<sup>1)</sup>, Nobuyuki Nishi<sup>2)</sup>, Motohiko Tanaka<sup>1)</sup>, Akihiro Matsubara<sup>1)</sup>, Sadatugu Takayama<sup>1)</sup>, Hideoki Fukushima<sup>3)</sup>, Maxim Ignatenko<sup>1)</sup>, Rustum Roy<sup>4)</sup>, Dinesh Agrawal<sup>4)</sup>, Jun Fukusima<sup>1)</sup>, *1) National Institute for Fusion Science, Japan, 2) Institute of Molecular Science, Japan, 3) Toyota Central R&D Laboratory, Japan, 4) Pennsylvania State University, USA*

#### **O2-39**      (A-46: August 8, 12:50 - 13:10)

“High Temperature Dielectric Property Measurement”, Edward Bolling Ripley, Brian C Warren, *B&W Technologies, USA*

### 13:10 – 13:30      **Closing Ceremony**

## Room B

### 8:30 – 9:50      **Industrial Applications [4]**

**Chair:** Hirotosugu Takizawa, *Tohoku Univ., Japan*

#### **O6-13**      (B-35: August 8, 8:30 - 8:50)

“Application of Microwave Heating to MOX Fuel Production and Its Contribution to Japanese Energy Strategy”, Masahiro Suzuki, Katsunori Ishii, Takuma Yamamoto, Yoshiyuki Kihara, Yoshiyuki Kato, Tsutomu Kurita, Katsunobu Yoshimoto, Kan-ichi Fujii, *Japan Atomic Energy Agency, Japan*

#### **O6-14**      (B-36: August 8, 8:50 - 9:10)

“Discussion on Optimization of Microwave Heating for MOX Fuel Production”, Yoshiyuki Kato, Tsutomu Kurita, Masaki Matsumoto, Katsunobu Yoshimoto, Masahiro Suzuki, Katsunori Ishii, Takuma Yamamoto, Yoshiyuki Kihara, Kan-ichi Fujii, *Japan atomic energy agency, Japan*

#### **O6-15**      (B-37: August 8, 9:10 - 9:30)

“Patch Array to Generate Microwave Surface Wave”, Yoshio Nikawa, *Kokushikan University, Japan*

#### **O6-11**      (B-38: August 8, 9:30 - 9:50)

“Development of a Continuous Kiln Using Progressive Wave”, Hisanori Hoshizuki, Yuji Maki, Fumihito Ozeki, Yoshiharu Kajita, *MINO CERAMIC CO., LTD., Japan*

### 10:10 – 11:30      **Theory and Measurements [3]**

**Chair:** Motohiko Tanaka, *National Institute for Fusion Science, Japan*

**O5-09** (B-39: August 8, 10:10 - 10:30)

“Microwave Heating of Pure Copper Powder with Different Particle Size and Porosity”, Avijit Mondal<sup>1)</sup>, Dinesh Agrawal<sup>2)</sup>, Anish Upadhyaya<sup>1)</sup>, 1) *Indian Institute of Technology Kanpur, India*, 2) *The Pennsylvania State University, USA*

**O5-10** (B-40: August 8, 10:30 - 10:50)

“Penetration of Microwave Radiation Through Metallic Powders”, V. D. Buchelnikov<sup>1)</sup>, D. V. Louzguine-Luzgin<sup>2)</sup>, G. Xie<sup>2)</sup>, S. Li<sup>2)</sup>, N. Yoshikawa<sup>2)</sup>, M. Sato<sup>3)</sup>, A. P. Anzulevich<sup>1)</sup>, I. V. Bychkov<sup>1)</sup>, A. Inoue<sup>2)</sup>, 1) *Chelyabinsk State University, Russia*, 2) *Tohoku University, Japan*, 3) *National Institute for Fusion Science, Japan*

**O5-11** (B-41: August 8, 10:50 - 11: 10)

“Microwave Absorbability of Various Solutions at Elevated Temperatures”, Tsukasa Chikata<sup>1)</sup>, Shunsaku Katoh<sup>1)</sup>, Masato Sakiyama<sup>2)</sup>, 1) *Research Institute for Solvothermal Technology, Japan*, 2) *A&A Material Corporation, Japan*

**O5-12** (B-42: August 8, 11:10 - 11:30)

“A Novel Approach for Measurement of Temperature Dependent Dielectric Properties of Polymer Resins at 2.45 GHz”, M. Jaleel Akhtar<sup>1)</sup>, Lambert Feher<sup>1)</sup>, Manfred Thumm<sup>2)</sup>, 1) *Research Center Karlsruhe GmbH, Germany*, 2) *Universitaet Karlsruhe, Germany*

**11:50 – 13:10**      **Theory and Measurements [4]**

**Chair:** Tsukasa Chikata, *Research Institute for Solvothermal Technology, Japan*

**O5-13** (B-43: August 8, 11:50 - 12:10)

“Influence of Microwave Irradiation on Calcium Sulphate Crystal Phase”, Xiaoqing Yang, Kama Huang, Guozhu Jia, *Sichuan University, China*

**O5-14** (B-44: August 8, 12:10 - 12:30)

“Microwave Absorption Mechanisms of Raw Materials and Refractories for Iron Making - Permittivity and Permeability Measurements of SiO<sub>2</sub> and Fe<sub>3</sub>O<sub>4</sub>”, Masahiro Hotta, Miyuki Hayashi, Kazuhiro Nagata, *Tokyo Institute of Technology, Japan*

**O5-07** (B-45: August 8, 12:30 - 12:50)

“Complex Permittivity Measurement of Fluids, at High Pressures, and High Temperatures, Using Coaxial Reflection Sensors”, Georgios Dimitrakis<sup>1)</sup>, Edward Lester<sup>1)</sup>, Samuel Kingman<sup>1)</sup>, Robert Clarke<sup>2)</sup>, Andrew P. Gregory<sup>2)</sup>, Kevin Lees<sup>2)</sup>, 1) *The University of Nottingham, UK*, 2) *National Physical Laboratory, UK*

**O5-16** (B-46: August 8, 12:50 - 13:10)

“Microwave Effects in Carbon-Polyolefin Composite”, Yutaka Iizuka, Jun-ichi Sugiyama, Takahiro Satou, *AIST, Japan*

**Room C**

**8:30 - 12:00**      **Workshop II: Millimeter-wave and THz Technologies**

**Session organizer:** Teruo Saito, *Fukui University, Japan*

**Chair:** Teruo Saito, *Fukui University, Japan*

**WSII-O1** (C36: August 8, 8:40 - 9:10)

“THz Gyrotrons FU CW Series for High Power THz Technologies”, Toshitaka Idehara, Teruo Saito, Isamu Ogawa, Seitaro Mitsudo, Yoshinori Tatematsu, *University of Fukui, Japan*

## Program

### **WSII-O2** (C37: August 8, 9:10 - 9:40)

“Millimeter-Wave Sintering of Optically Transparent Nd:Y<sub>2</sub>O<sub>3</sub>-Ceramics”, Yu. V. Bykov<sup>1)</sup>, S. V. Egorov<sup>1)</sup>, V. V. Kholoptsev<sup>1)</sup>, A. A. Sorokin<sup>1)</sup>, V. V. Osipov<sup>2)</sup>, M. G. Ivanov<sup>2)</sup>, V. V. Platonov<sup>2)</sup>, A. S. Kaygorodov<sup>2)</sup>, 1) *Institute of Applied Physics of the Russian Academy of Sciences, Russia*, 2) *Institute of Electrophysics, Russia*

### **WSII-O3** (C38: August 8, 9:40 - 10:10)

“Propagation of Terahertz Waves in Structured Metals”, Masanori Hangyo<sup>1)</sup>, Keisuke Takano<sup>1)</sup>, Kyoji Shibuya<sup>1)</sup>, Fumiaki Miyamaru<sup>2)</sup>, Keita Izumi<sup>3)</sup>, Hiroshi Miyazaki<sup>3)</sup>, Yoji Jimba<sup>4)</sup>, 1) *Osaka University, Institute of Laser Engineering, Japan*, 2) *Shinshu University, Japan*, 3) *Tohoku University, Japan*, 4) *Nihon University, Japan*

**10:10 – 10:30** coffee break

Chair: Takashi Shimozuma, *National Institute for Fusion Science, Japan*

### **WSII-O4** (C39: August 8, 10:30 - 10:50)

“Millimeter Wave Sintering of Metal Powder Compacts Utilizing a Modified Dilatometer for Resistivity Measurements”, Guido Link<sup>1)</sup>, Junichi Ichikawa<sup>2)</sup>, Manfred Thumm<sup>1,3)</sup>, 1) *Forschungszentrum Karlsruhe, Germany*, 2) *Hitachi Powdered Metals co., Ltd., Japan*, 3) *University of Karlsruhe, Germany*

### **WSII-O5** (C40: August 8, 10:50 - 11:10)

“Submillimeter Wave Material Processing”, Seitaro Mitsudo<sup>1)</sup>, Yoshihisa Kobayashi<sup>1)</sup>, Tomoaki Nakano<sup>1)</sup>, Toshitaka Idehara<sup>1)</sup>, Teruo Saito<sup>1)</sup>, Saburo Sano<sup>2)</sup>, Tsuguo Ueda<sup>3)</sup>, 1) *University of Fukui, Japan*, 2) *National Institute of Advanced Industrial Science and Technology*, 3) *Fukushin kougyou Co., Ltd., Japan*

### **WSII-O6** (C41: August 8, 11:10 - 11:30)

“Shock Wave Generation Using a High Power Millimeter Wave Beam”, Yasuhisa Oda<sup>1)</sup>, Ken Kajiwara<sup>1)</sup>, Koji Takahashi<sup>1)</sup>, Atsushi Kasugai<sup>1)</sup>, Keishi Sakamoto<sup>1)</sup>, Kimiya Komurasaki<sup>2)</sup>, 1) *Japan Atomic Energy Agency, Japan*, 2) *the university of Tokyo, Japan*

**11:30 – 11:50** coffee break

Chair: Yu. V. Bykov, *Institute of Applied Physics of the Russian Academy of Sciences, Russia*

### **WSII-O7** (C42: August 8, 11:50 - 12:10)

“Handling Technology of Mega-Watt Millimeter-Waves for Optimized Heating of Fusion Plasmas”, T. Shimozuma<sup>1)</sup>, S. Kubo<sup>1)</sup>, Y. Yoshimura<sup>1)</sup>, H. Igami<sup>1)</sup>, H. Takahashi<sup>1)</sup>, Y. Takita<sup>1)</sup>, S. Kobayashi<sup>1)</sup>, S. Ito<sup>1)</sup>, Y. Mizuno<sup>1)</sup>, H. Idei<sup>2)</sup>, T. Notake<sup>3)</sup>, M. Shapiro<sup>4)</sup>, R. Temkin<sup>4)</sup>, F. Felici<sup>5)</sup>, T. Goodman<sup>5)</sup>, O. Sauter<sup>5)</sup>, R. Minami<sup>6)</sup>, T. Kariya<sup>6)</sup>, T. Imai<sup>6)</sup>, T. Mutou<sup>1)</sup>, 1) *National Institute for Fusion Science, Japan*, 2) *Kyushu University, Japan*, 3) *University of Fukui, Japan*, 4) *Massachusetts Institute of Technology, USA*, 5) *Centre de Recherches en Physique des Plasmas*, 6) *University of Tsukuba, Japan*

### **WSII-O8** (C43: August 8, 12:10 - 12:30)

“ECRH Antenna Performance in a Limited Spatial Availability”, Hiroyuki Shidara, Tsuyoshi Imai, Yusuke Sakagoshi, Mark A Henderson, Tsuyoshi Kariya, Ryutaro Minami, 1) *University of Tsukuba, Japan*, 2) *ITER organization*

### **WSII-O9** (C-44: August 8, 12:30 - 12:50)

“Theory and Design of the Free Electron Maser with Advanced Bragg Resonator”, Keiichi Kamada<sup>1)</sup>, Mikiko Kawamura<sup>1)</sup>, Kousuke Aizawa<sup>1)</sup>, Shuhei Odawara<sup>1)</sup>, Ritoku Ando<sup>1)</sup>, N. S. Ginzburg<sup>2)</sup>, A. M. Malkin<sup>2)</sup>, N. Yu. Peskov<sup>2)</sup>, A. S. Sergeev<sup>2)</sup>, V. Yu. Zaslavsky<sup>2)</sup>, 1) *Kanazawa University, Japan*, 2) *Institute of Applied Physics, Russian Academy of Science, Russia*

## Poster Presentations

### Poster side discussion

**for even number posters: August 5, 16:20 - 17:30**

(e.g. P1-02, P1-04, .... P2-02, ....)

**for odd number posters: August 6, 16:20 - 17:30**

(e.g. P1-01, P1-03, .... P2-01, ....)

Posters should be posted before August 5, 12:00, and take off after August 7, 18:00.

### 1. Chemical Synthesis

#### P1-01

“Efficient Microwave-Assisted Synthesis of 1-Tetralones from 4-Arylbutyric Acids Using Solid Acid Catalysts”, Hiroshi Yamashita, Kazuaki Hiroki, Makiko Hatori, Jun-ichi Sugiyama, *National Institute of Advanced Industrial Science and Technology (AIST), Japan*

#### P1-02

“Biodegradable Films Preparation from Microwave-Assisted Esterification of Pineapple Leaf Cellulose”, Usarat Ratanakamnuan<sup>1)</sup>, Supakitt Treethammakul<sup>1)</sup>, Nutthawut Gritayarnon<sup>1)</sup>, Duangduen Atong<sup>2)</sup>, Duangdao Aht-Ong<sup>1)</sup>, *1) Chulalongkorn University, Thailand, 2) National Metal and Materials Technology Center, Thailand*

#### P1-03

“Solvent Effect for Microwave Irradiation to Claisen Rearrangement”, Fumiyoshi Ozaki, Yutaka Okada, *Ritsumeikan University, Japan*

#### P1-04

“Synthesis of Si<sub>3</sub>N<sub>4</sub> by Microwave-Assisted Carbothermal Reduction and Nitridation”, Ruth H. G .A. Kiminami, Argos Y. Coletti, Wellington I Idalgo, Pollyane M. de Souza, *Federal University of Sao Carlos, Brazil*

#### P1-05

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“An Industrial Microwave-Assisted Process and Associated Applicator for the Conversion of Ethane to Ethylene”, Jacqueline M. R. Bélanger<sup>1)</sup>, J. R. Jocelyn Paré<sup>1)</sup>, Craig Fairbridge<sup>2)</sup>, Ankam Bhaskar<sup>1)</sup>, Sateesh Mutyala<sup>2)</sup>, Siau Ng<sup>2)</sup>, Randall Hawkins<sup>2)</sup>, Adam Pawilan<sup>2)</sup>, 1) *Environment Canada, Canada*, 2) *Natural Resources Canada, Canada*

**P6-08**

“Influences of Stir and Viscosity Coefficient on the Formation of Hotspots During Microwave Heating”, Xiaoqing Yang, Kama Huang, Guozhu Jia, *Sichuan University, China*

**P6-09**

“Optimization and Validation of an Applicator for Wood Disinfestations by Microwaves”, Angela Tatiana Zona, Leila Landazábal, Oneira Calderón, Juan Vicente, Luis Nuño, Elías de los Reyes, *Polytechnic University of Valencia, Spain*

## Program

### **P6-10**

“Industrial Microwave Exfoliation of Vermiculite”, Sam Kingman, Chris Dodds, Georgios Dimitrakis, George Rice, *1) University of Nottingham, UK*

### **P6-11**

“Biomass for Microwave Assisted Steel Production”, Thorsten Gerdes, Monika Willert-Porada, Johannes Thiessen, *University of Bayreuth, Germany*

### **P6-12**

“Phase-and-Amplitude-Controlled Magnetron and Its Application for Microwave Heating”, Tomohiko Mitani, Naoki Shinohara, *Kyoto University, Japan*

### **P6-13**

“Microwave Heating of Organic Liquids in TM<sub>010</sub> Cylindrical Cavity”, Jun-ichi Sugiyama<sup>1)</sup>, Tadashi Okamoto<sup>2)</sup>, Masahiro Yasuda<sup>2)</sup>, *1) AIST, Japan, 2) IDX Co. Ltd., Japan*

## **7. Other Related Topics**

### **P7-01**

“Heating Characteristics of Iron/Iron-Oxide Compound by Microwave”, Nobuhiro Nishino, Shingo Sakurada, Tomoko Maeda, Takahide Takeuchi, Akira Tashiro, *Hiroshima University, Japan*