

**Kumamoto University Global COE Program
“Global Initiative Center for Pulsed Power Engineering”**

International COE Forum on Pulsed Power Engineering

PROGRAM AND ABSTRACTS



**January 8-11, 2009
Hotel Misaki Tei in Amakusa Islands, Kumamoto, Japan**

International COE Forum on Pulsed Power Engineering

**The Second Symposium of Research Consortium on High-pressure
(Shock & Static Compression) Research**

and

Young Researcher Training Camp

Hotel Misaki Tei in Amakusa Islands, Kumamoto

**Organized by: Kumamoto University Global COE Program on Pulsed Power Engineering,
International Research Consortium on Shock & Static High-Pressure Research**

Thursday, January 8, 2009

12:00 - 13:00 Registration

13:00 - 13:30 Prof. **Hidenori Akiyama** (G-COE Leader)

“Aim and Programs of Global Initiative Center on Pulsed Power Engineering”

13:30 - 14:30 Prof. **Sunao Katsuki**

“Introduction to Bioelectrics”

14:45 - 15:45 Prof. **Masayasu Ohtsu**

**“Mitigation Techniques for Environmental Problems in Concrete Engineering
leading to Pulsed-Power Engineering”**

16:00 - 17:00 Prof. **Motonobu Goto**

“Supercritical fluid”

17:15 - 18:15 Prof. **Firuz Zare**

**“Power Electronic Converters in Pulsed Power Systems: Design and Practical
Considerations”**

18:15 - 20:00 Dinner

20:00 - 20:30 Prof. **Tomoaki Ikegami**

“Application of Pulsed Laser to Material Synthesis and Analysis”

20:30 - 21:00 Prof. **Hiroyoshi Takano**

“Plant Cell Biology”

21:00 – 21:30 Prof. **Hamid Hosseini**

“Medical Application of Acoustic Waves”

Friday, January 9, 2009

The Second International Research Consortium Symposium on High-pressure (Shock & Static Compression) Research (9:00-12:15)

Session-1

9:00 - 9:40 Prof. **Tsutomu Mashimo** (Kumamoto University, Japan)

“Shock compression research of solids at Kumamoto University”

9:40 - 10:25 Prof. **Leonid Dubrovinsky** (Bayerisches Geoinstitut, Universität Bayreuth, Germany)

“From crust to core: High-pressure studies in Bayerisches Geoinstitut”

10:25 -11:10 Prof. **C.S. Yoo** (Associate Director, Institute for Shock Physics, Department of Physics and Astronomy, Washington State University, USA)

“Principles of High Pressure Chemistry”

11:10 -11:25 Coffee break

Session-2

11:25 -12:10 Prof. **Akira Yoshiasa** (Kumamoto University, Japan)

“Precise structure analyses and interesting properties of natural materials under high-pressure and high-temperature”

12:10 - 13:10 Lunch

Young Researcher Training Camp (13:20-17:45)

13:20 - 13:40 Dr. **Douyan Wang** (Kumamoto University, Japan)

“Pulsed Streamer Discharges Generated by Nano-second Pulsed Power in Atmospheric Air”

13:40 - 14:00 Dr. **Coralie Weigel** (Bayerisches Geoinstitut, Universität Bayreuth, Germany)

“⁵⁷Fe Mössbauer spectroscopy applied to silicate glasses at extreme conditions”

14:00 - 14:20 Dr. **Geertje Ganskow** (Bayerisches Geoinstitut, Universität Bayreuth, Germany)

“Stability of hydrous mantle phases in the MgFeSiO₄-H₂O system”

14:20 - 14:35 Coffee break

14:35 - 14:55 Dr. **Willem van Mierlo** (Bayerisches Geoinstitut, Universität Bayreuth, Germany)

“High Pressure Diffusion Study of the Majorite Component in Pyrope”

14:55 - 15:15 Dr. **Jing-Yin Chen** (Washington State University, USA)

“Physical and Chemical Transformations of CN Compounds at High Pressures”

15:15 - 15:35 Dr. **Wahyudiono** (Kumamoto University, Japan)

“Characterization of Upgraded Bitumen by Supercritical Water”

15:35 - 15:50 Coffee break

15:50 - 16:10 Dr. **Tsuyoshi Kiyari** (Kumamoto University, Japan)

“Investigation of Discharge Plasma in Supercritical fluid and its application”

16:10 - 16:30 Dr. **Keisuke Abe** (Kumamoto University, Japan)

“Effect on HeLa cell and animal organ stimulated by Intense Burst Sinusoidal Electric Fields (IBSEF)”

16:30 - 16:50 Dr. **Eri Shiraishi** (Kumamoto University, Japan)

“The role of Müllerian inhibiting substance signaling for germ cell proliferation and differentiation during early gonadal differentiation in medaka (*Oryzias latipes*)”

16:50 - 17:05 Coffee break

17: 05 - 17:25 Dr. **Akihisa Mori** (Kumamoto University, Japan)

“Property of Silicon Rubber Using as Pressure-Transmitting Medium”

17:25 - 17:45 Dr. **Tsuyoshi Ueda** (Kumamoto University, Japan)

“Characterization of ZnO and TiO₂ targets consolidated by underwater shockwave and preparation of thin films using consolidated targets”

19:00 - 21:00 Dinner Party

Saturday, January 10, 2009

The Second International Research Consortium Symposium on High-pressure (Shock & Static Compression) Research (9:00-12:15)

9:00 - 9:40 Dr. **N. Ozaki** (Osaka University, Japan)

“**Laser shock experiment in TPa region**”

9:40 - 10:25 Dr. **T. Mehlhorn** (Sandia National Laboratories, USA)

“**Understanding Dynamic Material Properties through Pulsed Power Experiments**”

10:25 - 10:40 Coffee break

10:40 - 11:25 Dr. **R. Chau** (Lawrence Livermore National Laboratory, USA)

“**Role of Kinetics in Shock Compression Experiments**”

11:30 - 12:05 Dr. **Nobuyoshi Miyajima** (Bayerisches Geoinstitut, Universität Bayreuth, Germany)

“**Dislocation microtextures of perovskite and post-perovskite: TEM studies from CaIrO₃ analogues to MgSiO₃**”

12:05 - 13:30 Lunch

Young Researcher Training Camp (13:30-17:00)

13:30 - 15:00 Short oral presentations (3 minutes presentation by poster presenters)

15:00 - 15:20 Break & Preparation for the poster session

15:20 - 17:00 Poster Session

18:15 - 20:00 Dinner

20:00 - 20:30 Prof. **Hiroataka Ihara**

“**Molecular Architecture Self-Assembling Molecular Tool for Nano-Fabrication**”

20:30 - 21:00 Prof. **Hisato Saito**

“**Molecular Modification**”

21:00 - 21:30 Prof. **Kazuyuki Hokamoto**

“**Explosive Processing for Materials**”

Sunday, January 11, 2009

9:00 – 9:30 Prof. **Toshifumi Komatsu** (Kumamoto University, Japan)

“Geology, Stratigraphy, and Fossils of the Upper Cretaceous Himenoura Group in Amakusa-Kamishima Island”

9:30 – 10:00 Prof. **Toshiaki Hasenaka** (Kumamoto University, Japan)

“Volcanic products of phreatomagmatic activities at Oyano-jima island”

10:00 – 10:30 Closing

10:30 - 15:00 **A field trip to Amakusa island Region and its rich natural environment: Volcanic products of phreatomagmatic activities and the Upper Cretaceous Himenoura Group.**

18:00 Kumamoto University

Posters

P01 **“Experimentation and Simulation Study for Reaction Mechanism of Heavy Oil Model Compounds in Super Critical Water”**

Pradip Chandra MANDAL*, Mitsuru SASAKI and Motonobu GOTO
Graduate School of Science and Technology, Kumamoto University, Japan

P02 **“Viscosity of Metallic Glass Forming Liquids: Analyses by the Bond Strength – Coordination Number Fluctuation Model and the VFT Law”**

Masahiro Ikeda* and Masaru Aniya
Graduate School of Science and Technology, Kumamoto University, Japan

P03 **“Radical Addition Reaction under Mega-gravity Field”**

Yasuyuki Abe*, Masao Ono, Tsutomu Mashimo and Hirotaka Ihara
Graduate School of Science and Technology, Kumamoto University, Japan

P04 **“Effect of neuregulins (NRGs), retinoic acid (RA) and IBSEF on spermatogenesis in culture of neonatal mouse testis”**

J. Zhang*, S. Okuma, K. Eto and S.-I Abe
Graduate School of Science and Technology, Kumamoto University, Japan

P05 **“Quality control of coarse aggregate recovered from waste concrete by pulsed discharge”**

Shinya Iizasa*, Mitsuhiro Shigeishi, Takao Namihira
Graduate School of Science and Technology, Kumamoto University, Japan

- P06 **“Investigation of Electroluminescent Material Processed by Explosive in a Pressure Vessel”**
G.B. Kennedy* and **S. Itoh**
 Graduate School of Science and Technology, Kumamoto University, Japan
- P07 **“Acoustic Emission Application to Identification of Damaged Area in Interior of Concrete”**
Ni Nyoman Kencanawati*, **Mitsuhiro Shigeishi**
 Graduate School of Science and Technology, Kumamoto University, Japan
- P08 **“Synthesis of zirconia bulks doped with yttrium by spark plasma sintering from nanopowders”**
Chen Liliang*, **Jia Chengchang**, **Wang Kaiming**
 Institute of Powder Metallurgy, School of Materials Science and Engineering,
 University of Science and Technology Beijing, China
- P09 **“Hugoniot Measurement of Teflon (PTFE)”**
Kazuyuki TASHIRO*, **Mitsuru MURAI**, **Tsutomu MASHIMO**, **Takumi KAWASAKI**, **Yoshihiko KOMADA**, **Kenichi KODA**
 Graduate School of Science and Technology, Kumamoto University, Japan
- P10 **“Application of supercritical CO₂ to extraction of essential oil from various Japanese citrus juice processing residues”**
Masahiro Tanaka*, **Akihiro Terada**, **Mitsuru Sasaki** and **Motonobu Goto**
 Graduate School of Science and Technology, Kumamoto University, Japan
- P11 **“Supercritical Carbon Dioxide Extraction of Lycopene From Tomato Skin By-Product With Tomato Seed Oil as Co-Solvent”**
Zakaria*, **Siti Machmudah**, **Sugeng Winardi**, **Mitsuru Sasaki** and **Motonobu Goto**
 Graduate School of Science and Technology, Kumamoto University, Japan
- P12 **“Synthesis of w-ZnS and ZnMgS by the Impulse Plasma in Liquid and Shock Compression”**
Emil Omurzak*, **Tsutomu Mashimo**, **Hideharu Iwasaki**, **Masato Okamoto** and **Saadat Sulaimankulova**
 Innovative Collaboration Organization, Kumamoto University, Japan
- P13 **“Non-thermal Intense Narrow Band Electric Field Induces Intracellular DNA to Denaturalize”**
Naoyuki Nomura*, **Masahiko Yano**, **Sunao Katsuki**, **Hidenori Akiyama**
 Graduate School of Science and Technology, Kumamoto University, Japan
- P14 **“Investigation of Initial Molecular Events in Human Leukemia Cells Treated by Pulsed Power: Towards Engineering Cellular Functions and Biological Activities via Manipulation of Molecular Modification by Pulsed Power”**
Junsuke Uwada*, **Niina Tanaka** and **Hisato Saitoh**
 Graduate School of Science and Technology, Kumamoto University, Japan
- P15 **“Laser Ablation to Copper in Supercritical Carbon Dioxide”**
Takashi Saito*, **Yutaka Kuwahara**, **Mitsuru Sasaki** and **Motonobu Goto**
 Graduate School of Science and Technology, Kumamoto University, Japan

- P16 **“Processing of Cotton Yarn by Using Underwater Shock Wave”**
G. M.Shafiur Rahman*, Shigeru Itoh
Graduate School of Science and Technology, Kumamoto University, Japan
- P17 **“The Environmental assessment by LCCO₂ and processing technology development of reproduction Class H of fine aggregate”**
Seiji Maeda*, Mitsuhiro Shigeishi and Takao Namihira
Graduate School of Science and Technology, Kumamoto University, Japan
- P18 **“Sedimentation of impurity atoms in InSb semiconductor under a strong gravitational field”**
Yusuke Iguchi*, Masao Ono, Satoru Okayasu and Tsutomu Mashimo
Kumamoto University, Japan
- P19 **“Explosive welding of Tungsten/Copper using underwater shock wave”**
JoonOh Lee*, P. Manikandan and K. Hokamoto
Graduate School of Science and Technology, Kumamoto University, Japan
- P20 **“Composition change in twinned Y₁Ba₂Cu₃O_{7-x} single crystal under strong-gravitational field”**
Rabaya Bagum*, Satoru Okayasu, Yusuke Iguchi, Emil Omurzak, Masao Ono, Akira Yoshiasa, Tsutomu Mashimo
Graduate School of Science and Technology, Kumamoto University, Japan
- P21 **“Measurement of Hugoniot-compression curve of MgO single crystal”**
Mitsuru MURAI*, Naoto KAWAYANAGI, Kazuyuki TASHIRO, Yuuya GOUMOTO and Tsutomu MASHIMO
Graduate School of Science and Technology, Kumamoto University, Japan
- P22 **“Performances of Nano Seconds Pulsed Discharge”**
S.Sakai*, T.Matsumoto, T.Tokuichi, D.Wang, T.Namihira, S.Katsuki and H.Akiyama
Kumamoto University, Japan
- P23 **“Hydrothermal Extraction of Phytochemicals from Polygonum cuspidatum Roots”**
Siti Machmudah*, Tomoyo Kamogawa, Mitsuru Sasaki and Motonobu Goto
Graduate School of Science and Technology, Kumamoto University, Japan
- P24 **“Automatic Detection of AE First Motion in Concrete for SiGMA Analysis”**
Kentaro Ohno* and Masayasu Ohtsu
Graduate School of Science and Technology, Kumamoto University, Japan