International Symposium on Global Multidisciplinary Engineering 2011
(S-GME2011)

Abstracts

January 24 ~ 25, 2011
Nagaoka, Japan

Organized by
Nagaoka University of Technology
Preface

Nagaoka University of Technology (NUT) gained an award on “Program of developing the supporting system for upgrading the education and research” from Japanese government (Ministry of Education, Culture, Sports, Science, and Technology) in 2009. The program title for NUT is the “Program for developing the supporting system for global multidisciplinary engineering establishment”, in which two main purposes are proposed. The first is to establish the supporting system for faculty and administration members and graduate students and to serve environments keeping and enhancing world-leading education and research activities in NUT. The second is to establish a sustainable green society through developments of new green energy sources, high-performance green processing and products, and green sensing and monitoring of changes in environments. To establish the purposes, innovations in next-generation of science and technology are required and staffs and students in various fields must take part in this program. And, this is the concept of “global multidisciplinary engineering establishment”.

The International Symposium on Global Multidisciplinary Engineering 2011 (S-GME2011) is planned to share recent progress in education and research activities focused on the supporting system for global multidisciplinary engineering establishment and to discuss future directions in this program aiming establishment of a sustainable green society.

January 24, 2011

Project Leader: Shigeharu Kamado
Project Manager: Takayuki Komatsu
Project Planner: Tadachika Nakayama
Program

24th January (HOTEL NEW OTANI NAGAOKA)

Room Haku - cho (白鳥)
9:00 ~ 9:10 Opening Remarks
9:10 ~ 11:10 Invited Lecture I
11:10 ~ 11:25 Coffee Break
12:25 ~ 13:25 Lunch Time
13:25 ~ 14:40 Poster Session
14:45 ~ 16:45 Invited Lecture II
16:45 ~ 17:00 Coffee Break
17:00 ~ 18:40 Oral Session II
18:45 Group Photo
19:00 Welcome Party Room Kashiwa (柏)

25th January (Nagaoka University of Technology)

Lecture Room E
10:00 ~ 12:20 Oral Session III
12:20 ~ 13:30 Lunch Time
13:30 ~ 15:30 Oral Session IV
15:30 Closing Remarks

Lecture Room F
10:00 ~ 12:20 Oral Session V
12:20 ~ 13:30 Lunch Time
13:30 ~ 15:30 Oral Session VI
15:30 Closing Remarks

15:45 ~ 17:30 Labo Tour
Program Contents

January 24th (Monday)

9:00 Opening Remarks: Professor Koichi Niihara (President, NUT, Japan)

9:10 ~ 11:10 Invited Lecture I (Chairpersons: T. Nakayama and T. Komatsu)

I-1: “Photoactive Glasses and Glass Ceramics”
   D. Ehrt (Otto-Schott Institute, Friedrich-Schiller Universität Jena, Germany)
I-2: “Formation of TiO$_2$ Nanotubes via Anodization and Its Potential Application:
   Photocatalyst, Biomedical Material and Photoelectrochemical”
   S. Sreekantan, K.A. Saharudin and L.C. Wei (School of Materials and Mineral
   Resources Engineering, Engineering Campus, Universiti Sains Malaysia)
I-3: “Development of Thermoelectric Micromodules for Energy Conversion”
   J.F. Li, and D.W. Liu (State Key Laboratory of New Ceramics and Fine
   Processing, Department of Materials Science and Engineering, Tsinghua
   Univ., China)
I-4: “Microstructural Characterization and Engineering Applications of Deformed
   Metals”
   Q. Liu (College of Materials Science and Engineering, Chongqing Univ., China)

11:10 ~ 11:25 Coffee Break


O-1: “Application of the Sugar Chains Attached to Proteins and Lipids for Protecting Our
   Health”
   K. Furukawa$^1$, S. Kishioka$^2$ and T. Sato$^3$ (NUT, Japan)
O-2: “Development of a Light Weight Micro Windmill”
   Y. Miyashita$^1$, N. Yamada$^1$, T. Takahashi$^1$ and Y. Otsuka$^2$ (NUT, Japan)
O-3: “In-liquid Plasma Process by Atmospheric Pressure Plasma for Reduction Treatment of
   SrAl$_2$O$_4$:Eu Phosphor”
   (NUT, Japan)

12:25 ~ 13:25 Lunch Time

13:25 ~ 14:40 Poster Session

14:45 ~ 16:45 Invited Lecture II (Chairpersons: M. Fukuda and K. Sato)

I-5: “Characterization of Polylactic Acid/ Liquid Deproteinized Natural Rubber Having
   Epoxy Group Blend”
   P.T. Nghia$^1$, N. Siripitakchai$^2$, W. Klinklai$^2$, T. Saito$^2$, ($^1$Hanoi University of
   Science and Technology, Vietnam, $^2$ NUT, Japan)
I-6: “Supercapacitive Behaviors of Co and Fe Doped Manganganese Oxide Thin Films
   Prepared by Anodic Electrodeposition “
   M.T. Tung$^1$, D.V. A. Dung$^1$, L.T.T. Hang$^1$ (Hanoi University of Science and
Technology, Vietnam)
I-7: “Challenges to Developing Biological Drugs: Two Case Studies”
Emmanuel Nony (Scientific Department, Stallergenes, France)

I-8: “Application of Oxide Nanofibers/Nanowires to Gas Sensors”
J.Y. Park¹, S.W. Choi², S.H. Jung² and S.S. Kim² (¹ Korea Institute of Industrial Technology, ² Inha Univ., Korea)

16:45 ~ 17:00 Coffee Break

17:00 ~ 18:40 Oral Session II (Chairpersons: K. Yasui and Y. Miyashita)

O-4: “Fabrication of Olivine Type LiMPO₄ Glass Ceramics for Rechargeable Lithium Ion Battery”
T. Honma¹, T. Komatsu¹, T. Sato², and A. Sakamoto³
(¹ NUT, ² Tsuruoka Nat. College Tech., ³ Nippon Electric Glass Comp., Japan)

O-5: “Cathodo- and Photoluminescence of (H₂O)Al₃(SO₄)₂(OH)₆:Cu Synthesized Under Hydrothermal Condition”
Y. Kuroki, N. Iwata, T. Hatsuse, T. Okamoto and M. Takata (NUT, Japan)

O-6: “Experimental Evidences of Site Preference for Mn Substitution in Ferromagnetic (Zn,Mn,Sn) As₂ Films”
N. Uchitomi, H. Endoh, H. Oomae, Y. Jinbo, E. Mammadov, T. Ishibashi (NUT, Japan)

O-7: “Visualization of High-Speed Phenomena and Progress of Dynamical Study”
R. Tanabe, H. Isobe, Y. Miyashita and T. Takahashi (NUT, Japan)

O-8: “Pattern Matching of Grammatical Phrase for Plain Japanese System”
M. Matsuda¹, S. Kodama², T. Kazuki³, K. Yoshiko⁴, and Y. Mikami⁵
(¹ Kanazawa Univ., ²,³,⁵ NUT, ⁴ Tokyo International Univ., Japan)

19:00 Welcome Party

January 25th (Tuesday)

Lecture Room E

10:00 ~ 12:20 Oral Session III (Chairpersons: T. Honma and S. Ishihara)

O-9: “Fabrication of Thermoelectric Mg₂Si by Mechanofusion Process and Pulsed Electric Current Sintering”
M. Nanko¹, H. Abe¹, M. Takeda¹ and H. Honma¹,²,³ Hiroya Abe³, Akira Kondo³ and Makio Naito³ (¹,² NUT, ³ Osaka Univ., Japan)

K. Yasui, M. Tahara and H. Nishiyama (NUT, Japan)

T.W. Tzu, N. Saito and K. Sato (NUT, Japan)

O-12: “Anisotropic Sintering of Oriented Ceramics Prepared in a Rotating Magnetic Field”
S. Tanaka and K. Uematsu (NUT, Japan)

O-14: “Transcriptional Analysis Using Microarray of Filamentous Fungus *Trichoderma reesei*
M. Yuki\(^1\), K. Mori\(^2\), Y. Morikawa\(^1\) and W. Ogasawara\(^1\): (\(^1\)NUT, \(^2\)Kyushu Univ., Japan)

O-15: “Raman Spectroscopic Study of Structure and Crystallization of MoO\(_3\)-La\(_2\)O\(_3\)-B\(_2\)O\(_3\) and MoO\(_3\)-ZnO-B\(_2\)O\(_3\) Glasses”
L. Aleksandrov, T. Komatsu, K. Nagamine, and K. Oishi (NUT, Japan)

12:20 ~ 13:30  **Lunch Time**

13:30 ~ 15:30  **Oral Session IV**  *(Chairpersons: M. Nanko and A.G.M. Roussy)*

O-16: “Information for Risk Communication in Chemical Plant”
T. Fukuda, and Y. Hirao (NUT, Japan)

O-17: “Electrolytic Membrane Formation of Fluoroalkyl Polymer Using UV-Radiation-Based Grafting Technique and Sulfonation”
S. Shironita, S. Mizoguchi and M. Umeda (NUT, Japan)

O-18: “Fatigue Crack Growth Behavior for 3-D Inclined Surface Crack”
F. Yang\(^1\), Z. Kuang\(^1\), Y. Mutoh\(^2\) and Y. Miyashita\(^2\): (\(^1\)Shanghai Jiaotong Univ., China, \(^2\)NUT, Japan)

O-19: “Preparation of Hydroxylated Natural Rubber and Its Gas Permeability”
Y. Yamamoto, T. Saito, K. Akabori, T. Yamaguchi and S. Kawahara (NUT, Japan)

O-20: “Experimental Evaluation of a High Speed Flywheel for a Energy Cash System”
J. Haruna\(^1\), K. Murai\(^2\), J. Itoh\(^1\), N. Yamada\(^3\), Y. Hirano\(^3\), T. Homma\(^3\)
(NUT, Japan)

O-21: “Nano-Sized Particles Formed by Pulsed Discharge of Powders Sealed in Heat-shrinkable Tubes”
S. Ishihara, H. Suematsu, T. Nakayama, T. Suzuki, and K. Niihara (NUT, Japan)

**Lecture Room F**

10:00 ~ 12:20  **Oral Session V**  *(Chairpersons: Y. Kuroki and E. Mammadov)*

A. G. M. Roussy (NUT, Japan)

S. Kodama (NUT, Japan)

O-24: “Development of Model for Optimal Design of a Revegetation Project”
R. Tachibana\(^1\), K. Fujie\(^3\), K. Fukunaga\(^1\) and T. Ohta\(^3\): (\(^1\)NUT, \(^2\)Yokohama National Univ., \(^3\)Tokyo Univ. Agri., Japan)

O-25: “Development of the Biological Nitrogen Removal System for a Fish-Breeding High-Salinity Water”
M. Takahashi\(^1\), T. Hamaguchi\(^1\), M. Kurabe\(^1\), S. Kawakami\(^1\), M. Hatamoto\(^1\),
N. Araki\(^2\), M. Mori\(^3\), M. Kawamata\(^3\), T. Hoaki\(^3\) and T. Yamaguchi\(^1\): (\(^1\)NUT,
\(^2\)Nagaoka National College of Tech. \(^3\)Taisei Corporation., Japan)

O-26: “Fretting Fatigue Strength Prediction of High Strength Steels and Al Alloys”
M. Jayaprakash, Y. Miyashita and Y. Mutoh (NUT, Japan)
O-27: “Development of Integrated Bio-Physiological Treatment System (UASB+DHS+Filtration) for Molasses-Based Wastewater”
N. Pattananuwan1, M. Takahashi1, S. Kawakami1, M. Hatamoto1, T. Kawai2, Y. Nagai2, H. Nakajima2, K. Syutsubo3, N. Araki4, S. Yamazaki5, T. Yamaguchi1
(1) NUT, 2) Mitsui Sugar Co., Ltd., 3) National Institute for Environmental Studies (NIES), 5) Kochi National College of Tech., Japan
O-28: “Interference Effect of the Wake Body on the Crossflow Vibration of the Square Cylinder”
Y. Kawabata and T. Takahashi (NUT, Japan)

12:20 ~ 13:30  Lunch Time

13:30 ~ 15:30  Oral Session VI  (Chairpersons: S. Kodama and M. Jayaprakash )

O-29: “Development of Extraordinary High-Strength Mg Alloy Containing Only Ubiquitous Alloying Elements by Hot Extrusion”
S. W. Xu a, b, K. Oh-ishi a, S. Kamado a, F. Uchida a, T. Homma a, K. Hono b
( a) NUT, b) National Institute for Materials Science, Japan
O-30: “Photoluminescence Properties of Epitaxial Mn-Doped ZnSnAs2 Layers”
E. Mammadoy, M. Haneta, H. Toyota, N. Uchitomi (NUT, Japan)
O-31: “RT Applications in Snowy and Ageing Areas in Japan toward Safe and Secure Society”
T. Kimura and S. Kamimura (NUT, Japan)
O-32: “Evaluation of Electrical Conductivity in Warm Dense State by using Pulsed-Power Discharges”
T. Sasaki1, T. Suzuki2, Y. Amano1, Y. Miki1, T. Kikuchi1, and N. Harada1
(NUT, Japan)
O-33: “Application of Microstructure Characterization for Development of Age Hardenable Magnesium Alloys”
K. Oh-ishi1, S. Kamado1 and K. Hono2 (1) NUT, 2) National Institute for Materials Science, Japan
O-34: “Improvement of Mechanical Properties of Mg-Gd-Y-Zn Alloy Castings by Grain Refinement”
Y. Hiramitsu, T. Homma and S. Kamado (NUT, Japan)

15:30  Closing Remarks

Poster Session (January 24th, 13:15 ~ 14:30)

P-1: “Growth Difference of Moss Protonema on Liquid Aerobic Culture System in Two Moss Species”
A. Oshio1, J. Aizawa2 and Y. Takahara1,2 (NUT, Japan)
P-2: “Mechanical Response Sensors Made of Electroactive Polymer Composites Having Synthetic Metal Layers”
L. J. F. Guzman and T. Kobayashi (NUT, Japan)
P-3: “Transcriptional Regulatory Mechanism of Biphenyl/PolyChlorinated Biphenyl-Degradation Genes in Rhodococcus jostii RHA1”
J. Shimodaira1, Y. Miyazawa1, H. Takeda2, D. Kasai1, K. Miyauchi3, E. Masai1, and M. Fukuda1 (1) NUT, 2) Hoshi Univ., School of Pharmacy and Pharmaceutical Sciences, 3) Tohoku Gakuin Univ., Japan)
P-4: “Transcriptome Analysis of Genes Involved in Glucose Uptake and Metabolism in Rhodococcus jostii RHA1”
N. Araki\textsuperscript{1}, T. Suzuki\textsuperscript{1}, K. Miyauchi\textsuperscript{2}, D. Kasai\textsuperscript{1}, E. Masai\textsuperscript{1} and M. Fukuda\textsuperscript{1}
\textsuperscript{(1) NUT, (2) Tohoku Gakuin Univ., Japan}

P-5: “Effect of Intracellular Calcium on Growth-Dependent Secretion of Galectin-3 in Mouse Balb/3T3 Cells”
R. Nakatani and K. Furukawa (NUT, Japan)

P-6: “Electric Characteristics and Temperature of Hot Spot for GdBa\textsubscript{2}Cu\textsubscript{3}O\textsubscript{7-δ} Rod with Gd\textsubscript{3}BaCuO\textsubscript{5} Core”
S. Fujihara, T. Okamoto and M. Takata (NUT, Japan)

P-7: “Isolation and Characterization of Novel Rubber-degrading Bacteria”
S. Imai, K. Ichikawa, D. Kasai, E. Masai and M. Fukuda (NUT, Japan)

P-8: “Experiment on Inducing an Artificial Avalanche by Blasting off the Wet Snowpack”
T. Machida\textsuperscript{1}, M. Lu\textsuperscript{3}, I. Kamiishi\textsuperscript{2}, M. Machida\textsuperscript{3}, and N. Hayakawa\textsuperscript{3} \textsuperscript{(1) NUT, (2) Snow and Ice Research Center, NIED, (3) Machida Construction Co., Ltd., Japan}

P-9: “Experiments and Theoretical Analysis of Fingering Flow in Dry Snowpack”
T. Katsushima \textsuperscript{1}, S. Yamaguchi\textsuperscript{2}, T. Kumakura\textsuperscript{1}, and A. Sato\textsuperscript{2} \textsuperscript{(1) NUT, (2) National Research Institute for Earth Science and Disaster Prevention, Japan}

P-10: “TEM Observation of Tungsten Oxide Film by Electric Current Heating Method Using Tungsten Wire”
T. Hagizawa, Y. Kuroki, T. Okamoto and M. Takata (NUT, Japan)

P-11: “Improvement of DC-link Voltage Control Performance Using a Disturbance Observer for PWM Rectifier and PM Generator”
T. Hoshino and J. Itoh (NUT, Japan)

P-12: “Identification of Genes Important for Life of a PCB-Degradating Bacterium Rhodococcus jostii RHA1 in the Soil.”
T. Iino\textsuperscript{1}, Y. Wang\textsuperscript{2}, K. Miyauchi\textsuperscript{3}, D. Kasai\textsuperscript{1}, E. Masai\textsuperscript{1}, T. Fuji\textsuperscript{2}, N. Ogawa\textsuperscript{4}, and M. Fukuda\textsuperscript{1} \textsuperscript{(1) NUT, (2) National Institute for Agro-Environmental Sciences, Japan}

P-13: “Corrosion Behavior of AM50 Mg-alloy in NaCl Solution”
K. Fujita, Y. Ichige, H. Nishiyama, K. Hodouchi, and H. Matsubara (NUT, Japan)

P-14: “Nanoindentation Analysis of Elastic/Mechanical Behavior on Surface of Transparent Glass-Ceramics with Fresnoite Ba\textsubscript{2}TiSi\textsubscript{2}O\textsubscript{8} Nanocrystals”
K. Shinozaki, T. Honma, and T. Komatsu (NUT, Japan)

P-15: “Fabrication of LiVOPO\textsubscript{4}/Carbon Composite via Glass Ceramics Processing”
K. Nagamine, T. Honma and T. Komatsu (NUT, Japan)

P-16: “Coloration and Thermoluminescence for Translucent AlN Ceramics Sintered with Ca\textsubscript{3}Al\textsubscript{2}O\textsubscript{6} as Sintering Additive”
T. Honma\textsuperscript{1}, Y. Kuroki\textsuperscript{1}, T. Okamoto\textsuperscript{1}, M. Takata\textsuperscript{1}, Y. Kanechika\textsuperscript{2}, M. Azuma\textsuperscript{3} and H. Taniguchi\textsuperscript{3} \textsuperscript{(1) NUT, (2) Development Department, Tokuyama Corporation, (3) R & D Promoting Department, Tokuyama Corporation, Japan}

P-17: “New Method to Prepare Single Polymer with Linearly Polarized White Fluorescence”
W. Kun\textsuperscript{2}, S.J. Zheng\textsuperscript{1}, and T. Kobayashi\textsuperscript{2} \textsuperscript{(1) Zhengzhou Univ., China, (2) NUT, Japan}

P-18: “Photoconductivity Investigation of Metal-Free Phthalocyanine/Triphenylamine Derivative Layered Structure”
Y. Osada, K. Miyamoto, A. Nakazawa and M. Umeda (NUT, Japan)

P-19: “Enhancement of the Electrode Activity in the Ni/(CeO\textsubscript{2})\textsubscript{1-x}(TiO\textsubscript{2})\textsubscript{x}
Anode for the Electrochemical Oxidation of Methane”

Tanawat Kanjanaboonmalert*, Teoh Wah Tzu and Sato Kazunori (NUT, Japan)

※ NUT : Nagaoka University of Technology