

# GOLDEN ACADEMY

## Message from the organizers

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Dear Colleagues and Friends,

2015 Symposium for the Promotion of Applied Research Collaboration in Asia (SPARCA 2015) will be held in Taipei, Taiwan during February 8-11 2015.

SPARCA stands for the Symposium for the Promotion of Applied Research Collaboration in Asia (SPARCA 2015), which is aimed at providing an international platform for the exchange and networking between top scientists, emerging young researchers, and students across a wide spectrum of materials science and engineering from US, Canada, UK, EU countries, and Asia Pacific areas including Japan, Korea, India, Singapore, Taiwan, Hong Kong and China.

We would like to invite you to participate in SPARCA 2015. Your active participation is the key to the success of this conference.



Yours Sincerely,

SPARCA 2015 Committee

Asia Pacific Society for Materials Science (APSMR)

[www.apsmr.org](http://www.apsmr.org)



# GOLDEN ACADEMY

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## Conference organizing committee

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### CONFERENCE CHAIRS

**Dr. Daniel J BLACKWOOD (National University of Singapore)**

**Prof. Chau-Chang CHOU (National Taiwan Ocean University)**

**Prof. Chia Chen HSU (National Chung Cheng University)**

**Prof. Jason S. C. JANG (National Central University)**

**Prof. Ken KUROSAKI (Osaka University)**

**Prof. Hyuk Sang KWON (Korea Advanced Institute of Science and Technology)**

**Prof. Wen-Jay LEE (National center for high performance computing)**

**Prof. Keon Jae LEE (Korea Advanced Institute of Science and Technology)**

**Dr. Michael K.H. LEUNG (City University of Hong Kong)**

**Prof. Chien-Neng LIAO (National Tsing Hua University)**

**Prof. Ru Shi LIU (National Taiwan University)**

**Prof. Takao MORI (National Institute for Materials Science (NIMS))**

**Prof. Yuichi OHYA (Kansai University)**

**Dr. Gauthier RYDZEK (National Institute for Materials Science (NIMS))**

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# GOLDEN ACADEMY

## **Conference organizing committee (Continued from previous section)**

### **CONFERENCE CHAIRS**

**Prof. Nyan-Hwa TAI (National Tsing-Hua University)**

**Prof. Shing Hoa WANG (National Taiwan Ocean University)**

**Dr. Jyh Ming WU (National Tsing Hua University)**

**Dr. Rudder WU (National Institute for Materials Science (NIMS))**

### **CONFERENCE PROGRAM DIRECTOR**

**Dr. Yingxue Song (APSMR)**

### **CONFERENCE SECRETARIAT**

**Ms. Yangjun Hu (APSMR)**



# GOLDEN ACADEMY

## Conference topics

- 1. Structure materials and Functional Coatings (metals, ceramics, and composites): No. C9-11**
- 2. Materials for energy (saving, conversion, transfer, storage) and environment plus electrochemistry**
  - 2.1. Photovoltaics: No. B21-23, C21-23**
  - 2.2. Rechargeable Batteries and Fuel Cells: No. D6-12**
  - 2.3. Thermoelectric and Thermal Insulation Materials: No. A2, A13, A15-23, A27, C3-8, C12**
  - 2.4. Materials for Energy and Environmental Applications: No. A1, A12-2, A28, B12-2, C20, D18-19**
- 3. Optics and Photonic Materials: No. A3-8, A11-12**
- 4. Electronics, Magnetics and Nanomaterials: No. C15-19, C26-28**
- 5. Polymer Science and Molecular Chemistry: No. A26, B3-4, B6-8, D20**
- 6. Organic Materials and Biomaterials: No. A14, B5, B15-20**
- 7. Theory, Characterization and Computational Modeling of Materials: No. A9-10, A24, B9-12, B26-27**

	SUN, 02/08	MON, 02/09	TUE, 02/10	WED, 02/11
9:15 – 10:15	Staff Meeting	Oral Presentation		
10:15 – 10:30		Coffee & Tea Break		
10:30 – 12:15		Oral Presentation		NIMS Private Session
12:15 – 13:30		Lunch Break		
13:30 – 15:15		Oral Presentation	Oral Presentation	Optional Conference Excursion
15:15 – 15:30		Coffee & Tea Break	Coffee & Tea Break	
15:30 – 17:15	Conference Registration	Oral Presentation	Oral Presentation	
17:15 – 18:45			Poster Session	
19:00 – 20:30			Conference Banquet (Approx. 2 hrs)	
20:30 – 22:00	Conference Reception			

# GOLDEN ACADEMY

## Presentation List (LIST A)

	SUN, 02/08	MON, 02/09	TUE, 02/10	WED, 02/11
9:15 - 10:15	Staff Meeting	1. JW CHOI 2. KH CHEN	13. T. MORI 14. Y. NAGASAKI	24. AHW NGAN 25. Y. AOKI
10:15 - 10:30		Coffee & Tea Break		
10:30 - 12:15		3. CB HUANG 4. DD NGUYEN 5. LC CHEN	15. H. ANNO 16. Y. KATSURA 17. N. KAWAMOTO	26. K. TOMINAGA 27. JD HWANG 28. EJ TEO
12:15 - 13:30		Lunch Break		
13:30 - 15:15		6. HC KAN 7. JR HO 8. PK WEI	18. M. GOTO 19. I. OHKUBO 20. P. MELE	Optional Conference Excursion
15:15 - 15:30		Coffee & Tea Break	Coffee & Tea Break	
15:30 - 17:15	Conference Registration	9. LQ WANG 10. WD HSU 11. YS LIN 12. AA BETTIOL 12-2. DJ BLACKWOOD	21. R. WU 22. R. VIRTUDAZO 23. AU KHAN	
17:15 - 18:45			Poster Session	
19:00 - 20:30			Conference Banquet (Approx. 2 hrs)	
20:30 - 22:00	Reception			

# GOLDEN ACADEMY

## Presentation List (LIST B)

	SUN, 02/08	MON, 02/09	TUE, 02/10	WED, 02/11
9:15 -	Staff Meeting			
10:15 -		Coffee & Tea Break		
10:30 -		3. K. SHIKINAKA 4. H. FUJIMORI 5. K. NUMATA	15. T. OOYA 16. K. KOGURE 17. M. KURISAWA	26. A. NAKATA 27. S. DUTTA 28.
12:15		Lunch Break		
12:15 -	Conference Registration	Lunch Break		
13:30 -		6. CL WANG 7. A TAKAI 8. Y. KOTSUCHIBASHI	18. JH JEONG 19. A. KUZUYA 20. Y. OHYA	Optional Conference Excursion
15:15 -		Coffee & Tea Break	Coffee & Tea Break	
15:30		9. CW PAO 10. EW HUANG 11. IL CHANG 12. M HADA 12-2. KJ LEE	21. MKH LEUNG 22. YT CHEN 23. WT CHONG	
15:30 -		Poster Session		
17:15 -				
17:15 -				
18:45				
19:00 -			Conference Banquet (Approx. 2 hrs)	
20:30 -				
20:30 -	Reception			
22:00				

# GOLDEN ACADEMY

## Presentation List (LIST C)

	SUN, 02/08	MON, 02/09	TUE, 02/10	WED, 02/11
9:15 -10:15	Staff Meeting			
10:15 -10:30		Coffee & Tea Break		
10:30 -12:15		3. YY CHEN 4. YK KUO 5. HJ WU	15. YJ CHIOU 16. SF HU 17. FM WANG	26. CH CHEN 27. N. SUZUKI 28. Y. NII
12:15 -13:30		Lunch Break		
13:30 -15:15		6. Y. TAKAGIWA 7. S. PINITSOONTORN 8. M. OHTA	18. H OZAWA 19. YJ HUNG 20. T. KINUMOTO	Optional Conference Excursion
15:15 -15:30		Coffee & Tea Break	Coffee & Tea Break	
15:30 -17:15	9. JP CHU 10. SY CHANG 11. JC LIN 12. A. YUSUFU	21. ZH LIN 22. M. LOZACH 23. CH WANG		
17:15 -18:45	Conference Registration		Poster Session	
19:00 -20:30			Conference Banquet (Approx. 2 hrs)	
20:30 -22:00	Reception			

# GOLDEN ACADEMY

## Presentation List (LIST D)

	SUN, 02/08	MON, 02/09	TUE, 02/10	WED, 02/11
9:15 - 10:15	Staff Meeting			
10:15 - 10:30		Coffee & Tea Break		
10:30 - 12:15				
12:15 - 13:30		Lunch Break		
13:30 - 15:15		6. CY LEE 7. CH LAI 8. WC JUNG	18. T. NAKAGAWA 19. G. RYDZEK 20. S. YAO	Optional Conference Excursion
15:15 - 15:30		Coffee & Tea Break	Coffee & Tea Break	
15:30 - 17:15		9. HS KWON 10. JT LEE 11. I KAGOMIYA 12. H MATSUMOTO	21. Reserved 22. Reserved 23. Reserved	
17:15 - 18:45	Conference Registration		Poster Session	
19:00 - 20:30			Conference Banquet (Approx. 2 hrs)	
20:30 - 22:00		Reception		



# GOLDEN ACADEMY

## Presentations for SPARCA 2015

### MONDAY 02/09

#### LIST A

1. High Capacity Silicon Anodes in Lithium Ion Batteries: Electrode Structures and Functional Binders (J.W. CHOI)
2. Manipulation of Composition and Phases in GeTe-rich Germanium Antimony Telluride alloys for Enhanced Thermoelectric Performance (K.H. CHEN)
3. Coherent control of surface plasmons using a single-frequency laser (C.B. HUANG)
4. Photothermal annealing of cellulose acetate on nickel towards transparent and conducting CNT-graphene hybrid films (D.D. NGUYEN)
5. Graphene Oxides and their Hybrids for Solar Fuels and CO<sub>2</sub> Conversion Applications (L.C. CHEN)
6. Enhancement of Fluorescent emission with Surface Plasmonics of Metallic Nanostructures and Guided Mode Resonance of Dielectric Wave Guide Grating Structures (H.C. KAN)
7. Study of Device Design and Fabrication Technology for Performance Enhancement of OLED Lighting (J.R. HO)
8. Highly sensitive biosensors using Fano resonances in optical nanostructures (P.K. WEI)

# GOLDEN ACADEMY

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9. Magic Microfluidic Droplets (L.Q. WANG)
10. Conduction of Lithium Ions in the Electrolyte of Li-ion Battery – First principles and molecular dynamics simulations (W.D. HSU)
11. Enhanced lithium electrochromic performance of plasma-polymerized flexible tungsten oxide films by iron oxide addition (Y.S. LIN)
12. Proton beam writing and modification of materials for photonic applications (A.A. BETTIOL)
  
- 12-2. Electrochromic Properties of Anodized WO<sub>3</sub>-TiO<sub>2</sub> Composite Films (D.J. BLACKWOOD)

## **LIST B**

3. Stimuli-Responsible hydrogels consisted of rigid inorganic nanotube “Imogolite” and organic acids (K. SHIKINAKA)
4. Structure of Octacalcium Phosphate with Two Kinds of Dicarboxylic Acids Co-incorporated in Interlayers by Solid State NMR (H. FUJIMORI)
5. Peptide-based gene carriers for organelle-targeted delivery system (K. NUMATA)
6. PDMS-assisted crystallization-a facile method in preparing single crystal arrays of conjugated molecules used in OFETs (C.L. WANG)
7. Conformation Control of pi-Conjugated Molecules and Their Optical Properties (A.TAKAI)

# GOLDEN ACADEMY

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8. Nanoparticle-kit consisting of temperature responsive statistical and block copolymers (Y. KOTSUCHIBASHI)
9. Device Level Modeling of Nanomorphology of Polymer Solar Cells (C.W. PAO)
10. Microyielding of Core-Shell Crystal Dendrites in a Bulk-metallic-glass Matrix Composite (E.W. HUANG)
11. The atomistic study on shape memory behavior of Ni-Al alloys (I.L. CHANG)
12. Relativistic Quantum-Chemical Calculations of Equilibrium Constants in Isotope Exchange Reaction of Metal Complexes (M. HADA)
- 12-2. Self-Powered Flexible Electronic Systems (K.J. LEE)

## **LIST C**

3. Manipulation, study, and applications of thermoelectric materials for energy applications (Y.Y. CHEN)
4. Optimization of thermoelectric performance of SrSi<sub>2</sub>-based alloys (Y.K. KUO)
5. Engineering Se-doped and Pb-doped AgSbTe<sub>2</sub>: their high zT values, microstructures and related phase equilibria (H.J. WU)
6. Thermoelectric properties of narrow band gap compounds: experimental and theoretical studies (Y. TAKAGIWA)
7. Synthesis, structure, and properties of calcium cobaltite (Ca<sub>3</sub>Co<sub>4</sub>O<sub>9</sub>) (S. PINITSOONTORN)

# GOLDEN ACADEMY

8. Hierarchical Architecturing for Thermoelectric Sulfides and Chalcogenides: From Materilas to Diveces (M. OHTA)
9. Thin Film Metallic Glasses: Novel Coating Materials For Advanced Applications (J.P. CHU)
10. Multi-component High-entropy Films: Applications to Diffusion Barriers and Hard Coatings (S.Y. CHANG)
11. Synthesis of  $\text{Ba}_{0.5}\text{Sr}_{0.5}\text{Fe}_{1-x}\text{Cu}_x\text{O}_{3-\delta}$  ( $x = 0 \sim 0.3$ ) by Co-precipitation Method (J.C. LIN)
12. Role of Nanoscale Precipitate and Point Defect Phonon Scattering for Enhancement of Thermoelectric Properties of Heavily P-doped Nanostructured Si-Ge alloys (A. YUSUFU)

## **LIST D**

6. Titanium Dioxides as the Anode of Lithium Ion Battery (C.Y. LEE)
7. Na-induced Efficiency boost for Se-deficient  $\text{Cu}(\text{In},\text{Ga})\text{Se}_2$  solar cells (C.H. LAI)
8. Sintering-Resistant Metal Nanoparticles for High Temperature Electrocatalysis (W.C. JUNG)
9. Advanced Sb-based and Sn-based anode materials for rechargeable Na-ion batteries (H.S. KWON)
10. Synthesis of nitroxide radical polymer brushes and their applications in batteries (J.T. LEE)

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11. Influence of crystal structure on oxygen permeabilities and ion transport properties in mixed conductive (La, Ba, Sr)(Co, Ta)O<sub>3-d</sub> (I. KAGOMIYA)
12. Zero-solvent electrolyte for secondary batteries (H. MATSUMOTO)

## **TUESDAY 02/10**

### **LIST A**

13. Development of viable thermoelectric materials (T. MORI)
14. Nitroxide-radical containing polymers for novel nanomedicine (Y. NAGASAKI)
15. Rattling Silicide: Ba-Al-Si-Based Clathrates (H. ANNO)
16. First-principles calculation of minimum thermal conductivity to design low thermal conductivity materials (Y. KATSURA)
17. Thermal conductivity analysis of a thermal conductive composite material in TEM (N. KAWAMOTO)
18. Combinatorial sputter coating technique applied to thermoelectric conversion research (M. GOTO)
19. Two-dimensional layered nitrides as a new class of thermoelectric materials (I. OHKUBO)
20. Epitaxial thin films of ZnAlO for thermoelectric applications (P. MELE)
21. Nanostructure engineering and characterization of high performance thermal insulation materials (R. WU)

# GOLDEN ACADEMY

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22. Simple Approach in Evaluating a Geometrically Tunable Nano-size Hollow Silicate Particles and their dip coated layer for Thermal Management Applications (R. VIRTUDAZO)
23. Si and Te co-doped, Rare-Earths free skutterudites with attractive ZT (A.U. KHAN)

## **LIST B**

15. Dendritic glycerols for application to drug delivery and biosensors (T. OOYA)
16. Anti-cancer vaccination by transdermal delivery of antigen peptide-loaded nanogels via iontophoresis (K. KOGURE)
17. Green Tea-Based Micellar Nanocomplex for Cancer Therapy (M. KURISAWA)
18. Self-Assembly of Bio-inspired Molecules for Patterning of Functional Neovessels (J.H. JEONG)
19. DNA-PEG-DNA Triblock Copolymers for Smart Hydrogels (A. KUZUYA)
20. Biodegradable thermo-gelling polymers: design and application as injectable medical devices (Y. OHYA)
21. Enhancement of photocatalysis by fuel cell integration and in-situ galvanic kinetics (M.K.H. LEUNG)

# GOLDEN ACADEMY

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22. High Photoresponsive Nanomembranes-Based Devices in Photodetection and Solar-Energy Conversion Applications (Y.T. CHEN)

23. Eco-Greenergy Outdoor Lighting System: Innovation in Technology, Product Design and Materials (W.T. CHONG)

## **LIST C**

15. Synthesis and Characterization of Nano Hybrid MWCNTs Electrocatalysts (Y.J. CHIOU)

16. Photoelectric Effect of Silicon Quantum Dots (S.F. HU)

17. A novel ionic host solid electrolyte interface formation on reduced graphene oxide of lithium ion battery (F.M. WANG)

18. Noncovalent modification of nano-carbon materials by functional metal complexes toward nanoelectronics devices (H. OZAWA)

19. Strong SERS Signals of Edge-Phonon Modes of Graphene Layers on Gold Grating Substrate (Y.J. HUNG)

20. Preparation of LaMnO<sub>3</sub>-CNF and its Activity for Oxygen Electrode Reaction in KOH Aqueous Solution (T. KINUMOTO)

21. Harvesting Hydropower by Triboelectric Nanogenerators (Z.H. LIN)

# GOLDEN ACADEMY

- 22. Semiconducting alloyed Silicon-tin nanocrystals as down converter layer for hybrid solar cell devices (M. LOZACH)
- 23. Modification of Carbon Felt for Vanadium Redox Flow Battery (C.H. WANG)

## **LIST D**

- 18. Regeneration of ammonia borane from several spent fuels (T. NAKAGAWA)
- 19. Polyaniline materials for energy and environment: toward versatile nanostructured surfaces and catalysts (G. RYDZEK)
- 20. Crystalline Supramolecular Interaction between Crystalline Polymer and Side Chain Crystalline Polymer and its Application (S. YAO)
- 21. Reserved
- 22. Reserved
- 23. Reserved

## **POSTER SESSION**

- P1. Frictional property of fluorine gum polymer surface with laser pattern modification; Low frictional property of ZnO coating films depended on a piezoelectric effect analyzed by a scanning probe microscopy (M. SASAKI, National Institute for Materials Science (NIMS))



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P2. Slurry Erosion on the Adhesion of Polyelectrolyte Multilayers Coated on a Biomedical Titanium Substrate (C.C. CHOU, National Taiwan Ocean University)

P3. Silver coated polymer helices for enhanced circular polarization in terahertz regime (S. P.TURAGA, National University of Singapore)

P4. Proton beam writing of three dimensional polymer microlasers (S.K.VANGA, National University of Singapore)

P5. Effect of the meta-multicrystal on glass forming ability of amorphous metallic alloys (T.H. LI, National Central University)

P6. TBA (A. N.P. SUSSARDI, National Institute for Materials Science (NIMS))

P7. Effect of Ionic Strength on Trivalent Chromium Electrodeposition (V.T. NGUYEN, Nation Central University)

P8. Optimization of poly (N-isopropylacrylamide) microgels exhibit enzyme-like amidase activity (Y.M. WONG, Riken Center for Sustainable Resource Science)

P9. Highly Efficient Photocurrent Generation in Multi-Layered GeS Nanosheets-Based Devices (R. K. ULAGANATHAN, National Taiwan University)

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P10. Effects of carbon coating on P2-type  $\text{Na}_{0.7}\text{MnO}_2$  cathode materials for sodium-ion batteries (D.R. SOHN, Korea Advanced Institute of Science and Technology)

P11. Green reduction of graphene oxide by black soybeans to fabricate graphene porous electrodes for supercapacitor (H.J. CHU, National Tsing-Hua University)

P12. Phase equilibria of Cu–Ga–Te thermoelectric materials (T.J. DUNG, National Sun Yat-Sen University)

P13. Electronic structure and thermoelectric properties of melt-spun metastable  $\text{Al}_6\text{Ge}_5$  (M. KUMAGAI, Osaka University)

P14. Guided-mode resonance enhanced near-infrared-to-visible upconversion fluorescence in a resonant waveguide grating (D.T. VU, National Chung Cheng University)

P15. SEI formation of Fluorine functional group of maleimide base additives in lithium ion battery (H. PEBRIANTO, National Taiwan University of Science and Technology)

# GOLDEN ACADEMY

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P16. High-Resolution Synchrotron X-ray and Neutron Powder Diffractions on Ba- or Ca-Substituted Strontium Tantalate Photocatalysts (I. KAWANISHI, Yamaguchi University)

P17. A cell-instructive bioactive hydrogel with microchanneled piezoelectric membrane (S.W. CHO, Soongsil University)

P18. Plasticity Enhancement of Fe<sub>77</sub>Mo<sub>5</sub>P<sub>9</sub>C<sub>7.5</sub>B<sub>1.5</sub>-Based Bulk Metallic Glass Composites Dispersed with Tantalum Particles (K.T. HSU, National Central University)

P19. Sol-gel Synthesis of a PVP/TiO<sub>2</sub>/Ag/Ce Coating as a Photocatalyst on Cotton Filter (S.C. LIAO, National Taiwan Ocean University)

P20. Potassium ion-responsive hydrogels made of DNA-PEG-DNA triblock copolymers (S. TANAKA, Kansai University)

P21. Fabrication of Aluminium ZnO nanorod by electrochemical deposition and study of its properties (A. CHOUDHURY, National Central University)

P22. High Performance and Bendable Few-Layered InSe Photodetectors and p-n Heterojunction of InSe/GeS (S. R. TAMALAMPUDI, National Central University & Academia Sinica)

# GOLDEN ACADEMY

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P23. Electrochemical synthesis of a porous and dendritic Sn foam for Na-ion batteries (T.H. KIM, Korea Advanced Institute of Science and Technology)

P24. Phase equilibria of Ag-Bi-Se thermoelectric materials (H.Y. CHENG, National Sun Yat-Sen University)

P25. Evaluation of electrode properties of Li-O<sub>2</sub> battery after charge and discharge (Y.ARAI, Oita University)

P26. Fabrication of Superhydrophobic Surfaces, and SERS Substrates (B. D. TO, National Chung Cheng University)

P27. Heterostructure of p-Si and Semi-metallic CoSe<sub>2</sub>: Efficient Photocathode for Photoelectrochemical Water Splitting (M. BASU, National Taiwan University)

P28. Variation of Ba-substituted Sodium Bismuth Titanate Ferroelectrics with Bi Deficiency (T.YAMATOH, Yamaguchi University)

P29. Introduction of Biological Proteins into Intact Plants via Peptide-based Delivery System to Realize Efficient CRISPR-Cas9 System (K. K. NG, Riken Center for Sustainable Resource Science)

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P30. Mechanisms and Prevention of Volcanic Ash Attack on Yttria Stabilized Zirconia Thermal Barrier Coatings (C.H. LEE, National Taiwan Ocean University)

P31. Application of the Temperature-Programmed Reduction Method for the Evaluation of the Edges and Functional Groups of Carbon Materials (K. MATSUMURA, Oita University)

P32. Phase Transformation of Duplex Stainless Steel under Different Temperature Conditions (P.C. LIN, National Taiwan Ocean University)

## **WEDNESDAY 02/11**

### **LIST A**

24. Alumina Nanohoneycombs - novel actuation behaviour and fabrication methods (A.H.W. NGAN)

25. NIMS overview (Y. AOKI)

26. Characterization of Condensed Material by Terahertz Radiation Spectroscopy (K. TOMINAGA)

27. Thermoelectric generator application on cement furnace (J.D. HWANG)

28. Ultrathin, low loss metal films for plasmonic applications (E.J. TEO)

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## **LIST B**

26. Efficient optimization of local orbitals and eigenstate calculations in a linear-scaling DFT program CONQUEST (A. NAKATA)
27. Origin of Magnetism in Graphene: Theoretical Perspective (S. DUTTA)
28. TBA

## **LIST C**

26. Revealing Graphene Thickness-dependent Photocatalysis and Surface-enhanced Raman Scattering (C.H. CHEN)
27. Efficient use of nanopores to enhance the ferro(poezo)electricity in barium titanate (N. SUZUKI)
28. Mechanical control of magnetic skyrmion (Y. NII)