

*The 19<sup>th</sup> International Conference on*  
**Semiconductor Photocatalysis**  
&  
**Solar Energy Conversion**  
**(SPASEC-19)**

**This conference is dedicated to the memory of the late  
Professor Alberto E. Cassano**

**FINAL PROGRAM**

**Crowne Plaza Hotel, San Diego, California, USA**  
**November 17-20, 2014**

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## **Conference Correspondence**

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**PL: Plenary Lecture**  
**IL: Invited Lecture**  
**ST: Short Talk**

## **Monday, November 17, 2014**

**8:30 – 8:35am**

**Opening Remarks**

### **Plenary Lecture**

**8:35 – 9:15am (PL)**

**Using TiO<sub>2</sub> Nanoconjugates for Treatment of Cancer Cells**  
**Tamara Koritarov<sup>1</sup> Vani Konda<sup>2</sup>, Riba Mustafi<sup>2</sup>, Marc Bissonnette<sup>2</sup>,  
Tijana Rajh<sup>1</sup>**

<sup>1</sup>Argonne National Laboratory, Argonne IL, USA

<sup>2</sup>The University of Chicago, Chicago, IL, USA

### **Session 1: Solar Cells**

**9:15 – 9:40am (IL)**

**Facet and Morphology of TiO<sub>2</sub> for Controlling Electron  
Transfer in Dye-sensitized Solar Cells**

**Masato Maitai, Yuji Wada**

Tokyo Institute of Technology, Meguro, Tokyo, Japan

**9:40 – 10:05am (IL)**

**Photoelectrochemical Cells Built on Conducting Oxide  
Nanowires**

**Jung-Kun Lee**

Department of Mechanical Engineering and Materials Science, University  
of Pittsburgh

**10:05 – 10:30am**

**Coffee Break**

**10:30 – 10:55am (IL)**

**Dye Sensitization of a Large Band Gap Semiconductor  
by an Iron(III) Complex**

**Debabrata Chatterjee**

CSIR-Central Mechanical Engineering Research Institute, Durgapur, India

**10:55 – 11:10am (ST)**

**Elaboration Application of TiO<sub>2</sub>/MWCNT (Multiwall Carbon  
Nanotubes) Nanocomposites and Their Application in Solid  
State Dye Sensitized Solar Cells**

**Jin Wang<sup>1</sup>, Mathieu Pinault<sup>1</sup>, Aurélie Habert<sup>1</sup>, Bernard Ratier<sup>2</sup>, Johann  
Bouclé<sup>2</sup>, Nathalie Herlin-Boime<sup>1\*</sup>**

<sup>1</sup>IRAMIS/NIMBE/LEDNA LFP, CEA-CNRS URA 2453, CEA de Saclay, Gif sur  
Yvette, France

<sup>2</sup>XLIM UMR 7252, Université de Limoges/CNRS, Limoges Cedex, France

## Session 2: Solar Energy Water Splitting / H<sub>2</sub> Generation - I

- 11:10 – 11:35am (IL)**      **A New Co-Catalyst for Photocatalytic Water Oxidation**  
**Claudio Minero, Fabrizio Sordello and Manuel Ghibaudo**  
University of Torino, Torino, Italy
- 11:35 – 12:00noon (IL)**      **Design of Visible-Light Sensitive Plasmonic Nanocatalysts for Efficient Hydrogen Production from Ammonia Borane**  
**Hefeng Cheng<sup>a</sup>, Kojirou Fuku<sup>a</sup>, Yasutaka Kuwahara<sup>a,B</sup>, Takashi Kamegawa<sup>a,C</sup>, Kohsuke Mori<sup>a,B</sup>, Hiromi Yamashita<sup>a,B\*</sup>**  
<sup>1</sup> Osaka University, Japan  
<sup>2</sup> Kyoto University, Japan  
<sup>3</sup> Osaka Prefecture University, Japan
- 12:00 – 12:25 (IL)**      **Graphene-Based Photocatalysts for Hydrogen Production**  
**Jianguo Yu**  
Wuhan University of Technology, Wuhan, China
- 12:25 – 1:30pm**      **Lunch**
- 1:30 – 1:45pm (ST)**      **Effects of Synthesis Parameters on the Photoelectrochemical Properties of Nanostructured Hematite ( $\alpha$ -Fe<sub>2</sub>O<sub>3</sub>) Thin Films Prepared via Electrodeposition Method**  
**Yi Wen Phuan, Meng Nan Chong\*, Tao Zhu**  
Monash University Malaysia, Jalan Lagoon Selatan, Bandar Sunway, Selangor Darul Ehsan, MalaysiaMalaysia

## Session 3: Wastewater Treatment - I

- 1:45 – 2:10pm (IL)**      **Hetero-junction Anodes for Reactive Chlorine Generation in Aqueous Solution**  
**Kangwoo Cho<sup>1,2</sup> and Michael R. Hoffmann<sup>\*,1</sup>**  
<sup>1</sup>California Institute of Technology, Pasadena, CA, USA  
<sup>2</sup>Korea Institute of Science and Technology, Seoul, Korea
- 2:10 – 2:35pm (IL)**      **Wastewater Treatment by a Combined Photocatalytic – Biological Approach: Letting the Bacteria to Do the Hard Work of Controlling the System**  
**Yaron Paz<sup>1\*</sup>, Zach Shidlovsky<sup>1</sup>, Sima Yaron<sup>2</sup>**  
<sup>1</sup> Department of Chemical Engineering, Technion, Haifa, Israel  
<sup>2</sup>Dept. of Biotechnology and Food Engineering, Technion, Haifa, Israel
- 2:35 – 3:00pm (IL)**      **Synthesis of Porous TiO<sub>2</sub> Film with Dominant {001} Facets for Aqueous Pollutants Degradation**  
**Pengyi Zhang<sup>1\*</sup>, Hong Zheng<sup>2</sup>, Wei Lin<sup>2</sup>, Tongzhou Xu<sup>2</sup>**

<sup>1</sup> Tsinghua University, Beijing, China

<sup>2</sup> China University of Geosciences, Beijing, China

3:00 – 3:30pm **Coffee Break**

## **Session 4: CO<sub>2</sub> Reduction – I**

- 3:30 – 3:55pm (IL) **Photocatalytic Reduction of Carbon Dioxide over Shape Controlled Titanium(IV) Oxide Nanoparticles and Nanocomposite Photocatalysts**  
**Teruhisa Ohno**  
Kyushu Institute of Technology, JST PRESTO
- 3:55 – 4:20pm (IL) **Photocatalytic Generation of Solar Fuels from the Reduction of H<sub>2</sub>O and CO<sub>2</sub>: A Look at the Patent Literature**  
**Stefano Protti, Angelo Albini, and Nick Serpone**  
Università di Pavia, Pavia, Italy
- 4:20 – 4:45pm (IL) **Photocatalytic Conversion of CO<sub>2</sub> in Water over Various Layered Double Hydroxides (LDHs)**  
**Shoji Iguchi<sup>1</sup>, Hirotaka Ishii<sup>1</sup>, Kentaro Teramura<sup>1,2,3</sup>, Saburo Hosokawa<sup>1,2</sup> and Tsunehiro Tanaka<sup>1,2,\*</sup>**  
<sup>1</sup> Dept. Molecular Engineering, Kyoto University  
<sup>2</sup>ESICB, Kyoto University  
<sup>3</sup>PRESTO, JST
- 4:45 – 5:10pm (IL) **Selective CO<sub>2</sub> Reduction to C1 Chemicals in Aqueous Solution Utilizing Semiconductor/Metal-Complex Hybrid Photoelectrodes**  
**Takeshi Morikawa, Takeo Arai, Shunsuke Sato, Keita Sekizawa, and Tomiko M. Suzuki**  
Toyota Central R&D Labs., Inc., Nagakute, Aichi, Japan
- 5:10 – 5:35pm (IL) **Photocatalytic Reduction of CO<sub>2</sub> on Surface Modified ZnO/ZnS with Metal or Oxide Deposits under Visible Light**  
**Miguel A. Valenzuela<sup>1,\*</sup>, Patricia Vázquez<sup>1,2</sup>, Jorge Aguilar<sup>2</sup>, Daniel Bahena<sup>3</sup>**  
<sup>1</sup>Lab. Catálisis y Materiales, ESIQIE-Instituto Politécnico Nacional, Zacatenco, México D.F., México  
<sup>2</sup>Escuela Superior de Física y Matemáticas-Instituto Politécnico Nacional, Zacatenco, México D.F., México  
<sup>3</sup>Lab. Avanzado de Nanoscopía Electrónica (LANE), Cinvestav-Instituto Politécnico Nacional, México D.F., México

**Tuesday, November 18, 2014**

**Session 5: Photocatalytic Air Treatment**

- 8:30 - 8:55am (IL)**      **The Influence of Irradiance and Humidity on the Photocatalytic Conversion of Nitrogen Oxides**  
**Ralf Dillert<sup>1,2</sup>, Olga Raisch<sup>1</sup>, Astrid Engel<sup>1,2</sup>, Anja Hülsewig<sup>3</sup>, Detlef W. Bahnemann<sup>1</sup>**  
<sup>1</sup> Institut für Technische Chemie, Gottfried Wilhelm Leibniz Universität Hannover, Hannover, Germany  
<sup>2</sup> Laboratorium für Nano- und Quantenengineering, Gottfried Wilhelm Leibniz Universität Hannover, Hannover, Germany  
<sup>3</sup> D-Tox, Hannover, Germany
- 8:55 - 9:20am (IL)**      **Effect of Water Vapor on Adsorption and Photocatalytic Properties of Titania-Adsorbent-Glass Composites**  
**Atsuo Yasumori<sup>1,2</sup>, Sayaka Yanagida<sup>1,2</sup>, Ryoh Serizawa<sup>1</sup>, and Yujiro Sawa<sup>1</sup>**  
<sup>1</sup>Dept. Materials Science and Engineering, <sup>2</sup>Photocatalysis International Research Center- RIST, Tokyo University of Science, Tokyo, Japan
- 9:20 - 9:45am (IL)**      **Evaluation of the Photocatalytic Performance of Commercial Materials for NO<sub>x</sub> Abatement: MINO<sub>x</sub> Project**  
**Silvia Suárez, Ingrid Jansson, Olga Vilanova and Benigno Sánchez**  
Photocatalytic Treatment of Pollutant in Air FOTOAIR. CIEMAT-DER., Madrid, Spain
- 9:45 - 10:10am (IL)**      **Semiconductor Nanocomposites for Air Treatment**  
**Martyna Marchelek<sup>1</sup>, Beata Bajorowicz<sup>1</sup>, Paweł Mazierski<sup>1</sup>, Anna Cybula<sup>2</sup>, Tomasz Klimczuk<sup>3</sup>, Michał Winiarski<sup>3</sup>, Adriana Zaleska**  
<sup>1</sup>Dept. of Environmental Technology, University of Gdansk, Poland  
<sup>2</sup>Dept. of Chemical Technology, Gdansk University of Technology, Poland  
<sup>3</sup>Dept. of Solid State Physics, Gdansk University of Technology, Poland
- 10:109 - 10:30am**      **Coffee Break**
- 10:30 - 10:45am (ST)**      **Comparison of Nitric Oxide Photocatalytic Oxidation over Precious Metals Doped TiO<sub>2</sub>**  
**Kinga Skalska<sup>1</sup>, Adrianna Zaleska<sup>2</sup>, Anna Cybula<sup>2</sup>**  
<sup>1</sup> Lodz University of Technology, Lodz, Poland  
<sup>2</sup> University of Gdansk, Gdansk, Poland

## Session 6: Fundamentals -I

- 10:45 – 11:10am (IL)**      **Theoretical Understanding of Photo-induced Processes in Photocatalysis and Molecular-structured Solar Cell**  
**Shozo Yanagida**  
Emeritus Professor, Osaka Univ. Suita, Osaka, Japan
- 11:10 – 11:35am (IL)**      **Electron Traps in Metal Oxide Particulate Photocatalysts as a Key Parameter Governing Their Photocatalytic Activities**  
**Bunsho Ohtani<sup>1,2</sup>, Mai Takase<sup>1,2</sup> and Akio Nitta<sup>2</sup>**  
<sup>1</sup>Catalysis Research Center, Hokkaido University, Sapporo, Japan  
<sup>2</sup>Graduate School of Environmental Science, Hokkaido University, Sapporo, Japan
- 11:35 – 12:00n (IL)**      **Modification of TiO<sub>2</sub> Charge-Carrier Dynamics by Surface Deposition Followed by Time Resolved Microwave Conductivity**  
**C. Colbeau-Justin, A.L. Luna Barrón, N. Kouame, A. Hérisson, J. Verrett, H. Remita**  
Laboratoire de Chimie Physique, CNRS UMR 8000, Université Paris-Sud, Orsay France
- 12:00 -12:25pm (IL)**      **On the Role of Electron Reactions in TiO<sub>2</sub> Photocatalysis**  
**Joseph Rabani**  
The Hebrew University of Jerusalem, Jerusalem, Israel
- 12:25 – 1:30pm**              **Lunch**
- 1:30 – 1:55pm (IL)**      **Structural Formation and Photocatalytic Activity of Magnetron Sputtered Titania and Doped-Titania Coatings**  
**Peter Kelly<sup>1,\*</sup>, Glen West<sup>1</sup> and Marina Ratova<sup>2</sup>**  
<sup>1</sup>Manchester Metropolitan University, Manchester, UK  
<sup>2</sup>Queens University Belfast, Northern Ireland, UK

## Session 7: Photocatalysis Applications

- 1:55 – 2:20pm (IL)**      **Effect of Photocatalysis on Membranes Performance in Photocatalytic Membrane Reactors**  
**Sylwia Mozia<sup>\*</sup>, Dominika Darowna, Kacper Szymański, Piotr Brożek, Antoni W. Morawski**  
West Pomeranian University of Technology, Szczecin, Poland
- 2:20 – 2:45pm (IL)**      **Selective C-N and C-O Coupling Reactions over Semiconductor Photocatalyst**  
**Tetsuya Shishido<sup>1,2</sup>, Atsushi Noda,<sup>3</sup> Yasuhiro Ohno,<sup>3</sup> Hiroki, Miura,<sup>1</sup> Saburo Hosokawa,<sup>2,3</sup> Kentaro Teramura,<sup>2,3,4</sup> Tsunehiro Tanaka<sup>2,3</sup>**



<sup>1</sup>Tokyo Metropolitan University, Tokyo, Japan

<sup>2</sup>Elements Strategy Initiative for Catalysts & Batteries - Kyoto University, Kyoto, Japan

<sup>3</sup>Department of Molecular Engineering - Kyoto University, Kyoto, Japan

<sup>4</sup>Precursory Research for Embryonic Science and Technology (PRESTO), Japan Science and Technology Agency (JST), Saitama, Japan

2:45 – 3:10pm (IL)

### **Effect of TiO<sub>2</sub> Crystal Orientation on the Adsorption and Photoinduced Electron Transfer: CdSe Quantum Dot-Sensitization System**

**T. Toyoda**<sup>1,4</sup>, **W. Yindeesuk**<sup>1</sup>, **K. Kamiyama**<sup>2</sup>, **S. Hayase**<sup>3,4</sup> and **Q. Shen**<sup>1,4</sup>

<sup>1</sup>The University of Electro-Communications, Chofu, Tokyo, Japan

<sup>2</sup>Bunkoukeiki, Co., Ltd., Hachioji, Tokyo, Japan

<sup>3</sup>Kyushu Institute of Technology, Kitakyushu, Fukuoka, Japan

<sup>4</sup>CREST, Japan Science and Technology Agency (JST), Kawaguchi, Saitama, Japan

3:10 – 3:30pm

### **Coffee Break**

3:30 – 3:55pm (IL)

### **The Adsorption and Photocatalytic Decomposition of Gaseous Styrene on {001} Faceted TiO<sub>2</sub> Single Crystal: Experimental and Theoretical Investigation**

**Honghong Wang**<sup>1,2</sup>, **Jiangyao Chen**<sup>1</sup>, **Guiying Li**<sup>1</sup>, **Yuemeng Ji**<sup>1</sup>, **Taicheng An**<sup>1,\*</sup>

<sup>1</sup>Guangzhou Institute of Geochemistry, Chinese Academy of Sciences, Guangzhou, China

<sup>2</sup>University of Chinese Academy of Sciences, Beijing, China

## **Session 8: Wastewater Treatment – II**

3:55 – 4:20pm (IL)

### **One-Pot Synthesis of Bi<sub>2</sub>Fe<sub>4</sub>O<sub>9</sub> and Its Composites at Low Temperature for Photocatalytic Degradation of Bisphenol A under Solar Light**

**Teik-Thye Lim**, **Zhong-Ting Hu**, **Jincheng Liu**, **Xiaoli Yan**  
Nanyang Technological University, Singapore

4:20 – 4:45pm (IL)

### **Titania Based Materials: From Adsorption to Photocatalysis**

**Shujuan Zhang**<sup>\*</sup>, **Minghui Li**, **Yan Peng**  
Nanjing University, Nanjing, China

4:45 – 5:10pm (IL)

### **Cu<sub>x</sub>S/MO<sub>x</sub> Tandem Semiconductors for Dyes Mineralization**

**Alexandru Enesca**<sup>\*</sup>, **Luminita Isac**, **Anca Duta**

Wednesday, November 19, 2014

## Session 9: Solar Energy Water Splitting / H<sub>2</sub> Generation -II

- 8:30 – 8:55am (IL)      **Sacrificial Reagents in Photocatalytic Systems: Influence of Their Chemical Transformation on the Overall Process**  
**Jenny Schneider and Detlef Bahnemann**  
Leibniz University of Hannover, Hannover, Germany
- 8:55 – 9:20am (IL)      **TiO<sub>2</sub> and Fe<sub>2</sub>O<sub>3</sub> Films for Photoelectrochemical Water Splitting**  
**Josef Krýsa<sup>1</sup>, Martin Zlámal<sup>1</sup>, Štěpán Kment<sup>2</sup>, Michaela Brunclíková<sup>1</sup>, Zdeněk Hubička<sup>2</sup>**  
<sup>1</sup>Department of Inorganic Technology, Institute of Chemical Technology, Prague, Czech Republic  
<sup>2</sup>Institute of Physics, Academy of Sciences of the Czech Republic, Prague, Czech Republic
- 9:20 – 9:45am (IL)      **The Challenge of Coupling of Catalysts and Protection Layers to Tandem Design for Solar Water Splitting**  
**B. Seger<sup>1</sup>, M. Malizia<sup>1</sup>, D. Bae<sup>1</sup>, B. Mei<sup>1</sup>, T. Pedersen<sup>2</sup>, P. C. K. Vesborg<sup>1</sup>, R. Frydendal<sup>1</sup>, E. Paoli<sup>1</sup>, C. Schlaup<sup>1</sup>, I. E. Castelli<sup>3</sup>, K.W. Jacobsen<sup>3</sup>, S. Horch<sup>1</sup>, O. Hansen<sup>2</sup>, I. Chorkendorff<sup>1</sup>**  
<sup>1</sup>CINF, Department of Physics, The Technical University of Denmark  
<sup>2</sup>Nanotech, The Technical University of Denmark  
<sup>3</sup>CAMd, Department of Physics, The Technical University of Denmark
- 9:45 – 10:10am (IL)      **Enhancement of Photocatalytic H<sub>2</sub> Evolution via TiO<sub>2</sub> Heterojunction and Quasi-Heterojunction**  
**Danping Wang, Qiuling Tay, Zhong Chen\***  
Nanyang Technological University, Singapore, Singapore
- 10:10 – 10:30am      **Coffee Break**
- 10:30 – 10:45am (ST)      **Effects of Nickel Co-Catalyst on the Photoelectrochemical Properties of Nanostructured Tungsten Trioxide (WO<sub>3</sub>) Thin Films Prepared via Electrodeposition Method**  
**Meng Nan Chong\***, Tao Zhu, Robert Sie Huong Lau, Yi Wen Phuan  
Monash University Malaysia, Jalan Lagoon Selatan, Bandar Sunway, Selangor Darul Ehsan, Malaysia

## Session 10: Wastewater Treatment -III

- 10:45 – 11:10am (IL)      **Photocatalytic Methods for Reusing Produced Water**

**Jan Hupka**  
Gdansk University of Technology, Gdansk, Poland

- 11:10 – 11:35am (IL)**      **Preparation and Characterization of TiO<sub>2</sub> – Graphene Photocatalysts for Water Purification**  
**A.W. Morawski<sup>1</sup>, E. Kusiak-Nejman<sup>1</sup>, A. Wanag<sup>1</sup>, J. Kapica<sup>1</sup>, L. Kowalczyk<sup>1</sup>, B. Tryba<sup>1</sup>, S. Mozia<sup>1</sup>, M. Aksienionek<sup>2</sup>, M. Woluntarski<sup>2</sup>, L. Lipińska<sup>2</sup>**  
<sup>1</sup> West Pomeranian University of Technology, Szczecin, Szczecin, Poland  
<sup>2</sup> Institute of Electronic Materials Technology, Warsaw, Poland
- 11:35 – 11:50am (ST)**      **Mineralization of Organic Pollutants in Aqueous Solutions by Semiconductor Photocatalysis**  
**S. Lathasree and I. Prabha**  
Sathyabama University, Chennai, Tamilnadu, India
- 11:50 – 12:05pm (ST)**      **Fixed Photocatalytic Nanomaterials from the Lab to Land Field Experiments**  
**Juan Rodríguez**  
Universidad Nacional de Ingeniería, Lima, Perú
- 12:05 – 1:30pm**              **Lunch**

## **Session 11: Self-Cleaning and Safety**

- 1:30 – 1:55pm (IL)**      **Overview of Some Medical, Safety and Well-Being Applications of TiO<sub>2</sub> Photocatalysis**  
**Pierre Pichat**  
"Photocatalyse et Environnement", CNRS/Ecole Centrale de Lyon (STMS)  
69134 Ecully CEDEX, France
- 1:55 – 2:20pm (IL)**      **Kinetics of Self-Cleaning Photocatalytic Surfaces: A General Decision Tree Analysis for Reaction Order**  
**David Ollis**  
North Carolina State University, Raleigh, NC, USA
- 2:20 – 2:35pm (ST)**      **Assessment of the Self-Cleaning Properties of the Building Materials Containing TiO<sub>2</sub> Modified with Nitrogen and/or Carbon**  
**M. Janus<sup>1,2</sup>, K. Bubacz<sup>2</sup>, A. Czyżewski<sup>2</sup>, J. Zatorska<sup>2</sup>, E. Kusiak - Nejman<sup>2</sup>, A. W. Morawski<sup>2</sup>**  
<sup>1</sup> West Pomerania University of Technology, Department of Sanitary Engineering, Szczecin, Poland  
<sup>2</sup> West Pomerania University of Technology, Szczecin, Institute of Chemical and Environmental Engineering, Szczecin, Poland

## Session 12: Photocatalytic Inactivation/Degradation of Biological Matters

- 2:35 – 3:00pm (IL)**      **Photocatalytic Inactivation of Yeast Cells: Toward Targets and Mechanisms**  
**Chantal Guillard, Sana Thabet<sup>1,2</sup>, Michele Weiss-Gayet<sup>3</sup>, Frederic Dappozze<sup>1</sup>, Marc Lemaire<sup>2</sup>, Pascale Cotton<sup>2</sup>**  
<sup>1</sup> Université de Lyon, Université Lyon 1, CNRS, UMR 5256, IRCELYON, Institut de Recherches sur la Catalyse et l'Environnement de Lyon, 2 avenue Albert Einstein, Villeurbanne, France  
<sup>2</sup> Université de Lyon, Université Lyon1, CNRS-UCB-INSA-BCS, UMR 5240, Génétique Moléculaire des Levures, Microbiologie ,Adaptation et Pathogénie, Domaine scientifique de la Doua, Villeurbanne, France  
<sup>3</sup> Université de Lyon, Université Lyon 1, UMR 5534, Centre de Génétique et de Physiologie Moléculaire et Cellulaire, Villeurbanne, France
- 3:00 – 3:20pm**      **Coffee Break**
- 3:20 – 3:45pm (IL)**      **Plasmonic Photocatalysts for Decontamination of Chemical and Biological Pollutants**  
**Ewa Kowalska<sup>1,2</sup>, Zhishun Wei<sup>1</sup>, Baris Karabiyik<sup>1</sup>, Marcin Janczarek<sup>1,3</sup>, Maya Endo<sup>1</sup>, Kunlei Wang<sup>2</sup>, Paulina Rokicka<sup>4</sup>, Bunsho Ohtani<sup>1,2</sup> and Agata Markowska-Szczupak<sup>4</sup>**  
<sup>1</sup>Catalysis Research Center, Hokkaido University, Sapporo, Japan  
<sup>2</sup>Graduate School of Environmental Science, Hokkaido University, Sapporo, Japan  
<sup>3</sup>Gdansk University of Technology, Gdansk, Poland  
<sup>4</sup>West Pomeranian University of Technology, Szczecin, Poland
- 3:45 – 4:00pm (ST)**      **Synthesis and Characterization of TiO<sub>2</sub> Nanowires Grown by Thermal Oxidation for Application in Water Purification**  
**E. Arcadipane, L. Romano, M. Zimbone, R. Sanz, G. Impellizzeri, M. A. Buccheri, M. Cantarella, M. Miritello, M. G. Grimaldi, V. Privitera**  
Università di Catania and IMM-CNR MATIS, Catania, Italy
- 4:00 – 4:15pm (ST)**      **Efficiency Evaluation in a Fixed-Bed Photocatalytic Reactor: Radiation Modeling Using the Monte Carlo Method**  
S. M. Zacarías, M. L. Satuf, M. C. Vaccari, O. M. Alfano  
INTEC (Universidad Nacional del Litoral and CONICET), Santa Fe, Argentina
- 4:15 – 5:30pm**      **Poster Session and Refreshment**
- 5:30 – 7:00pm**      **Free Time**
- 7:00 – 9:00pm**      **Banquet Dinner**

**Thursday, November 20, 2014**

## Session 13: Fundamentals - II

- 8:30 – 8:55am (IL)**      **Isotope Labeled Titania: A Versatile Tool in Photocatalysis and Electrochemistry**  
**Ladislav Kavan**  
J. Heyrovský Institute of Physical Chemistry, Academy of Sciences of the Czech Republic, Prague, Czech Republic
- 8:55 – 9:20am (IL)**      **Nanomaterials for Solar Energy Conversion, Utilizing the Interaction between Excitons and Surface Plasmons**  
**Jao van de Lagemaat**  
National Renewable Energy Laboratory, Golden, Colorado, USA & University of Colorado at Boulder, Boulder, Colorado, USA
- 9:20 – 9:45am (IL)**      **Operando X-Ray Absorption Spectroscopy for Elucidating Photocatalytic Reaction Mechanism**  
**E.Puzenat<sup>1</sup>, J.Couble<sup>1</sup>, O. Proux<sup>2</sup>, I. Llorens<sup>1</sup>, P. Afanasiev<sup>1</sup>, C. Geantet<sup>1</sup>**  
<sup>1</sup>IRCELYON, Villeurbanne Cedex, France  
<sup>2</sup>Observatoire des Sciences de l'Univers de Grenoble, UMS 832 CNRS / Université Joseph Fourier, Grenoble Cedex, France & BM30B/CRG-FAME beamline, ESRF, Grenoble Cedex, France

## Session 14: Photocatalyst Preparation

- 9:45 – 10:00am (ST)**      **Electron Transfer Processes and Redox Potentials in Metal Doped TiO<sub>2</sub> Semiconductors: Towards More Selective Photocatalysts**  
**Andrea Folli<sup>2,1</sup>, Jonathan Z. Bloh<sup>1</sup> and Donald E. Macphee<sup>1</sup>**  
<sup>1</sup>University of Aberdeen, Aberdeen, United Kingdom  
<sup>2</sup>Danish Technological Institute, Taastrup, Denmark
- 10:00 – 10:15am (ST)**      **WO<sub>3</sub> Thin Films Prepared by Sedimentation or High Power Impulse Magnetron Sputtering**  
**Jiri Olejnicek<sup>1</sup>, Michaela Brunclikova<sup>1</sup>, Zdenek Hubicka<sup>1</sup>, Stepan Kment<sup>1</sup>, Martin Cada<sup>1</sup>, Martin Zlamal<sup>2</sup>, Josef Krysa<sup>2</sup>**  
<sup>1</sup> Institute of Physics, Academy of Sciences of the Czech Republic, Prague, Czech Republic  
<sup>2</sup> Institute of Chemical Technology, Prague, Czech Republic
- 10:15 – 10:30am**      **Coffee Break**
- 10:30 – 10:45am (ST)**      **Plasma Deposition of Photonic Materials Based on Iron Thin Films for Renewable Energy**  
**Stepan Kment<sup>1</sup>, Zdenek Hubicka<sup>1</sup>, Jiri Olejnicek<sup>1</sup>, Martin Cada<sup>1</sup>, Patrik Schmuki<sup>2</sup>, and Josef Krysa<sup>3</sup>**

<sup>1</sup>Institute of Physics, Academy of Sciences of the Czech Republic, Prague, Czech Republic

<sup>2</sup>University of Erlangen-Nuremberg, Erlangen, Germany

<sup>3</sup>Institute of Chemical Technology, Prague, Czech Republic

## **Session 15: CO<sub>2</sub> Reduction-II**

- 10:45 – 11:10am (IL)**      **g-C<sub>3</sub>N<sub>4</sub>-Based Composite Photocatalysts for Solar-to-Fuel Conversion**  
**Shaowen Cao\* and Jiaguo Yu**  
Wuhan University of Technology, Wuhan, P. R. China
- 11:10 – 11:25am (ST)**      **Harvesting Visible Light with Noble Metal-Mediated Graphitic Carbon Nitride for Efficient Photoreduction of Carbon Dioxide into Solar Fuels**  
**Wee-Jun Ong, Lling-Lling Tan, Siang-Piao Chai, Siek-Ting Yong**  
Monash University, Jalan Lagoon Selatan, Selangor, Malaysia
- 11:25 – 11:40am (ST)**      **Carbon Nanodots for Light Driven Energy Conversion Applications**  
**Sushant Sahu**  
Clemson University, Clemson, South Carolina, USA

## **Session 16: Wastewater Treatment-IV**

- 11:40 – 11:55am (ST)**      **TiO<sub>2</sub>-ZnO Photocatalysts Evaluation on Solar Pilot Plant for Real Dye Wastewaters**  
**Monica Almansa-Ortegon and Fiderman Machuca-Martinez**  
Universidad del Valle, Cali, Colombia
- 11:55 – 12:10pm (ST)**      **Surface Hydrophilicity and Photocatalytic Activity of Thin Nano TiO<sub>2</sub> Films Immobilized with Surfactants**  
**Eden G. Mariquit<sup>1</sup>, Winarto Kurniawan<sup>1</sup>, Masahiro Miyauchi<sup>2</sup>, Hirofumi Hinode<sup>1</sup>**  
<sup>1</sup>Department of International Development Engineering, <sup>2</sup>Department of Metallurgy and Ceramics Science, Tokyo Institute of Technology, Japan
- 12:10 – 1:30pm**                      **Lunch**
- 1:30 – 1:45pm (ST)**              **Investigation on the Use of UV/Light-Emitting Diodes in Water Treatment Systems**  
**Kelsey Duckworth<sup>1</sup>, Catherine Almquist<sup>2</sup>, Sarah Fyda<sup>3</sup>, and Nate Godby<sup>4</sup>, Michael Magnuson<sup>5</sup>, Michael Miller<sup>1</sup>, Leeanne Racz<sup>1</sup>, and Willie Harper<sup>1</sup>**  
<sup>1</sup> Air Force Institute of Technology, Wright Patterson Air Force Base, Dayton, Ohio, USA

<sup>2</sup> Miami University, Oxford, Ohio, USA

<sup>3</sup> University of Dayton, Dayton, Ohio, USA

<sup>4</sup> Wilmington College, Wilmington, Ohio, USA

<sup>5</sup> US Environmental Protection Agency, Cincinnati, Ohio, USA

1:45 – 2:00pm (ST)

**Pilot Plant Production of Highly Photoactive Faceted Anatase Nanoparticles Obtained Using Trifluoroacetic Acid: Application to Degradation of Emerging Contaminants in Real Waters**

**Daniel Fernández Hevia**

INAEL Electrical Systems, Toledo, Spain and Universidad de Las Palmas de Gran Canaria, Gran Canaria, Spain

**David G. Calatayud, Teresa Jardiel, and Amador C. Caballero**

Instituto de Cerámica y Vidrio, CSIC, Madrid, Spain

**Cristina Fernández and Óscar González**

Universidad de Las Palmas de Gran Canaria, Gran Canaria, Spain

**Oriol Lamiel-Garcia and Francesc Illas**

Universitat de Barcelona, Barcelona, Spain

2:00 – 2:15pm (ST)

**Synthesis of Mesoporous Mn/TiO<sub>2</sub> Nanocomposites and Investigating the Photo-Catalytic Properties in Aqueous Systems**

**Ekemena O. Oseghe, Patrick G. Ndungu, Sreekanth B. Jonnalagadda\***

School of Chemistry and Physics, University of Kwa-Zulu Natal, Westville Campus, Private Bag X 54001, Durban, 4000, South Africa

2:15 – 2:30pm (ST)

**Synthesis, Photocatalytic Properties and Photogenerated Hydroxyl Radicals of Hollow CdS Nanospheres**

**Han Wang<sup>1,2</sup>, Jingtang Zheng<sup>1,\*</sup>, Bo Jiang<sup>1</sup>**

<sup>1</sup>China University of Petroleum, Qingdao, China

<sup>2</sup>Baotou Light Industry and Vocational Technical College, Baotou, China

2:30pm

**Adjourn**

## Posters

### **Kinetic Study of the Process of Sensitization of TiO<sub>2</sub> at Solar Pilot Scale Level in Industrial Wastewater Treatment: A Review**

**Jennyfer Diaz-Angulo<sup>1</sup>, Miguel Angel Mueses<sup>2</sup>, and Fiderman Machuca-Martinez<sup>1</sup>**

<sup>1</sup>Universidad del Valle, Sede Meléndez, Cali, Colombia

<sup>2</sup>Universidad de Cartagena, Cartagena, Colombia

### **Effect of Chloride Ion Addition on the Photocatalytic Conversion of CO<sub>2</sub> in an Aqueous Solution Using Ni-Al LDH as a Photocatalyst**

**Shoji Iguchi<sup>1</sup>, Kentaro Teramura<sup>1, 2, 3</sup>, Saburo Hosokawa<sup>1, 2</sup>, and Tsunehiro Tanaka<sup>1, 2</sup>**

<sup>1</sup> Graduated School of Engineering, Kyoto University

<sup>2</sup> Elements Strategy Initiative for Catalysts & Batteries (ESICB), Kyoto University

<sup>3</sup> Precursory Research for Embryonic Science and Technology (PRESTO), JST

### **Noble Metal-Doped Reduced Graphene Oxide/TiO<sub>2</sub> Ternary Nanocomposites as Photocatalysts for the Reduction of CO<sub>2</sub>**

**Lling-Lling Tan<sup>1</sup>, Wee-Jun Ong<sup>1</sup>, Siang-Piao Chai<sup>1</sup> and Abdul Rahman Mohamed<sup>2</sup>**

<sup>1</sup> Monash University, Jalan Lagoon Selatan, Bandar Sunway, Selangor, Malaysia

<sup>2</sup> Universiti Sains Malaysia, Nibong Tebal, Pulau Pinang, Malaysia

### **Interaction Between Fe Cluster and Anatase TiO<sub>2</sub>(101) Surface Using DFT for Understand Hydrodesulphurization Reaction**

**Aida Liliana Barbosa L\*María Díaz Granados, Freddy Rosales Hernández**

University of Cartagena, Cartagena, Colombia

### **Rice Husk-Templated TiO<sub>2</sub> Hollow Microparticles**

**Zekiye Çinar and Nazlı Turkten**

Yildiz Technical University, Istanbul, Turkey

### **The Effect of Surface-Doped Cations on the Enhanced Solar Photocatalytic Activity of TiO<sub>2</sub>**

**Zekiye Cinar<sup>1</sup>, Serap Kirci<sup>1</sup>, Esra Kasapbasi<sup>2</sup>**

<sup>1</sup>Yildiz Technical University, Istanbul, Turkey

<sup>2</sup> Istanbul Aydin University, Istanbul, Turkey

### **Effects of Raw Materials on Adhesion Strength and Photocatalytic Activity of Titania Thin Films Prepared by Dip-Coating Method**

**Yuki Nakamura<sup>1</sup>, Sayaka Yanagida<sup>1, 2</sup> and Atsuo Yasumori<sup>1, 2</sup>**

<sup>1</sup>Dept. Materials Science and Engineering, <sup>2</sup>Photocatalysis International Research Center- RIST, Tokyo University of Science, Tokyo, Japan

### **Adsorption and Photocatalytic Decomposition of Gaseous 2-Propanol by Titania Coated Porous Glass Cloth**

**Junki Nishiyama<sup>1</sup>, Sayaka Yanagida<sup>1, 2</sup>, and Atsuo Yasumori<sup>1, 2</sup>**



<sup>1</sup>Dept. Materials Science and Engineering, <sup>2</sup>Photocatalysis International Research Center- RIST, Tokyo University of Science, Tokyo, Japan

## **Analysis on the Energy-Resolved Distribution of Electron Traps in Titania Photocatalysts by Reversed Double-Beam Photoacoustic Spectroscopy**

**Akio Nitta,<sup>1</sup> Mai Takase<sup>1,2</sup> and Bunsho Ohtani<sup>1,2</sup>**

<sup>1</sup>Graduate School of Environmental Science, Hokkaido University, Sapporo, Japan

<sup>2</sup>Catalysis Research Center, Hokkaido University, Sapporo, Japan

## **Enhanced Activity of Silver Doped TiO<sub>2</sub> Photocatalysts for the Inactivation of Bacterial Spores**

**A. Manassero, M. L. Satuf, O. M. Alfano**

INTEC (Universidad Nacional del Litoral and CONICET), Santa Fe, Argentina

## **Influence of Crystal Facets of Decahedral-Shaped Anatase Titania Particles on Their Physical Properties and Photocatalytic Activities**

**Mai Takase, Kenta Kobayashi, Kazuki Matsui and Bunsho Ohtani**

Catalysis Research Center, Hokkaido University, Sapporo, Japan

## **Oxidation of 2,5-Dihydroxybenzoic Acid on ZnO Suspensions**

**Katerine Antil<sup>1</sup>, Lorena Cornejo<sup>2</sup>, David Contreras<sup>1</sup>, C. Zaror<sup>3</sup>, H. D. Mansilla<sup>1</sup>**

<sup>1</sup>Faculty of Chemical Sciences, University of Concepción, Casilla, Chile

<sup>2</sup>Laboratory of Environmental Research on Arid Zones, LIMZA, EUIIIS, University of Tarapacá, Chile

<sup>3</sup>Chemical Engineering Department, University of Concepción, Concepcion, Chile

## **Gold and Nitrogen Co-doped TiO<sub>2</sub> Nanoparticles Synthesized by Laser Pyrolysis: Application in Photocatalysis**

**S. Bouhadoun<sup>1,2</sup>, C. Guillard<sup>2</sup> and N. Herlin-Boime<sup>1\*</sup>**

<sup>1</sup> IRAMIS/NIMBE/LEDNA Francis Perrin Laboratory, CEA-CNRS URA 245, CEA Saclay, Gif sur yvette, France

<sup>2</sup> IRCELYON, Villeurbanne, France

## **Synthesis and Characterization of ZnO Nanorod Films on PET for Photocatalytic Disinfection of Water**

**Luis Sanchez<sup>1</sup>, Lucas Guz<sup>2</sup>, Pilar García<sup>1</sup>, Silvia Ponce<sup>3</sup>, Silvia Goyanes<sup>4</sup> María Claudia Marchi<sup>5</sup>, Roberto Candal<sup>2,6</sup>, Juan Rodriguez<sup>1</sup>**

<sup>1</sup> Universidad Nacional de Ingeniería, Lima, Perú

<sup>2</sup> Universidad Nacional de San Martín, Argentina

<sup>3</sup> University of Lima, Lima, Perú

<sup>4</sup> Departamento de Física, FCEyN, Universidad de Buenos Aires, IFIBA-CONICET

<sup>5</sup> Centro de Microscopias Avanzadas, Universidad de Buenos Aires

<sup>6</sup> INQUIMAE, CONICET-FCEyN, Universidad de Buenos Aires, Argentina

## **Synthesis, Characterization and Photocatalytic Efficiency of 1 D TiO<sub>2</sub> Nanostructures Prepared from Seeds Presenting Tailored TiO<sub>2</sub> Crystalline Phases**

**Julieta Cabrera<sup>1</sup>, Hugo Alarcón<sup>1</sup>, Alcides López<sup>1</sup>, Roberto Candal<sup>2</sup>, Dwigth Acosta<sup>3</sup>, Juan Rodriguez<sup>1</sup>**

<sup>1</sup> Universidad Nacional de Ingeniería, Lima, Perú

<sup>2</sup>INQUIMAE, Universidad de Buenos Aires, Argentina

<sup>3</sup>Instituto de Física, UNAM, México D.F.

## **Degradation of Humic Acid using Visible Light Sensitive Photocatalysts: Se-Doped, N-Doped and Se-N Codoped TiO<sub>2</sub>**

**N. Cemre Birben<sup>1</sup>, Ayse Tomruk<sup>1</sup>, Nazli Turkten<sup>2</sup>, Yelda Yalcin Gurkan<sup>3</sup>, Zekiye Cinar<sup>2</sup> and Miray Bekbolet<sup>1</sup>**

<sup>1</sup>Institute of Environmental Sciences, Bogazici University, 34342 Bebek-Istanbul, Turkey,

<sup>2</sup>Department of Chemistry, Yildiz Technical University, Davutpasa- Istanbul, Turkey

<sup>3</sup>Department of Chemistry, Namik Kemal University, Tekirdag, Turkey

## **Solar Photocatalytic Degradation of Natural Organic Matter: Performance Evaluation of Visible Light Activated TiO<sub>2</sub> Specimens**

**N. Cemre Birben<sup>1\*</sup>, Ceyda S. Uyguner-Demirel<sup>1</sup>, Nazli Turkten<sup>2</sup>, Yelda Yalcin Gurkan<sup>3</sup>, Zekiye Cinar<sup>2</sup> and Miray Bekbolet<sup>1</sup>**

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