

Chair: Masayuki Morita (Kyoto University)

Plenary Lecture

PL-01 13:00 **Research on pseudocapacitive materials : getting nowhere fast**
Thierry Brousse
(Université de Nantes, Réseau sur le Stockage Electrochimique de l'énergie (RS2E))

Keynote Lecture

KL-01 13:40 **First-Principles Calculations of MXene Electrode Materials for Electrochemical Energy Storage**
Yasuaki OKADA, Kosuke Shiratsuyu
(Murata Manufacturing Co., Ltd.)

Chairs: Frédéric Favier (Université de Montpellier)
Etsuro Iwama (Tokyo University of Agriculture & Technology)

Invited Talk

1O-01 14:10 **Polycationic oxides for aqueous electrochemical capacitors: example of the Fe/W/O System**
Olivier Crosnier, Nicolas Goubard-Brétésché, Julio Cesar Espinosa-Angeles, Camille Douard, Frédéric Favier, Thierry Brousse
(Université de Nantes, Réseau sur le Stockage de l'Energie (RS2E), Institut Charles Gerhardt Montpellier)

14:30 **Coffee Break**

1O-02 14:50 **Cation-Disordered Li_3VO_4 : Transformation from Battery to Pseudocapacitive Materials**
Etsuro Iwama, Keisuke Matsumura, Kenta Takagi, Wako Naoi, Yuki Orikasa, Patrick Rozier, Patrice Simon, Katsuhiko Naoi
(Tokyo University of Agriculture & Technology, K & W Inc., Ritsumeikan University, Université de Toulouse, Réseau sur le Stockage Electrochimique de l'Energie)

1O-03 15:10 **Pseudo Capacitive Reaction of Several Metal Oxide Positive Electrodes with Al Metal Negative Electrode**
Masanobu Chiku, Tian Yihan, Eiji Higuchi, Hiroshi Inoue
(Osaka Prefecture University)

1O-04 15:30 **Preparation and structure of pillared carbons for electric double layer capacitors**
Takuma Kino, Junichi Inamoto, Yoshiaki Matsuo
(University of Hyogo)

1O-05 15:50 **Staking, folding, wrapping, drilling 2D materials for supercapacitors**
Frédéric Favier, Yachao Zhu, Patrice Simon
(Université de Montpellier, Université Paul Sabatier de Toulouse, Réseau sur le stockage électrochimique de l'énergie, (RS2E))

16:10 **Coffee Break**

- 10-06 16:30 **Conductive nanosheets for fast charge storage: 2D to 3D architectures**
Wataru Sugimoto
(Shinshu University)
- 10-07 16:50 **Solvents' Influence on Pseudocapacitive Intercalation in Mxenes**
Xuehang Wang, Tyler Mathis, Patrice Simon, Yury Gogotsi
(Drexel University, Université Paul Sabatier)
- 10-08 17:10 **Charging MXenes in aqueous electrolytes**
Masashi Okubo, Atsuo Yamada
(The University of Tokyo)

Contributed Oral

- 10-09 17:30 **Pseudocapacitive Behavior of $Ti_3C_2T_x$ MXene Material in Aqueous Electrolytes**
Hui Shao, Zifeng Lin, Kui Xu, Pierre-Louis Taberna, Patrice Simon
(Sichuan University, Université Paul Sabatier, Réseau sur le Stockage Electrochimique de l'Energie (RS2E))
- 18:10 **Welcome Reception at Auditorium**

Chair: Masashi Ishikawa (Kansai University)

Plenary Lecture

PL-02 8:30 **Hybrid electrochemical capacitors: a promising technology**
François Béguin
(Poznan University of Technology)

Keynote Lecture

KL-02 9:10 **Progress, commercial status and future opportunities for high power energy storage devices**
Xiaoxi He, Alex Holland, Peter Harrop
(IDTechEx)

Chairs: Enn Lust (University of Tartu)
Soshi Shiraishi (Gunma University)

Invited Talk

2O-01 9:40 **Metallacarboranes as additive to stabilize superactivated carbon-based aqueous supercapacitors**
Isabel Fuentes, María José Mostazo-López, Clara Viñas, Francesc Teixidor, Emilia Morallón, Diego Cazorla-Amorós
(Instituto de Ciencia de Materiales de Barcelona, Universidad de Alicante)

2O-02 10:00 **Preparation of micro-mesoporous carbons from organic materials for supercapacitors, Na-ion batteries and polymer electrolyte fuel cells**
Enn Lust, Meelis Härmas, Maarja Paalo, Riinu Härmas, Rasmus Palm, Eneli Härk, Peeter Valk, Jaanus Kruusma, Ove Oll, Georg Gorbatovski, Jinfeng Zhao, Silver Sepp, Rutha Jäger, Tavo Romann, Thomas Thomberg, Alar Jänes, Jaak Nerut
(University of Tartu, Helmholtz-Zentrum für Materialien und Energie GmbH)

10:20 **Coffee Break**

2O-03 10:40 **Carbon-Based Supercapacitors: From Materials to Electrodes**
Bin Xu
(Beijing University of Chemical Technology)

2O-04 11:00 **Electrochemical Advantages of Seamless-activated Carbon Electrode**
Soshi Shiraishi, Yoshikiyo Hatakeyama, Hidehiko Tsukada
(Gunma University, AION Co. Ltd.)

2O-05 11:20 **K-ion vs. Li-ion capacitors: What about graphite electrode?**
Shinichi Komaba, Hiroo Onuma, Kei Kubota, Tomooki Hosaka
(Tokyo University of Science, Kyoto University)

2O-06 11:40 **Rice husk based silicon carbide derived carbon for capacitor electrode**
Takahiro Saito, Shinji Ishikawa
(Sumitomo Electric Industries, Ltd., Gunma University)

2O-07 12:00 **Capacitive performance and porous structure of carbonized materials from cellulose**
Akinori Muto
(Osaka Prefecture University)

12:20 **Lunch**

Chair: Thierry Brousse (Université de Nantes)

Keynote Lecture

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| KL-03 | 13:30 | The cutting edge of electrochemical capacitor and its novel materials
Sekihiro Takeda
(Nippon Chemi-Con Corporation) |
| KL-04 | 14:00 | Behavior of interconnected mesoporous carbon for electrochemical application
Yoshio Shodai
(Toyo Tanso Co., Ltd.) |

Chairs: Krzysztof Fic (Poznan University of Technology)
 Shinichi Komaba (Tokyo University of Science)

Invited Talk

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| 2O-08 | 14:30 | Strategies to Entrance Rate Performance of Oxide Pseudocapacitors
<u>Nae-Lih Wu</u> , Mozaffar Abdollahifar
(National Taiwan University) |
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Contributed Oral

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| 2O-09 | 14:50 | Investigating the aging mechanism of electrochemical activated carbon material
<u>Tien-Yu Yi</u> , Cheng-Wei Dai, Chi-Chang Hu
(National Tsing Hua University) |
| 2O-10 | 15:10 | Electrostatic double layer capacitance characteristics of carbon material prepared from coal extract
<u>Hiroki Watanabe</u> , Kikuchi Naoki, Maki Hamaguchi, Toshinori Inoue, Tomoki Tsumura, Masahiro Toyoda
(Oita University, Kobe Steel, Ltd., Kobelco Research Institute, Inc. :) |
| | 15:30 | Poster Session 1 & Coffee Break |
| 2O-11 | 16:30 | Effect of nitrogen doping to suppressing the self-discharge and gas evolution of activated carbon supercapacitor electrode
<u>Sutarsis</u> , Jeng-Kuei Chang
(National Central University, National Chiao Tung University) |
| 2O-12 | 16:50 | Electric Double-layer Capacitance of Shōchū Waste-derived Activated Carbons in Non-aqueous Electrolyte
<u>Takuya Eguchi</u> , Tashima Daisuke, Masumi Fukuma, Seiji Kumagi
(Akita University, Fukuoka Institute of Technology, National Institute of Technology, Matsue College) |
| 2O-13 | 17:10 | Advanced Carbons (ACS) with High Capacitance and Low Ash for EDLC in Organic Electrolyte System
Yu-Liang Chen
(China Steel Chemical Corp.) |
| 2O-14 | 17:30 | Target-oriented electrode constructions toward ultra-fast and ultra-stable all-graphene lithium ion capacitors
Liming Jin, <u>Junsheng Zheng</u> , Jim P. Zheng
(Tongji University) |

- 20-15 17:50 **Combustion synthesis of graphene-welded activated carbon for supercapacitive energy storage**
Chen Li, Xiong Zhang, Xianzhong Sun, Kai Wang, Yanwei Ma
(Chinese Academy of Sciences)
- 20-16 18:10 **Quantum Capacitance Origin of Graphene Cathode in Lithium Ion Capacitor: A DFT Study**
Fangyuan Su, Guohua Sun, Chengmeng Chen
(Chinese Academy of Sciences)

Chair: Yury Gogotsi (Drexel University)

Plenary Lecture

PL-03 8:30 **Electroanalytical Characterization of Electrochemical Capacitor Materials and Devices**
 Scott W. Donne
 (University of Newcastle)

Keynote Lecture

KL-05 9:10 **Ultracapacitive Energy Storage Using 2D Nanomaterials Under Extreme Conditions**
 Ho Seok Park
 (Sungkyunkwan University)

Chairs: Andrea Balducci (Friedrich-Schiller-University Jena)
 Minato Egashira (Nihon University)

Invited Talk

3O-01 9:40 **The impact of imide-based salts in high voltage EDLCs**
 Andrea Balducci, S. Schütter, L. H. Heß, T. Stettner
 (Friedrich-Schiller-University Jena)

3O-02 10:00 **Cation Design of Ionic Liquid for Low-Temperature Electric Double Layer Capacitors**
 Ching-Wen Su, Wen-Yueh Ho, I-Wen Sun, Chi-Cheng Chiu, Hsisheng Teng
 (National Cheng Kung University, Chia Nan University of Pharmacy & Science,)

10:20 **Coffee Break**

3O-03 10:40 **Liquid properties for solid devices : lowered activation energy of ionic liquids confined within ionogels**
 T. Guillemin, A. Marie, B. Asbani, C. Lethien, C. Douard, T. Brousse, B. Humbert, Jean Le Bideau
 (University of Nantes, Université Lille)

3O-04 11:00 **Ferrocene-based Ionic Liquids and Polymers in Electrochemical Capacitors**
 Wang Yanyu, Xie HanJin, Skrypnik Valentyn, Rochefort Dominic
 (Université de Montréal)

3O-05 11:20 **Li-Ion Hopping Conduction in Highly Concentrated Electrolyte Solutions**
 Kaoru Dokko, Yosuke Ugata, Shohei Sasagawa, Daiki Watanabe, Morgan L. Thomas, Kazuhide Ueno, Masayoshi Watanabe
 (Yokohama National University)

3O-06 11:40 **Hyperconcentrated Hydrogel as Electrochemical Capacitor Electrolyte**
 Minato Egashira
 (Nihon University)

3O-07 12:00 **Free-standing, carbon fiber-paper-supported carbon nanofoams enable promising sodium-ion capacitors**
Ryan DeBlock, Jesse Ko, Megan Sassin, Ashley Hoffmaster, Bruce Dunn, Debra Rolison, Jeffrey Long
(University of California at Los Angeles, U.S. Naval Research Laboratory)

12:20 ***Lunch***

Chair: Katsuhiko Naoi (Tokyo University of Agriculture and Technology)

Plenary Lecture

PL-04 8:30 **Key Technologies for Reliable Lithium-ion Capacitor**
Masashi Ishikawa
(Kansai University)

Keynote Lecture

KL-06 9:10 **Bifunctional charge storage via nanostructured electrodes and electrolyte composition**
Megan Sassin, Jeffrey W. Long, Jesse S. Ko, Christopher N. Chervin, Joseph F. Parker, Maya E. Helms, Seokmin Jeon, Christopher R. So, Debra R. Rolison
(U.S. Naval Research Laboratory, SLAC National Accelerator Laboratory)

Chairs: Olivier Crosnier (Université de Nantes)
Kazumi Chiba (Japan Carlit Co., Ltd)

Contributed Oral

4O-01 9:40 **Al(TFSI)₃ in acetonitrile as electrolyte for high-performance EDLCs**
Jakob Krummacher, L.H. Hess, A. Balducci
(Friedrich Schiller University Jena)

4O-02 10:00 **Low-Temperature and high-voltage Supercapacitor Enabled by novel electrolytes and mixed solvent**
Weili Zhang, Zhiqiang Shi, Dianbo Ruan, Xuewen Yu
(Tianjin Polytechnic University, Ningbo CRRC New Energy Technology Co. Ltd.)

10:20 **Coffee Break**

Young Invited Oral

4O-03 10:40 **NOx-free oxidation of carbon nanotubes for supercapacitors**
Chaohui Wei, Bamidele Akinwolemiwa, Linpo Yu, George Chen
(University of Nottingham Ningbo China, University of Nottingham)

4O-04 11:00 **Capacitive behavior of the carbons produced by ball milling of natural graphite**
Yuya Kado, Yasushi Soneda, Daisuke Horii, Kazuma Okura, Shunzo Suematsu
(National Institute of Advanced Industrial Science and Technology, Nippon Chemi-Con Corporation)

4O-05 11:20 **Electrochemical capacitor based on in-situ electrolyte and bio-mass derived carbons**
Lars Henning Heß, Desiree Leistenschneider, Christoph Schuetter, Alberto Varzi, L. Lodovico, P. Ruschhaupt, Lars Borchardt, S. Passerini, A. Balducci
(Friedrich-Schiller-University Jena, University of Alberta, Helmholtz Institute Ulm, Karlsruhe Institute of Technology, Ruhr-University Bochum)

4O-06 11:40 **Fabrication of Self-standing Electrodes Based on Vertically Standing 3D Porous MnO₂ Nanosheets for High-Performance Micro-Supercapacitors**
Wen-Yin Ko, Kuan-Jiuh Lin
(National Chung Hsing University)

4O-07 12:00 **Adsorption, migration and penetration of hydrogen atoms in RuO₂ (110) surfaces as a guide to engineer novel pseudocapacitive electrode thin films**
Ankita Jadon, Mehdi Djafari Rouhania, Alain Estevea, David Pech
(Laboratoire d'Analyse et d'architecture des Systems)

12:20 **Lunch**

Chair: Chi-Chang Hu (National Tsing Hua University)

Keynote Lecture

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| KL-07 | 13:30 | <p>Operando exploration of the ionic fluxes at the electrode/electrolyte interface for better electrochemical capacitors
 <u>Krzysztof Fic</u>, Anetta Płatek, Jakub Menzel, Adam Ślesiński, Paulina Bujewska, Justyna Piwek, Przemysław Galek, Elżbieta Frąckowiak
 (Poznan University of Technology)</p> |
| KL-08 | 14:00 | <p>Development of multifunctional power supply system for Electric Power Steering (EPS) using capacitor and development of high heat-resistant lithium-ion capacitor
 <u>Takumi Mio</u>, Yukihiro Komatsubara, Naoki Ohmi, Yusuke Kimoto, Kentaro Iizuka, Tomoki Suganuma, Shun Maruyama, Fumihiko Sato, Satoshi Shinoda, Tokuaki Hibino, Koji Nishi
 (JTEKT Corporation)</p> |

Chairs: Megan Sassin (U.S. Naval Research Laboratory)
 Shuichi Ishimoto (Nippon Chemi-Con Corporation)

Young Invited Oral

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| 4O-08 | 14:30 | <p>Improved charge transfer at the electrified carbon/redox species interface for hybrid capacitors in aqueous media
 <u>Qamar Abbas</u>, Bernhard Gollas
 (Graz University of Technology)</p> |
| 4O-09 | 14:50 | <p>Shifting parasitic reaction equilibria for the voltage enhancement of aqueous electrochemical capacitors
 <u>Adam Slesinski</u>, Elzbieta Frackowiakand, Krzysztof Fic
 (Poznan University of Technology)</p> |
| 4O-10 | 15:10 | <p>Asymmetric supercapacitors based on riboflavin-modified activated carbon
 <u>E. Bohorquez-Guarín</u>, <u>D. Salinas-Torres</u>, R. Ruiz-Rosas, D. Cazorla-Amorós, E. Morallón
 (Universidad de Alicante)</p> |
| | 15:30 | <p>Poster Session 2 & Coffee Break</p> |
| 4O-11 | 16:30 | <p>Approaches for improved cyclability and lower resistance of 4 V-class aqueous hybrid capacitor
 <u>Yusuke Sato</u>, Sho Makino, Sho Hideshima, Dai Mochizuki, Wataru Sugimoto
 (Shinshu University)</p> |
| 4O-12 | 16:50 | <p>Ultrafast $\text{Li}_4\text{Ti}_5\text{O}_{12}/\text{Li}_3\text{V}_2(\text{PO}_4)_3$ Full Cell Configuration via Electrochemical Preconditioning
 <u>Naohisa Okita</u>, Etsuro Iwama, Satoyuki Tatsumi, Trang Nguyễn Hồng Võ, Yuta Harada, Wako Naoi, McMahan Thomas, Homer Reid, Katsuhiko Naoi
 (Tokyo University of Agriculture & Technology, K & W Inc.)</p> |
| 4O-13 | 17:10 | <p>Highly porous 3D platinum scaffold for RuO_2 based pseudocapacitive microsupercapacitors
 <u>Sai Gourang Patnaik</u>, Lotfi Benali Karroubi, Daniel Guay, David Pech
 (LAAS-CNRS, INRS-Énergie)</p> |

4O-14 17:30 **3D integration on a chip in an interdigitated stacked configuration for electrochemical energy storage micro devices**
Chau Cam Hoang Tran, David Bourrier, Sai Gourang Patnaik, Lotfi Benali Karroubi, Daniel Guay, David Pech
(LAAS-CNRS, INRS-Énergie)

Invited Talk

4O-15 17:50 **Application of MF_n salts as electric double layer capacitor electrolytes**
Hiroo Miyauchi
(Mitsubishi Chemical Corporation)

19:00 ***Banquet at Ueda Tokyu Rei Hotel***

Chair: Patrice Simon (Université Paul Sabatier)

Plenary Lecture

PL-05 8:30 **Materials Design for Flexible Supercapacitors**
Chi-Chang Hu, Jeng-An Wang, Sheng-Chi Lin, Chen-Chi M. Ma
 (National Tsing Hua University)

Keynote Lecture

KL-09 9:10 **Asymmetric capacitors compatible with high energy density and safety using intercalated metal organic framework electrodes**
 Nobuhiro Ogihara
 (Toyota Central R&D Labs., Inc.)

Chairs: François Béguin (Poznan University of Technology)
 Sekihiro Takeda (Nippon Chemi-Con Corporation)

Invited Talk

5O-01 9:40 **Comparison of Energy Storage Systems Comprised of Different Electrochemical Capacitor Products**
John R. Miller, Sue Butler
 (Case Western Reserve University, JME Inc.)

5O-02 10:00 **The development of supercapacitor and its future for the next generation**
DianBo Ruan, Bin Yang, Guansheng Fu
 (Zhejiang CRRC New Energy Technology Co.)

10:20 **Coffee Break**

5O-03 10:40 **Evolution of Supercapacitors towards Climate Change –Promoting Effective Solar/Regenerative Energy Utilization-**
Katsuhiko Naoi, Wako Naoi
 (Tokyo University of Agriculture & Technology, K & W, Inc.)

5O-04 11:00 **Ageing of electrode/electrolyte interface in electrochemical capacitor**
Elżbieta Fraćkowiak, Justyna Piwek, Anetta Płatek, Krzysztof Fic
 (Poznan University of Technology)

5O-05 11:20 **Mastering electrode/electrolyte interface: a way to improve the energy density of electrochemical capacitors**
 Patrice Simon
 (Université Paul Sabatier, RS2E)

5O-06 11:40 **Three dimension modelling of the components in supercapacitors for proper understanding and contribution of each parameter to the final electrochemical performance**
Farshad Barzegar, Lijun Zhang, Abdulhakeem Bello, Ncholu Manyala, Xiaohua Xia
 (University of Pretoria, African University of Science and Technology)

5O-07 12:00 **Highly increased breakdown voltage of anodic alumina films by pore-filling of a pre-formed porous layer**
Hiroki Habazaki, Junhui Cao, Tatsuyuki Takano, Chunyu Zhu, Yoshitaka Aoki
(Hokkaido University)

12:20 **Lunch**

Chairs: Elżbieta Frąckowiak (Poznan University of Technology)
Nobuhiro Ogihara (Toyota Central R&D Labs., Inc.)

Invited Talk

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| 50-08 | 13:30 | Aqueous Binders for High Mass Loading Supercapacitor Electrodes
Stefano Passerini, <u>Peter Ruschaupt</u> , Alberto Varzi
(Helmholtz Institute Ulm) |
| 50-09 | 13:50 | Influence of current collector on the long-term performance of electrochemical capacitors
<u>Grzegorz Lota</u> , Jarosław Wojciechowski, Łukasz Kolanowski, Małgorzata Graś, Krzysztof Fic, Karol Szubert, Andreas Bund
(Poznan University of Technology, Adam Mickiewicz University, Technische Universität Ilmenau) |
| 50-10 | 14:10 | Key Aspects in Microsupercapacitors
David Pech
(LAAS-CNRS) |

Contributed Oral

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| 50-11 | 14:30 | High Performance Quasi-Solid Supercapacitor using Graphitized Porous Silicon Electrodes
<u>Irina-Nicoleta Bratosin</u> , Cosmin Romanitan, Antonio Radoi, Mihaela Kusko
(National Institute for Research and Development in Microtechnology (IMT-Bucharest), University of Bucharest) |
| 50-12 | 14:50 | Solid State On Chip Micro supercapacitors Based on Photopatternable Ionogel Solid Electrolytes
<u>Christopher Choi</u> , Kevin Brousse, Patrice Simon, Bruce Dunn
(University of California, Réseau sur le Stockage Electrochimique de l'Energie) |
| | 15:10 | Coffee Break |
| 50-13 | 15:30 | Leakage current and self-discharge in lithium-ion capacitor
<u>Xianzhong Sun</u> , Yabin An, Linbin Geng, Xiong Zhang, Kai Wang, Yanwei Ma
(Chinese Academy of Sciences) |
| 50-14 | 15:50 | A high performance pouch-type lithium-ion capacitor based on SiOx/graphite composite anode
<u>Xiong Zhang</u> , Chen Li, Xianzhong Sun, Kai Wang, Yanwei Ma
(Chinese Academy of Sciences) |
| 50-15 | 16:10 | High Performance Flexible Solid-state Supercapacitors
<u>Kai Wang</u> , Xiong Zhang, Xianzhong Sun, Chen Li, Yanwei Ma
(Chinese Academy of Sciences) |
| | 16:30 | Closing |