E-MRS European Materials Research Society
Spring Meeting 2022
May 30 | June 3
Virtual Conference

SYMPOSIUM J

Future electrochemical energy storage materials: from nanoscience to device integration and real environment application

Symposium Organizers :

Adélio MENDES, Faculdade de Engenharia da Universidade do Porto

Carlos PONCE DE LEON ALBARRAN, University of Southampton

Cristina FLOX, Institut de Ciencia de Materials de Barcelona, CSIC

Olivier CROSNIER, Université de Nantes

Volker PRESSER, Leibniz Institut für Neue Materialien GmbH

Monday may 30

08:45 **Welcome and Introduction to the Symposium**

Supercapacitor : Olivier Crosnier

09:00 INV **Tracking ion fluxes in electrodes for energy storage applications** — J 1.1
Patrice SIMON
1. Université Toulouse-3 Paul Sabatier, CIRIMAT Laboratory, Toulouse, France 2. RS2E, FR CNRS 3459, F-31062 Toulouse, France E-mail address: simon@chimie.ups-tlse.fr

09:30 INV **Microsupercapacitors: between a rock and a hard place** — J 1.2
Thierry Brousse1,2, Jean Le Bideau1,2 and Christophe Lethien2,3
1. Institut des Matériaux Jean Rouxel (IMN), CNRS UMR 6502 – Université de Nantes, 2 rue de la Houssinière BP32229, 44322 Nantes cedex 3, France 2. Réseau sur le Stockage Electrochimique de l'Energie (RS2E), CNRS FR 3459, 33 rue Saint Leu, 80039 Amiens Cedex, France 3. Institut d'Electronique, de Microélectronique et de Nanotechnologies (IEMN), Université de Lille, CNRS, Centrale Lille, ISEN, Université de Valenciennes, UMR 8520 - IEMN, F-59000 Lille, France

10:00 **Developpement of polysiloxane based polymer electrolyte for application in solid state micro-supercapacitors** — J 1.3
Mathieu Deschanels(1), Marc Dietrich(2,3), Pascale Gentile(3), Saïd Sadki(2), Cristina Iojoiu(1) et Fannie Alloin(1)
1) Univ. Grenoble Alpes, CNRS, Grenoble INP LEPMI, 38000 Grenoble, France
(2) Univ. Grenoble Alpes, CEA, CNRS, IRIG-SyMMES, 38000 Grenoble, France
(3) Université Grenoble Alpes, CEA-Grenoble, IRIG-DEPHY-PHELIQS-SINAPS, F-38000 Grenoble, France

10:15 **Asymmetric VN // RuN micro-supercapacitors based on sputtered metal nitride films** — J 1.4
Khac Huy Dinh (1 2 3), Kevin Robert (1 3), Florent Blanchard (2), Marielle Huvé (1 2), Pascal Roussel (1 2), Christophe Lethien (1 3 4)
1 Institut d'Electronique, de Microélectronique et de Nanotechnologies, Université de Lille, CNRS, Centrale Lille, Université Polytechnique Hauts-de-France, UMR 8520 - IEMN, F-59000 Lille, France 2 Unité de Catalyse et de Chimie du Solide (UCCS), Université de Lille, CNRS, Centrale Lille, Université d'Artois, UMR 8181 – UCCS, F-59000 Lille, France 3 Réseau sur le Stockage Electrochimique de l'Energie (RS2E), CNRS FR 3459, 33 rue Saint Leu, 80039 Amiens Cedex, France 4 Institut Universitaire de France (IUF)

10:30 **Discussion**

10:45

11:00 **Decorating porous current collectors with ALD RuOx for supercapacitor applications** — J 1.5
Sakeb Hasan Choudhury, Guillaume Vignaud, Botayna Bounor, Jensheer Shamsudeen Seenath, Pascal Dubreuil, David Bourrier and David Pech
Sakeb Hasan Choudhury: Botayna Bounor: Jensheer Shamsudeen Seenath: Pascal Dubreuil: David Bourrier: and David Pech LAAS-CNRS, Université de Toulouse, CNRS, 7 avenue du colonel Roche, Toulouse 31400, France. Guillaume Vignaud Université Bretagne Sud, 2 rue Coat Saint-Haouen, BP 92116 Lorient, France

11:15 **Single walled-carbon nanotube electrodes boosted by iodonium salts for electrochemical capacitors** — J 1.6
Maciej Tobis*(1), Anetta Płatek-Mielczarek(1), Justyna Piwek(1), Łukasz Przypis(2), Dawid Janas(2), Elżbieta Frąckowiak(1)
(1) Poznan University of Technology, Institute of Chemistry and Technical Electrochemistry, 60 – 965 Poznań, Berdychowo 4, Poland, (2) Silesian University of Technology, Faculty of Chemistry, 44 – 100 Gliwice, B. Krzywoustego 4, Poland
* lead presenter

11:30 **Nitrogen-doped graphene matrix decorated with Sn particles as negative electrode for high performance lithium-ion capacitors** — J 1.7
Miguel Granados-Moreno*(1)(2), Gelines Moreno-Fernández(1), Rosalía Cid(1), Juan Luis Gómez Urbano(1)(2) and Daniel Carriazo(1)(3).
(1)Centre for Cooperative Research on Alternative Energies (CIC energiGUNE), Basque Research and Technology Alliance (BRTA), Alava Technology Park, Albert Einstein 48, 01510 Vitoria-Gasteiz, Spain. (2)Universidad del País Vasco, UPV/EHU, 48080 Bilbao, Spain (3)IKERBASQUE, Basque Foundation for Science, 48013 Bilbao, Spain

11:45 **Discussion**

12:00 **LUNCH**

13:45 INV **Composite electrodes for higher energy supercapacitors: a path towards fit for purpose devices** — J 1.9
M. F. Montemor
Centro de Química Estrutural, Institute of Molecular Sciences, Departamento de Engenharia Química Instituto Superior Técnico, Universidade de Lisboa, Av. Rovisco Pais 1049 001 Lisboa, Portugal

14:15 **Synergistic Contributions of Two Magnetic Elements for Improving the Performance of Magnetic Supercapacitors** — J 1.10
Joyanti Halder, Ananya Chowdhury, Puja De, Sakshi Kansal, Surbhi Priya, Amreesh Chandra
Indian Institute of Technology, Kharagpur, Department of Physics, Indian Institute of Technology, Kharagpur, Department of Physics, Indian Institute of Technology, Kharagpur, Department of Physics, Indian Institute of Technology, Kharagpur, School of energy science and engineering, Indian Institute of Technology, Kharagpur, School of energy science and Engineering, Indian Institute of Technology, Kharagpur, Department of Physics

14:30 **Sustainable, non-volatile supercapacitors for photo-supercapacitors applications** — J 1.11
Nilanka M. Keppetipola* (1), G. R. A Kumara (2), Marie-Anne Dourges (1), Céline Olivier (1), Thierry Toupance (1), Ludmila Cojocaru (1)
(1) The University of Bordeaux, Institute of the Molecular Science, 351 Cours de la Libération F-33405 Talence Cedex, France (2) National Institute of Fundamental Studies, Hantana Road, 20000 Kandy, Sri Lanka

14:45 **Discussion**

1 - Electrodes for energy storage : Cristina Flox

16:30 **Silicon/Graphene Composite for Electrochemical Energy Storage** — J 2.4
Farjana J. Sonia*, Golam Haider, Martin Müller, Milan Bousa, Antonín Fejfar, Martin Kalbáč, Otakar Frank
Farjana J. Sonia, Golam Haider, Milan Bousa, Martin Kalbáč, Otakar Frank - J. Heyrovsky Institute of Physical Chemistry of the AS CR, v.v.i., Dolejskova 2155/3, 182 23 Prague 8, Czech Republic, Martin Müller, Antonín Fejfar - FZU-Institute of Physics of the Czech Academy of Sciences, 16200 Prague 6, Czech Republic

16:30 **Electrochemical studies on Cs-functionalized carbon nanotubes** — J 2.5
E.I.Ionete1 , S.M. Iordache2 ,3, A.M. Iordache2 ,3, I. Stamatin3, E. Tanasa4, V. Barna5, I. C.Vasiliu2, M.Elisa2, I. Chilibon2, S. Caramizoiu3,6, C.E.A. Grigorescu2
1National R&D Institute for Cryogenics and Isotopic Technologies – ICSI Rm.Valcea, 4 Uzinei Str. RM Valcea, 240050, Valcea, Romania. 2National Institute for Research and Development in Optoelectronics-INOE 2000,Optospintronics Department, 409 Atomistilor, 077125, Magurele Romania 3University of Bucharest, Faculty of Physics, 3Nano-SAE Research Center, 405 Atomistilor, P.O. Box MG-38, 077125, Magurele, Romania. 4Politehnica University of Bucharest, 313 Splaiul Independenței, Bucharest, Romania. 5University of Bucharest, Faculty of Physics, 405 Atomistilor, 077125, Magurele, Romania 6National Institute for R&D in Microtechnologies IMT-Bucharest, 126A Erou Iancu Nicolae Str., Voluntari, 077190, Romania

16:30 **Porous cobalt oxides nanostructures electrodeposited on graphene electrode for energy storage applications** — J 2.6
H. Ghannam*(1,2), O.Elkhouja (1,3), T. Tite (1), C. Ungureanu(4), M. Buga(4), A. A. Zaulet(4), E. Matei(1), C. C. Negrilă(1), A.C. Galca(1), G. Stan(1), A. Chahboun(2)
(1) National Institute of Materials Physics, RO-077125 Magurele, Romania (2) Abdelmalek Essaadi University, FSTT, Thin Films and Nanomaterials Lab., 90000 Tangier, Morocco (3)Laboratory of Materials and Subatomic Physics, Faculty of Sciences, Ibn Tofail University, Campus Universitaire, 14000 Kenitra, Morocco
(4) National Research and Development Institute for Cryogenics and Isotopic Technologies - ICSI Rm. Valcea, Uzinei Street no. 4, PO Box Râureni 7, 240050, Râmnicu Vâlcea, Romania

Electrolytes for batteries : Olivier Crosnier

09:00 INV **Ionic liquids electrolytes: industrial challenges from lab to market** — J 3.1
Sébastien FANTINI, Rongying LIN, Anaïs FALGAYRAT, Pauline RULLIERE, Pierre-Alexandre MARTIN, Tom GOUVEIA, François MALBOSC
Solvionic SA, Chemin de la Loge, CS 27813, Toulouse, 31078, France

09:30 **Ionic liquids as electrolytes for high voltage Li-ion batteries within the Si-Drive Project: links between the physical properti** — J 3.2
Palumbo, O. (1), Sarra, A. (1), Cimini, A.(1), Brutti. S. (1,2), Appetecchi, G.B.(3), Simonetti, E.(3), Maresca, G.(3), Fantini, S.(4), Lin, R.(4), Falgayrat, A.(4), Paolone, A.(1).
(1) Consiglio Nazionale delle Ricerche, Istituto dei Sistemi Complessi,Piazzale Aldo Moro 5, 00185 Rome, Italy (2) Sapienza University of Rome, Department of Chemistry, Piazzale Aldo Moro 5, 00185 Rome, Italy (3) Agenzia Nazionale per le Nuove Tecnologie, l'Energia e lo Sviluppo Economico Sostenibile (ENEA), Materials and Physicochemical Processes Technical Unit (SSPT-PROMAS- MATPRO), Via Anguillarese 301, 00123 Rome, Italy (4) Solvionic SA, 11 Chemin des Silos, 31100 Toulouse, France

09:45 **Structural and dynamic properties of pyrrolidinium-based ionic liquid - Li electrolyte solutions** — J 3.3
Michele A. Salvador, Elena Degoli, Alice Ruini, Rita Magri
University of Modena and Reggio Emilia, University of Modena and Reggio Emilia, University of Modena and Reggio Emilia, University of Modena and Reggio Emilia, University of Modena and Reggio Emilia

10:00 **Long Cycle Life Li-ion Batteries Using Non-flammable Gel Electrolyte Prepared Via In-situ Crosslinking** — J 3.4
Cluzeau Benoît, Dedryvere Rémi, Dumont Erwan, Gillot Stephane, Jordy Christian, Pavlenko Ekaterina
IPREM laboratory, IPREM laboratory, Saft compagny, Saft compagny, Saft Compagny, Saft compagny.

10:15 **Low resisitance at interface of [LiG4][TFSA] ionic liquid and LiCoO2(001) positive electrode by introducing Li3PO4 buffer layer** — J 3.5
Jun Deng, Kazunori Nishio, Yuki Watanabe, Kurei Edamura, Ryota Shimizu, and Taro Hitosugi
Tokyo Institute of Technology, Japan

10:30 **Discussion**

10:45

11:00 **Searching better performing methods to calculate the electrochemical stability of ionic liquids** — J 3.6
A. Paolone (1), S. Brutti (1,2), S. Di Muzio (1)
(1) Consiglio Nazionale delle Ricerche, Istituto dei Sistemi Complessi, Rome, Italy, (2) Sapienza Università di Roma, Dipartimento di Chimica, Rome, Italy

11:15 **Micro-spectroscopic investigation of the SEI on amorphous Si electrodes operating in ionic liquid electrolytes** — J 3.7
N. Carboni,(a) S. Brutti,(a),(b),(c) O. Palumbo,(a) G.B. Appetecchi,(d) G. Maresca,(d) H. Geaney,(e) K. M. Ryan,(e) F. Capitani,(f) S. Fantini,(g) R. Lin,(g) P.-A. Martin,(g) A. Paolone(a)
(a) ISC-CNR, UOS Sapienza, Piazzale A. Moro 5, 00185 Roma (IT), (b) Dip. Chimica Un. Roma La Sapienza, P.le Aldo Moro 5, 00185 Roma (IT), (c) GISEL—Centro di Riferimento Nazionale per i Sistemi di Accumulo Elettrochimico di Energia, INSTM, via G. Giusti 9, 50121 Firenze (IT), (d) ENEA, Materials and Physicochemical Processes Technical Unit (SSPT-PROMAS- MATPRO), Via Anguillarese 301, 00123 Roma (IT), (e) Department of Chemical Sciences, University of Limerick (IE), (f) Synchrotron Soleil, BP 48, 91192 Gif-sur-Yvette (FR), (g) SOLVIONIC, 11 Chemin des Silos, 31100 Toulose (FR)

11:30 **Eutectogel and ionogel hybrid solid electrolytes for rechargeable batteries** — J 3.8
A. Hardy, J. Mercken, A.-S. Kelchtermans, B. Joos, D. De Sloovere, M.K. Van Bael UHasselt, Institute for Materials Research, imec division imomec, Energyville, Agoralaan building D, 3590 Diepenbeek, Belgium

12:00 **Discussion**

12:15 **LUNCH**

Redox Flow Batteries : Cristina Flox

15:00 INV **Sustainable Carbon Fibres for the Next Generation of Redox Flow Batteries** — J 4.1
Ana Belen Jorge Sobrido*, Rhodri Jervis, Michael W Thielke, Maria Crespo Ribadeneyra
Associate Professor in Sustainable Energy Materials, UKRI Future Leaders Fellow School of Engineering and Materials Science, Queen Mary University of London
*a.sobrido@qmul.ac.uk

15:30 **Solid boosted flow batteries: Operation from the point of view of thermodynamics and kinetics of charge transfer between the re** — J 4.2
M. Moghaddam1 and P. Peljo1
1. Research group of Battery Materials and Technologies, Faculty of Technology, University of Turku, 20500 Finland pekka.peljo@utu.fi / mahdi.moghaddam@utu.fi

15:45 **A long cycle life zinc-iodide flow battery enabled by a low cost electrolyte additive** — J 4.3
M. Chakraborty1,2, T. Andreu1,3, M. Guc1, J.R. Morante1,3, S. Murcia-López1
1 Catalonia Institute for Energy Research (IREC), Jardins de les Dones de Negre 1, Sant Adrià de Besós, 08930, Spain 2 Universitat Autonoma de Barcelona (UAB), Plaça Cívica, Bellaterra, 08193, Spain 3 University of Barcelona (UB), Martí i Franquès 1, Barcelona, 08020, Spain e-mail address: mchakraborty@irec.cat

16:00 **Modelling electrolyte degradations in aqueous redox flow batteries** — J 4.4
Loïs BRIOT(a), Quentin CACCIUTTOLO(a), Martin PETIT(a), Marie-Cécile PERA(b)
(a) IFP Energies Nouvelles, Rond-Point de l'échangeur de Solaize, F-69360 Solaize, France. (b) FEMTO-ST Institute, FCLAB, Univ. Bourgogne Franche-Comté, CNRS, F-90000 Belfort, France.

16:15 **Discussion**

16:30 INV **Recent works on the membrane for non-aqueous redox flow battery** — J 4.5
Yongdan Li a,b,c*
a) Department of Chemical and Metallurgical Engineering, Aalto University, Kemistintie 1, FI-00076 Aalto, Finland b) State Key Laboratory of Chemical Engineering (Tianjin University), Tianjin Key Laboratory of Applied Catalysis Science and Technology, School of Chemical Engineering and Technology, Tianjin University, Tianjin 300072, China c) Collaborative Innovation Center of Chemical Science and Engineering (Tianjin), Tianjin 300072, China E-mail of corresponding author: yongdan.li@aalto.fi

17:00 INV **Material designs and testings of organic redox flow batteries based on multi-electron quinone molecule** — J 4.6
Puiki Leung
School of Energy and Power Engineering, Chongqing University, ChongQing, China

17:30 **Novel Organic Materials for Non-Aqueous Redox Flow Batteries: Implementation of Triarylamine and Phenazine Core Structures** — J 4.7
Romadina E.I.[1], Stevenson K.J.[1]
[1] Skolkovo Institute of Science and Technology, Bolshoy Boulevard 30, bld. 1, Moscow, Russia

17:45 **Discussion**

Wednesday june 1

Lithium ion batteries : Cristina Flox

09:00 INV **Digitalization of Battery Manufacturing Processes: From Fundamentals to Accelerated Optimization** J 5.1
Alejandro A. Franco
Laboratoire de Réactivité et Chimie des Solides (LRCS), CNRS UMR 7314, Université de Picardie Jules Verne, Hub de l'Energie, 15 Rue Baudelocque, 80039 Amiens, France,Réseau sur le Stockage Electrochimique de l'Energie (RS2E), Fédération de Recherche CNRS 3459, Hub de l'Energie, 15 Rue Baudelocque, 80039 Amiens, France, ALISTORE-European Research Institute, Fédération de Recherche CNRS 3104, Hub de l'Energie, 15 Rue Baudelocque, 80039 Amiens, France, Institut Universitaire de France, 103 Boulevard Saint-Michel, 75005 Paris, France

09:30 **In operando chemical and structural imaging of battery materials using correlative SEM and SIMS** J 5.2
Cressa, L.* (1), Sun, Y. (2), Kopljar, D. (2), Burkhardt, C. (3), De Castro, O. (1), Gerard, M. (1), Wirtz, T. (1), Eswara, S. (1)
(1) Advanced Instrumentation for Nano-Analytics (AINA), MRT Department, Luxembourg Institute of Science and Technology, 41, rue du Brill, L-4422 Belvaux, Luxembourg, (2) German Aerospace Center (DLR), Institute of Engineering Thermodynamics, Pfaffenwaldring 38-40, 70569 Stuttgart, Germany, (3) Natural and Medical Sciences Institute (NMI) at the University of Tübingen, Markwiesenstr. 55, 72770 Reutlingen, Germany

09:45 **Enabling Layer-Structured Si-Anodes for usage in Li-ion Batteries by Controlled Kirkendall Void Formation** J 5.3
Sahar Lausch, Andreas Krause-Bader, Robert Gorgas, Toni Buttler, Susan Fülle, Marcel Neubert
Sahar Lausch, Andreas Krause-Bader, Robert Gorgas, Susan Fülle, Marcel Neubert are with the NORCSi GmbH Battery Company, Weinbergweg 23, D-06120 Halle, Germany. Toni Buttler is with the Interdisciplinary Centre for Materials Sciences (IZM), Martin Luther University Halle-Wittenberg, D-06120 Halle, Germany.

10:00 **Unveiling the (electro-)chemical interface degradation upon cycling of NCM622/LPSCl solid-state batteries** J 5.4
Lelotte, B.* (1), Vaz, C. A. F. (2), Pelé, V. (3), Jordy, C. (3), Gubler, L. (1) & El Kazzi, M. (1)
(1) Electrochemistry Laboratory, Paul Scherrer Institut, Villigen PSI, Switzerland (2) Swiss Light Source, Paul Scherrer Institut, Villigen PSI, Switzerland (3) SAFT, Direction de la Recherche, Bordeaux, France

10:15 **Improved electrochemical performance of a high voltage spinel LiNi0.5Mn1.5O4 modified by an Al rich coating** J 5.5
Gwenaëlle COURBARON (1,2), Nathalie DELPUECH (1,3,4), Emmanuel PETIT (2,3,4), Jon SERRANO (2,4,5), Dany CARLIER (2,3,4), Jacob OLCHOWKA (2,3,4), Christine LABRUGERE (6), Cyril AYMONIER (2,3), Laurence CROGUENNEC (2,3,4)
(1) Renault SAS, Technocentre, 1 avenue du golf, 78280 Guyancourt, France (2) Univ. Bordeaux, CNRS, Bordeaux INP, ICMCB UMR 5026, F-33600 Pessac, France (3) RS2E, Réseau Français sur le Stockage Electrochimique de l'Energie, FR CNRS 3459, France (4) ALISTORE-ERI European Research Institute, FR CNRS 3104, 80039 Amiens Cedex France (5) CIC Energigune, Albert Einstein 48, Parque Tecnologico de Alava, Miñano 01510, Spain (6) PLACAMAT, UMS 3626, CNRS Université Bordeaux, 33600 Pessac, France

10:30 **Discussion**

10:45

11:00 **Multiscale investigation of sulfide based solid electrolyte** J 5.6
Adrien fauchier-Magnan1, Patrice Perrenot2, Oscar Defoor3, Emmanuelle Suard4, François Fauth5, Claire Villevieille1
1. Univ. Grenoble Alpes, Univ. Savoie Mont Blanc, CNRS, Grenoble INP*, LEPMI, 38000 Grenoble, France 2. CEA- LITEN, 17 rue des Martyrs, F-38000 Grenoble, France 3. CEA, IRIG Institute, 17 rue des Martyrs, F-38000 Grenoble, France 4. ILL, rue des Martyrs, F-38000 Grenoble, France 5. ALBA synchrotron, Barcelona, Spain

11:15 **Unraveling the role of counter electrode in the analysis of the nucleation overpotential in lithium metal batteries** J 5.7
Abdolkhaled Mohammadi Laure Monconduit Lorenzo Stievano Reza Younesi
1 ICGM, University Montpellier, CNRS, Montpellier, France 2 Department of Chemistry – Ångström Laboratory, Uppsala University, Box 538, 75121 Uppsala, Sweden 3 Alistore-ERI, CNRS FR, Amiens 3104, France 4 RS2E, CNRS, Amiens, France

11:30 **Hybrid materials based on carbon-metal sulphide nanocrystals as electrodes for rechargeable batteries** J 5.11
María Bernechea1,2,3,4*, Sergio Aina1,2, M. Pilar Lobera1,2,3
1 Instituto de Nanociencia y Materiales de Aragón (INMA) CSIC-Universidad de Zaragoza, Zaragoza, Spain 2 Departamento de Ingeniería Química y Tecnologías del Medio Ambiente, Universidad de Zaragoza, Zaragoza, Spain 3 Networking Biomedical Research Centre of Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN), Madrid, Spain 4 ARAID, Zaragoza, Spain * mbernechea@unizar.es

11:45 **Cross-section nano-Auger analysis to reveal bulk chemical/morphological information in composites for energy storage** J 5.9
Madec, L.*(1,2), Ledeuil, J.B.(1), Tang, C.(2,3), Giaume, D.(2,4), Guerlou-Demourgues, L.(2,3), Monconduit, L.(2,5), Martinez, H.(1,2)
(1) Universite de Pau et des Pays de l'Adour, E2S UPPA, CNRS, IPREM, Pau, France, (2) Réseau sur le Stockage Electrochimique de l'Energie, CNRS FR3459, Amiens, France, (3) Bordeaux, Bordeaux INP, ICMCB UMR5026, F-33600 Pessac, France, (4) Chimie-ParisTech, PSL Research University, CNRS, IRCP, 75005 Paris, France, (5) ICGM, Université de Montpellier, CNRS, Montpellier, France

12:00 **Discussion**

12:15 **Lunch**

15:00 **Vanadium oxides and zinc oxide thin films for energy storage applications: study of their combination and synergy with graphene** J 5.10
T. Tite*(1), H. Ghannam(1,2), O.Elkhouja(1,3), C. Ungureanu(4), M. Buga(4), A. A. Zaulet(4), I. Stavarache(1), E. Matei(1), M. Y. Zaki(1), C. C. Negrila(1), A.C. Galca(1), G.E. Stan(1), A. Galatanu(1), M-C. Bartha(1), M. Baibarac(1), A. Chahboun(2)
(1) National Institute of Materials Physics, RO-077125 Magurele, Romania (2) Abdelmalek Essaadi University, FSTT, Thin Films and Nanomaterials Lab., 90000 Tangier, Morocco (3) Laboratory of Materials and Subatomic Physics, Faculty of Sciences, Ibn Tofail University, Campus Universitaire, 14000 Kenitra, Morocco (4) National Research and Development Institute for Cryogenics and Isotopic Technologies - ICSI Rm. Valcea, Uzinei Street no. 4, PO Box Râureni 7, 240050, Râmnicu Vâlcea, Romania

15:15 **A cost and performance analysis of organic battery materials** J 5.8
Innocenti, A. (1, 2)*, Chen, Z. (1, 2) & Passerini, S. (1, 2)
1) Helmholtz Institute Ulm (HIU), Germany 2) Karlsruhe Institute for Technology (KIT), Germany

15:30 **Anodic sulfate adsorption on vicinal Cu(111) electrode surfaces** J 5.12
Gianlorenzo Bussetti1, Claudia Filoni*1, Lamberto Duò1, Franco Ciccacci1, Klaus Wandelt2
1) Department of Physics, Politecnico di Milano (Italy) 2) Institute of Physical and Theoretical Chemistry, Bonn University (Germany)

15:45 **Investigation of the thermodynamic properties of new full-Heusler Co2Ti Pb by using first principles calculations** J 5.13
Ali Zitouni, Gherici Remil, Bouabdellah Bouadjemi, Samira Cherid, Yamina Sefir, Mohamed Houari, Mohamed Matougui, Tayeb Lantri and Samir Bentata.
Laboratory of Technology and of Solids Properties / Faculty of Sciences and Technology, BP227 AbdelhamidIbn Badis University, 27000 Mostaganem, Algeria

16:00 **Discussion**

16:15

2 - Materials for electrochemical applications : -

16:30 **Electrodeposited Pt NPs on highly ordered TiO2 nanotubes for photocatalytic application: degradation of amido black dye** **J J.5.1**
M.Azziz. HAJJAJI1, A.HAJJAJI1*,A.A.ASSADI2 and B. BESSAIS1
1 Laboratoire de Photovoltaïque, Centre de Recherches et des Technologies de l'Energie, Technopole de Borj-Cédria, BP 95, 2050 Hammam-Lif, Tunisia. 2 Univ. Rennes, Ecole Nationale Supérieure de Chimie de Rennes, CNRS, ISCR-UMR 6226, F-35000 Rennes, France

16:30 **Impact of annealing ZrO2 nanotubes on photocatalytic degradation of pollutants** **J J.5.2**
Safa Jemai1,4, Kaouther Gueddana1, Khaled Trabelsi1, Anouar Hajjaji1*, Mosbah Amlouk3, Bernabé Mari Soucase4, Sami Rtimi2, Brahim Bessais1
1Laboratoire de Photovoltaïque, Centre de Recherches et des Technologies de l'Energie, Technopole de Borj-Cédria, BP 95, 2050 Hammam-Lif, Tunisia 2 Ecole Polytechnique Fédérale de Lausanne (EPFL), EPFL-STI-IMX-LTP, Station 12, CH-1015, Lausanne, Switzerland 3Laboratory of Nanomaterials, Nanotechnology and Energy (L2NE),Faculty of Sciences of Tunisia, El Manar University,2092 Tunis, Tunisia 4 School of Design Engineering, Departamento de Fisica Aplicada, Universitat Politecnica de Valencia, Cami de Vera, Spain

16:30 **Stable PbS-doped Ta2O5 nanotubes prepared by Silar method for photocatalytic dye degradation.** **J J.5.3**
Ines Khemissi a , Khaled Trabelsi a , Abdeslem Kouki b , Anouar Hajjaji *a , Sami Rtimi c and Brahim Bessais a
(a) Laboratoire de Photovoltaïque, Centre de Recherches et des Technologies de l'Energie, BP 95, 2050 Hammam-Lif, Tunisia (b) Université de Carthage, Faculté des Sciences de Bizerte, LR01ES15, Laboratoire de Physique des Matériaux: Structure et Propriétés, 7021 Zarzouna Bizerte, Tunisie (c) Ecole Polytechnique Fédérale de Lausanne (EPFL), EPFL-STI-IMX-LTP, Station 12, CH-1015, Lausanne, Switzerland

16:30 **Electrochemical Performance of Porous Carbon / One-Dimensional Polypyrrole Electrodes for Water Desalination** **J J.5.4**
Vagenas M.* (1,2), Plakantonaki N. (1), Giannakopoulou T. (1), Todorova N. (1), Papailias I. (1), Argirusis C. (2), Trapalis C. (1) * lead presenter
(1)Institute of Nanoscience and Nanotechnology, National Centre for Scientific Research "Demokritos", 15341, Greece (2) School of Chemical Engineering, National Technical University of Athens, 15773, Greece

Post Lithium-ion batteries : Cristina Flox

09:00 INV **Semi solid lithium/oxygen flow batteries: challenges and promises** **J 6.1**
Francesca Soavi1,2,3,4*, Alessandro Brilloni1,2,3,4, Francesca De Giorgio3,4,5, Federico Poli1,2,3,4
1 Department of Chemistry "Giacomo Ciamician", Alma Mater Studiorum Università di Bologna, Via Selmi 2, Bologna 40126, Italy 2 ENERCube, Centro Ricerche Energia, Ambiente e Mare, Centro Interdipartimentale per la Ricerca Industriale Fonti Rinnovabili, Ambiente, Mare ed Energia (CIRI -FRAME), - Alma Mater Studiorum University of Bologna, Viale Ciro Menotti, 48, 48122 Marina di Ravenna RA (RA) 3 BETTERY Srl, Via C. Pisacane 56, Massafra 74016, Italy 4 National Reference Center for Electrochemical Energy Storage (GISEL) - INSTM, Via G. Giusti 9, 50121 Firenze (Italy) 5 Consiglio Nazionale delle Ricerche, Istituto per lo Studio dei Materiali Nanostrutturati (CNR-ISMN), via Piero Gobetti 101, Bologna, 40129, Italy

09:30 **Investigation of Zinc-based spinels & (pyro)phosphates for Zn-ion and Zn-air batteries** **J 6.2**
Deepa Singh* (1), A Baby (1,2), & Prabeer Barpanda (1)
(1) Indian Institute of Science, Bangalore, India, (2) University of Illinois at Urbana Champaign (UIUC), IL, USA.

09:45 **Nanostructured zinc manganite thin films as cathodes for aqueous zinc-ion batteries.** **J 6.3**
Macrelli, A.*(1), Casari, C.S.(1), Li Bassi, A.(1), Russo, V.(1) & Bozzini, B.(2).
(1) Micro- and Nanostructured Materials Lab (NanoLab), Department of Energy, Politecnico di Milano, 20133 Milano, Italy, (2) Battery Materials Engineering Laboratory (BMEL), Department of Energy, Politecnico di Milano, 20156 Milano, Italy. * lead presenter

10:00 **Hydrothermally Synthesized V2O5 as an Advanced Cathode Material for Low-Cost Aqueous Aluminum Ion Battery** **J 6.4**
Puja De, Joyanti Halder, Surbhi Priya, Amreesh Chandra
Department of Physics, Department of Energy Science and Engineering, Indian Institute of Technology Kharagpur, Kharagpur-721302, India

10:15 **Understanding of the Solid Electrolyte Interphase Formed in Ca Metal Batteries** **J 6.5**
Bodin C.* (1) (2), Forero-Saboya J.D. (1), Yousef I. (3), Davoisne, C. (2) (4), Dedryvère R. (2) (5) & Ponrouch A. (1) (2).
(1) Institut de Ciència de Materials de Barcelona, ICMAB-CSIC, Campus UAB, 08193 Bellaterra, Spain (2) ALISTORE - European Research Institute - CNRS FR 3104 - Hub de l'Energie - 80039 Amiens - France (3) MIRAS Beamline, ALBA Synchrotron Light Source, Carrer de la Llum 2-26, 08290 Cerdanyola del Vallès, Spain (4) Laboratoire de Réactivité et Chimie des Solides, Université de Picardie Jules Verne, CNRS UMR7314, 33 rue Saint Leu, 80039 Amiens, France
(5) IPREM, E2S-UPPA/CNRS/ Université de Pau & Pays de l'Adour, 64000 Pau, France

10:30 **Discussion**

10:45

11:00 **From electrochemical to failure mechanisms in KxVPO4F1-yOy high voltage positive electrodes for K-ion batteries** **J 6.6**
Romain Wernert, Antonella Iadecola, François Fauth, Laure Monconduit, Dany Carlier, Laurence Croguennec
Université de Bordeaux, CNRS, Bordeaux INP, ICMCB UMR CNRS #5026, Pessac, F-33600, France, RS2E, Réseau Français sur le Stockage Electrochimique de l'Energie, FR CNRS #3459, Amiens F-80039 Cedex 1, France, CELLS-ALBA synchrotron, E-08290, Cerdanyola del Vallès, Barcelona, Spain, ICGM, Univ. Montpellier, CNRS, Montpellier, France, Université de Bordeaux, CNRS, Bordeaux INP, ICMCB UMR CNRS #5026, Pessac, F-33600, France,Université de Bordeaux, CNRS, Bordeaux INP, ICMCB UMR CNRS #5026, Pessac, F-33600, France

11:15 **Real-time imaging of Na+ reversible intercalation in "Janus" graphene stacks for battery applications** **J 6.7**
Vincenzo Palermo1,3 Jinhua Sun1, Matthew Sadd1, Philip Edenborg1, Henrik Grönbeck1, Peter Thiesen2, Zhenyuan Xia1, Vanesa Quintano1, Ren Qiu1, Aleksandar Matic1
1Chalmers University of Technology, Göteborg, Sweden. 2Accurion GmbH, Stresemannstraße 30, Göttingen 37079, Germany. 3Institute of Organic Synthesis and Photoreactivity (ISOF), National Research Council of Italy (CNR), Bologna, Italy.

11:30 **Stoichiometry of electrochemical solvent co-intercalation reactions and new sodium-ion electrolyte for graphite anodes** **J 6.8**
Gustav Åvall, Youhyun Son, Guillermo Alvarez Ferrero, Knut Arne Janßen, Philipp Adelhelm
Institut für Chemie, Humboldt Universität zu Berlin, Brook-Taylor-Str. 2, 12489 Berlin, Germany,Institut für Chemie, Humboldt Universität zu Berlin, Brook-Taylor-Str. 2, 12489 Berlin, Germany,Institut für Chemie, Humboldt Universität zu Berlin, Brook-Taylor-Str. 2, 12489 Berlin, Germany,Institut für Chemie, Humboldt Universität zu Berlin, Brook-Taylor-Str. 2, 12489 Berlin, Germany,Institut für Chemie, Humboldt Universität zu Berlin, Brook-Taylor-Str. 2, 12489 Berlin, Germany, Joint Research Group Operando Battery Analysis, Helmholtz-Zentrum Berlin, Hahn-Meltner-Platz 1, 14109 Berlin, Germany

11:45 **Ab initio study of external electric field effects on Na adsorption and uptake at TiO2 anatase surfaces** **J 6.9**
Fasulo, F. *(1), Massaro, A. (1), Muñoz-García, A.B. (2) & Pavone, M. (1).
(1) Department of Chemical Sciences, University of Naples Federico II, Via Cintia 21, 80126 Napoli, Italy (2) Department of Physics “E. Pancini”, University of Naples Federico II, Via Cintia 21, 80126 Napoli, Italy * lead presenter

12:00 **Discussion**

12:15 **Lunch**

Post Lithium-ion batteries : Olivier Crosnier

15:00 **Exploration of spray drying prepared mixed polyanionic NaFe2PO4¬(SO4¬)2 battery insertion material** **J 6.10**
Lochab, S.*(1), Singh, D.(2), Jayanthi, K.(3) Navrotsky, A.(3), Ahuja, R.(2) & Barpanda, P.(1)
(1) Indian Institute of Science, Bangalore, India, (2) Uppsala University, Upsala, Sweden, (3) Arizona State University, Arizona, United States,

15:15 **Stable cycling of sodium metal anodes enabled by a sodium/silica-gel host** **J 6.12**
A. Petrongari (a), M. Tuccillo (a), A. Latini (a), S. Brutti (a)
(a) Dipartimento di Chimica, Università di Roma La Sapienza, P.le Aldo Moro 5, 00185 Roma (Italy)

15:30 **Oxygen redox activity in P2-type layered oxides as high-energy cathodes for Na-ion battery** **J 6.13**
Arianna Massaro, Ana Bélen Muñoz-García, Michele Pavone
Department of Chemical Science, University of Naples “Federico II”, Naples, Italy
Department of Physics “E. Pancini”, University of Naples “Federico II”, Naples, Italy

15:45 **The energy problem solution on base of the nuclear fusion reactions realization in frame of radiation fluxes waveguide-resonance** **J 6.14**
Egorov E.V.(1,2,3), Egorov V.K.(1)
(1) Institute of Microelectronics Technology Russian Academy of Science (IMT RAS) (2) Institute of Radio Engineering and Electronics Russian Academy of Science (IRE RAS) (3) Financial University under the Government of the Russian Federation

16:00 **Discussion and Closing Remarks**