Call for Papers

deadline for abstract submission:
15 January 2020

www.european-mrs.com
Announcement for 2020 Spring Meeting

It is with great pleasure that we announce the 2020 Spring Meeting of the European Materials Research Society (E-MRS) to be held at the Convention and Exhibition Centre in Strasbourg, France from May 27 to 31.

In line with the previous conferences, it is expected that this event will be the largest in Europe in the field of Materials Science and Technology. Indeed, the E-MRS Spring Meeting is a major conference with over 2500 attendees coming from all over the world every year.

The 2020 Spring Meeting will consist of parallel symposia with invited speakers, oral and poster presentations, assorted by three plenary sessions and a number of workshops and training courses. In parallel with the technical sessions, more than 90 international exhibitors are expected to display equipment, systems, products, software, publications and services during the meeting.

The high quality scientific program will address different topics organized into 25 symposia arranged in four clusters covering the fields of Energy materials; Nanomaterials and advanced characterization ; Biomaterials and soft materials ; Electronics, magnetics and photonics and 2 tutorials on Artificial Intelligence for Advancing Materials Science and Thin Film chalcogenide photovoltaic materials.

The latest scientific results will be presented and authors are invited to submit papers in the selected journals that fit the scope of each symposium. It is worth noting that the papers are peer-reviewed at a high scientific level, according to a process and timetable that are at the discretion of the symposia organizers.

The focus of the scientific program will be both on fundamental investigations and technological applications, providing an international forum for discussing recent advances related to the different aspects to be considered to promote innovation.

The focal point of the conference will be the three plenary sessions, each consisting of one high level presentation given by Prof. Sir James Fraser Stoddart from Northwestern University, USA (Nobel Laureate in Chemistry 2016), Prof. André Geim from University of Manchester, U.K. (Nobel Laureate in Physics 2010) and Prof. Ulrike Diebold from TU Vienna, Austria.

On Wednesday evening, two eminent presentations will be given by the MRS Mid-Career Award winner and the winner of the EU-40 E-MRS Prize. These assorted presentations demonstrate exceptional promise for leadership and have made outstanding and innovative contributions to Materials Research in Europe and the US. The presentation of Graduate Students Awards, delivered for each one of the run symposia, will conclude the session. We encourage all junior researchers to apply to these awards.

Please note the deadline for abstract submission is set for January 15, 2020!

It will be our great pleasure to welcome you all in Strasbourg next May.

Prof. Peter WELLMANN
E-MRS President
Presentation

EUROPEAN COORDINATION GROUP

President
Peter WELLMANN
Materials Department 6
Electronic Materials
and Energy Technology
University of Erlangen
Martensstr. 7
91058 Erlangen
Germany
peter.wellmann@ww.uni-erlangen.de

Vice-President
Valentin CRACIUN
National Institute for Laser,
Plasma, and Radiation
Physics Laser Department
Bucharest
Romania
valentin.craciun@infpr.ro

Vice-President
Joan Ramon MORANTE
IREC, Catalonia Institute for Energy
Research
Jardi Dones de Negre 1
Sant Adrià del Besòs 08930
Spain
jrmorante@irec.cat

General Secretary
Paul SIFFERT
E-MRS
BP.20
67037 Strasbourg cedex 2
France
Phone: +33 3 88 10 65 43
emrs@european-mrs.com

President
Peter WELLMANN
Materials Department 6
Electronic Materials
and Energy Technology
University of Erlangen
Martensstr. 7
91058 Erlangen
Germany
peter.wellmann@ww.uni-erlangen.de

Vice-President
Valentin CRACIUN
National Institute for Laser,
Plasma, and Radiation
Physics Laser Department
Bucharest
Romania
valentin.craciun@infpr.ro

Vice-President
Joan Ramon MORANTE
IREC, Catalonia Institute for Energy
Research
Jardi Dones de Negre 1
Sant Adrià del Besòs 08930
Spain
jrmorante@irec.cat

General Secretary
Paul SIFFERT
E-MRS
BP.20
67037 Strasbourg cedex 2
France
Phone: +33 3 88 10 65 43
emrs@european-mrs.com

CONFERENCE CHAIRS

Catherine DUBOURDIEU
Helmholtz-Zentrum Berlin für Materia-
lien und Energie GmbH - Freie Univer-
sität Berlin
Hahn-Meitner-Platz 1
D-14109 Berlin, Germany
catherine.dubourdieu@helmholtz-ber-
ilin.de

Giovanni MARLETTA
University of Catania
Laboratory for Molecular Surfaces and
Nanotechnology V.le A.Doria 6
Catania Italy
gmarletta@unict.it

Paolo SAMORI
University of Strasbourg
Institut de Science et d’Ingénierie Su-
pramoléculaires
8 allée Gaspard Monge
67000 Strasbourg, France
samori@unistra.fr

Wenping HU
Tianjin University
Key Laboratory of Molecular Optoe-
lectronic Sciences
P.R. China
huwp@tj.edu.cn

CONFERENCE SECRETARIAT

E-MRS Headquarters
BP.20
67037 Strasbourg cedex 2
France
Phone: +33 3 88 10 63 72
emrs@european-mrs.com
www.european-mrs.com

deadline for abstract submission: 15 January 2020
PLENARY SESSIONS

1. Tuesday, May 26 (8:45 - 9:45)
   Prof. Sir James Fraser Stoddart
   Nobel Laureate in Chemistry (2016)
   Northwestern University, USA

2. Wednesday, May 27 (8:45 - 9:45)
   Prof. André Geim
   Nobel Laureate in Physics (2010)
   University of Manchester, U.K.

3. Thursday, May 28 (8:45 - 9:45)
   Prof. Ulrike Diebold
   TU Vienna, Austria

EU-40 MATERIALS PRIZE

The award is reserved to researchers showing exceptional promise as leaders in the materials science having performed the research for which this prize is awarded while working in Europe.

The award consists of a 5,000 Euro cash prize, a certificate, waiver of the meeting registration fees and a plenary talk at the 2020 Spring Meeting of the European Materials Research Society where the award will be presented.

Nominations should include:
1. Curriculum Vitae including birth date
2. List of key publications (including citations and impact factors)
3. Letters of support from two well established scientists
4. Any additional supporting information relevant to the award.

The nomination package should not exceed 10 pages (excluding the list of key publications) and should be sent by email at emrs@european-mrs.com (subject: eu40materials) before February 28th, 2020.

The nominee shall not have reached his/her 40th birthday in the year in which the nomination is submitted (2019). Proposals will be evaluated shortly after and the candidates will be informed end of March 2020.

GRADUATE STUDENT AWARDS

E-MRS announces the availability of awards (up to 2 per symposium) for graduate students conducting research on a topic to be addressed in the symposia planned for the E-MRS 2020 Spring Meeting. Each award will consist of a cash grant of 450 Euro, that will be offered during the award ceremony on Wednesday evening jointly with a diploma.

Criteria for selection are:
- Participation at the E-MRS 2020 Spring Meeting as an attendee and author or co-author of a symposium paper.
- Outstanding performance in the conduct of this project and promise for future substantial achievement in materials research as judged by the faculty advisor.
- Significant and timely research results.
- Application materials required:
  - Application form under www.european-mrs.com
  - Abstract of paper to be presented at the meeting
  - Letter of support from research supervisor.
- Submit the complete application to the E-MRS Secretariat.

Deadline for complete application is April 27th, 2020.

Winners will be notified directly by the concerned symposium organizer. E-MRS Graduate Student Award Winners must be present during the social event to get their prizes.

EXHIBITION

Around 90 international exhibitors will display a full spectrum of equipment, instrumentation, products, software, publications and services. To be held on May 26-28 in the Convention and Exhibition Centre of Strasbourg, the exhibit will be convenient to the technical session rooms and scheduled to coincide with the technical program. For exhibitors, it will mean an excellent opportunity to meet just the right customers and disseminate information effectively.

For meeting attendees, the E-MRS exhibition will offer the convenience of visiting with multiple vendors all under one roof. So, pick up some literature, enjoy a hands-on product demonstration or meet face-to-face with company representatives.

See more at: www.european-mrs.com

E-MRS sponsorship can help you raise awareness for your company, promote brand image and visibility, publicize a new product or generate quality sales leads. Be sure to plan early for the best availability and exposure.

Companies interested in exhibiting should contact:
E-MRS Headquarters
BP.20 - 67037 Strasbourg Cedex 2
France
Phone: +33 3 88 10 63 72 - Email: emrs@european-mrs.com

SATELLITE EVENTS

Satellite events are full-/half-day workshops or tutorials that are part of the conference programme but will be held on Sunday, prior to the conference. Two tutorials will be organized on May 24:
- Thin Film chalcogenide photovoltaic materials
  (as part of the symposium A: Thin film chalcogenide photovoltaic materials)
- Artificial intelligence for advancing materials science

AWARDS CEREMONY

The Awards ceremony will be held on Wednesday May 27, starting at 18:30. Two eminent presentations will be given by the MRS Mid-Career Award winner and the winner of the EU-40 E-MRS Prize. The presentation of the Graduate Students Awards, delivered to the recipients of all running symposia, will conclude the session.

SOCIAL EVENT

CONFERENCE RECEPTION

All participants are invited to attend the conference reception on Wednesday May 27, 2020 at 20:00. Enjoy drinks and food while listening to live music! It is a chance to meet and renew relationships with colleagues. The participation is free of charge.
Programme

Energy materials
A Thin film chalcogenide photovoltaic materials
B Advances in thermophotovoltaics: materials, devices and systems
C Doping and charge transport processes in organic and hybrid materials for energy applications
D Organic semiconductors for energy and electronics: from fundamental properties to devices
E Exotic materials and innovative concepts for photovoltaics
F 2D materials for energy applications
G Chemical functionalization of 2D materials
H Solid state ionics: advanced concepts and devices

Nanomaterials and advanced characterization
I Laser material processing: from fundamental interactions to innovative applications
J Advanced functional films grown by pulsed deposition methods
K Recent advances and challenges in chemical synthesis and solution processing of advanced inorganic nanomaterials
L Carbon- and/or nitrogen-containing thin films and nanomaterials
M Defect-induced effects in nanomaterials
N Advanced small-scale mechanical characterization: strength, plasticity, fracture and fatigue
O New developments in the modeling and analysis of radiation damage in materials II
P ALTECH 2020 - analytical techniques for precise characterization of nano materials
Q Current trends in optical and X-ray metrology of advanced materials for nanoscale devices VI

Biomaterials and soft materials
R Bioinspired and biointegrated materials as new frontiers nanomaterials X
S Biohybrid nanomaterials: bioinspired, DNA- and peptide-based assemblies for sensing, delivery and electronics
T Cellulose electronics and photonics: a new challenge for materials a new opportunity for devices III
U Biocomputation: materials, algorithms, devices and fabrication

Electronics, magnetics and photonics
V Carrier transport, photonics and sensing in group IV-based and other semiconductors nanodevices
W Materials research for group IV semiconductors: growth, characterization and technological developments IV
Y Neuro-inspired information processing: from novel materials concepts for neuromorphic computing to local processing of biological signals
Z Substitution and recycling of critical raw materials in optoelectronic, magnetic and energy devices III

deadline for abstract submission: 15 January 2020
ENERGY MATERIALS

Symposium A

Thin film chalcogenide photovoltaic materials

The Thin Film Chalcogenide Photovoltaic Materials symposium 2020 will closely follow the research in the field of chalcogenide materials for PV applications based on derivatives of CdTe, Cu(In,Ga)(S,Se)2, Cu2ZnSn(S,Se)4 and their related alloys. It aims to provide a platform for presenting recent and on-going researches for further efficiency improvements and cost reduction of these systems.

Scope:

Chalcogenides are highly interesting for their use as light absorber layers in solar cells due to their uniquely high absorbance, bandgap tunability and defect chemistry. Stability and reliability, monolithic deposition, aesthetic appearance, applicability onto flexible substrates and in roll-to-roll production, superior temperature coefficient, potential in tandem applications are other advantages that chalcogenide technology offers. These materials include CdTe and its alloys, Cu(In,Ga)Se2 – Cu2SnSe3 – Cu(In,Ga)S2– AghnSe2–Cu2ZnSn(S,Se)4 system (commonly called CsGIS) and their alloys and Cu2ZnSn(S,Se)4.

Presently, record efficiencies of 23.3% for Cu(In,Ga)Se2 and 22.1% for CdTe were obtained, which outperform 22.3% efficiency of multicrystalline silicon. Moreover, industrial activities continue to expand, especially in the field of CdTe and Cu(In,Ga)Se2 which are now produced at the gigawatts peak (GWp) scale.

All of the aforementioned materials are complex and further fundamental research is needed to improve the electrical and material properties and thus enhance the quality of solar cells and modules. New findings will lead to a better understanding of the fundamental physical properties of the semiconductors, which ultimately will lead to increased efficiencies of the solar cell devices and thereby improved cost structures of the photovoltaic systems.

This symposium aims to bring together different actors on these technologies and to provide a platform for presenting recent and on-going researches for further efficiency improvements and cost reduction employing new concepts of solar cell architectures such as passivation and light management, tandem multi-junction architectures, bulk and interfacial optimization, novel related absorber materials as well as deep characterization and modelling.

The symposium has a long tradition on attracting the most successful researchers in the world and is becoming over the years one of the largest symposia at E-MRS Spring Meetings. In previous E-MRS conferences, the research communities in these highly productive research fields have met to discuss and learn from each other. In addition to oral presentations and poster sessions, discussion sessions with thematic topics have also been included at the end of each day. A young scientist tutorial has been a very popular event among the PhD students in the field. We strongly believe that this successful series will attract the leading researchers in the field also in the next E-MRS Spring Meeting 2020.

Hot topics to be covered by the symposium:

- Chalcogenide PV materials, theory and modeling
- Novel alloyed chalcogenide materials
- Processes for film synthesis
- Thin film growth, theory and experimental aspects
- Material combinations and heterostructures
- Material characterization methods
- Electrical characterization methods, device analysis
- New understanding of defects in chalcogenide-based PV materials
- Research related to upscaling and manufacturing
- Diagnostic tools
- Chalcogenide-based solar cells in tandem devices
- The role of alkaline elements in chalcogenide-based solar cells
- Passivation of interfaces and surfaces
- Novel device concepts
- Advanced light management concepts

List of confirmed invited speakers:

- Stepanne Collin (C2N, France): Highly reflective BC for ultrathin CIGS solar cells
- Edgardo Saucedo, (IREC Spain): Progress and Perspectives of Thin Film Kesterite and new chalcogenide materials for thin film photovoltaic technology
- Takeaki Sakurai, (Univ. of Tsukuba, Japan): Defect study for CIGS Se with CsF-PDT
- John M. Walls (Loughborough University, UK): Advanced materials characterization and role of Se in high efficiency CdTe-based devices
- Christian Koffmann (HZB, Germany): Highly efficient monolithic 2 terminal CIGS/Perovskite tandem solar cells
- William Shaftaran, (Dalaware University, US): Comparison of Ag and Ga alloying in low bandgap CuInSe2-based solar cells
- Jon Major (university of Liverpool, UK): Sb2Se3 based thin film solar cells
- Sarah Sofila (MIT, US): Industrial perspective on chalcopyrite tandem devices
- Gang Xiong (First Solar, US): Latest Progress in CdTe solar cells and modules
- Hiroki Sugimoto, (Solar Frontier, Japan): Cd-free Cu(In, Ga)(Se, S)2 thin film solar cell with world record efficiencies
- Claudia Schnorr, (University of Leipzig, Germany): Atomic scale structure characterization of CIGS and alloys (invited talk for the joint session with ALTECH symposium)

Tentative list of scientific committee members:

- D. Lincot (IPVF), France
- T. Wada, (Ryokoku Univ.) Japan
- A.N. Tiwari (Empa), Switzerland
- J.F. Guillemoles (IPVF) France
- D. Cahen (Weizmann Institute of Science) Israel
- U. Rau (Jülich) Germany
- R. Scheer (University of Halle) Germany
- A. Romeo, (University of Verona) Italy
- M. Edoff, (University of Uppsala) Sweden
- D. Abou-Ras (H2B) Germany

Symposium organizers

Alex REDINGER
University of Luxembourg
Scanning Probe Microscopy Laboratory - 162a, avenue de la Falencerie - L-1511 Luxembourg
Phone: +352 4666 44 6358
Mail: alex.redinger@uni.lu

Amit MUNSHI
Colorado State University
Department of Mechanical Engineering, 1374 Campus Delivery, Fort Collins, CO 80523, USA
Phone: +1 970 491 8861
Mail: Amit.Munshi@colostate.edu

Jiro NISHINAGA
National Institute of Advanced Industrial Science and Technology (AIST)
Central 2, 1-1-1, Umezono, Tsukuba, Ibaraki, 305-8568, Japan
Phone: +81 29 861 5042
Mail: jiro.nishinaga@aist.go.jp

Negar NAGHAVI (Main)
Centre National de Recherche Scientifique (CNRS) / Eco-Efficient Products and Process Laboratory (E2P2L)
3 rue Michel Ange, 75016 Paris, France
Phone: +33 6 79 50 90 69
Mail: negar.naghabi@chimieparistech.psl.eu

Romain CARRON
Empa
Laboratory for Thin Films and Photovoltaics, Überlandstrasse 129, 8600 Dübendorf, Switzerland
Phone: +41 56 785 4791
Mail: romain.carron@empa.ch
Advances in thermophotovoltaics: materials, devices and systems

An analysis of the scientific literature indicates a revival of research on thermophotovoltaics, boosted by the development of systems for converting waste or stored heat into electrical power. The symposium will provide an interdisciplinary platform for sharing the latest advances in the field.

Scope:
Thermophotovoltaics (TPV) refers to thermal to electrical power conversion based on the photovoltaic effect. It is suited for thermal sources operating at temperatures near or above 1000 K, such as waste or stored heat recovery, or solar energy conversion involving an intermediate thermal energy storage. Given the huge potentials of these systems, and recent progresses in high-temperature materials science, photonics, growth and processing of III-V semiconductors, a renaissance of research on thermophotovoltaics has taken place over the last decade. The challenges to tackle are indeed multiple, for designing, fabricating and testing new materials, devices and systems for TPV applications. In this context, the symposium will cover recent advances in areas relevant to the field: selective emitters to tailor the spectrum of radiation useful to photovoltaic conversion and their thermal stability; optimum materials and architectures of the photovoltaic cells and their fabrication and characterization; laboratory experiments assessing the performances of devices and systems; assessment of optical, electrical and thermal losses and their mitigation; new concepts for improving efficiency including hybridization with other thermal-to-electrical power converters; solar-TPV, TPV for space, near-field TPV systems; thermophotonic power generation and cooling, scaling-up of research prototypes. It is expected that the symposium will facilitate networking in this field through the establishment of exchanges across multiple disciplines in physics and engineering.

Hot topics to be covered by the symposium:
- Tailored spectral thermal emission: photonic crystals, resonant emitters, metamaterials, etc.
- Tailored spectral reflection and transmission: optical filters and reflectors, plasmonics, etc.
- High temperature emitters: fabrication and characterization
- Infrared semiconductors: III-V, quantum nanostructures, etc.
- Thermophotovoltaic devices: design, fabrication and characterization
- Thermophotovoltaic applications: solar, space, waste heat recovery, energy storage, etc.
- Novel concepts: near-field thermophotovoltaics, thermo-photonics, hybrid devices, etc.
- Competing technologies: thermionics and thermoelectrics
- Market assessment and exploitation

List of invited speakers:
- P. Bermel (USA): Review of high-temperature emitters for thermophotovoltaics (tentative)
- Y-B. Chen (China): Development of scalable and cost-effective thermophotovoltaic emitters
- A. Henry (USA): Thermal energy grid storage using multi-junction photovoltaics
- T. Inoue (Japan): Silicon-based one-chip near-field thermophotovoltaic devices
- A. Krier (UK): Developing metamorphic TPV modules for energy conversion
- B.-J. Lee (Republic of Korea): Towards the development of near-field thermophotovoltaic device operating at experimentally achievable gaps
- A. Lenert (USA): Control of photon-recycling phenomena in radiation-limited thermophotovoltaic cells
- H. Linke (Sweden): Hot-carrier photovoltaics in heterostructure nanowires
- Y. Okada (Japan): Thermal up-conversion of sub-bandgap photons in quantum nanostructures for photovoltaics
- J. Oksanen (Finland): Thermophotonic cooling - thermophotovoltaics on steroids
- Y. Cuminal (France): Hot-carrier photovoltaics in heterostructure nanowires
- V. Steimakh (USA): A photonic crystal enabled practical thermophotovoltaic portable power generator
- Z. Zhang (USA): Review of plasmonic and photonic thermal emitters — from theory to practice

Tentative list of scientific committee members:
- R. Alcubilla (Universidad Politècnica de Catalunya, Spain)
- C. Algora (IES-UPM, Spain)
- P. Bermel (Purdue University, USA)
- W. Chan (MIT, USA)
- D. Chubb (NASA, USA)
- Y. Cuminal (IES-U. Montpellier, France)
- P.-O. Chapuis (CNRS, France)
- J. Drevillon (Institut Pprime, France)
- L. Frais (JX Crystals, USA)
- M. A. Green (UNSW, Australia)
- K. Hanamura (Tokyo Inst. of Technology, Japan)
- B-J. Lee (KAIST, Republic of Korea)
- A. Marti (IES-UPM, Spain)
- K. Park (Univ. Utah, USA)
- P. Reddy (U. Michigan, USA)
- E. Tourneil (IES-U. Montpellier, France)
- D. Trucchi (CNR - Institute of Structure of Matter, Italy)
- H. Yugami (Tohoku University, Japan)
- Z. Zhang (Georgia Tech, USA)

Publication:
Selected papers will be published in a Special Issue of Optics Express (OSA).

Symposium organizers
Alejandro DATAS
Technical University of Madrid
Instituto de Energía Solar, Avda. Complutense, 30, 28040, Madrid, Spain
Phone: +34 910672554
Mail: a.datas@ies.upm.es

Makoto SHIMIZU
Tohoku University
Aoba 6-6-01, Arahama, Aoba-ku, Sendai, 980-8579, Japan
Phone: +81 022 795 6925
Mail: m_shimizu@energy.mech.tohoku.ac.jp

Mathieu FRANCOEUR
University of Utah
1495 E 100 S (1550 MEK) - SLC UT 84112, USA
Phone: +1 801 581 5721
Mail: mfrancceur@mech.utah.edu

Rodolphe VAILLON (Main)
Univ. Montpellier, CNRS
Institut d’Electronique et des Systemes - 860, rue Saint Priest - Bâtiment 5 - CC 05001 - 34095 Montpellier Cedex 5, France
Phone: +33 (0)4 67 14 32 27
Mail: rodolphe.vaillon@ies.univ-montp2.fr

Deadline for abstract submission: 15 January 2020
Doping and charge transport processes in organic and hybrid materials for energy applications

Doping and charge transport are key processes to enhance electrical, thermal and optical functions in organic and hybrid materials. They underpin emerging energy saving and bioelectronic devices. The symposium will bring together key investigators to discuss challenges and perspectives of widespread applications of organic and hybrid electronics.

Scope:

Scope of the symposium is to bring together the experimental and theoretical communities to discuss new challenges and perspectives in the areas of doping and charge transport processes in organic and hybrid functional materials. Such themes have been the subject of in-depth investigations in the past, however new findings are challenging the traditional structure-property paradigms, which have been driving the materials design and modeling up to now. The doping mechanisms and the role of dopants in governing the structural and functional properties of either high-charge carrier mobility polymers or perovskites is not well understood yet. New molecular-design methods, dopants and doping techniques are continuously enhancing the values of parameters such as the electrical conductivity, Seebeck coefficient and redox activities, paving the way for organic and hybrid materials to emerging applications such as thermoelectric, supercapacitors and bioelectronic devices.

Great challenges still have to be faced, mainly regarding:

Materials Synthesis
1. Design and synthesis of new organic semiconductors including both small molecule and polymeric conjugated materials
2. Design and synthesis of new dopant systems
3. Design and synthesis of new hybrid materials

Materials and Device Characterization
1. Fundamental understanding of the various doping mechanisms
2. Overcome limited processability and control over the microstructure of doped films
3. Fundamental understanding of the intrinsic chemical instability of n-doped films

Materials Modeling
1. Modeling morphology and structural properties of doped organic and hybrid materials.

Hot topics to be covered by the symposium:

- Fundamental mechanisms of bulk and interfacial doping.
- Structural, optical, electronic, and thermoelectric properties of doped organic and hybrid materials.
- Charge transport in intrinsic and doped systems.
- First-principles methods for charge and thermal transport properties in doped organic and hybrid materials.
- Steady-state and time-dependent vibrational and electronic spectroscopies in doped materials.

List of invited speakers (confirmed):

- Henning Sirringhaus (Uni. Cambridge) – device physics, transport and doping
- Thomas Anthopoulos (KAUST) – OFET and materials
- Michael Chabinyc (UCSB) – organic thermoelectric
- Adam Moule (UC Davis) – doping in organic materials
- Christian Mueller (Chalmers University) – materials chemistry and doping
- Martin Kemnerink (Linköping University) – doping and device physics
- Alberto Salles (Stanford University) – structure-property relationships, doping
- Antonio Facchetti (Northwestern University) – materials chemistry, OFET, PV
- Mariano Campoy-Quiles (ICMAB-CSIC) – polymer, perovskite solar cells
- Mario Ceroni, (IIT) – device physics, organic thermoelectric
- Jana Zawres (Heidelberg University) – nanotubes, OECT
- John Grey, (Uni. New Mexico) - spectroscopy of organic semiconductors
- Koen Vandewal (Hasselt Uni.) – charge recombination in organic solar cells
- Enrico da Como (Uni. Bath) – spectroscopy of organic semiconductors
- Natalie Banerji (Uni. Bern) - molecular spectroscopy of organic semiconductors
- Zhigang Shuai (Tsinghua University, China) – organic/hybrid modeling
- Fabrizia Negri (Uni. Bologna, Italy) – charge transport modeling, organic
- Veaceslav Coropceanu (Georgia Tech, US) – electron-phonon couplings
- Jenny Nelson (Imperial College London, UK) – modeling device physics
- Xavier Blaise (CNRS, France) – modeling doping in organic materials
- Klaus Meerholz (Uni. Cologne) – OLED, device physics
- Enrico da Como (Uni. Bath) – spectroscopy of organic semiconductors
- Matteo Scarcelli (Uni. Firenze, Italy) – modeling doping in organic materials
- Martijn Kemerink (Linköping University) – doping and device physics
- Martijn Kemerink (Linköping University) – doping and device physics
- Natalia Banerji (Uni. Bern) - molecular spectroscopy of organic semiconductors
- Zhigang Shuai (Tsinghua University, China) – organic/hybrid modeling
- Fabrizia Negri (Uni. Bologna, Italy) – charge transport modeling, organic
- Veaceslav Coropceanu (Georgia Tech, US) – electron-phonon couplings
- Jenny Nelson (Imperial College London, UK) – modeling device physics
- Xavier Blaise (CNRS, France) – modeling doping in organic materials
- Klaus Meerholz (Uni. Cologne) – OLED, device physics

Symposium organizers

Christian NIELSEN
Queen Mary University of London
School of Biological and Chemical Sciences, Mile End Road, London E1 4NS, UK
Phone: +44 207882 5902
Mail: c.b.nielsen@qmul.ac.uk

Daniele FAZZI (Main)
University of Cologne
Institute of Physical Chemistry, Luxemburger Str. 116, D - 50939 Cologne, Germany
Phone: +49 221 470 3279
Mail: dfazzi@uni-koehn.de

Simone FABIANO
Linköping University
Department of Science and Technology, SE-60174 Norrköping, Sweden
Phone: +46 11363833
Mail: simone.fabiano@liu.se

Sophia C. HAYES
University of Cyprus
Department of Chemistry, P.O. Box 20537 1678, Nicosia, Cyprus
Phone: +357 22 892769
Mail: shayes@ucy.ac.cy

截止日期：2020年1月15日
**Symposium D**

**Organic semiconductors for energy and electronics: from fundamental properties to devices**

Organic semiconductors exhibit unique traits that make them attractive from the fundamental point of view as well as for a wide range of applications such as solar cells, thin-film transistors, sensors and thermoelectrics. This symposium aims to bring together key researchers in this field to discuss the main challenges towards the widespread application of organic electronics.

**Scope:**

The past years have witnessed a tremendous progress in the development of novel organic materials that have continuously pushed the performance of traditional applications, such as OLEDs, OFETs and OPV, and simultaneously enabled the emergence of innovative technologies, including organic thermoelectrics, conjugated polymer based batteries, and advanced sensors. Further development is expected to come from the combination of new fundamental concepts, in depth understanding of the physico-chemical properties and structure-property nexus, and optimization of devices, keeping an eye on the requirements for upscaling. We expect strong cross-fertilization during the symposium by providing transversal and multidisciplinary sessions centred around issues that are common to several different technologies.

The ability of charge carriers to flow through organic semiconductors is a key aspect for most applications, and it is strongly affected by the morphology of the solid film. The capability of tuning charge density through molecular doping is likewise vital, especially for n-type materials that underpin complementary logic, bulk heterojunction photovoltaics, all-polymer batteries and thermoelectric generators. Transport of heat also affects different technologies, from heat management in emitting devices, to phonon assisted electronic transport, and the figure of merit for thermoelectric materials.

The path towards commercialization involves challenges that again span across applications, including green synthesis and processing, device stability, or flexibility and conformability. Approaches that are currently gaining weight across material sciences, such as high throughput screening or application of data science, are also starting to root in this field. Finally, all these features combined have resulted in of novel applications, including electrolyte-gated OFETs, polymer photocatalysis, artificial skin and neuromorphic devices.

**Hot topics to be covered by the symposium:**

- Green chemistry and green processing
- Charge transfer states and its role on device performance
- Non-fullerene acceptors and ternary blends for organic photovoltaics
- Phonon assisted charge transport/understanding charge transport
- Thermal transport in organic semiconductors
- Doping of organic semiconductors
- Synthesis of n-type materials and dopants
- Novel materials and fundamental concepts for highly efficient organic thermoelectrics
- Device stability
- Materials and architectures for organic electronics operating at high frequency
- Ultraconformable electronics
- High throughput methods and data science applied to organic electronics
- Emerging applications, including EGOFETs, all-(conjugated)-polymer batteries, polymer photocatalysis, neuromorphic devices, advanced photodetectors, etc.

**Confirmed invited speakers:**

- Jenny Nelson (Imperial College London, UK)
- Henning Sinninghaus (University of Cambridge, UK)
- Young-Yong Noh (POSTECH, South Korea)
- Iain McCulloch (KAUST, Saudi Arabia)
- Christine Luscombe (University of Washington, USA)
- Michael Sommer (TU Chemnitz, Germany)
- Barry Rand (Princeton University, USA)
- Jana Zaumseil (University of Heidelberg, Germany)
- Quyen Nguyen (UCSB, USA)
- Christian Muller (Chalmers University of Technology, Sweden)
- Sungjune Jung (POSTECH, South Korea)
- Virgilio Mattoli (IIT Pontedera, Italy)
- Koen Vandewal (University of Hasselt, Belgium)
- Hin-Lap Yip (South China University of Technology, China)
- Yana Vaynzof (University of Heidelberg, Germany)

**Symposium organizers**

Derya BARAN  
King Abdullah University of Science and Technology (KAUST)  
KAUST Solar Center (KSC) - Al Kindi (Building 5), Level 3, Office 3336 Thuwal 23955-6900, Kingdom of Saudi Arabia  
Phone: +966 (0)12 808 7238  
Mail: derya.baran@kaust.edu.sa

Hugo BRONSTEIN  
University of Cambridge  
Department of Chemistry and Physics - Lensfield Road, Cambridge, CB2 1EW, U.K.  
Phone: +44 1223 336697  
Mail: hab60@cam.ac.uk

Mariano CAMPOY QUILES (Main)  
Material Science Institute of Barcelona (ICMAB-CSIC)  
Campus Universitat Autónoma de Barcelona - Bellaterra 08193, Spain  
Phone: +34 935 801 853  
Mail: mcampo@icmab.es

Mario CAIRONI  
Center for Nano Science and Technology  
Istituto Italiano di Tecnologia, Via Pascoli 70/3, 20133 Milano, Italy  
Mail: mario.caironi@iit.it
Symposium E

Exotic materials and innovative concepts for photovoltaics

The success story of hybrid perovskite solar cells confirms that research on novel photovoltaic materials can produce outstanding breakthroughs. This clearly strongly supports the organization of an E-MRS symposium on novel and emerging materials and concepts for photovoltaics which will serve to make E-MRS a leader in the world in new energy materials.

Scope:

This symposium will address fundamental and applied research on innovative photovoltaics materials and device integration. The focus will be on non-conventional photovoltaics, or conventional photovoltaics but with a radically new approach. Novel materials such as exotic silicon, oxides or multinary compounds, novel organic/inorganic materials will be included. It should be noted that inorganic perovskites have reached a conversion efficiency of 12.4% in 2018 (CsPbI3). All third generation and emerging concepts such as multiple carrier generation, hot carrier and intermediate band solar cells, upconversion and downconversion are of increasing relevance and will be discussed. Novel experimental synthesis and characterization techniques are of interest in this symposium. Novel contacting and packaging approaches are also of interest. Theoretical calculations of novel materials or emerging concepts are also relevant. Theoretical approaches on novel absorbers and concepts are fundamental to give directions to experimentalists in the field of photovoltaics.

Hot topics to be covered by the symposium:

- Emerging solar cell absorbers
- Computational design of novel materials or concepts
- Novel solar cell devices
- Oxide solar cells
- Bulk photovoltaics and photogalvanic effects
- Organic and hybrid solar cells
- Exotic forms of silicon
- Downshifting, downconversion, upconversion
- Multiple carrier generation
- Intermediate band solar cells
- Hot carrier solar cells
- Transparent conductive oxides
- Innovative characterization techniques
- New contacting and packaging approaches
- New module approaches

List of invited speakers:

- Laurent Lombez, IPVF, France, «Multidimensional luminescence imaging»
- Jan Christoph Goldschmidt, Fraunhofer ISE, Germany «Materials for perovskite silicon tandem solar cells»
- Federico Rosei, INRS, Canada, “Multifunctional Materials for Emerging Solar Technologies”
- Mingmin Yang, University of Warwick, UK, «Inversion Symmetry Breaking Induced Photoelectric Effect»
- Aron Walsh, Imperial College, UK, «Progress in computational materials discovery for photovoltaics»
- Yoshitaka Okada, University of Tokyo, Japan, «Approaches to high-efficiency intermediate band photovoltaics»
- Mingjian Yuan, Nankai University, China, «Reduced-dimensional Perovskite for Efficient Optoelectronics»
- Judith Driscoll, University of Cambridge, UK, «BiOx: a stable, highly promising Pb-free absorber»

List of scientific committee members:

- Jean-François Guillemoles, IPVF, France
- Mohamed Amara, INL, France
- Stéphane Collin, C2N, France
- Edgardo Saucedo, IREC, Spain
- Abdellah Sloui, ICube, France
- Janez Krc, University of Ljubljana, Slovenia
- Ivan Gordon, IMEC, Belgium
- Akash Bhatnagar, MLU-Halle, Germany

Symposium organizers

David GINLEY
NREL
15313 Denver West Pkwy, Golden, CO 80401, USA
Phone : +1 303 384 6573
Mail : David.ginley@nrel.gov

Marin ALEXE
University of Warwick
Department of Physics, Gibbet Hill Rd. Coventry, CV4 7AL, UK
Phone : +44 (0)24 765 26083
Mail : M.Alexe@warwick.ac.uk

Mutsumi SUGIYAMA
Tokyo University of Science
Research Institute for Science and Technology, Tokyo University of Science, 2641 Yamanashi, Noda, Chiba 278-8510, Japan
Phone : +81 4 7122 1034
Mail : mutsumi@rs.noda.tus.ac.jp

Thomas FIX (Main)
ICube laboratory, CNRS and University of Strasbourg
23 rue du Loess, BP 20 CR, 67037 Strasbourg Cedex 2, France
Phone : +33 (0) 3 88 10 63 34
Mail : thomas.fix@unistra.fr

ENERGY MATERIALS

deadline for abstract submission: 15 January 2020
2D materials for energy applications

Fifty years ago, it was forecast that our modern society would be supported and operated mainly by three elements of technology; i.e. materials, energy and information. Rapid rise in the research and development of new materials has not only largely improved our modern life but also controls further expansions of the other two technologies. The research of materials, such as more efficient batteries and light chemical energy conversion materials, is urgently required. Our symposium will be one such attempt in the field of energy research with focus on 2D materials.

Scope:

The growth of the human population coupled with the simultaneous improvement of living conditions is resulting in a rapidly rising global energy demand, and the negative effects on the environment in the form of pollution and global warming are becoming ever more apparent. Therefore, it is of utmost importance to take action now and concentrate on an active search for alternatives to our current fossil fuel based economy. The general consensus is that only renewable energies could provide a long-term sustainable source of energy. One needs, however, to consider that if fossil fuel is taken out of the picture, one requires an adequate substitute energy carrier for mobile applications (cars, planes, etc.). Our symposium will focus on 2D materials that have attracted the focus of the scientific community in the vast field of energy materials. The applications of such materials will be having a broad view in the area of solar cell, Battery, super capacitor, thermoelectric, spintronics, photo catalysis, and fuel cells. Scientists doing their research in all the above area will be getting a common platform to showcase their latest findings, which all will be attached through a common string named Energy.

For example, the driving force behind the solar hydrogen generation is the green environment with enormous resources of clean fuels. Semiconducting materials emerge as the prominent media that assist water splitting into oxygen and hydrogen with the help of sunlight. The proposal of symposium on 2D materials aims to integrate cutting edge computational aided systematic and high throughput investigation and newly synthesized 2D materials for the enhanced water dissociation activity of the recently synthesized semiconducting materials MX2 (where M= Transition metal & X=S, Se, Te) and hydrogenated silicone, stanine, phosphorene & Mexene synthesized semiconducting materials MX2 (where M= Transition metal & X=S, Se, Te) and hydrogenated silicone, stanine, phosphorene & Mexene. The rapid advancement of exfoliation and synthetic techniques immensely motivates the proposal on 2D materials that have attracted the focus of the scientific community in the vast field of energy materials. The applications of such materials will be having a broad view in the area of solar cell, Battery, super capacitor, thermoelectric, spintronics, photo catalysis, and fuel cells.

Hot topics to be covered by the symposium:

- Two-dimensional (2D) materials for energy production and storage
- 2D based materials for solar cells
- 2D materials for enhance battery performance
- 2D Materials for super Capacitor Technology
- 2D Materials for Thermoelectrics
- 2D Materials for Spintronics

Tentative list of invited speakers:

A. Experiments:
- Z.L.Wang, Georgia Institute of Technology, Atlanta, USA, zhong.wang[at]mse.gatech.edu
- Yaroslav Romanyuk (Empa - Swiss Federal Laboratories for Materials Science and Technology) yaroslav.romanyuk[at]empa.ch
- Katarzyna Wiesenbüthe (Heinrich-Heine-University Düsseldorf) k.wiesenbüthe[at]hhu.de
- Stuart Irvine (Centre for Solar Energy Research CSER/Glyndwr University) s.irvine[at]glyndwr.ac.uk
- Kevin Sivula (EPFL - Ecole polytechnique fédérale de Lausanne) kevin.sivula[at]epfl.ch

B. Theory and Computation:
- Maurizia Palummo (University Tor Vergata Rome) maurizia.palummo[at]roma2.infn.it
- Michael Nolan (Tyndall Natl. Institute, Cork) michael.nolan[at]tyndall.ie

Scope:

The following topics both in the field of Theory and Experiments will be covered in our Symposium “2D Materials for Energy Applications”

- Two-dimensional (2D) materials for energy production and storage
- 2D based materials for solar cells
- 2D materials for enhance battery performance
- 2D Materials for super Capacitor Technology
- 2D Materials for Thermoelectrics
- 2D Materials for Spintronics

Tentative list of scientific committee members:

Tentative list of invited speakers:

A. Experiments:
- Z.L.Wang, Georgia Institute of Technology, Atlanta, USA, zhong.wang[at]mse.gatech.edu
- Yaroslav Romanyuk (Empa - Swiss Federal Laboratories for Materials Science and Technology) yaroslav.romanyuk[at]empa.ch
- Katarzyna Wiesenbüthe (Heinrich-Heine-University Düsseldorf) k.wiesenbüthe[at]hhu.de
- Stuart Irvine (Centre for Solar Energy Research CSER/Glyndwr University) s.irvine[at]glyndwr.ac.uk
- Kevin Sivula (EPFL - Ecole polytechnique fédérale de Lausanne) kevin.sivula[at]epfl.ch

B. Theory and Computation:
- Maurizia Palummo (University Tor Vergata Rome) maurizia.palummo[at]roma2.infn.it
- Michael Nolan (Tyndall Natl. Institute, Cork) michael.nolan[at]tyndall.ie

Symposium organizers

Manickam MINAKSHI
Murdock University
School of Engineering and Information - Technology, Murdoch, WA 6150, Australia
Mail : minakshi@murdoch.edu.au

Rajeev AHUJA (Main)
Department of Physics and Astronomy, Uppsala University
Box-516 SE-75120 Uppsala, Sweden
Mail : rajeev.ahuja@physics.uu.se

Yong-Mook KANG
Dongguk University
Dept. of Energy & Materials Engineering - 30, Pildong-ro 1 gil, Jung-gu, Seoul, 04620, Korea
Mail : dake1234@dongguk.edu

Symposium organizers

Manickam MINAKSHI
Murdock University
School of Engineering and Information - Technology, Murdoch, WA 6150, Australia
Mail : minakshi@murdoch.edu.au

Rajeev AHUJA (Main)
Department of Physics and Astronomy, Uppsala University
Box-516 SE-75120 Uppsala, Sweden
Mail : rajeev.ahuja@physics.uu.se

Yong-Mook KANG
Dongguk University
Dept. of Energy & Materials Engineering - 30, Pildong-ro 1 gil, Jung-gu, Seoul, 04620, Korea
Mail : dake1234@dongguk.edu

Deadline for abstract submission: 15 January 2020
Symposium G

Chemical functionalization of 2D materials

2D materials have recently attracted significant attention due to their extraordinary properties (electrical, optical, chemical, mechanical and thermal), which make them interesting candidates for many technological applications. The symposium will include the state of art progress in the field of chemical functionalization of 2D materials, focusing on new chemistries on 2D materials, and also covering relevant applications in energy storage, sensing, catalysis, composites and nanodevices, etc.

Scope:

This symposium aims to attract experts working on the chemical functionalization of 2D materials and their relevant applications, including chemists, materials scientists, physicists and industrial partners. The goal is to provide a platform/forum for experts on the topic to meet, present latest results, share views/ideas and connect with each other for potential collaborations, in the end to further move forward the field.

The chemical functionalization of 2D materials is a very important branch and a fast-moving area within 2D materials research. Chemical functionalization is a powerful approach that can prevent the aggregation of 2D materials in solvents (e.g., to preserve their large aspect ratio and specific surface area), improve their dispersibility, wettability and processibility, tune their physicochemical properties, and potentially impart new properties. Chemically functionalized 2D materials have already shown potential applications in energy conversion and storage, multifunctional nanocomposites, electronics devices, sensing, etc. For example, chemically functionalized graphene can enhance the interfacial interactions between graphene and polymers to form much stronger nanocomposites.

In the symposium, the recent development of chemical modification of 2D materials will be discussed by invited and oral speakers, and also presented in the form of posters. The scope of topics to be covered include not only on the new chemistries on graphene, but also emerging chemistries of other beyond-graphene 2D materials (transition metal dichalcogenides, phosphorene, MXene, etc). Furthermore, the relevant applications of chemically modified 2D materials will be demonstrated by the participants.

We will invite some experts from industry working on 2D materials to give presentations from the viewpoints of industrial applications, to bridge the gap between academia and industry, and to explore opportunities to collaborate towards the practical use of chemically functionalized 2D materials.

We will also organize a special issue on the topic of chemical functionalization of 2D materials in a scientific journal (e.g., Chemistry-A European Journal, Wiley). The participants in the symposium will have an opportunity to publish their latest results in a leading journal.

Hot topics to be covered by the symposium:

The symposium will cover a wide range of hot topics relating to chemical functionalization of 2D materials, including, but not limited to:

- Graphene
- Transition metal dichalcogenides (TMDs)
- Phosphorene
- MXene
- Boron nitride
- Other 2D materials
- Heterostructures
- Catalysts
- Energy conversion and storage
- Sensing
- Nanodevices
- Photonics
- Nanocomposites
- Membranes

Symposium organizers

Nazario MARTIN
Universidad Complutense de Madrid
Organic Chemistry Department, Chemistry Faculty, 28040 Madrid, Spain
Mail: nazmar@quim.ucm.es

Nikos TAGMATARCHIS
National Hellenic Research Foundation
Theoretical and Physical Chemistry Institute, 48 Vassileos Constantinou Avenue, Athens 11635 Greece
Mail: tagmatar@eie.gr

Qing Hua WANG
Arizona State University
Materials Science and Engineering, School for Engineering of Matter, Transport and Energy Ira A. Fulton Schools of Engineering, Tempe, Arizona 85287, USA
Mail: qhwang@asu.edu

Xiaoyan ZHANG (Main)
Chalmers University of Technology
Division of Chemistry and Biochemistry, Department of Chemistry and Chemical Engineering, Kemigården 4, 412 96 Göteborg, Sweden
Mail: xiaoyan.zhang@chalmers.se
Solid state ionics: advanced concepts and devices

This symposium will focus on functional properties of ionic and mixed ionic-electronic conducting materials with special emphasis on the interplay between ions and electrons and with a view toward their application in relevant smart and energy devices.

Scope:

Mass and charge transport properties occurring at the bulk, interface or surface level in ionic or mixed ionic-electronic conducting materials are often controlling the properties of relevant solid state based devices such as solid oxide fuel and electrolysis cells, solid state batteries, permeation membranes, gas sensors or memristors. This symposium will focus on fundamental and applied aspects of Solid State Ionics covering theory, advanced characterization techniques, functional materials and interfaces as well as novel methodologies for the implementation of innovative concepts into enhanced devices. Moreover, the symposium will cover recent interest in ion-assisted phenomena that give rise to new families of fascinating devices such as all oxide photovoltaic cells or electrostriction-based transducers.

This symposium will provide a forum for extensive discussion and exchange of information among researchers exploring ion-conducting functional oxides in different contexts and diverse applications. This will include state-of-the art methods for structural and chemical characterization such as high resolution transmission electron microscopy, synchrotron-based spectroscopy and diffractometry, scanning probe microscopy and atom probe tomography, just to name a few, combined in many cases with modeling and simulation methodologies such as density functional theory and molecular dynamics. In addition, new methodologies for engineering ionic transport in functional materials will also be one of the main topics under discussion, with special emphasis in heterostructuring, doping and strain. Alternatively, advanced fabrication techniques able to define enhanced materials by design at the macroscale, such as 3D printing or ex-solution decoration, will be covered. Electrolysis, switching phenomena, photocatalysis, gas sensing, and solid state devices for energy and informatics (batteries, solid oxide fuel cells, memristors) will be some of the main applications and devices to be discussed.

Hot topics to be covered by the symposium:

Papers are solicited on (but not limited to) the following topics:

- Defect chemistry in functional oxides
- Nanionics: mass and charge transport in the nanoscale
- Ion-assisted phenomena including iontronics, ferroelectrics, etc
- Methodologies for engineering ionic transport in functional materials
- Advanced structural characterization tools
- Advanced techniques for in situ/ in operando characterization of solid state ionics materials and devices
- Mass transport in bulk materials for solid state devices
- Solid State Ionics applied to energy devices: solid oxide cells, solid state batteries, permeation membranes, all oxide photovoltaics, oxide thermoelectrics, etc
- Solid State Ionics applied to smart devices: memristors, gas sensors, transducers, etc
- Thin film based solid state devices

Tentative list of invited speakers:

- Stefano Passerini, Helmholtz-Institut Ulm, Germany
- Rotraut Merkle, Max Planck Institute, Germany
- Ryan O’Hayre, Colorado School of Mines, USA
- John T. S. Irvine University of St Andrews, UK
- Regina Dietmann, Forschungszentrum Jülich GmbH, Germany
- Mark Huijben, University of Twente, The Netherlands
- Felix Gunek, Forschungszentrum Jülich GmbH, Germany
- Pedro Gomez Romero, ICN2, Spain
- Sandrine Ricote, Colorado School of Mines, USA
- Andreas Klein, Technische Universität Darmstadt, Germany
- Mónica Burriel, CNRS-INP, France
- Truls Norby, University of Oslo, Norway
- Jeff Sakamoto, University of Michigan, USA
- Paul Shearing, University College London, UK
- Sam Copper, Imperial College, UK
- David Mebane, West Virginia University, USA
- Vincenzo Esposti, DTU, DK
- Sossina Haile, Northwestern University, USA
- George Harrington, Kyushu University, Japan
- Jürgen Janek, Justus-Liebig-Universität Gießen Physikalisch-Chemisches Institut, Germany
- Stephen Skinner, Imperial College London, UK
- Joachim Maier, Max Planck Institute for Solid State Research, Germany
- Igor Lubomirsky, Weizmann Institute, Israel
- Juergen Fleig, T U Wien, Austria
- Bilge Yildiz, Massachusetts Institute of Technology, Cambridge, USA
- Werner Sitte, Graz University of Technology, Austria
- Scott Barnett, Northwestern University, USA
- Susanne Hoffmann-Elft, FZ-Juelich, Germany
- Harry L. Tuller, Massachusetts Institute of Technology, Cambridge, USA
- Zonping Shao, Nanjing University of Technology, China
- Jennifer Rupp, ETHZ, Switzerland and MIT, USA
- Tatsumi Ishihara, Kyushu University, Fukuoka, Japan
- Jose Santiso, ICN2, Barcelona, Spain

Symposium organizers

Ainara AGUADERO
Imperial College London
Department of Materials - Sw7 2AZ London - U.K.
Phone : +44(0)20 7594 5174
Mail : a.aguadero@imperial.ac.uk

Albert Tarancon (Main)
Catalonia Institute for Energy Research - IREC
Jardins de les Dones de Negró, 1, Planta 2, E-08930, Sant Adrià del Besós, Barcelona, Spain
Phone : +34 933642615
Mail : atarancon@irec.cat

Nicola H. PERRY
University of Illinois at Urbana-Champaign
104 S. Goodwin Ave, Urbana, IL 61801 - USA
Phone : +1 (217) 300 6335
Mail : nhperry@illinois.edu

Nini PRYDS
Technical University of Denmark
Department of Energy Conversion and Storage - Frederiksbergvej 399, 4000 Roskilde - Denmark
Phone : +45 22195752
Mail : nipr@dtu.dk

Symposium H

deadline for abstract submission: 15 January 2020
Symposium I
Laser material processing: from fundamental interactions to innovative applications

This laser symposium will bring together leading academic scientists, researchers and laser users and manufacturers for an intensive exchange and share of their experiences on recent progress in Laser Science and Technology, in particular in the fields of laser materials processing and synthesis. It also gives room to present and discuss the most recent innovations, trends, and concerns, practical challenges from nanofabrication via energy to biomedicine.

Scope:

This symposium will cover all new advances in laser-matter interaction coupled to recent applications of emerging materials, their fabrication and applications. The main objective is to update the basic phenomena involved in the interaction of the wide range of laser systems, where still new and efficient devices including smart optics, high and low repetition rate processing as well as high and low beam fluences come up regularly. The symposium will consider recent progress in laser-assisted additive fabrication (SLS, SLIM), laser and intense light applications in printed electronics, laser-based nanofabrication, nano-LIPSS formation, laser lift of biological materials and systems and more emerging techniques such as laser synthesis of nanoparticles in liquids, and will thus offer a unique opportunity for researchers from Europe and worldwide areas to discuss their results in a friendly, interactive, and engaging atmosphere. Laser techniques will facilitate environmental and eco-design through the useful processing of photovoltaic cells, photocatalytic materials, thermoelectric materials and devices, micro and nanosystems for energy storage and conversion. A special focus will be given for these ‘hot’ topics. All contributions on laser interaction with hard, soft and smart materials, targeting future applications from nanotechnology to biomedicine as well as recent progress on the fundamental mechanisms are welcome. The symposium Laser Material Processing: From fundamental interactions to innovative applications will provide a platform to establish interdisciplinary international research collaborations between scientists working in the field of laser-matter interaction.

The symposium will consist of invited presentations by leading scientists in their respective fields and contributed papers for oral and poster presentations. Special emphasis will be given to young scientists presenting high quality research papers. The contributions should concern, but are not limited to the topics listed below.

Hot topics to be covered by the symposium:

- Lasers in nanotechnology and nanofabrication: electronics, magnetics, photonics, sensors;
- Lasers in environmental technology, decarbonized energy materials, storage, and sustainability;
- Laser 3D micro-structuring: MEMS, MOEMS, photonic crystals, photonic applications; biological devices
- Laser processing of 2D materials;
- Ultra-short, ultra-high power laser interaction with matter: fundamentals and applications;
- Subwavelength laser produced structures for smart optical, electro-optical, electronic and biological devices;
- Laser-induced nanostructures: from theory to applications;
- Lasers for large-scale fabrication: 3D printing, roll-to-roll processing, printed electronics;
- Photonic curing: methods and emerging applications;
- Laser process monitoring and control, time resolved diagnostics, advanced characterization of materials.

List of invited speakers (confirmed):

- Maria Dinescu, Bucharest, Romania
- Avi Katz, Palo Alto, USA
- Emmanuel Stratakis, Greece
- Valentina Dinca, Bucharest, Romania
- Dirk Hauschild, LIMO GmbH, Germany

Symposium organizers

Andreea MATEI
National Institute for Lasers, Plasma and Radiation Physics (INFLPR)
Laser Department, 409 Atomistilor Str., 077125 Magurele - Bucharest, Romania
Mail: andreea.purice@inflpr.ro

Catalin-Daniel CONSTANTINESCU
CNRS
Laboratoire I2RC (UMR CNRS 7315; Centre Européen de la Céramique (CEC), 12 rue Atlantis, 87068 Limoges, France
Mail: catalin.constantinescu@unilim.fr

Mykola VINNICHENKO
Fraunhofer Institute for Ceramic Technologies and Systems IKTS
Fraunhofer IKTS, Winterbergstr. 28, 01277 Dresden, Germany
Mail: mykola.vinnichenko@ikts.fraunhofer.de

Peter SCHAAF (Main)
TU Ilmenau
Institute of Materials Science and Engineering, Gustav-Kirchhoff-Str. 5, 98693 Ilmenau, Germany
Mail: peter.schaaf@tu-ilmenau.de

NANOMATERIALS AND ADVANCED CHARACTERIZATION
Advanced functional thin films require specific properties and their performances are tightly related to their composition, structure, surface morphology and interface properties which, in turn, are dictated by the film growth environment. Pulsed deposition methods of thin films offer unique opportunities to achieve higher performance products than with the continuous methods.

The symposium aims at discussing cutting edge research on pulsed techniques such as HiPIMS, PLD, PED as well as pulsed RF/DC magnetron sputtering, arc discharges and other processes for which the pulsed characteristics play a key role in the film growth. The goal is to better understand the relationship between parameters such as the high kinetic energy of film forming species, pulse width and pulse repetition rate, ionization of plasma species, transport phenomena, non-equilibrium growth, etc. and the film properties. Whatever the pulsed deposition process, this symposium aims at discussing the growth of oxides, nitrides, carbides and related thin films which cover a wide range of controllable properties. Specificities of the pulsed methods effects on thin film stoichiometry, structure and surface morphology will be addressed with particular emphasis on low temperature crystalization and epitaxy, metastable phase stabilization, self-assembled nanostructures, nanocomposites, nanosheets on rigid/flexible substrates, etc. The effect of pulsed deposition methods on the films quality and the promotion of novel or substantially improved properties are tightly related to their composition, structure, surface morphology and interface properties which, in turn, are dictated by the film growth environment. Pulsed deposition methods of thin films offer unique opportunities to achieve higher performance products than with the continuous methods.

Hot topics to be covered by the symposium:

- Advanced functional thin films by pulsed deposition methods with emphasis on the role of process parameters (high kinetic energy of species, pulse width, growth rate, etc.)
- Focus on the relationship between the thin films structure and physical properties
- Oxide, nitride, carbide related thin films for a wide range of advanced applications
- Nanocomposite and metastable phase thin films
- Self-assembled nanostructures, growth and novel properties
- Low / room temperature epitaxial growth of thin films by pulsed methods
- Van der Waals epitaxy on 2D materials and flexible substrates.

Deadline for abstract submission: 15 January 2020

Scientific committee members:

- Jacques Perriere, Sorbonne Universités, UPMC Paris 06 & CNRS, Paris, France
- Manfred Martin, RWTH Aachen University, Germany
- Maria Luisa Grilli, ENEA Casaccia Research Centre, Italy
- David Babonneau, University of Poitiers-ENMSA, France
- Arke Weidenkaff, Technical University of Darmstadt, Germany.

List of invited speakers:

- Amaël Caillard, GREMI, CNRS, University of Orléans, France - Comparison between pulsed growth methods and the correlation with the properties of the thin films
- Michael Lorentz, University of Leipzig, Germany - Correlation between pulsed laser deposition and properties of the thin films
- Ulf Helmersson, Linkoping University (Sweden) - Bi-polar HiPMS
- Tetsuhide Shimizu, Tokyo Metropolitan University (Japan) - Peak-current controlled HiPIMS for the deposition of thin films with tailored properties.

1 or 2 invited talks will be selected from submitted oral contributions, preferentially chosen in order to address the scope of symposium, to bring to the stage younger researchers who make significant contributions to the field of the symposium, and to also promote the participation of the less represented gender.

Symposium organizers

José GONZALO
Instituto de Óptica
Consejo Superior de Investigaciones Científicas (CSIC), Madrid, Spain
Mail : j.gonzalo@io.cfmac.csic.es

Magdalena NISTOR
National Institute for Lasers, Plasmas and Radiation Physics
L22, 409 Atomistilor Street, 77125 Bucharest-Magurele, Romania
Mail : mnistor@infm.ro

Nadhir Bensaada Laidani (Main)
Fondazione Bruno Kessler
Centro Materiali e Microsistemi, 18 Via Sommarive, 38123 Trento, Italy
Mail : laidani@fbk.eu

Stephanos Konstantinidis
University of Mons
National Fund for Scientific Research (FNRS), Mons, Belgium
Mail : Stephanos.Konstantinidis@umons.ac.be
NANOMATERIALS AND ADVANCED CHARACTERIZATION

Recent advances and challenges in chemical synthesis and solution processing of advanced inorganic nanomaterials

The symposium provides a platform and a discussion forum for researchers and students working in the field of chemical synthesis and processing of inorganic (nano)materials, with emphasis on novel syntheses routes, scale-up of (nano)material synthesis, design of functional nanoscale architectures, and their utilization in emerging energy, health and environmental applications.

Scope:

The world is facing a number of global societal challenges for which no overarching solutions are available or implemented yet: think of reduction of global CO2 emissions, the transition from fossil fuels to clean energy conversion & storage technologies, the development of green processes and recyclable materials using earth-abundant elements for a sustainable economy, or the ageing of populations in developed countries and the health issues related to that.

A key requirement to overcome or contribute substantially to each of the above challenges is the successful development of new functional materials. Novel inorganic materials are needed for emerging energy harvesting & storage technologies, carbon capture and utilization schemes, biomedical & health applications, electronics and sensing, to name just a few. The production methods with which these future materials are to be produced should have the potential for large- to massive-scale, yet flexible, production, while employing sustainable, green synthesis methods and cost-effective processing technologies at the same time. In light of these considerations, chemical solution-based processing methods, also known as “wet chemistry” routes, have gained renewed interest by the scientific community and industry. Chemical synthesis and solution processing of inorganic (nano)materials are generally acknowledged to be highly flexible in terms of precursor composition, targeted substrate and processing procedures, often at ambient pressure and temperature, and thus can be faster and less expensive than gas-based deposition routes while providing materials with matching or even superior properties.

Significant advances have been made in recent years, yet various scientific challenges remain: for example, the development of low-temperature crystallization pathways and green processing routes, realization of high-throughput synthesis of nanocrystals, self-assembly of nanoparticles, -rods, and -platelets into functional assemblies using solution processing, and the optimization of the microstructure towards the targeted area of application on multiple length scales. In all cases, a thorough understanding of the relation between the solution chemistry, deposition process, and final solid-state properties are key to achieving high performance, irrespective of the targeted application. Advanced characterization tools are often indispensable to understand the formation and function of materials derived via chemical synthesis routes.

Hot topics to be covered by the symposium:

- Nanocrystal formation & crystallization pathways
- Unconventional, low temperature & green chemical synthesis
- Microstructural characterization, electron microscopy, synchrotron, ope-rando methods
- Sol-gel, hydrothermal/solvothermal, co-precipitation, hot injection, mini-
- and microemulsion, polymer-assisted, photo-assisted synthesis, etc.
- Colloidal nanocrystals, nanoparticles, nanofilms, nanorods, 2D mate-
- rials,…
- Multilayers, hierarchical materials, porous materials,…
- Solution-derived epitaxial films
- Ink jet printing, 3D printing, imprinting
- Innovative thin film processing methods
- High-throughput processing, scale-up
- Solution-derived materials for energy harvesting & storage, carbon cap-
- ture and utilization
- Solution-derived materials for biomedical applications & health, electron-
- ics and sensing

List of invited speakers (confirmed):

- Lourdes Calzada (ICM-CSC)
- David Grosso (Aix-Marseille Univ)
- Katharina Landfester (Max Planck Institute)
- Raffaella Buonsanti (EPFL)
- Jesus Santamaría Ramiro (Zaragoza University)
- Peter Wick (EMPA)
- Markus Niederberger (ETH Zürich)
- Bettina Lotsch (Max Planck Institute)
- Elvira Fortunato (New University of Lisbon)
- Nicola Pinna (Humboldt University)
- Ali Abou-Hassan (Sorbonne University)
- Eduard Saiz Gutierrez (Imperial College London)
- Bernd Smarsly (University of Gießen)
- Sanjay Mathur (University of Cologne)
- Monica Lira-Cantú (Catalan Institute of Nanoscience & Nanotechnology ICN2)
- Karen de Clerck (Ghent University)
- Richard Walton (University of Warwick)

List of scientific committee members:

- Marlies van Bael (University of Hasselt)
- Barbara Malic (Jozef Stefan Institute)
- Thomas Palstra (University of Twente)
- Torsten Brezesinski (Karlsruhe Institute of Technology)
- Yong Lei (Technical University Ilmenau)
- Silvie Beirn (University of Strasbourg)
- Guido Kickelbick (Saarland University)
- Susagna Ricart (ICMAB-CSIC)
- Monica Lira Cantu (ICN2)

Publication:

The Journal of Sol-Gel Science and Technology has agreed to publish the proceedings of this symposium as a special issue and manuscripts will undergo the normal peer review process.

Symposium organizers

An HARDY
Hasselt University
Institute for Materials Research Inorganic and Physical Chemistry and IMEC division MOCOME Martelarenlaan 42 3500 Hasselt Belgium
Phone : +32 11 268308
Mail : an.hardy@uhasselt.be

Johan E. TEN ELSHOFF (Main)
University of Twente
MESA+ Institute for Nanotechnology, P.O. Box 217, 7500 AE Enschede, The Netherlands
Phone : +31 53 489 2695
Mail : j.e.tenelshof@utwente.nl

Narcis MESTRES
ICMAB-CSIC
Institute of Materials Science of Barcelona Campus UAB E-08193 Bellaterra, Catalonia Spain
Phone : +34 93 5801853
Mail : narcis.mestres@icmab.es

Silvia GROSS
Università degli Studi di Padova
Dipartimento di Scienze Chimiche - Via Francesco Marzolo, 1, 35131- Padova, Italy
Phone : +39 049 8275736
Mail : silvia.gross@unipd.it

deadline for abstract submission: 15 January 2020
Carbon- and/or nitrogen-containing thin films and nanomaterials

The focus of this proposal is on C- and/or N-containing thin films and nano-materials. The objective is to provide an exchange platform for scientists, engineers and students dealing with the synthesis, characterization and application of these materials. Experimental and theoretical papers as well as industrial contributions are welcome.

Scope:

C- or N-containing thin films and nano-materials offer a wealth of structures based on metastable phases, nanocomposites or nanosized multilayers and low-dimensional structures which allow various properties such as optical, optoelectronic, magnetic, electrical and mechanical ones. Metastable films can consist of plasma polymers, diamond-like carbon or CNx phases, while nanocomposite can be tailored by adding either metallic or non-metallic elements with various C or N affinity to amorphous or crystalline matrices. Finally, nitride and C-based low-dimensional structures such as flakes or tubes can be functionalized by appropriate chemical functionalities to be integrated in a composite material or to be used as building part in different types of sensors, nanomachines... The objective of this symposium is to highlight the progresses in fundamental and applied issues related to the development of these materials and to bridge the gap between science and technology. Among others, carbon- or nitrogen-containing films or composites materials consisting on nanocrystalline particles embedded in an inorganic and/or organic matrix, including plasma polymers, will be considered. On the other hand, nanolaminated structures such as MAX-phases are also in the scope of this symposium. Finally, we also aim to address N- and C-based low-dimensional structures unembedded or not in a matrix.

Contributions investigating plasma composition – material structure - films property – relationships by experimental and theoretical means will be considered. The foreseen contributions will belong to one of these categories: (i) films’ synthesis by advanced processes, such as high power impulse magnetron sputtering, atmospheric plasma processes, and hybrid techniques, (ii) mechanical, tribological, thermal, electrical, optical, optoelectronic and magnetic properties, biomedical compatibility, and correlations between these properties and deposition parameters, structure or films’ composition, (iii) process modeling and diagnostic, surface interaction and nucleation phenomena, investigation of degradation mechanisms e.g. phase and microstructure stability under different environments and coating-substrate interdiffusion, (iv) engineering-oriented contributions including automotive, chemical, electrical, optical, magnetic/optical data storage, pharmaceutical or biomedical applications, and emerging applications as in energy systems.

Hot topics to be covered by the symposium:

- Novel fabrication and synthesis routes in physical and (plasma enhanced) chemical vapor deposition
- Advances in controlled growth of nanocomposite thin films and nanostructured materials
- Plasma treatment and synthesis of N- and C-based low dimensional structures including their characterizations
- Diagnostics providing insight into the growth process and resulting material properties
- Modeling of growth processes and film properties
- Degradation mechanisms linked to phase and microstructure stability and interdiffusion
- Multifunctional coatings with advanced applications in tribology, optics, data storage, (bio)sensing and energy-relevant fields
- Biomedical and pharmaceutical applications of coated materials
- Advanced micro- and nanofabrication techniques for C- and/or N-containing thin films and nanomaterials

Symposium organizers

Carla BITTENCOURT
University of Mons
20 Place du Parc, 7000 Mons, Belgium
Phone : +32474727988
Mail : carla.bittencourt@umons.ac.be

Eloisa SARDELLA
CNR – NANTOC, Institute of Nanotechnology
c/o Department of Chemistry, University of Bari, via Orabona,4 - 70126 Bari, Italy
Phone : +39 3420897912
Mail : eloisa.sardella@cnr.it

Jean-François PIERSON (Main)
Institut Jean Lamour – University of Lorraine
Campus ARTEM, 2 allée André Guinier, 54011 NANCY cedex, France
Phone : +33 3 72 74 25 99
Mail : jean-francois.pierson@univ-lorraine.fr

Sigitas TAMULEVICIUS
Kaunas University of Technology
Institute of Materials Science, Barsausko str.59, Kaunas 51423, Lithuania
Phone : +37068612300
Mail : Sigitas.Tamulevicius@ktu.lt

List of invited speakers (confirmed):

- S. Carvalho (University of Minho, Portugal), How C/N based matrix determines the functional behaviour of antimicrobial nanocomposite sputtered coatings?
- A.M. Coclite (Graz University of Technology, Austria), Functional and responsive thin polymer films deposited from initiated chemical vapor deposition
- F. Faupel (University of Kiel, Germany), Functional Nanocomposites - From Fabrication to Function
- S. Marchesan (University of Trieste, Italy), Carbon nanomorphology effects on functional materials
- P. Patsalas (University of Thessaloniki, Greece), Transition metal nitrides and carbides: Feasible candidates for plasmonics and photonics or overrified expectations
- B. Ratner (University of Washington, USA), Plasma-Deposited Thin Films Engineered to Control Biology at Interfaces
- F. Sanchette (University of Technology of Troyes, France), Deposition and characterization of (Ti, Al)N coatings deposited by thermal LPVD
- G.F. Schneider (Leiden University, The Netherlands), Graphene in the eyes of a chemist: Nanopores, nanogaps and their applications in single molecule detection and water filtration
- J. Tyczkowski (Lodz University of Technology, Poland), Well-known films plasma-deposited from alkyl derivatives of the carbon family – a new look at them as electronic nanocomposites with potential photocatalytic properties

deadline for abstract submission: 15 January 2020
Defect-induced effects in nanomaterials

Following the success of the four previous similar symposia this symposium addresses the progress in tailoring basic properties of low-dimensional and nano-materials by introducing dopants (e.g., implantation) or applying external loads- and radiation-induced defects.

Scope:

This symposium focuses on understanding the formation and evolution of defects at the nanoscale through experiments and theory/simulations. Solids without defects are impossible to achieve based on thermodynamics. The defects are a Janus Bifrons: they can deteriorate the properties of materials and structures, but they can also enhance them with unique and useful properties which are absent in the perfect solids. The formation and evolution of defects becomes more critical at the nanoscale as their interaction with grain boundaries and interfaces plays a key role in determining material behavior due to the high surface to volume ratio. This symposium will cover how such defects could be introduced controllably, categorized and controlled in nanostructures. Understanding and controlling defect properties and capturing the grain boundary effects in a wide class of advanced nanostructures (novel 2D materials, multiferroics, quantum dots and wires, etc.) could well be a key to breakthroughs in several crucial areas of science and technology. Recent work has demonstrated spectacular optical and magnetic effects due to deliberately created defects or radiation-induced transformation of nanomaterials as well as radiation-induced displacements in low-dimensional insulators and semiconductors, with numerous potential applications. The high sensitivity of modern technologies on the submicron scale has promoted the exciting opportunity of developing new advanced materials with reduced dimensionality. This opens new prospects for ion and electron beam applications. Ion tracks and other radiation-induced effects provide a means for controlled synthesis and modification of low-dimensional materials, such as nanoclusters and nanowires, allowing for efficient nano-optoelectronic and energy storage devices.

Hot topics to be covered by the symposium:

- Defects in nanomaterials, including graphene and other 2D materials
- Swift heavy ion irradiation as the means to tailor nanomaterials
- Defect interaction with grain boundaries and interfaces
- Electronic structure of defects in nanostructures.
- Defects in nanomaterials for energy storage
- Defects in semiconductors
- Creation, evolution and properties of radiation defects in nanosize materials
- Multiscale modeling capturing defect creation and transformation in nanomaterials.

List of confirmed invited speakers:

- Elias Altanitis, Aristotle University, Greece
- Maksim Ananyev, Institute of High Temperature Electrochemistry, Russia
- Hanna Bandarenka, Belarusian State Univ of Informatics and Radiotechnics, Belarus
- Thomas Böhlke, Karlsruhe Institute of Technology, Germany
- Alexei Bouvralev, St. Petersburg Academic University RAS, Russia
- José Coutinho, University of Aveiro, Portugal
- Jeff De Hosson, University of Groningen, The Netherlands
- Evgueni Konstantinidis, Aristotle University of Thessaloniki/Greece
- Eugene Kotomin, MPI Stuttgart/ISSP LUI, Latvia
- R. V. Kumar, University of Cambridge, UK
- Jörg K. N. Lindner, Universität Paderborn, Germany
- Igor Lubomirsky, Weizmann Institute, Israel
- Takahito Ohmura, National Institute of Materials Science, Japan
- Vladimir Pankratov, University of Latvia, Latvia
- Eugen Rabkin, Technion-Israel Institute of Technology, Israel
- Janis Timosenko, Fritz-Haber-Institut der Max-Planck-Gesellschaft, Germany
- Anatoly V. Dvurechenski, Acad. Sci., Novosibirsk, Russia

List of scientific committee members:

- Elias Altanitis, Aristotle University, Greece
- Eugene Kotomin, Max Planck Institute, Germany
- Eugen Rabkin, Technion, Israel
- Eduardo Alves, Lisbon University, Portugal
- Christina Dittmann, Juelich Research Center, Germany
- Ion Tiginyanu, Acad. Sci., Moldova
- Andrei I. Titov, St. Petersburg State Polytechnical University, Russia
- Elke Wendler, Friedrich Schiller University of Jena, Germany
- Anatoly V. Dvurechenski, Acad. Sci., Novosibirsk, Russia

Symposium organizers

Anatoli POPOV
University of Latvia
Institute of Solid State Physics, Kengaraga 8, Riga LV-1063, Latvia
Phone: +371 67187480
Mail: popov@latnet.lv

Flyura DJURABEKOVA
University of Helsinki
Helsinki Institute of Physics and Department of Physics, Pietari Kalkkipa, 2, 0014 Helsinki, Finland
Phone: +358 249 150084
Mail: flyura.djurabekova@helsinki.fi

Katerina E. AIFANTIS (Main)
University of Florida
Mechanical and Aerospace Engineering, 1064 Center Drive, Gainesville FL 32611, USA
Phone: +1 352 392 6227
Mail: kafiantis@ufl.edu

Nikolai A. SOBOLEV
Universidade de Aveiro
Departamento de Fisica and I3N, Campus de Santiago, 3810-193 Aveiro, Portugal
Phone: +351 234 378117
Mail: sobolev@ua.pt

deadline for abstract submission: 15 January 2020
Symposium N

Advanced small-scale mechanical characterization: strength, plasticity, fracture and fatigue

Thin films, coatings, welds, flexible electronics, sensors and MEMS rank among the most critical components made of small volumes of materials used in a variety of applications (automotive, energy, nuclear, microelectronics, aerospace...). Ensuring their service performance and lifetime requires detailed knowledge about the small-scale mechanical behaviour of materials, which can only be gained through advanced experimental and/or simulation methods.

Scope:

The small-scale mechanical characterization of materials relies upon the development and use of a wide range of highly specialized experimental and simulation techniques, aimed at investigating different mechanical aspects. Past research has mostly focused on the yield behavior of single crystalline microsized structures. Although they represent a big initial step toward a better understanding of mechanical size effects, these investigations were very limited in scope regarding both the kind of failure and the type of microsamples. The present symposium will focus on recent developments aimed at expanding our knowledge to the behavior of more complex specimens (for instance nano-objects, thin films and bulk nanostructured materials) and/or under more complex loading conditions (including cyclic fatigue, fracture testing...). To date, the most promising investigations build upon the combination of mechanical testing either with in-situ characterization methods (such as TEM, SEM, AFM, micro-XRD, synchrotron, electrical measurements) or with simulation methods (such as for instance atomistic simulations and discrete dislocation dynamics). The symposium highly welcomes such contributions, which are well suited for gaining a deep insight into the mechanisms responsible for mechanical size effects. Direct applications of these methods to solve complex engineering issues are also warmly welcomed.

Hot topics to be covered by the symposium:

- Small-scale plasticity, fracture and fatigue testing
- Advances in in-situ and ex-situ micro/nanomechanical testing
- Recent advances in characterization methods, including TEM, SEM, AFM, synchrotron techniques
- Advances in numerical technical methods
- Complex loading situations
- Applications to nuclear materials
- Applications to nano-objects, thin films and bulk nanostructured materials
- Applications to crystalline, amorphous or hybrid materials

Tentative list of invited speakers:

- Sandra Korte-Kerzel (RWTH Aachen University, Germany)
- David E.J. Armstrong (University of Oxford, United Kingdom)
- Jon Molina-Aldareguia (IMDEA Materials Institute, Spain)
- Wolfgang Ludwig (INSA Lyon University of Lyon, France)
- Jeffrey M. Wheeler (Swiss Federal Institute of Technology ETH Zürich, Switzerland)

Tentative list of scientific committee members:

- Thomas Pardoen (ULouvain, Belgium)
- Finn Giuliani (Imperial College London, U.K.)
- Cynthia Volkert (University Göttingen, Germany)
- Daniel Klener (Austrian Academy of Sciences, Austria)
- Erddmarin Spiecker (University Erlangen, Germany)
- Frédéric Mompiou (CNRS Toulouse, France)
- Rebecca Janisch (University Bochum, Germany)
- Sandrine Brochard (University Poitiers, France)
- Erik Bitzek (University Erlangen, Germany)
- Marc Legros (CNRS Toulouse, France)
- Marc Fivel (CNRS Grenoble, France)

Symposium organizers

Ana Maria Ruiz Moreno
European Commission
DG Joint Research Centre, Nuclear Safety and Security Directorate, Westerdriuwdeg 3 - 1755 LE Petten, The Netherlands
Phone: +31 224 565097
Mail: ana.ruiz-moreno@ec.europa.eu

Benoît Merle (Main)
Friedrich-Alexander-University Erlangen-Nürnberg (FAU)
Materials Science & Engineering I, Martensstr. 5 / 3.OG - 91058 Erlangen, Germany
Phone: +49 9131 8527473
Mail: benoit.merle@fau.de

Hosni Idrissi
Université Catholique de Louvain
IMMC, Place Sainte Barbe 2, 1348 Louvain la Neuve, Belgium
Mail: hosni.idrissi@uclouvain.be

Megan J. Cordill
Erich Schmid Institute for Materials Science, Austrian Academy of Sciences
Jahnstrasse 12, Leoben 8700, Austria
Phone: +43 3842 804 102
Mail: megan.cordill@oeaw.ac.at

Thomas W. Cornelius
CNRS, IM2NP UMR 7334, Aix-Marseille Université
Faculté des Sciences, Campus St Jérome - Case 262, Avenue Escadrille Normandie Niemen, 13397 Marseille Cedex 20, France
Phone: +33 4 91 28 80 13
Mail: thomas.cornelius@im2np.fr

Deadline for abstract submission: 15 January 2020
New developments in the modeling and analysis of radiation damage in materials II

Nowadays, it is common to find technological environments subject to irradiation with energetic particles, such as for instance materials in spintronics, semiconductors, space applications or nuclear reactors. This particle/matter interaction strongly affects the properties of the materials. This symposium will provide a forum to discuss the latest development in the characterization and modeling of particle/solid interactions.

**Scope:**

The use of particle (ions, photons, neutrons, protons...) beams over a broad range of energies is a powerful tool to synthesize, test, and modify the properties of advanced materials. On the other hand, there also exist technological applications subject to undesired energetic particle fluxes that strongly degrade their performances. Research and applications of energetic particle beams encompass, among others, advanced electro-optical devices, nanostructures, strain engineering, nuclear materials, and space exploration. In most cases, particle beam modification of materials relies on the energy transfer from the energetic particles to atomic nuclei and/or electrons of the target. Usually, the deposited energy leads to defect generation and damage accumulation. These phenomena are sometimes desired, e.g., to simulate radiation environments such as those encountered in space and nuclear reactors; but they may also be a drawback, for instance in ion doping processes, or in the synthesis of nanostructures. In any case, understanding the mechanisms of damage formation and accumulation in materials as a result of energy deposition under irradiation is a crucial task to tackle.

This symposium is the follow-up of the 2018 edition which took place during the E-MRS Spring meeting and gathered ~ 60 scientists (speakers + posters) from more than 10 countries around the world. The aim of this symposium is therefore to provide a forum for researchers to present and discuss the developments and improvements of experimental characterization techniques, computational tools, theoretical models and codes for data fitting in the field of radiation damage. Special focus will be given to techniques, protocols, and methodologies allowing damage quantification. The coupling of experimental and computational characterizations will also receive particular attention. Finally, recent progress in in situ measurements, small-scale testing as well as improvements of conventional techniques to investigate radiation damage will also be addressed. To finish, this symposium is cross-disciplinary on a wide range of materials including metals, semiconductors, and ionic-covalent materials with different dimensionality (e.g. 0D quantum dots, 1D nanowires or tubes, 2D thin film materials and 3D bulk materials) and on a broad range of irradiation conditions, experimental techniques and computational simulations.

**Hot topics to be covered by the symposium:**

The topics covered by the symposium include, but are not restricted to, the following hot topics:

- Time resolved measurements of phase transformations, micro-structural changes, and surface effects
- High (time/-space) resolution characterization of defects and disorder
- Computer simulation and modeling of damage formation and evolution
- Combination of computing and experimental approaches
- Quantification of radiation disorder

**Tentative list of invited speakers:**

- Aurélien Debelle [M] (CSNSM, Université Paris-Sud, France)
- «Combining experimental techniques and numerical simulations for a better irradiation-induced disorder description»
- Katharina Lorenz [F] (Instituto Superior Técnico, Universidade de Lisboa, Portugal)
- “Radiation effects in wide bandgap semiconductors”
- André Redondo Cubero [M] (Department of Applied Physics, Universidad Autonoma de Madrid, Spain)
- “Nanstructuring surfaces by medium energy ion beam irradiation”
- Alexander Stukowski [M] (Darmstadt University, Germany)
- “Computational method to analyze defects”
- Alain Charlier [M] (CEA Saclay, France)
- “Study of radiation damage using Molecular Dynamics”
- Marie-France Barthe [F] (CEMHTI - CNRS, France)
- “Characterization of radiation damage by means of Positron Annihilation Spectroscopy”
- Bias Liberato [M] (Materials Science and Technology Division, Los Alamos National Laboratory, USA)
- “Kinetic effects of defects”
- Daniel Mason [M] (Culham Centre Fusion Energy, UK)
- “Multiscale modelling of defect evolution in irradiated materials”
- Bärbel Retthfeld [F] (Technische Universität Kaiserslautern, Germany)
- “Dynamical processes during the irradiation of materials with ultra-fast lasers”
- Claire Grygel [F] (CIMP CAEN, France)
- “Swift heavy ion irradiation”
- Kevin Field [M] (Oak Ridge National Laboratory, USA)
- “Investigation of defects in irradiated materials using TEM”
- Chiara Maurizio [F] (University of Padova, Italy)
- “X-ray Absorption Spectroscopy”
- Anton Barty [M] (Center for Free Electron Laser Science, DESY, Hamburg, Germany)
- “Femto-second characterization of cascades in solids”

**Tentative list of scientific committee members:**

- Eduardo Alves, University of Lisbon, Lisbon, Portugal
- Charlotte Becquart, University of Lille, Lille, France
- Maria José Caturia, University of Alicante, Alicante, Spain
- Fyura Djurabekova, University of Helsinki, Helsinki, Finland
- Thomas Jourdan, CEA-Saclay, Saclay, France
- Giovanni Mattei, University of Padova, Padova, Italy
- Lionel Thomé, CNRS/IN2P3, Orsay, France
- Christina Trautmann, GSI Helmholtzzentrum, Darmstadt, Germany
- William J. Weber, University of Knoxville, Knoxville (TN), USA
- Yanwen Zhang, Oak Ridge National Laboratory, USA

**Symposium organizers**

**Alexandre BOULLE**
National Center for Scientific Research
Ceramics Research Institute - 12, rue Atlantis, 87068 Limoges, France
Phone : +33 5 87 50 23 82
Mail : alexandre.bouille@unilim.fr

**Christophe ORTIZ (Main)**
CIEMAT
Laboratorio Nacional de Fusión por Confinamiento Magnético - Avenida Complutense, 40, 28040, Madrid, Spain
Phone : +34 914 96 25 82
Mail : christophe.ortiz@ciemat.es

**Emmanuelle MARQUISS**
University of Michigan
Department of Materials Science and Engineering, 2300 Hayward St, Ann Arbor, MI 48109, USA
Phone : +1 734 764 8717
Mail : emmarco@umich.edu

**Tiziana CESCA**
Università di Padova
Dipartimento di Fisica e Astronomia «G. Galilei» - Via Marzolo, 8, I-35131 Padova, Italy
Phone : 39 049277044
Mail : tiziana.cesca@unipd.it

**deadline for abstract submission: 15 January 2020**
ALTECH 2020 - analytical techniques for precise characterization of nano materials

Metryology is a prerequisite for the development of novel materials on the nanoscale. It supports the correlation of material properties and functionalities. The expected contributions should demonstrate how innovative analytical techniques enable a deep understanding of new materials. This symposium organized by four major European National Metrology Institutes is a networking platform for scientist and engineers from metrology and research institutes, academia and industry.

Scope:

Nanomaterials can have unique properties associated with their small dimensionality. Recently functional nanomaterials are rapidly finding wider use in modern technological products in many areas, such as displays, energy conversion, energy storage and sensors. Here, the accurate characterization of nanoscale materials by traceable dimensional and analytical techniques is essential for the development and quality control of innovative products. Metrology for nanoscale materials relies on the ability to measure, with nm or even atomic resolution, in three dimensions over large regions, and traceable to SI units. Often, additional measurands of importance are chemical states and composition. As the structures and the dimensions are ‘nano’ or even at the atomic scale, traditional analytical techniques are being pushed to their limits requiring new innovative approaches to face state of the art problems leading to international standardisation.

This Symposium will cover recent and innovative developments in analytical techniques that can provide precise characterization of materials and devices with nanoscale and/or atomic resolution. The objective of this symposium is to highlight the capabilities of precise techniques for the determination of the key structural and material parameters and for a better understanding of the functional properties of challenging new materials. One major focus will be on application of these techniques to new and complex materials systems with high potential of industrial application which includes nanoscale objects (nanowires, quantum dots, nanoparticles) and nanostructured thin films of organic, hybrid or inorganic semiconductors, functionalized surfaces and others.

A huge range of measurement tools have emerged to characterize nanomaterials from different perspectives. To this end, this symposium will have a special focus on in-situ, operando and complementary metrology that seeks to merge the best attributes of different measurement perspectives to support each other for solving analytical problems. Complementary analytical techniques are crucial for the analysis of complex materials, where often a single measurement method is not sufficient to ensure metrological precision, traceability and a well-described uncertainty budget. Often, a combination of optical methods, X-ray methods, ion beam methods, surface analytical and scanning-probe methods is required to ensure accurate results. Lastly, for advanced material based devices, nanoscale probing of optical and electronic properties is crucial, using methods such as tip-enhanced spectroscopy, super-resolution microscopy and other advanced opto-electronic, charged particle based and X-ray based characterization techniques. As many of these techniques depend on modeling for gaining results, effective material analysis and computational optical analysis of materials and thin layers will be a central subject.

Hot topics to be covered by the symposium:

• Combined metrology for complex thin films and nanomaterials (e.g. new multiple-method approaches and combined data analysis) Analytical and dimensional nanometrology including combined methods addressing thin films, interfaces, advanced materials and nanostructures, qualification of calibration specimen and international standardization.
• X-Ray diffraction, tomography, scattering and spectrometry-based applications on advanced materials and in nanoscience
• Ion beam and charged particle techniques (SIMS, XPS, ...) for characterization of nanomaterials
• Advanced optical spectroscopic techniques, ultramicroscopy and interferometric or non-interferometric methods
• Scanning-probe techniques for high resolution characterization of organic, hybrid and inorganic advanced materials (AFM, tip-enhanced spectroscopy, ...) Advanced metrology for energy conversion and storage materials (CIGS, thin film photovoltaics, batteries, fuel cells) as well as for nanoelectronics with respect to thin layer, depth profiling, interfacial elemental, coordination and species information

List of invited speakers (confirmed):

• Jean-Paul Barnes (CEA-LETI, France): Correlating SIMS, XPS and AFM for the analysis of organic and inorganic semiconductor devices
• Emiliano Descrovi (Politecnico di Torino, Italy): Phase-imaging with partially coherent illumination for biological samples
• Claudia Schnoehr (University of Leipzig, Germany): Atomic scale structure characterization of CIGS and alloys

Tentative list of scientific committee members:

• Hele Savin / Aalto University – Finland
• Omar El Gawhary / VSL – Netherlands
• Ravi Silva / Univ Surrey – United Kingdom
• Peti Klapecek / CMI – Czech Republic
• Francois Piquemal / LNE – France
• Roland Mainz / HZB – Germany
• Sebastian Wood / NPL – United Kingdom
• Narciso Gambacorti / CEA-LETI – France
• Francesco Riganti Fulginei / Univ Roma Tre – Italy
• Philipp Hoenicke / PTB – Germany
• Peter Petrik / MFA / TTK – Hungary
• Andreas Hertwig / BAM – Germany
• Poul-Erik Hansen / DFM – Denmark
• Sascha Nowak / MEET – Germany
• Sebastian Risse / HZB – Germany
• Natascia del Leo, INRIM – Italy

Symposium organizers

Burkhard BECKHOFF (Main)
Physikalisch Technische Bundesanstalt
Abbestrasse 2-12, Berlin, Germany
Mail: burkhard.beckhoff@ptb.de

Fernando Araujo de CASTRO
National Physical Laboratory
Hampston Road, Teddington TW11 0LW, U.K.
Mail: fernando.castro@npl.co.uk

Luca BOARINO
INRIM
Strada delle Cacce 91, 10135 Torino, Italy
Mail: l.boarino@inrim.it

Marie-Christine LEPY
LNE / Laboratoire National Henri Becquerel
CEA Saclay, F- 91191 GIF-sur-Yvette, France
Mail: marie-christine.lepy@cea.fr

deadline for abstract submission: 15 January 2020
Current trends in optical and X-ray metrology of advanced materials for nanoscale devices VI

Photonic probes are an essential tool to characterize novel materials, since they can be non-destructive and are sensitive to many of the critical characteristics of the materials. This symposium will: i) explore the use of photons from terahertz to x-ray to characterize materials essential for many emerging technologies; ii) give an overview of the current status of optical and x-ray metrology for materials characterization and quality assurance of thin films, layer-structured materials, and one-dimensional nanomaterials, with a particular emphasis on state-of-the-art metrology; iii) promote and encourage the interaction between academic and industrial research to address scientific and technological challenges associated with the improvement of standard analytical methods and qualification of newer techniques with a particular emphasis for ICT, Microwave/Terahertz, Renewable Energy and Energy storage, health and heritage conservation; iv) promoting and encouraging young researches and academics interaction with industry to address scientific and technological challenges associated with the improvement of standard analytical methods and qualification of newer techniques suitable for addressing the needs for the emerging technologies of the future at nanoscale; v) foster networking activities within all these emerging fields of science and technologies that are expected to have a significant societal impact.

Scope:

This symposium will explore recent advances in photonic characterization of novel materials used in applications as varied as renewable energy, medical applications, and art restoration. Visible photons are very easy to produce and manipulate, and have the proper energy to characterize semiconductor materials, such as might be found in solar cells. Infrared and terahertz photons much lower energy and are harder to produce and manipulate, but give information about lattice vibrations and impurities in materials. X-rays are much higher energy, and therefore can explore material characteristics such as lattice spacing and atom identification. This international symposium is intended to give an overview of the current status and future trends of optical, terahertz, infrared and x-ray metrology used to characterize nanoscale and other materials essential for many emerging technologies such as ICT, Microwave/Terahertz, Renewable Energy and Energy storage, health and heritage conservation. Another emphasis of the symposium will be on the use of larger facilities, such as synchrotrons, which produce x-rays with characteristics beyond the capability of laboratory light sources. An important consideration in this symposium will be on the actual characteristics measured, as well as the limits of the technique. In addition to the scientific objectives, we will promote and encourage the interaction between worldwide academics, National lab scientists and scientific instrument manufacturer to improve standard analytical methods and qualification of newer techniques suitable for addressing the needs for the emerging technologies of the future. A special networking event between Europe and Japan will be organised as part of this symposium.

Hot topics to be covered by the symposium:
- Ellipsometric techniques (Mueller Matrix, Infrared, THz, time-resolved and in-situ)
- X-ray diffuse scattering
- THz spectroscopy
- Spatially resolved optical and x-ray techniques at nanoscale
- Characterization of complex materials such as halide perovskites, graphene, graphene oxide, 2D semiconductor materials, nanotubes and nanowires, nanomaterials, and composites.
- Bio-related materials (Proteins, Cancer Cells, in-vivo and ex-vivo characterization)
- Materials for New Mobility (Batteries, Supercapacitors, 5G/6G, Fuel cells, CFRRPs)
- Nanostructures, photonic crystals, and metamaterials; transparent conductive materials
- Dielectrics and ceramics: low- and high-k materials; transparent semiconductors
- Novel functional materials: Ferroelectrics, ferromagnetics and multiferroics
- Emerging X-ray Techniques: Coherent imaging, Ultrafast timing fs (FEL)
- Novel imaging and mapping capabilities and high spatial resolution: Nanoscale Raman (TERS SERS), IR and Photoluminescence Spectroscopies
- Ultrafast Spectroscopy/ Optical Pump-probe techniques
- High Resolution Transmission Electron Microscopy

Publication:

Selected papers will be published as a special issue in Physica Status Solidi a (pss-a), Wiley.

Symposium organizers

Gerald E. JELLISON
Materials Science and Technology Division - Oak Ridge National Laboratory
1 Bethel Valley Road Oak Ridge, TN 37831 USA
Phone : +865 576 7309
Mail : jellisonej@ornl.gov

Mirea MODREANU (Main)
Tyndall National Institute-University College Cork
Lee Maltings, Dyke Parade, Cork, Ireland
Phone : +353 21 4904267
Mail : mirea.modreanu@tyndall.ie

Olivier DURAND
Université Européenne de Bretagne - FOTON-OMH - UMR-CNRS 6082
INSA de Rennes, 20, avenue des Buttes de Coësmes - CS 70 839, 35708 Rennes, France
Phone : +33 (0) 2 23 23 86 28
Mail : olivier.durand@insa-rennes.fr

Toshihiko KIWA
Okayama University
3-1-1 Tushima-naka, Kita-ku, Okayama, 700-8530 Japan
Phone : + 81 (86) 251 8130
Mail : kiwa@okayama-u.ac.jp

deadline for abstract submission: 15 January 2020
BIOMATERIALS AND SOFT MATERIALS

Symposium R

Bioinspired and biointegrated materials as new frontiers in nanomaterials X

This symposium is composed of SPECIAL SESSIONS contemporary hottest topics from a field a nature inspiration - mimetic single, supramolecular nanomaterials to micromimetic materials with mimetic supramolecular chemistry and which will be smart living building blocks, with LIFE inspired processes, of smart materials for better Human Life.

Scope:

Newest science ideas and nanotechnologies for smart nano - materials - integrated systems, - robotic devices fields which determine developing biomimetic cells and skin, bone tissue engineering, remodeling ones and adapting to a regeneration of nervous systems using created implantable bionic systems. These systems can include molecular systems, biomobilized Nanoparticles NPs as nanorobots in vivo applications and designed synthesized supramolecules which are templated by biomolecules (virus, marine plants, proteins, pigments) inorganic NPs for the quantum dots nanosystems, bioinspired composites -Biohybrids- materials ... The design, engineering of these materials are aimed to obtain the properties which respond to external, biologically compatible stimuli (physical, chemical, biological) and to electronic, photonic, magnetic nanosystems. Next step is transferring from nano to macro materials for regenerative medicine of bones and teeth (stem cells regenerative orthopedic and dental medicine), for example, and engineering of multifunctional biointerfaces and biotemplating.

The symposium will bring together researchers from chemical, physical sciences and bio - science and – nanotechnology biomaterials for nano - medicine and engineering bio - electronic, - photonic, - magnetic nanosystems to discuss the latest advancements.

Proposed subjects for discussions at this event have actuality for Investigators - Collaborators of the EU COST Actions, as and the EU HORIZON 2020-2025 Projects. A special Young Scientist FORUM (session for Advanced Researchers (Post-Graduate, PhD and Graduate students’ talks) will be held at the symposium’s second day.

Hot topics to be covered by the symposium:

1. Designed synthesized single, supramolecular materials and their action in bio – mimetic material synthesis;
2. Bioinspired synthesis of inorganic nanoparticles (NPs), hybrid systems with smart activity;
3. Design and creation of the 2D and 3D nanocarbon’s smart supramolecular materials and their Biohybrids;
4. Novel concepts in nano - characterization, bio-recognition of smart and specially bio-hybrid stimuli responsible nanomaterials (biosynthesized, immobilized and biointegrated inorganic nanoparticles, carbon and biomobilized carbon supramolecules) with applications for clinical, food, feed and environmental monitoring;
5. 2D-3D-4D molecular imprinting biological cell structures and biomimetics ones as scaffolds in tissue engineering with specially cell, tissue actuating, manipulation using constructed bionic systems;
6. Electronic, photonic and magnetic smart functions of biosupramolecules (nucleic acids, virus, marine plants proteins, pigments) and mimetic analogs: adaptation to human systems functions for biomedical nano – systems, - robotic devices designing, for example, molecular robot - DNA motor “robotic” molecule into living cell; Special – Neuroelectronics;
7. Biosensing characterization for medical (in vivo and in vitro diagnostics) and environmental biotechnologies (developed 3rd Generation Biosensors on biomolecules, carbon 2D materials, bioelectronic textiles, wears tissues, printed paper electronics, electronic skin);
8. Biomimetic analogs functions in compare to bionic functions for natural systems (electronic skin, neuroengineering).

Invited partners:

- DE GRUYTER Open Chemistry Peer-reviewed open access journal. www.openchemistry.com. Instructions for authors are available here.
- Open Chemistry Managing Editor - Agnieszka Topolska - Agnieszka.To - polska@degruyter.com

Symposium organizers

Emmanuel STRATAKIS
Institute of Electric Structure and Laser (IESL)
Foundation of Research and Technology Hellas (FORTH) and University of Crete, Nikolaou Plastira 1000, Voutes, Heraklion, Crete
Phone : +30 2810 3912 74
Mail : stratak@iesl.forth.gr

Eugenia BUZANAEVA
Taras Shevchenko National University of Kyiv
NASU “Physical and Chemical Material Science Centre”, Volodymyrs’ka Str. 64/13, 01601 Kyiv, Ukraine
Phone : +38 044 294 26 22
Mail : emms@univ.kiev.ua

Insung S. CHOI (Main)
The Center for Cell-Encapsulation Research, KAIST
Dep. of Chemistry and Dep. Bio and Brain Engineering - 281, Daejeon 34141, Korea
Phone : +82 42 350 2880
Mail : ischoi@kaist.ac.kr

Peter SCHARFF
Technical University of Ilmenau
Institute of Chemistry and Biotechnology, Weimarer Strasse 25, 98693 Ilmenau, Germany
Phone : +49 36 77 69 3603(04)
Mail : peter.scharff@tu-ilmenau.de

Thomas J. WEBSTER
Northeastern University
Department of Chemical Engineering - Center Advanced Materials Research - 313 Snell Engineering Center - Boston, IMA 02115, USA
Phone : +1 617 373 6585
Mail : th.webster@neu.edu

deadline for abstract submission: 15 January 2020
Biohybrid nanomaterials: bioinspired, DNA- and peptide-based assemblies for sensing, delivery and electronics

The combination of biomolecules and synthetic constructs can lead to biohybrid nanomaterials with new functions that emerge through design at the molecular and supramolecular levels. This symposium will encompass the design, characterization, and the recent applications of bioinspired and biohybrid assemblies in sensing, delivery, and bioelectronics.

Scope:

The scope of this symposium is to explore the many facets of biohybrid nanomaterials, dealing with their design, synthesis, characterization, self-assembly, modeling, properties, and functions and biological investigations (in vitro, in vivo). The symposium will cover bio-supramolecular and bio-inspired assemblies, peptide-based and DNA-templated nanostructures, as well as biomolecular nanoarrays, with perspectives and applications in (bio)sensing, delivery, and bioelectronics.

Bioinspiration and biomimicry are nowadays seen as sound approaches to evolve towards sustainable and smart materials for applications in the fields of healthcare and information technology. In this context, biomolecules such as peptides or nucleic acids can be seen as natural, information-rich, and tunable scaffolds. Thus, researchers are seeking novel functions by interfacing biomolecules with synthetic nanomaterials (small organic compounds, macromolecules, nanoparticles, carbon nanotubes and 2D nanomaterials) in a unique fashion that lead to the self-construction of functional static and dynamic biohybrid nanostructures of high interest for sensing, delivery and bioelectronic applications. Mastering this self-assembly process requires proper molecular design of the biomolecular and synthetic partners, and a synergistic set of interactions at the supramolecular level.

The study of biohybrid nanomaterials requires a multidisciplinary approach, hence this symposium aims at bringing together materials scientists, supramolecular chemists, biophysicists, and computational chemists to share the various viewpoints and approaches in the emerging field of biohybrid nanomaterials. Particular emphasis will be given to DNA- and peptide-based strategies, but more general approaches employing supramolecular interactions to control the formation of biohybrid nanostructures are within the scope of the symposium.

Hot topics to be covered by the symposium:

- Bio-supramolecular nanostructures
- DNA-templated nanostructures
- Peptide- and polyamide-based self-assembled nanostructures
- Interfacing biomolecules with nanoparticles/nanotubes/nanoshells
- Stimuli-responsive biomolecular assemblies
- Molecular modeling of hybrid biomolecular structures
- Optical/Electrical/Electrochemical sensing based on biomolecular hybrids
- Single-molecule bioelectronics
- Supramolecular approaches for delivery applications

List of invited speakers (confirmed):

- Rein Ulijn, Nanoscience Initiative at the Advanced Science Research Center, City University of New York
- "Design Principles for Peptide Matter with Life-Like Functions"
- Jennifer N. Cha, University Colorado Boulder
- "Generating Renewable Fuels from Bio-Nano Architectures"
- Sébastien Lecommandoux, ENSCBP, CNRS, University of Bordeaux
- "Bioactive nanomaterials by design from self-assembly of polypeptide-based biohybrid copolymers"
- Ignacio Alfonso, Institute for Advanced Chemistry of Catalonia (IQAC-CQCIC), Barcelona
- "Molecular recognition and dynamic covalent chemistry applied to chemical biology"
- Davide Bonifazi, School of Chemistry, Cardiff University
- "Tailoring functional architectures with peptide templates"
- Mathieu Linaires, Linköping University
- "Theoretical investigations of DNA-molecule interactions"
- Peter Crowley, NUI Galway
- "Programmable Protein Assembly by Supramolecular Receptors"
- Mihail Barboiu, CNRS, University of Montpellier
- "Dynamic Constitutional Frameworks – new tools for biorecognition"
- Javier Montenegro, Center for Research in Biological Chemistry and Molecular Materials, University of Santiago de Compostel
- "Supramolecular Lessons for New Biomaterials in Gene Delivery and Cytoskeleton Mimics"

List of scientific committee members:

- Beatriu Escuder, University of Castellon
- Subi J. George, JNCASR, Bangalore, India
- Andrés de la Escosura, Universidad Autónoma de Madrid
- Sébastien Clément, University of Montpellier
- Christian Nielsen, Queen Mary University of London
- Stefan Matie, University of Geneva
- John Hardy, Lancaster University
- Tanja Weil, Max Planck Institute for Polymer Research, Mainz
- Luc Bruinsveld, Technische Universität Eindhoven

Symposium organizers

Elisabeth GARANGER
Université de Bordeaux
Laboratoire de Chimie des Polyémers Organiques (LCPO), 16 avenue Pey-Berland, 33607 Pessac, France
Phone: +33 540006693
Mail: elisabeth.garanger@enscbp.fr

Mathieu SURIN (Main)
University of Mons – UMONS
Laboratory for Chemistry of Novel Materials, 20 Place du Parc - 7000 Mons, Belgium
Phone: +32 65 373855
Mail: mathieu.surin@umons.ac.be

Matteo PALMA
Queen Mary University of London
Room 1.11, Joseph Priestley Building, Mile End Road, London E1 4NS, U.K.
Phone: +44 20 7882 6601
Mail: m.palma@qmul.ac.uk

Sébastien ULRICH
IBMM, Université de Montpellier, CNRS
ENSCM, 8 rue de l’école normale, 34090 Montpellier, France
Phone: +33 467144346
Mail: sebastien.ulrich@enscm.fr
BIOMATERIALS AND SOFT MATERIALS

Symposium I

Cellulose electronics and photonics: a new challenge for materials a new opportunity for devices III

This symposium aims to join the research community working in multifunctional cellulose-based materials posing an innovative vision for new concepts, fundamental understanding, and applications. This includes topics from fibre preparation/functionization and multi-scale modelling to new devices and processing techniques.

Scope:

Concerns about sustainability have attracted a great interest in renewable materials from nature as emerging solutions to a range of technological challenges. In particular, cellulose-based materials are not only biocompatible and earth-abundant but also have nature-provided intrinsic structures for potentially transformative impact on new recyclable electronic and photonic devices like paper displays, smart labels, smart packaging, bio- and medical applications, point-of-care (PoC) devices, RFID tags, disposable sensors and actuators, energy harvesting devices, among others.

To enable all these possible applications, some challenges in fundamental research and understanding must be surmounted, which include giving new functionalities to cellulose and structures with tailored properties, novel devices with both proper functionality and mechanical flexibility, cost effectiveness, scalable and reliable manufacturing techniques, and system-level integration.

This symposium aims to gather the research community working with cellulose-based materials and cover recent developments in topics that include: micro/nano fibers functionalization and assembling, new cellulose-based substrates (nanocellulose, bacterial cellulose, etc), nanocomposites with other functional materials (conductors, semiconductor, insulators, piezoelectric/triboelectric, ion-permeable), multi-functional devices and actuators, bio-mimetic/nature-inspired structures, and cost-effective manufacturing technologies on large area (printing and roll-to-roll processes).

Hot topics to be covered by the symposium:

- Cellulose and other related biomaterials such as lignin.
- Nanocellulose-based functional structures and self/hierarchical assembly
- Mechanical/thermal/barrier properties and multi-scale modeling
- Micro/nanostructured and biosensors on cellulose and related biomaterials
- Electronic devices such as flexible electronics,
- Sensors and actuators
- Plasmonics and nanophotonics.
- Energy harvesting applications such as solar cells, batteries, supercapacitors and piezoelectric devices
- Other emerging applications such as smart materials, membranes and others

Tentative list of invited speakers:

- George Whitesides, Harvard University, USA “Ibd”
- Babak Ziaie, Purdue University, USA “Laser-patterning and paper-based MEMS”
- Sameer Sonkusale, Tufts University, USA “Paper and thread-based diagnostics”
- Liangbing Hu, Maryland University, USA, “Printed flexible energy devices”
- Wadood Hamad, University of British Columbia, Canada, “Cellulose Nanocrystals: Towards New Transformations in Functional Polymers and Optoelectronic Materials”
- Orlando Rojas, Aalto University, Finland “Nanocellulose Cryogels for electrochemical devices”
- Andrew Steckl, University of Cincinnati, USA “POC diagnostics on paper”
- Elvira Fortunato, NOVA University, Portugal “Ibd”
- Aline Rougier, ICMB, France “Electrochromic devices on paper”
- Mats Sandberg, RISE, Sweden, “Cellulose-oxide nanoparticles composite”
- Silvia Vignolini, University of Cambridge, UK, “New horizons for cellulose nanophotonics”
- Subir Biswas, Kyoto University, Japan, “Cellulosic-Nanorod-Reinforced Transparent Substrates”
- Jie Qi, University of Tokyo, Japan “Sketching in Circuits: Designing and Building Electronics on Paper”
- Sang-Young Lee, Ulsan National Institute of Science and Technology, Korea “Handwriting Batteries”
- Pool See Lee, Nanyang Technological University, Singapore “Graphene Patterning on Woods and Leaves for Green Electronics”
- Zhe-Sheng Feng, University of Electronic Science and Technology of China, China “Flexible Metal Antennas on Paper-Based Substrates”

Tentative list of scientific committee members:

- Rodrigo Martins (NOVA University, Portugal)
- Guy Eymir Petot Tourlofit (Centre Technique du Papier, France)
- Maria Smolander (VTT, Finland)
- Chuck Henry (Colorado State University, USA)
- Patterning on Woods and Leaves for Green Electronics
- Masood Atashbar (Western Michigan University, USA)
- Building Electronics on Paper
- Maria Smolander (VTT, Finland)
- Andrew Steckl, University of Cincinnati, USA “POC diagnostics on paper”
- Wadood Hamad, University of British Columbia, Canada, “Cellulose Nanocrystals: Towards New Transformations in Functional Polymers and Optoelectronic Materials”
- Rodrigo Martins (NOVA University, Portugal)
- Antonio José Felix DE CARVALHO

Universidade de São Paulo
Department of Materials Engineering, Av. João Dagnone, 1100 Jd. Sta Angelina, CEP: 13563-120, São Carlos - SP – Brasil
Phone: +55 16 3380 3300
Mail: antonio@tec.usp.br

Ari ALASTALO
VTT, Printed and hybrid functionalities, Printed sensors and electronic devices
Tietotie 3, FI-02150 Espoo, Finland
Mail: ari.alastalo@vtt.fi

Luís PEREIRA (Main)
CENIMAT/I3N / Faculdade de Ciências e Tecnologia / Universidade Nova de Lisboa and CEMOP/UNINOVA
Campus da Caparica, 2629-516 Caparica, Portugal
Phone: +351212934852
Mail: lrmp@tct.unl.pt

Massaya NOGI
Osaka University
Department of Functionalized Natural Materials ISIR, Mihogaoka 8-1, Ibaraki, Osaka, 567-0047, Japan
Mail: nogi@eco.sanken.osaka-u.ac.jp

Symposium organizers

Aaron MAZZEO
Department of Mechanical and Aerospace Engineering
98 Brett Road, Piscataway, NJ 08854, USA
Phone: +1 848 228 2498
Mail: aaron.mazzeo@rutgers.edu

Antonio José Felix DE CARVALHO
Universidade de São Paulo
Department of Materials Engineering, Av. João Dagnone, 1100 Jd. Sta Angelina, CEP: 13563-120, São Carlos - SP – Brasil
Phone: +55 16 3380 3300
Mail: antonio@tec.usp.br

Ari ALASTALO
VTT, Printed and hybrid functionalities, Printed sensors and electronic devices
Tietotie 3, FI-02150 Espoo, Finland
Mail: ari.alastalo@vtt.fi

Luís PEREIRA (Main)
CENIMAT/I3N / Faculdade de Ciências e Tecnologia / Universidade Nova de Lisboa and CEMOP/UNINOVA
Campus da Caparica, 2629-516 Caparica, Portugal
Phone: +351212934852
Mail: lrmp@tct.unl.pt

Massaya NOGI
Osaka University
Department of Functionalized Natural Materials ISIR, Mihogaoka 8-1, Ibaraki, Osaka, 567-0047, Japan
Mail: nogi@eco.sanken.osaka-u.ac.jp

deadline for abstract submission: 15 January 2020
BioComputation: materials, algorithms, devices and fabrication

There is wide agreement that Moore’s law regarding exponential growth of the number of components in integrated circuits is finally coming to an end. Beyond 2020, the expectation is that the further development of computing devices will be driven less by miniaturization of conventional technology and more by specialized architectures, drawing on different technologies for different applications. For example, neural networks and crypto currencies are creating markets for devices that are very energy efficient at solving these problems, creating opportunities for entirely new, highly energy efficient architectures. In this symposium we will focus on bio-computation and bio-inspired circuits that are important avenues to addressing these needs, and they provide an alternative to future quantum technology, which may take a long time to realize and will address different and complementary computing needs. A key advantage of bio-computation is the potential for much-improved energy efficiency compared to both traditional, digital transistor technology and – probably – quantum computation. However, progress in bio- and bio-inspired computation is critically dependent on the development of new materials and fabrication technologies, and requires an interdisciplinary approach engaging materials science, computer science, biophysics, cognitive science, micro- and nanofabrication, sensing, electronics and photonics. By inviting key scientists active in bio-computation in these different areas, the symposium will offer an overview of the latest advances in materials research at an international level and of relevant interdisciplinary research in both fundamental and applied areas.

Topical cluster: Biomaterials and Soft Materials (with direct relevance for Decarbonized Energy and Sustainability)

Scope:

Materials, algorithms, devices and fabrication technologies for bio- and bio-inspired computation. This includes DNA computation, network-based bio-computation, cell-inspired computation (e.g. based on proteins), and neuromorphic computing architectures. In biological computing, bio-molecules – proteins, cells or DNA – are used to perform logic operations, store and retrieve data as well as data readout. In neuromorphic computing, the efficient architecture of the brain is emulated to achieve high-performing computation of specific types of problems.

Hot topics to be covered by the symposium:

- Materials and molecular design and approaches
- Approaches to bio- and parallel computing including hybrid solutions
- Implementation of efficient algorithms and design of networks
- Efficient encoding and readout of large amounts of information into (biological) computing agents
- Reducing error rates and formal verification
- Single-molecule sensing and detection
- Fabrication and scale-up of computing devices including microfluidic approaches

List of invited speakers (confirmed):

- Adam Micolich, UNSW
- Aydogan Ozcan, UCLA
- Cristiano Malossi, IBM, Zürich
- Dan Nicolau, McGill University, Montreal
- Eric Lutz, Stuttgart University
- Falco van Delft, Eindhoven
- Irene Fernandez Cuesta, Hamburg
- Luis Ceze, University of Washington, Seattle (tentatively confirmed)
- Mart Graef, TU Delft
- Till Korten, TU Dresden

Scientific committee:

- Heiner Linke (Lund University, Sweden) (Chair)
- Henry Hess (Columbia University, USA)
- Hillel Kugler (Bar-Ilan University, Israel)
- Friedrich Simmel (TU Munich, Germany)

Symposium organizers

Friedrich SIMMEL
TU Munich
Germany
Mail: simmel@tum.de

Heiner LINKE (Main)
Lund University
NanoLund and Solid State Physics - Box 118 - 22100 Lund, Sweden
Mail: heiner.linke@ftf.lth.se

Henry HESS
Columbia University
USA
Mail: hhess@columbia.edu

Hillel KUGLER
Bar-Ilan University
Israel
Mail: kugler.hillel@biu.ac.il

BIOMATERIALS AND SOFT MATERIALS

Deadline for abstract submission: 15 January 2020
Symposium V

Carrier transport, photonics and sensing in group IV-based and other semiconductors nanodevices

The new composites, nanostructures and designs of group IV materials provide a platform for advanced devices for Nanoelectronics, Photonics and Sensors. The symposium will focus on group IV materials but also other semiconductors, nanostructures and related devices with the objective to bring together scientists working in different application fields.

Scope:

The scope of the proposed symposium will include experimental and theoretical innovations related to group IV and other semiconductors nanoelectronics, nanophotonics and nanosensing. An emphasis will be made on high mobility materials suitable for fast devices, light emission and light absorption.

These topics have attracted an increasing attention in the recent years for various applications, including infrared communication and imaging. The very critical issues are therefore carrier transport properties and lifetimes which will be reflected in the symposium program. The photonic devices of particular interest are detectors, light emitting sources, waveguides, optical modulators. Additional topics in the symposium scope are defect characterization, engineering and the impact of crystal quality on the properties of electronic and photonic devices.

Moreover, integrated photonic devices are recently emerging in the field of biological and chemical sensing by allowing ultra-high sensing performances and efficient CMOS-compatible systems. Simulations and calculations of nanodevices, predicting their physical properties and performances are vital to successful device design and optimization. This is particularly important for nanoscale devices, where conventional approximations can no longer be applied.

The symposium will bring together the whole chain starting with novel technological and scientific developments in the field of material synthesis, subsequently, material characterization, device design and fabrication, and finally, device characterization, simulation and modeling. New applications will be welcomed as well.

Hot topics to be covered by the symposium:

- Fabrication and characterization of group IV- nanostructures, nano-devices and nano-sensors
- Carrier transport in nano-devices
- Optoelectronic materials and nano-devices using Si-based hetero-structures and nanostructures
- Integration of photonics with Si CMOS technology
- Strain band-gap engineering and carrier transport in CMOS
- Si-based optical modulators, switches and detectors
- Si-based waveguide technology and nano-devices
- Luminescence in Si-based materials
- Photonic crystals
- Integrated waveguide sensing
- Nanomaterials for life science applications
- Nanoscale biosensors
- Defect engineering and characterization
- New mechanisms of crystal growth and synthesis
- Nano-structuration and self-organization
- 2D materials based on group IV materials

Symposium organizers

Alessia IRRERA
CNR IPCF
Via Ferdinando Stagno D’Alcontres, 98168 Messina, Italy
Phone : +3909039762286
Mail : irrella@me.cnr.it

Arie RUZIN
Tel Aviv University
Haim Levinson st., 69978 Tel Aviv, Israel
Phone : +972 3 6405214
Mail : ruzin@tauex.tau.ac.il

Henry H. RADAMSON (Main)
Mid Sweden University
Holmgatan 10, 85170 Sundsvall, Sweden & Chinese Academy of Sciences, Department of Microelectronics, 100029 Beijing, China
Phone : +46 702287355 & +86 18311498633
Mail : henry.radamson@miun.se & rad@ime.ac.cn

Isabelle BERBEZIER
CNRS – IM2NP - AMU
Campus de St Jérôme – Case 142 – 13397 Marseille Cedex 20, France
Phone : +33 491 28 91 63 / +33 687 28 23 48
Mail : isabelle.berbezier@im2np.fr

ELECTRONICS, MAGNETICS AND PHOTONICS
Materials research for group IV semiconductors: growth, characterization and technological developments IV

Group IV semiconductors lie at the heart of many electronic and photovoltaic devices. Major challenges for fundamental research and technological development are no longer confined to bulk silicon, but also to other group IV materials and a wide variety of silicon-based structures, such as alloys, nanostructured and nanocomposite materials, composite systems, thin and thick films, and heteroepitaxy on patterned silicon substrates. Advances in device performance are underpinned by new defect engineering procedures, development of novel growth techniques, and improvements in advanced diagnostic tools. Point and extended defects remain at the center of interest, and in some cases their engineering represents an option for new functionalities (e.g. spintronic devices).

Scope:

Crystal growth
- Modeling of defect generation and modeling of crystal growth
- Crystal growth for solar applications
- Control of carbon, phosphorus and boron in solar grade silicon
- Growth of group IV alloy crystals
- Wafering technologies and defect evolution in wafering processes
- Large diameter crystal growth with emphasis on 450mm diameter wafers
- Low quality polycrystalline silicon refinement

Nanostructures of on group IV semiconductors
- Layer deposition for electronic and photovoltaic applications
- Nanocrystalline materials
- Quantum wires, nanothread/ nanowire/ gate-all-around transistors, and quantum dots

Heteroepitaxy on silicon
- Perovskite on silicon for photovoltaic applications
- Selective epitaxy for advanced electronic applications
- Strain engineering in strained layer epitaxy
- Heterogeneous integration of Si or Ge with III-V epitaxial device quality layers
- Defects at heteroepitaxial merging on patterned Si
- Epitaxial deposition of nitrides and SiC on silicon substrates
- Novel methods for the growth of graphene, silicene and germanene on silicon
- Modelling and simulation of epitaxial structures

Thin layer technology
- Deposition of amorphous and crystalline thin layers
- Surface passivation of silicon for photovoltaics
- Silicon membranes

Basic research on point defects and extended defects
- Defects causing light induced degradation of solar silicon
- Vacancy and interstitial related point defect complexes with oxygen, nitrogen, carbon, and hydrogen
- Complexes of dopants with intrinsic point defects and light elements
- Diffusivity of impurities and intrinsic point defects
- Modelling and simulation of extended defects

Gettering and defect engineering
- Gettering of metallic impurities and impurity precipitation in silicon
- Interaction of metals with dopants, impurity atoms and extended defects
- Defect engineered and defect-free silicon wafers
- Dislocation engineering by substrate and process optimization

Technological applications for group IV semiconductors
- Thin layer and multilayer solar cells
- High speed and high frequency electronic devices
- Power devices
- SOI and sSOI devices
- Silicon-based light emitting devices
- Spintronics
- Thermo-mechanical systems

Hot topics to be covered by the symposium:
- Perovskite-on-silicon solar cells.
- Group IV nanowires.
- Silicon for high efficiency PV devices.
- Light emission from silicon-integrated devices.
- Quasi-mono crystalline silicon for photovoltaic applications.
- Fabrication, doping and characteristics of two dimensional allotropes.
- Spintronics.
- Vertical membranes for FinFETS.
- Defects at heteroepitaxial merging on patterned Si.
- Materials for power devices.

Tentative list of scientific committee members:

- Simona Binetti (University Milano-Bicocca, Italy)
- Sebastian Borilla (University of Oxford, UK)
- Stefan Estreicher (Texas Tech University, USA)
- Matthew Halsall (University of Manchester, UK)
- Masatake Hourai (SUMCO, Japan)
- Oleg Koronchuk (STITEC, France)
- Sergio Pizzini (University of Milano-Bicocca, Italy)
- Hele Savin (Aalto University, Finland)
- Eddy Simoen (IMEC and Ghent University, Belgium)
- Yuji Takekawa (Tohoku University, Japan)
- Jun Xu (Nanjing University, China)
- Shigeaki Zaima (Meijo University, Japan)

Symposium organizers

Chioko KANETA
Fujitsu Laboratories Ltd.
10-1 Morinosato-Wakamiya, Atsugi 243-0197, Japan
Phone: +81 46 250 8212
Mail: kaneta.chioko@jp.fujitsu.com

Deren YANG
Zhejiang University
State Key Lab of Silicon Materials Zheda Road 38# Hangzhou 310027 P. R. China
Phone: +86 571 87951667
Mail: mseyang@zju.edu.cn

Gudrun KISSINGER
IHP Im Technologiepark 25 15236 Frankfurt (Oder) Germany
Phone: +49 335 5625 388
Mail: gkissinger@ihp-microelectronics.com

John MURPHY (Main)
University of Warwick
School of Engineering, University of Warwick, Coventry, CV4 7AL, UK
Phone: +44 24 765 75378
Mail: john.d.murphy@warwick.ac.uk

---

deadline for abstract submission: 15 January 2020
Neuro-inspired information processing: from novel materials concepts for neuromorphic computing to local processing of biological signals

The widely anticipated end to Moore’s law and the growing demand for low-power computing systems capable of learning, pattern recognition and real-time analysis of large streams of unstructured data has spurred intense interest in devices with basic forms of neuromplasticity as building blocks for efficient neuromorphic computing systems.

Scope:

The latest advancements of inorganic and organic neuromorphic devices will be broadly covered in this symposium. The symposium will offer an overview the desired properties of bio-inspired or neuromorphic devices and systems, including the merged processing and storage capabilities, adaptivity, delocalized or spatially correlated features, biocompatibility, generic classification and learning. Key showcases of novel neuromorphic devices and materials systems will be highlighted, that are oriented to a range of applications that span from traditional neuromorphic computing and efficient hardware-implemented neural networks to emulate biological neural network behavior and various concepts of neuromorphic sensing in bioelectronics.

The rapidly expanding field of adaptable biointerfacing through the merging of bioelectronics and neuromorphic sensing / actuation will also be covered in this symposium. The field of bioelectronics has made an enormous progress towards the development of concepts, materials and devices that are capable of bi-directional interaction with a biological environment by incorporating concepts such as drug delivery and electrical / chemical stimulation. Nevertheless, fully autonomous applications in the field of organic bioelectronics demand not only the acquisition of biological signals but also local data processing, storage and the extraction of specific features of merit. As such, materials, devices and architectures with bio-inspired features, can offer promising solutions for the manipulation and the processing of biological signals spanning from brain-computer-interfaces and robotics to bioinformatics and the definition of novel computational paradigms at the interface with biology.

This symposium aspires to bring together world-wide experts in the fields of bio-inspired computing and bioelectronics in order to enhance trans-disciplinary interactions and bridge the gaps between memristive devices and neuroscience. The envisioned forum purports the exploitation of the disciplinary interactions and bridge the gaps between memristive devices and neuroscience. The envisioned forum purports the exploitation of the interdisciplinary interfaces for efficient neuromorphic computing systems.

Hot topics to be covered by the symposium:

- Bio-inspired information processing
- Neuromorphic computing
- Inorganic and organic neuromorphic devices
- Novel device systems (multi-terminal, hybrid devices etc.)
- Memristive materials / devices at the interface with biology
- Bioelectronics
- Neuromorphic sensing
- Neural interface devices
- Adaptable / trainable biointerfacing
- Systems neuroscience

List of confirmed invited speakers:

**Neuromorphic computing – inorganic materials (Day 1)**
- Ronald Tetlzlaff (TU Dresden, DE)
- Daniele Ielmini (Politecnico di Milano, IT)
- Ilia Valov (RWTH Aachen, DE)
- Manan Suri (IIT Delhi, IN)
- Wilfried van der Wel (University of Twente, NL)
- Karin Everschor-Sitte (JGU Mainz, DE)

**Neuromorphic computing – organic materials (Day 2)**
- Alberto Salieo (Stanford University, US)
- Tae-Woo Lee (Seoul National University, KR)
- Dominique Vuillaume (IEMN-CNRS, FR)
- Victor Erokhin (CNR-IMEM, IT)
- Simone Fabiano (Linköping University, SE)
- Emil List-Kratochvil (Humboldt University Berlin, DE)

**Bioelectronics, neuromorphic sensing and adaptable biointerfacing (Day 3-4)**
- George Malliaras (University of Cambridge, UK)
- Fabio Biscarini (University of Modena, IT)
- Themis Prodromakis (University of Southampton, UK)
- Magnus Berggren (Linköping University, SE)
- Robert Nawrocki (Purdue University, US)
- Fabien Alibart (IEMN-CNRS, FR)
- Michela Chiappalone (IIT Genova, IT)
- Xiaodong Chen (Nanyang Technological University, SG)

**Tentative list of scientific committee members:**
- Alberto Salieo (Stanford University, US)
- George Malliaras (University of Cambridge, UK)
- Giacomo Indiveri (University of Zurich, CH)
- Themis Prodromakis (University of Southampton, UK)

**Symposium organizers**

Duygu KUZUM
University of California
Department of Electrical and Computer Engineering, San Diego, USA
Phone : +1 858 534 2985
Mail : dkuzum@ucsd.edu

Jessamyn FAIRFIELD
National University of Ireland
School of Physics, Galway, Ireland
Phone : +353 91 492494
Mail : jessamyn.fairfield@nuigalway.ie

Paschalis GKOUPIDENIS (Main)
Max Planck Institute for Polymer Research
Department of Molecular Electronics, Mainz, Germany
Phone : +49 6131379 605
Mail : gkoupidenis@mpip-mainz.mpg.de

Yoeri VAN DE BURGT
Eindhoven University of Technology
Department of Mechanical Engineering, Eindhoven, The Netherlands
Phone : +31402474419
Mail : y.b.v.d.burgt@tue.nl

**Symposium deadline for abstract submission:** 15 January 2020
Substitution and recycling of critical raw materials in optoelectronic, magnetic and energy devices III

Following the successful editions in 2016 and 2018, the Symposium is devoted to academic and industrial partners working on the substitution and recycling of critical raw materials (CRMs) in electronic, magnetic and energy harvesting devices. The objective is to strengthen the synergies in this community and promote the development of new efficient CRM-free/lean devices.

Scope:

Raw materials are the basic, but fundamental, elements for a wealth of current technological applications. However, some of these materials (14 elements) have been defined since 2011 by the EU Commission as “critical” due to the high risk of supply shortage expected in the next 10 years and for their importance to the European industry. Thus, their (total or partial) substitution and recycling are essential for Europe’s economy. This list has been updated to up to 27 elements in 2017.

Many technologies with a high impact on the quality of life rely on critical raw materials (CRMs) as key elements, from lighting devices (LED, OLED, CFL: rare earths, like Ce, Y, Eu and Tb), in as CRMs) to energy harvesting devices (displacement conductive layers, solar absorbers, caloric materials), permanent magnets (SmCo, NdFeB), catalytic converters, electrode catalysts in fuel cells (Pt group metals (PGM) and Rh-based catalysts) and rechargeable batteries (rare earths, graphite, Co, Li and Ni as CRMs). New research and development activities are required to improve the fundamental understanding of new material solutions containing reduced or no critical content while maintaining or enhancing the performance of the materials, components and products. The design of the alternative compounds, the control of growth process coupled with accurate characterization are mandatory for further development of new CRM-free/lean devices.

The symposium provides an interdisciplinary and intersectoral platform to discuss about CRM alternatives from the modelling, synthesis, characterization, processing and device integration viewpoints. Bringing together researchers from academia and industry, we aim at increasing the interaction among scientists, engineers, and students working on different areas of the CRM field that are too often treated separately.

Hot topics to be covered by the symposium:

Materials Science, Design, Synthesis, Growth, Characterization of Advanced Materials with reduced or free from Critical Raw Materials and Recovery/Recycling of CRMs for:

- Transparent conductive layers
- Rechargeable batteries
- Phosphors for LED applications, Scintillators, Displays
- OLEDs
- Catalysis
- Solar: photovoltaics, photocatalysis, hydrogen production
- Smart windows
- Caloric Materials for energy harvesting or efficient cooling
- Exchange-coupled nanocomposite magnets with less or no rare earths
- New RE-free/lean highly anisotropic magnetic materials
- New and energy efficient motors and generator technologies which do not depend on permanent magnets

List of invited speakers:

- Jose Angel de Toro, Universidad de Castilla-La Mancha (Ciudad Real, Spain): "Towards high-performance permanent magnets without rare earths".
- Pier Carlo Ricci, University of Cagliari (Italy): "Hybrids organic/inorganic materials as reliable alternatives in photonic applications".
- Gwendolyn Bailey, KU-Leuven (Belgium): "Extending lifetime of perovskite solar cell by passivation approach".
- Manuel Salado, BCMaterials (Spain): "A State of the Art Life Cycle Assessment of Rare Earth Elements".

List of scientific committee members:

- T. Schrefl (Danube University Krems, Vienna)
- D. Niarchos (NCSR “Demokritos”, Greece)
- M. Barandiaran (University of the Basque Country, Spain)
- S. Lanceros (BCMaterials, Spain)
- P. Nieves (University of Burgos, Spain)
- G. Hadjipanayis (University of Delaware, USA)
- A. Bollero (IMDEA, Spain)
- P. Normile (University of Castilla-La Mancha)
- G. Perez (University of Valle, Colombia)
- D. Valerini (Enea, Italy)
- M.L. Ruello (Universita` Politecnica delle Marche, Italy)
- N. Lisi (Enea, Italy)
- M. Girtan (Univ. of Angers, France)
- S. Ahmad (BCMaterials, Spain)
- A. Bianchin (MBN Nanomaterialia s.p.a., Italy)

Symposium organizers

Daniel SALAZAR JARAMILLO (Main)
Basque Center for Materials, Applications and Nanostructures, BCMaterials
Barrio Sarriena s/n, UPV/EHU Science Park, Martina Casiano Blvd. 3rd floor, 48940 Leioa, Spain
Phone : +34 648603845
Mail : daniel.salazar@bcmaterials.net

Maria Luisa GRILLI
Enea-Italian National Agency for New Technologies, Energy and Sustainable Economic Development
Energy Technology Department, Casaccia Research Centre, Via Anguillarese 301, 00123 Rome, Italy
Phone : +39 0630486234
Mail : marialuisa.grilli@enea.it

Valentina IVANOVA
CEA Tech
Scientific Direction CEA Saclay - Nano-NINOV Bât. 861 – PC 1043
91191 Gif-sur-Yvette Cedex France
Phone : +33 169082349
Mail : valentina.ivanova@cea.fr

deadline for abstract submission: 15 January 2020
Joint E-MRS/MRS Tutorial on “Artificial Intelligence for Advancing Materials Science”

The joint E-MRS/MRS tutorial on “Artificial Intelligence (AI) for Advancing Materials Science” aims to introduce scientists and engineers from the field of materials science to a novel computer based planning and execution of experiments as well as approach of data analysis in order to support the research and development of new materials and processes. It is believed that AI-based working techniques will significantly change the way how research and development will be carried out in the future. The aim of the workshop is to acquaint the participants with the state-of-the-art methods applied in AI-based research and development.

Importance of AI-based working methods for young researchers and their careers:

In recent years, we have seen exciting progress in artificial intelligence (AI). AI systems are now reaching human-level and even superhuman-level performance on a range of tasks, such as speech recognition, image interpretation, machine translation (Google translate), and gameplay (DeepBlue for Chess, Watson for Jeopardy, and AlphaGo for Go). There is a general belief that AI is poised to radically transform many components of our society and economy. Just to mention one example, self-driving cars and trucks, which incorporate real-time image recognition and control, are close to becoming a reality.

Given these advances in AI and machine learning (ML), the scientific community has taken note and is exploring the use of AI for scientific discovery. Deep learning and AI reasoning methods enable scientists to uncover new types of structure in large amounts of data and design new experiments leading to the most promising areas for further experimentation. These techniques also open up new opportunities for accelerating materials research and discovery. To reap the full potential of these developments, it is critical to educate the materials science community, in particular students and young researchers: Not only can AI dramatically accelerate the pace of materials discovery; AI can also reduce the cost of scientific discovery.

Outline for the workshop:

The most promising AI approaches for scientific discovery, in general, and materials science, in particular, involves a combination of AI techniques: Machine learning, deep learning, search and optimization, reasoning, knowledge representation, and decision making. These techniques should be combined with human insights, simulations, and experimentation.

Schedule (Suggestion: each lecture 45 minutes: 2 lectures + lunch break + 2 lectures + coffee break + 2 lectures)

1. AI for Materials Discovery: Overview (Cara P. Gomes)
   - Overview of AI techniques for Materials Science
   - Problem representation, problem solving, and computational complexity

2. Machine Learning Intro (Stefan Sandfeld)
   - Concepts in statistical and machine learning, Data processing techniques

3. Machine Learning – Supervised Learning (Stefan Sandfeld)
   - Parametric Models (Statistical Models, Classification and regression with models), Non-parametric models (k-Nearest Neighbors, Decision Trees, Support Vector Machines, Gaussian processes, Ensemble learning)

   - Artificial Neural Networks (Neural Network Definition and Elements, Custom layers, Activation Functions, Loss functions), Deep Neural Networks (CNN, RNN)

   - Clustering (Latent variable models (e.g., EM, PCA, ICA, NMF), Neural network-based models (Autoencoders, Deep Generative Models)

6. Sequential Decision Making and Reinforcement Learning (Kristofer Reyes)
   - Bayesian Optimization, Markov Decision Processes, Reinforcement Learning
SATELLITE EVENTS:

Sunday afternoon, May 24
Thin Film chalcogenide photovoltaic materials

As part of the Symposium A:
Thin film chalcogenide photovoltaic materials

Young scientist tutorial for thin-film solar cells

Tutorial overview:
This tutorial is intended for young researchers (students and post-graduates within 3 years of degree completion) who are active in the field of thin-film solar cells and would like to learn the fundamentals of characterization methods that are being used in research and development of these materials and devices. All presentations will be given (mostly) by young, yet experienced researchers who are active in the characterization of Si-, III-V-, chalcogenide-, kesterite-, as well as perovskite-based solar cells. Although these materials will be discussed as model systems, the presentations will primarily focus on the characterization and simulation techniques and thus should be of interest to participants from other symposia as well. Since 2005, this tutorial has already been organized successfully at various E-MRS and MRS Spring Meetings.

Tutorial outline:
Fundamental characterization and modeling of thin-film solar cells
Overview of various scanning probe microscopy techniques
Optoelectronic characterization of photovoltaic materials and devices

Tutorial chairperson:
Daniel ABOU-RAS
Helmholz Zentrum Berlin für Materialien und Energie GmbH
Hahn-Meitner Platz 1
14109 Berlin Germany
Phone: +49 30 8062 43218
daniel.abou-ras@helmholtz-berlin.de
Practical information
All practical information to simplify your coming: contact address, conference venue, transportation, hotel reservation, Visa assistance, bank information, financial support, etc ...

CONFERENCE SECRETARIAT
E-MRS 2020 SPRING MEETING
BP 20
F-67037 Strasbourg Cedex 2
Phone: +33 3 88 10 63 72
Fax: +33 3 88 10 63 43
emrs@european-mrs.com

Identification number:
SIRET n°: 382 390 292 00011
APE code: 9499Z

Address for express mail:
E-MRS
Campus CNRS - Building 50
23 rue du Loess
67200 Strasbourg – France

Contact person:
P. Siffert +33 (0)3 88 10 63 72

BANK DETAILS
Bank: BP ALSACE LORRAINE CHAMPAGNE
Address: Immeuble Le Concorde
4 quai Kléber
BP 10401
67001 Strasbourg cedex - FRANCE
Account: ASS E MRS
Domiciliation / Paying Bank:
CRONENBOURG MITTEL
IBAN (International Bank Account Number):
FR76 1470 7500 1111 1913 8543 942
BIC (Bank Identification Code): CCBPFRPPMTZ

HOTEL ACCOMMODATION
Book your hotel on time. Strasbourg is a very busy city at this period.

STRASBOURG EVENEMENTS, as the OFFICIAL HOTEL PROVIDER FOR E-MRS 2020 SPRING MEETING, has the pleasure to offer various accommodations at discounted rates. Accommodation can be easily booked by using the online booking system available on E-MRS website.

For general information about hotel accommodation in Strasbourg, please visit www.otstrasbourg.fr/en/your-stay/accomodation.html

Warning for Participants
The European Materials Research Society (E-MRS) has been made aware of service providers of the name Exhibition Housing Services (EHS), Travelion or Expo Planners, which have contacted a number of participants, citing the Congress, to offer hotel reservation services. Please note that Exhibition Housing Services (EHS), Travelion or Expo Planners do not represent the European Materials Research Society (E-MRS) nor Strasbourg Convention Centre, nor have the E-MRS Strasbourg Convention Centre authorised them to use their names or trademarks on information they send out to participants.

VISA ASSISTANCE
Citizen having passports from certain countries need a visa to enter France. If you need any assistance to obtain your visa, please contact us as soon as possible (indicate your address, date and place of birth, your passport number and date of expiration).

By email: visa@european-mrs.com
Subject: VISA ASSISTANCE - SPRING MEETING

Because the application for a visa can be a lengthy process, we recommend that you start your visa application process as soon as you have been notified that your paper has been accepted. We also recommend that you secure your travel visa before registering for the symposium.

All letters of invitation will be sent by airmail and by PDF e-mail attachment unless a courier account number is provided with the original request. E-MRS is not able to contact Embassies in support of an individual attempting to gain entry to attend the meeting.

CONFERENCE VENUE
Palais de la Musique et des Congrès
Place de Bordeaux
67082 Strasbourg
http://www.strasbourg-events.com/en
Tram station: Wacken (line B and E)

CONFERENCE LANGUAGE IS ENGLISH

ABSTRACT SUBMISSION


Abstract Length: submissions are limited to 1500 characters. (including spaces, only plain text, no figures, no formulae...)

Note: All abstracts must be submitted via the E-MRS website www.european-mrs.com

Submitting abstracts via the E-MRS website is easy and convenient. Follow the step-by-step instructions on the template, making sure that complete mailing
Practical information

address information is included for the presenting and contact authors. After submitting your abstract, please use your Control ID number in all communications with E-MRS regarding the abstract UNTIL a paper number (e.g., A-IV.8) is later assigned.

Because major revisions may affect a symposium organizer’s decision to accept your abstract, please review it carefully before submission. In the unusual circumstance of having to revise your original abstract, the online submission center enables authors to revise their abstracts up to and including the submission deadline of January 15. After that date, the change must be submitted to: emrs@european-mrs.com (Subject: Abstract Revision) and must include your Control ID number. Please state exactly where the revisions are located (e.g., title, author, body, etc.).

Papers will be selected by the scientific committee of each symposium.

Authors will be notified of acceptance and mode of presentation by March 5, 2020 at the latest.

MANUSCRIPTS AND PROCEEDINGS

Depending on the symposium, a selection of full length papers will be published as special issues in appropriate journals. Submitted papers will be refereed to journals standards. Instructions to authors will be dispatched together with the notification of acceptance of the abstract.

The decision of which journals shall publish the symposia proceedings will be made jointly by symposium organizers and journal editors. An announcement of these journals will be published on the concerned symposium webpage.

POSTERS

A printing office will welcome you on site and will give you the opportunity to print your poster at special cost (conference badge required)

OPENING TIMES: 9:00 - 17:00 (Mon – Thu)

The viewable size of the poster board is: vertical 1.10 m and horizontal 0.90 m. The boards are full white. Please use tape (no pins)! Attendees can preview their posters the morning before the formal presentation.

Authors need to be present at their posters for discussion with attendees during the session. Subsequently, it is each author’s responsibility to remove his/her poster immediately at the end of the session. E-MRS assumes no responsibility for posters left up after this time.

REGISTRATION

All participants (including chairpersons, invited speakers, presenting authors, co-authors, scientific committee members....) must register online.

Registration starts at the end of the abstract submission period only. Online registration will be possible until May 14. If you do not have an E-MRS account on our website, you need to create one before registering to the Spring Meeting. Pre-registration is compulsory and pre-payment is recommended to avoid a long queue.

IMPORTANT: Abstract acceptance does not mean registration. Each author attending the conference must register separately

REGISTRATION FEES

FULL RATE

including: access to symposia, lunches (from Mon to Thu. - No meal on Fri.), coffee breaks, social event, E-MRS membership for one year and one proceedings volume (if applicable).

BEFORE April 8, 2020 580 EUR net
AFTER April 8, 2020 710 EUR net
ON SITE 750 EUR net

STUDENT RATE

including: access to symposia, lunches (from Mon to Thu. - No meal on Fri.), coffee breaks, social event, E-MRS membership for one year and one proceedings volume (if applicable). (Students have to give evidence of their university registration at the main desk)

BEFORE April 8, 2020 320 EUR net
AFTER April 8, 2020 450 EUR net
ON SITE 490 EUR net

E-MRS is a non-profit organization, no subject to VAT.
ON-SITE REGISTRATION

Attendees can also register on-site at the Convention Centre (within the limit of available seats). On-site registration opens SUNDAY, May 24 at 14:00.

IMPORTANT: On-site registration may not include any conference pack: bag, printed version of the conference program, … (depends on availability left). It includes only access to symposium rooms, lunches, coffee breaks and social event.

On-site payment hours:

- Sunday May 24: 14:00 - 18:30
- Monday May 25: 7:30 - 18:00
- Tuesday May 26: 8:00 - 18:00
- Wednesday May 27: 8:00 - 18:00
- Thursday May 28: 8:00 - 18:00
- Friday May 29: 8:00 - 12:00

PAYMENT OF FEES

Payment should be made in EURO for the net total amount due.

The following possibilities are offered:

- Credit card (Carte Bleue, Visa, Eurocard/ Mastercard) (mode preferred)
- Bank transfer:
  - Bank: BP ALSACE LORRAINE CHAMPAGNE
  - Paying Bank: CRONENBOURG MITTEL
  - Account: ASS E MRS
  - IBAN: FR76 1470 7500 1111 1913 8543 942
  - BIC: CCBPFRPPMTZ
  - Watch to identify well your transfer by indicating your ID Number and your name and first name
- Purchase order (bon de commande) to be sent by April 24 at the latest.
- Cash (on-site payment only)

CANCELLATION

In case the E-MRS conference is cancelled, the conference attendees will be entitled to claim the reimbursement of the registration fee. In no case can the Conference Organisers be held liable for the reimbursement of any other cost, such as travel costs, accommodation costs, living expenses etc. Such costs are the exclusive responsibility of Conference attendees.

In order to receive a refund, cancellation requests must be in writing and sent by May 4th which will cause a €25 processing fee. No refunds will be issued on requests postmarked after May 6th. In recent years, there has been a move away from long scary disclaimers of liability for acts of God, terrorism, strikes, volcano eruption etc., so these are no longer included.

EXHIBITION HOURS

Location:
Palais de la Musique et des Congrès
Place de Bordeaux
67082 Strasbourg
http://www.strasbourg-events.com/en

Installation: Monday May 25 (14:00 - 19:00)

Exhibition hours:
- Tuesday May 26: 9:30 - 18:30 pm
- Wednesday May 27: 9:30 - 18:30 pm
- Thursday May 28: 9:30 - 16:30 pm

Dismantling: May 28, after 16:30

PLENARY SESSIONS

Three plenary sessions are scheduled early in the morning on Tue., Wed. And Thu., each consisting of one high level presentation.

TUESDAY MAY 26 from 8:45 to 9:45
Prof. Sir James Fraser Stoddart
Nobel Laureate in Chemistry (2016)
Northwestern University, USA

WEDNESDAY MAY 27 from 8:45 to 9:45
Prof. André Geim
Nobel Laureate (2010)
University of Manchester, U.K.

THURSDAY MAY 28 from 8:45 to 9:45
Prof. Ulrike Diebold
TU Vienna, Austria

SOCIAL EVENT

A reception is being arranged for all the conference participants on Wednesday evening May 27 starting at 20:00. All conference attendees are invited to this reception as a chance to meet and renew relationships with colleagues. Music and food will be provided free of charge. The Graduate Student Awards ceremony will be held at the beginning of the social event.

deadline for abstract submission: 15 January 2020
Practical information

**COFFEE BREAKS**
Free coffee will be served during the morning and afternoon breaks. Please check the individual technical conference listings for exact times.

**AUDIOVISUAL PACKAGE**
The standard audio-visual package in each symposium room will consist of:

- video projector, screen, laser pointer/remote control & microphone
- PC windows XP pro / Microsoft Office pack (including power point) / USB plug

**INTERNET ACCESS / WIFI**
A limited number of internet access terminals will allow attendees to access their internet e-mail during the conference. E-MRS is also pleased to provide complimentary wireless access to the internet for all conference attendees bringing their own laptops.

**CONFERENCE APP**
Navigate conference venue, receive most recent push up information from the organizers, arrange meetings with other participants (app required on both sides). Also check recent programme, speakers list and exhibitors list. Download it from Apple Store if you have iOS or from Google Play for Android system.

**TRAVEL INFORMATION**
REACHING STRASBOURG
Strasbourg enjoys excellent national and international connections, with a TGV high-speed train station with direct access to trains in the city center.

by air

**Strasbourg-Entzheim International Airport**
Strasbourg airport is just 10 minutes from the city center by connected train to the railway station. It offers several flights a day to and from Lyon, Nice as well as some international connections, for example Amsterdam, Bruxelles, London, Luton, Madrid, Prague.


**Paris Charles de Gaulle (France)** – Directly from the airport, you can take a TGV to Strasbourg. When booking with Air France, your airfare can include the transportation by TGV to the Strasbourg main station.


**Basel-Mulhouse-Freiburg Airport (France)** - one-hour twenty minutes by train (take the shuttle bus to the Saint-Louis train station (Line 11) and then catch the train to Strasbourg).

**Karlsruhe/Baden-Baden Airport (Germany)** is located about 60km away in Germany. The best way to get to Strasbourg is to get a bus from the airport to Baden-Baden Hauptbahnhof (Main Station) from there trains run to Strasbourg, normally with one change in Offenburg. From station to station the journey is about 45m-1hr.

More information on [https://www.baden-airpark.de/en](https://www.baden-airpark.de/en)

**Frankfurt International Airport (Germany)** 2h30 away from Strasbourg by express bus and is the nearest intercontinental airports to Strasbourg. Lufthansa operates a shuttle bus between Strasbourg (stops at the train station and at the Hilton Hotel, just in front of the Convention Center) and Frankfurt Terminal 1 – « THE SQUAIRE WEST ». You can also take a train from Frankfurt to Strasbourg.

More information on: [http://www.frankfurt-airport.com](http://www.frankfurt-airport.com)

Attractive discounts, up to -15%, on a wide range of public fares on all AIR FRANCE, KLM and their code-shared flights worldwide.

**Event:** E-MRS 2020 SPRING MEETING  
**ID Code:** 36006AF  
**Travel Valid Period:** 17/05/2020 to 05/06/2020  
**Event location:** STRASBOURG


deadline for abstract submission: 15 January 2020
by train

Strasbourg has one of the largest railway stations in France and enjoys direct TGV connections to many French towns and cities. The city is also an important high-speed train hub, lying on the intersection of the East European and Rhine Rhône TGV lines, and is a short ride away from major European cities. For more information, please visit the SNCF web site.

Examples of travel times to Strasbourg:
• 1h20 from Stuttgart
• 2h05 from Zürich
• 1h50 from Paris
• 3h40 from Munich
• 1h45 from Frankfurt central station or airport (at least one change)

For more information, please visit http://en.voyages-sncf.com/en/

by bus


by road

Strasbourg can be reached from various directions:
• From the west (Paris, Benelux) taking the A4 highway (E25). About 4 hours from Paris;
• From the north and east (Germany), taking the A5 highway (E35).

The Strasbourg-Mulhouse route joins it to the rest of the French motorway network. Strasbourg is fifteen minutes from the Hamburg-Frankfurt-Basel-Genova or Milan motorway, itself linked to the entire European motorway network.

REACHING THE CONGRESS CENTRE
• 10 minutes by tramway from the center of the city. Trams are running every 10 minutes.
• 15 to 20 minutes from the Central Railway Station (connection with Strasbourg Airport and fast train to Paris)
• Tramway: lines B and E - Wacken tram stop
• Parking: 250 free parking spaces on-site and a 570-space park-and-ride nearby
• Vélhop self-service cycle hire scheme: rental points at the railway station and in the city centre. A cycle path brings you directly to the Convention Centre
deadline for abstract submission: 15 January 2020