63rd Annual Meeting

of the International Society of Electrochemistry

19 - 24 August, 2012
Prague, Czech Republic

Electrochemistry for Advanced Materials, Technologies and Instrumentation

2nd Announcement and Call for Papers

http://event12.ise-online.org
e-mail: events@ise-online.org

Invitation to ISE 2012

Prague is a city that has a special relationship with electrochemistry. Polarographic methods of electrochemical analysis were developed in Prague. The city also has often facilitated fruitful meetings of the electrochemical community. Czech electrochemists hosted in Prague the 1st Polarographic Congress in 1951, the 21st CITCE Meeting in 1970, and the 41st ISE Meeting in 1990, organized jointly with the J. Heyrovsky Centennial Congress on Polarography. Now Prague opens its gates to the electrochemical community for a fourth time. The Organizing Committee of the 63rd Annual ISE Meeting cordially invites you to participate in the meeting on "Electrochemistry for Advanced Materials, Technologies and Instrumentation".

The theme of the Meeting outlines challenges to electrochemical science and technology associated with satisfying societal needs in the 21st century. A detailed understanding and consequent control of charge-transfer related processes will be essential in the development of novel processes and materials in diverse fields of science and technology ranging from energy conversion to biological sciences. The meeting will emphasize the multidisciplinary nature and impact of today's electrochemistry. Join us in Prague to contribute to a discussion of the latest developments in the field of electrochemistry and to establish and strengthen the links between electrochemists from different regions and cultural backgrounds.

Organizing Committee

Elisabet Ahlberg, Sweden
Christian Amatore, France
Karel Bouzek, Czech Republic
Ladislav Kavan, Czech Republic
Petr Krtil, Czech Republic **(co-chair)**
Zhongfan Liu, China
Vladimír Mareček, Czech Republic
Mark Orazem, USA
Sharon Roscoe, Canada
Zdeněk Samec, Czech Republic **(co-chair)**

Summary of Symposia

Symposium 1: Recent Advances in Electrochemical Instrumentation and Electrodes

Symposium 2: Electrochemistry meets Biology:
Fundamental Aspects of Electrochemistry with Biological Systems

Symposium 3: Advanced Materials Design for Bioelectrochemical Applications:
from Biosensors to Biofuel Cells

Symposium 4: Advanced Batteries and Electrochemical Capacitors

Symposium 5: Fuel Cells: Materials, Properties, Performance and Durability

Symposium 6: Physical Modeling and Numerical Simulation of Electrochemical Power Generators

Symposium 7: Cathodic and Anodic Routes to Electrochemical Fabrication

Symposium 8: Electroactive Polymeric and Inorganic Materials

Symposium 9: Corrosion Science and Engineering

Symposium 10: Electrochemical Process Engineering and Technology

Symposium 11: Intermediates and Mechanisms at a Molecular Level

Symposium 12: Photoelectrochemistry, Electrochromism and Electrochemiluminescence

Symposium 13: Physical Electrochemistry:
from Fundamentals to Smart Materials and New Catalysts

Symposium 14: Electrochemistry at Liquid-Liquid Interfaces

Symposium 15: General Session

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Plenary Lecturers

Jens Norskov, Stanford University, USA
Kazunari Domen, Tokyo University, Japan
Katharina Krischer, Technical University Munich, Germany
Mark Meyerhoff, Michigan University, USA

2011 ISE Prize Winners and Award Lecturers

Frumkin Memorial Medal
Dieter Kolb, University of Ulm, Germany

Prix Jacques Tacussel
Kingo Itaya, Tohoku University, Sendai, Japan

Katsumi Niki Prize for Bioelectrochemistry
Wolfgang Schuhmann, Ruhr-Universität Bochum, Germany

Alexander Kuznetsov Prize for Theoretical Electrochemistry
Wolfgang Schmickler, University of Ulm, Germany

Tajima Prize
Hogan Yu, Simon Fraser University, Burnaby, BC, Canada

Hans-Jürgen Engell Prize
Jamil Elias, EMPA, Thun, Switzerland

ISE Prize for Environmental Electrochemistry
Cristina Saez, Universidad de Castilla La Mancha, Ciudad Real, Spain

ISE Prize for Applied Electrochemistry
Frederic Maillard, LEPMI/CNRS, Grenoble, France

Oronzio and Niccolò De Nora Foundation Young Author Prize
Meng Li, Brookhaven National Laboratory, Upton, NY, USA

Electrochemistry for Advanced Materials, Technologies and Instrumentation

Electrochimica Acta

Call for Papers

A special issue of the Society's journal, **Electrochimica Acta**, is planned based on selected original contributions made at the conference. Selection will be made by an international Editorial Committee comprising a Guest Editor for each Symposium, appointed and co-ordinated by the Editor-in-Chief, Professor Sergio Trasatti.

Authors are invited to submit an abstract in English of no more than one page in length, including figures, tables and references. Abstracts should be submitted online through the ISE website (http://event12.ise-online.org). The site will open for submission of abstracts on 1 December, 2011. The closing date for submission of abstracts will be **1 March, 2012**.
For details and updates please refer to the ISE website.
At the close of the submission, the Symposium Organizers will assign contributions to either oral or poster presentations.

Symposium 1

Recent Advances in Electrochemical Instrumentation and Electrodes

Sponsored by :
Division 1, Analytical Electrochemistry

The development and utilization of electroanalytical methods is closely connected with development of new instrumentation. New challenges lie ahead in improvement of data acquisition speed, level of automation, improvement in data analysis as well as in implementation of large arrays of micro- and nanoelectrodes – often in combination with complementary spectroscopic techniques. This places new demands on electrochemical instrumentation with respect to sensitivity, accuracy and simultaneous acquisition of signals of different kinds. The symposium will gather contributions highlighting recent developments in the field and those predicted to be important in the near future.

Topics include but are not limited to:

- Advanced instrumentation and prospects for new electroanalytical techniques
- Hyphenated and hybrid systems involving electrochemical instrumentation
- Working and reference electrode materials and designs tailored to specific applications
- Integrated instrument and electrode systems
- Impact of nanotechnology in electroanalytical chemistry

Symposium Organizers

Guenther Wittstock (Coordinator), University Oldenburg, Germany (gunther.wittstock@uni-oldenburg.de)
Fethi Bedioui, ENSCP Paris, France (fethi-bedioui@chimie-paristech.fr)
Toh Chee Seng, National Technical University Singapore, Singapore (cstoh@ntnu.edu.sg)
Tomáš Navrátil, J. Heyrovský Institute of Physical Chemistry, Prague, Czech Republic (tomas.navratil@jh-inst.cas.cz)

Symposium 2

Electrochemistry meets Biology: Fundamental Aspects of Electrochemistry with Biological Systems

Sponsored by:
Division 2, Bioelectrochemistry

This symposium focuses on fundamentals of electron transfer pathways and mechanisms within and between biological systems and electrodes. Electron transfer reactions play a key role in biology and deeper understanding of these processes is prerequisite to successful applications of biological systems in analysis, medicine, energy conversion, and other areas.
This symposium also covers all general aspects of bioelectrochemistry.

Topics include but are not limited to:

- Electron transfer reactions and mechanisms within and between proteins/redox proteins/enzymes and electrodes
- Modification of surfaces and interfaces with enzymes, organelles, cells, and biomimics
- Switchable and tunable electrochemical interfaces and information processing in bioelectrochemical systems
- Electrochemical transport through membranes and their mimics
- Enzyme, biomembrane, organelle, and whole cell bioelectrochemistry and bioenergetics
- Photosynthesis and electrochemistry
- Electrochemistry of nucleic acids and electrochemical nucleic acid sensors

Symposium Organizers

Elena Ferapontova (Coordinator), Aarhus University, Denmark (elena.ferapontova@inano.au.dk)
Taek Dong Chung, Seoul National University, Korea (tdchung@snu.ac.kr)
Lo Gorton, Lund University, Sweden (lo.gorton@biochemistry.lu.se)
Miroslav Fojta, Institute of Biophysics, Brno, Czech Republic (fojta@ibp.cz)

Symposium 3

Advanced Materials Design for Bioelectrochemical Applications: from Biosensors to Biofuel Cells

Sponsored by:
Division 2, Bioelectrochemistry

Nanostructured electrode materials and sophisticated electrode architectures integrating biological elements are key factors for the successful development of state-of-the-art devices with optimized performance for applications ranging from biosensors to biofuel cells. Therefore this symposium focuses primarily on the rational design of electrode materials and surfaces for the study of fundamental and applied aspects in the field of bioelectrochemistry.

Topics include but are not limited to:

- Nanostructured electrode materials with bioelectrochemical activities
- Organized surfaces and interfaces modified with biological systems
- Bioelectrocatalysis and electrochemically driven or assisted biological conversions
- Engineering the bioelectrochemistry of cells and tissues
- Nucleic acid, enzyme and whole cell biosensors based on advanced materials
- Optimised design of enzymatic and microbial fuel cells

Symposium Organizers

Alexander Kuhn (Coordinator), Université de Bordeaux, France (kuhn@enscbp.fr)
Evgeny Katz, Clarkson University, Potsdam, USA (ekatz@clarkson.edu)
Woonsup Shin, Sogang University, Korea (shinws@sogang.ac.kr)
Wolfgang Schuhmann, Ruhr-Universität Bochum, Germany (wolfgang.schuhmann@rub.de)
Jiří Barek, Charles University, Prague, Czech Republic (barek@natur.cuni.cz)

Symposium 4

Advanced Batteries and Electrochemical Capacitors

Sponsored by:
Division 3, Electrochemical Energy Conversion and Storage

This symposium will be devoted to the recent progress of electrochemical energy conversion and storage systems. It will cover the fundamental and applied aspects of different types of batteries (e.g. Li-ion cells) and electrochemical capacitors (EDL capacitors and pseudo-capacitors). New developments in energy and power devices, their hybrid combinations and performance in aqueous, non-aqueous and polymer electrolytes and ionic liquids will be presented.

Topics include but are not limited to:

- Innovative materials and systems for high energy storage devices
- Novel anode and cathode materials for lithium batteries
- Electrode materials for high performance superca-pacitors
- Hybrid and asymmetric capacitors
- Pseudo-capacitive phenomena
- New approaches to elucidate the degradation mechanisms during cycle life of batteries and capacitors
- In-situ and ex-situ studies
- New electrolytes, ionic liquids
- Flow-redox batteries

Symposium Organizers

Elzbieta Frackowiak (Coordinator) Poznan University of Technology, Poland (elzbieta.frackowiak@put.poznan.pl)
Martin Winter, Muenster University, Germany (martin.winter@uni-muenster.de)
Robert Kostecki, Lawrence Berkeley National Laboratory, USA (r.kostecki@lbl.gov)

Symposium 5

Fuel Cells: Materials, Properties, Performance and Durability

Sponsored by:
Division 3, Electrochemical Energy Conversion and Storage

Advances in materials for electrochemical energy conversion are expected to make significant contributions to improved device activity and performance while addressing also the important topics of lower usage of limited resources and sustainability. Particular emphasis will be given in this symposium to current developments in novel materials components for membrane electrode assemblies of fuel cells, including all types of technologies from low to high temperature cell types.

Topics include but are not limited to:

- Synthesis and design of novel electrolyte, catalyst and electrode materials
- Importance of architecture, structure, texture, porosity on fuel cell materials properties
- New experimental approaches to characterization of fuel cell materials and composite electrodes
- Catalysts for oxygen reduction, for electrooxidation of hydrogen, reformate and organic fuels
- Basic understanding of electrochemical reaction processes in fuel cells, including simulation and modeling
- New insights into the degradation and aging modes of component materials and failure mechanisms of fuel cells
- Recycling of fuel cell materials

Symposium Organizers

Deborah Jones (Coordinator), CNRS and University of Montpellier 2, France (deborah.jones@univ-montp2.fr)
Sanjeev Mukerjee, Northeastern University, Boston, USA (s.mukerjee@neu.edu)
Peter Strasser, Freie Universitaet Berlin, Germany (pstrasser@tu-berlin.de)

Symposium 6

Physical Modeling and Numerical Simulation of Electrochemical Power Generators

Sponsored by:
Division 3, Electrochemical Energy Conversion and Storage

This symposium will focus on the role of physical theory and multi-scale computational modeling (from first principles to meso-scale and upto device level) to understand the structure-function relationships of materials and components used in electrochemical power sources (fuel cell, batteries) and electrolyzers. Solicited papers should outline modeling-based diagnostics, experimental validation, as well as design of materials, components, and devices.

Topics include but are not limited to:

- Modeling of electrochemical processes in fuel cell, electrolyzers and batteries
- Self-organization phenomena in fuel cell components (catalyst layer, membrane)
- Electrocatalysis and nanostructure-activity-stability relationships
- Modeling of fuel cell materials and battery components and relevant transport phenomena
- Modeling of material degradation and deactivation phenomena (e.g. corrosion of catalyst support materials, catalyst oxidation/ripening, membrane degradation, contamination, graphite exfoliation, SEI formation and aging in Li-ion batteries)
- System integration, system dynamics modeling, and control approaches: non-linear behaviour of electrode potential in fuel cells and batteries

Symposium Organizers

Alejandro Franco (Coordinator), CEA, Grenoble, France (alejandro.franco@cea.fr)
Kourosh Malek, NRC-IFCI, Vancouver, Canada (kourosh.malek@nrc.gc.ca)
Yann Bultel, INPG, Grenoble, France (bultel@minatec.inpg.fr)

Symposium 7

Cathodic and Anodic Routes to Electrochemical Fabrication

Sponsored by:
Division 4, Electrochemical Materials Science

This symposium integrates current research on electrochemical fabrication by cathodic and anodic processes. The fabrication of novel nanostructures and functional devices will be described for applications encompassing catalysis, energy, electronics, magnetics, optics, energy, and biotechnology. Fundamental studies on nanostructure formation, such as self-ordering mechanisms, will be covered.

Topics include but are not limited to:

- Cathodic electrodeposition of coatings and nanostructures composed of metals, semiconductors, polymers, or minerals
- Anodic oxidation or dissolution to create porous anodic oxides on metals, alloys, and semiconductors, and nanoporous metals formed by dealloying
- Fabrication strategies that integrate cathodic and anodic reactions, such as electrodeposition in porous templates, and electroless deposition.

Symposium Organizers

Kurt Hebert (Coordinator), Iowa State University, USA (krhebert@iastate.edu)
Patrik Schmuki, University of Erlangen-Nuremberg, Germany (schmuki@ww.uni-erlangen.de)
Josef Krýsa, Prague Institute of Chemical Technology, Czech Republic (krysaj@vscht.cz)

Symposium 8

Electroactive Polymeric and Inorganic Materials

Sponsored by:
Division 4, Electrochemical Materials Science

This symposium will focus on electroactive materials, including conducting and redox polymers, inorganic electroactive solids and various electroactive inorganic–organic composite materials. The topics cover both synthesis and characterization of these materials as well as promising areas for their application.

Topics include but are not limited to:

- Synthesis and characterization of electroactive polymers and inorganic electroactive solids
- Electroactive composites containing inorganic component (metal, oxide, salt, carbon, clay) and polymer particles or structures
- Electrocatalytic applications of electroactive polymeric, inorganic and composite materials
- Electroanalytical applications, sensors and actuators
- Applications in energy storage, fuel cells, batteries and supercapacitors
- Other applications of electroactive materials (molecular electronics, biomedicine, electrochromic windows, solar cells)

Symposium Organizers

Vessela Tsakova (Coordinator), Institute of Physical Chemistry, Sofia, Bulgaria (tsakova@ipc.bas.bg)
Mikhail Vorotyntsev, Institut de Chimie Moléculaire, Dijon, France (mv@u-bourgogne.fr)
Jaroslav Stejskal, Institute of Macromolecular Chemistry, Prague, Czech Republic (stejskal@imc.cas.cz)

Symposium 9

Corrosion Science and Engineering

Sponsored by:
Division 4, Electrochemical Materials Science

This symposium focuses on all aspects of corrosion science and engineering with an emphasis on high temperature oxidation, passivity, anodic oxidation, biocorrosion, stress corrosion cracking, corrosion mechanisms and methods of corrosion control.

Topics include but are not limited to:

- New environment-friendly surface treatments for corrosion protection
- Growth and characterization of chemically and electrochemically formed surface films
- Mechanisms of corrosion and corrosion protection of surface-treated materials
- In situ and ex situ characterization with micro- and nano-resolution for application in corrosion studies
- Advanced electrochemical techniques for studying corrosion and surface treatments
- Electronic properties of passive films
- Passivity breakdown and localized corrosion
- Biocorrosion

Symposium Organizers

Monica Santamaria (Coordinator), University of Palermo, Italy (monica.santamaria@unipa.it)
Nick Birbilis, Monash University, Australia (nick.birbilis@monash.edu)
Pavel Novák, Prague Institute of Chemical Technology, Czech Republic (pavel.novak@vscht.cz)

Symposium 10

Electrochemical Process Engineering and Technology

Sponsored by:
Division 5, Electrochemical Process Engineering and Technology

Electrochemical engineering follows up and utilizes the results generated by fundamental and applied electrochemical research. The aim of this symposium is to update electrochemical engineers on recent advances in understanding of the underlying fundamental electrochemical processes and to outline present and future challenges of the electrochemical technologies.

Topics include but are not limited to:

- Electrochemical synthesis
- Pollution treatment and abatement
- Electrodes as a major electrochemical tool
- Engineering of fuel cell systems
- Energy storage for stabilization of the electricity distribution grid
- High temperature and molten salt processes
- Microstructured systems for electrochemical research and production
- Surface treatment and protection
- Mathematical modeling as an efficient tool for process understanding, design and optimization
- New ideas in electrochemical engineering and technology

Symposium Organizers

Karel Bouzek (Coordinator), Prague Institute of Chemical Technology, Czech Republic (bouzekk@vscht.cz)
Ann Cornell, Royal Institute of Technology, Stockholm, Sweden (ann.cornell@ket.kth.se)
François Lapicque, CNRS Nancy, France (lapicque@ensic.inpl-nancy.fr)
Takayuki Homma, Waseda University, Japan (t.homma@waseda.jp)

Symposium 11

Intermediates and Mechanisms at a Molecular Level

Sponsored by:
Division 6, Molecular Electrochemistry

Molecular electrochemistry deals with the relationships between structure and electrochemical properties of redox active molecules. This symposium outlines the role of molecular electrochemistry in characterization of organometallic molecules intended for applications in catalysis, pharmacy, sensorics or as building blocks for new materials. Emphasis will be given to papers combining electrochemical experiments with quantum chemical calculations.

Topics include but are not limited to:

- Electrochemistry of organic molecules and biologically significant compounds, their redox, metabolic and degradation pathways
- Electrochemistry of inorganic, organometallic and coordination compounds, catalysts, markers
- Electrosynthesis including bond activation by electron transfer, new mechanisms
- Stereospecific electrode reactions
- Structure-activity relationship, correlation of experimental data with quantum chemical calculations
- Molecules with multiple redox centers
- Electrochemistry of supramolecular systems

Symposium Organizers

Jiří Ludvik (coordinator), J. Heyrovský Institute of Physical Chemistry, Prague, Czech Republic (ludvik@jh-inst.cas.cz)
Marilia Goulart, Federal University of Alagoas, Brazil (mofg@qui.ufal.br)
Patrizia Mussini, University of Milano, Italy (patrizia.mussini@unimi.it)
Bernd Speiser, University Tuebingen, Germany (bernd.speiser@uni-tuebingen.de)

Symposium 12

Photoelectrochemistry, Electrochromism and Electrochemiluminescence

Sponsored by:
Division 6, Molecular Electrochemistry

This symposium will review state of the art in photo-electrochemistry and electrochemical characterization of systems in excited states. The papers combining electro-chemistry and spectroscopic techniques are particularly solicited.

Topics include but are not limited to:

- Photoelectrochemistry, electrochemistry of excited states
- Electrochromism
- (Spectro)electrochemistry of molecules used for energy conversion and storage, NMR imaging, liquid crystals, dyes and pigments, chiral compounds
- Relationship between structure, UV-visible spectra, HOMO and LUMO energy and redox potentials
- Electrochemically generated chemiluminescence, generation of triplet states
- Combination of electrochemistry with other techniques "on line" and "in situ" (MS, NMR, EPR, sonoelectro-chemistry)

Symposium Organizers

Magdalena Hromadová (Coordinator), J. Heyrovský Institute of Physical Chemistry, Prague, Czech Republic (hromadom@jh-inst.cas.cz)
Frantisek Hartl, University of Reading, United Kingdom (f.hartl@reading.ac.uk)
Jay Wadhawan, University of Hull, United Kingdom (j.wadhawan@hull.ac.uk)
Francesco Paolucci, University of Bologna, Italy (francesco.paolucci@unibo.it)

Symposium 13

Physical Electrochemistry: from Fundamentals to Smart Materials and New Catalysts

Sponsored by:
Division 7, Physical Electrochemistry

Fundamental processes at electrochemical interfaces determine the properties of smart materials and the performance of electrocatalysts. This symposium will review recent advances in understanding of the fundamentals of interfacial processes relevant to rational design of electrodes and applications.

Topics include but are not limited to:

- Electrocatalysis
- Fundamentals of supercapacitors and electroactuators
- Electrovariable optical elements and switches, lubricants
- Molecular electronic devices and molecular machines
- Quantum chemical modeling of electrode processes

Symposium Organizers

Alexei Kornyshev (Coordinator), Imperial College London, United Kingdom (a.kornyshev@imperial.ac.uk)
Angel Cuesta, University of Madrid, Spain (a.cuesta@iqfr.csic.es)
Zhong-Qun Tian, Xiamen University, China (zqtian@xmu.edu.cn)
Petr Krtil, J. Heyrovský Institute of Physical Chemistry, Prague, Czech Republic (petr.krtil@jh-inst.cas.cz)

Symposium 14

Electrochemistry at Liquid-Liquid Interfaces

Sponsored by:
Division 7, Physical Electrochemistry

This symposium will focus on novel theoretical and methodological concepts in electrochemistry on polarized liquid-liquid interfaces and membranes. Papers are solicited addressing the interfacial structure, charge transfer kinetics, interfacial instabilities, effects of the interfacial boundary modification, as well as applications in electroanalysis, ion partition and drug delivery, molecular electrocatalysis and photocatalysis.

Topics include but are not limited to:

- Interfaces between two immiscible electrolyte solutions (ITIES)
- Interfaces between aqueous electrolyte solutions and room temperature ionic liquids (RTIL)
- Ion-conducting membranes placed between two aqueous electrolyte solutions
- Three-phase boundaries supported on a solid electrode
- Unconventional liquid-liquid systems

Symposium Organizers

Takashi Kakiuchi (Coordinator), Kyoto University, Japan (kakiuchi@scl.kyoto-u.ac.jp)
Hubert H. Girault, EPFL, Lausanne, Switzerland (hubert.girault@epfl.ch)
Vladimír Mareček, J. Heyrovský Institute of Physical Chemistry, Prague, Czech Republic (marecek@jh-inst.cas.cz)
Zdeněk Samec, J. Heyrovský Institute of Physical Chemistry, Prague, Czech Republic (zdenek.samec@jh-inst.cas.cz)

Symposium 15

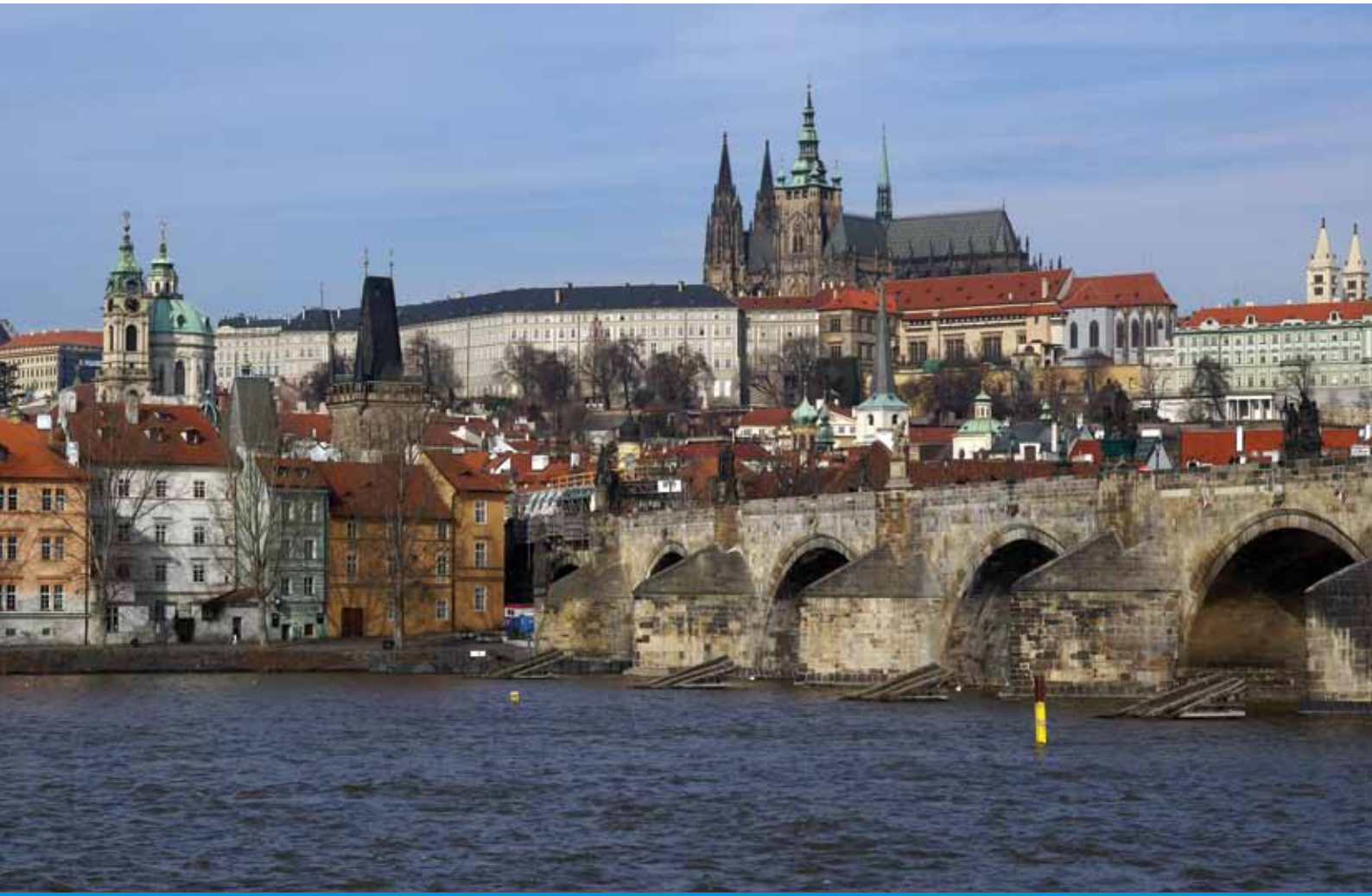
General Session

Sponsored by:
All divisions

Papers concerning any aspects of electrochemistry not covered by topic areas of other specialized symposia at this meeting including all aspects of the fundamentals of electrochemistry, electrochemical instrumentation and new technologies for electrochemical research are welcome.

Symposium Organizers

Elisabet Ahlberg, University of Gothenburg, Sweden (ela@chem.gu.se)
Waldfried Plieth, Technical University Dresden, Germany (waldfried.plieth@tu-dresden.de)



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19-24 August, 2012
Prague, Czech Republic

General Information

Venue

Clarion Congress Hotel, Prague, Czech Republic (http://www.cchp.cz)
Ideally located in the heart of Prague, 15 minutes from historic downtown, with easy access to the metro system.

Transportation

Prague can be conveniently reached by air via Prague-Ruzyne airport. Prague is well connected with major European-intercontinental hubs (Frankfurt, Paris, London and Amsterdam) and other major cities. The city can also be conveniently reached by surface transportation. Prague is connected with two major European highways (E50, E55) and there are frequent direct train connections from all neighboring countries.

Climate

Prague has a moderate climate. The weather in August is usually warm and stable with daytime temperatures between 20° and 25°C (70°F).

Important Dates and Deadlines

Opening date for abstract submission: **1 December, 2011**
Deadline for abstract submission: **1 March, 2012**
Conference begins: **19 August, 2012**

http://event12.ise-online.org
e-mail: events@ise-online.org