

# SEAC *communications*

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## **Editor**

**J. Faye Rubinson**  
Department of Chemistry  
Georgetown University  
Washington, DC 20057-1227  
jfr@georgetown.edu

## **Associate Editor**

**Philippe Buhlmann**  
Dept of Chemistry  
University of Minnesota  
Minneapolis, MN  
buhlmann@umn.edu

## **Regional Editors**

**Alan Bond**  
Professor Alan M. Bond  
School of Chemistry  
Monash University  
Victoria 3800 Australia  
a.bond@sci.monash.edu.au

**Karl Cammann**  
Westfälische Wilhelms Universität  
D-4400 Münster, Germany  
Cammann@uni-muenster.de

**Yoshio Umezawa**  
Research Institute of Pharmaceutical Sciences  
1-1-20 Shinmachi, Nishitokyo-shi  
Tokyo 202-8585 Japan  
omezawa@musashino-u.ac.jp

## **SEAC Web Editor**

**Samuel Kounaves**  
Department of Chemistry  
Tufts University  
Medford, MA 02155  
samuel.kounaves@tufts.edu



## PRESIDENT'S MESSAGE - PATHOLOGICAL SCIENCE

I've been fascinated by the topic of pathological science (sometimes called pseudoscience) since even before the cold fusion debacle in March of 1989. There are numerous examples of this phenomenon going back many decades. It is often described as self-delusion, to distinguish it from outright fraud, and it results from the loss of objectivity on the part of the scientist.

Irving Langmuir, the Nobel prize-winning chemist from GE, is credited with coining this term and describing the six "symptoms" of this syndrome during a colloquium presented in December 1953 [see *Physics Today* 42, 36-48 (Oct. 1989)]. Briefly, the first two symptoms are that the phenomenon studied is often at the limits of detectability and has very low statistical significance. In spite of this, there are claims of great accuracy. Another characteristic of pathological science is the readiness to disregard prevailing ideas and instead advance fantastic new theories to explain the phenomenon. And what of subsequent criticisms and experiments that contradict the original claims? They are met by ad hoc excuses and claims that the criticisms are erroneous. Another interesting symptom is that, after the initial widespread acceptance, the number of supporters gradually decreases until only a relatively few diehards remain. Another symptom that might be added to Langmuir's list would be the rush to reporting the phenomenon in the popular press (of course, after filing appropriate patents) before publication in a reputable peer-reviewed journal. For another good review of this subject, see Denis Rousseau, *American Scientist* 80, 54-63 (Jan.-Feb. 1992).

Having been around during the heyday of a couple of these pseudoscience episodes, polywater and cold fusion, I can appreciate the excitement that is generated and the subjective desire to believe that something so novel and unique has been observed. This is especially so with a phenomenon like cold fusion, which had the potential to provide limitless clean energy for all of mankind, not to mention untold wealth for the discoverers. Few of us will ever make this type of discovery in which our objectivity is compromised by the glory of untold fame and fortune. But it might be edifying to consider how we would behave in such a situation; before we cast the first stone.

Both of these aforementioned phenomena were investigated while I was at the National Bureau of Standards (now NIST), and the excitement was truly palpable! For the cold fusion studies, I headed up a team of chemists, physicists, metallurgists and engineers who couldn't do enough to be part of this adventure. When we couldn't duplicate the results, we sadly terminated the experiments. But it did get us into the Smithsonian Museum in DC. If you ever get to the Museum of American History, be sure to look for us at the permanent cold fusion exhibit. We'll be the group of scientists pictured with the paper bags over our heads! (Look me up at one of the SEAC activities at PITTCON, and I'll explain why.)

By the way, does anyone know the status of cold fusion? I know that research and meetings in this area are still ongoing, but where does it now stand as far as new insights and

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results? I recently read that an analytical chemist at the U.S. Navy's Space and Naval Warfare Systems Center in San Diego reported success in Low-Energy Nuclear Reaction experiments (as cold fusion is now called) using an electrochemical process. It would be great if one of our members could update us on this topic.

Before closing, I congratulate our many SEAC members who have recently received a variety of awards and honors, as noted elsewhere in this issue. It clearly exemplifies that electroanalytical chemists are at the forefront of science. -- Dick Durst

## RECENT AWARDS

Several of our electrochemistry colleagues have gained recognition for their work in recent months. The 2009 Analytical Chemistry Division Award in Electrochemistry was presented to **Jim Rusling** at the recent ACS meeting and **Rick Van Duyne** will receive the 2010 ACS Award in Analytical Chemistry at the spring national ACS meeting and also has been named the 2010 Recipient of the Bomem-Michelson Award. In addition, three of our members and electrochemistry friends were in the inaugural class of ACS fellows - **Allen Bard, William Heineman, and Jeanne Pemberton**. Not to mention our very own webmeister, **Sam Kounaves**, who received TWO awards – one from NASA and one from the State of Massachusetts!



**Jim Rusling** obtained his B.Sc. in Chemistry from Drexel University, and Ph. D. from Clarkson University. He is Professor of Chemistry at [University of Connecticut](#) and Professor of Cell Biology at University of Connecticut Health Center. Our research focuses on applications of bioanalytical chemistry, biocatalysis, nanobiotechnology, and medical diagnostics. His group applies its expertise to couple bioanalytical and biological chemistry with nanoscience as they impact on medical diagnostics, environmental health, and drug technologies. They have ongoing research projects in biosensor arrays for in-vitro sensing of toxicity, arrays for cancer biomarkers for early detection, high temperature biocatalysis for chiral synthesis, and fundamental protein redox chemistry. He has written nearly 300 research papers and edited three books, and he is also a musician interested in Irish and American folk styles.

CN Reilley would have been proud of Richard Van Duyne (who, as he puts it, worked for Reilley "in ancient times"). Rick was recently named the winner of the 2010 ACS Award in Analytical Chemistry sponsored by the Battelle Memorial Institute. He was also recently named the recipient of the 2010 Bomem-Michelson Award, awarded by the Coblenz Society. Rick is the Charles E. and Emma H. Morrison Professor of Chemistry at Northwestern University. He is a Fellow of the APS, AAAS, and the American Academy of Arts and Sciences, and adds this award to an already impressive list (2004 Plyer Molecular Spectroscopy Prize (APS), 2005 Noble Laureate Signature Award (ACS), and 2008 Ellis R. Lippincott Award (OSA). The research carried out by Rick and his group focuses on exploiting the tunability



of the localized surface plasmon resonance to act as signal transduction mechanisms for the sensing of molecular binding and understanding of surface chemistry. They apply localized surface plasmon resonance spectroscopy, resonant Rayleigh scattering, electron microscopy, and atomic force microscopy to solve problems in electrochemistry, surface science, materials chemistry, and biochemistry to these problems. He is, however, best known for his discovery of surface enhanced Raman spectroscopy.

At the August, 2009 national meeting of the ACS, the Society honored its inaugural class of ACS Fellows. The Fellows were recognized for their scientific excellence combined with their service to the ACS or the broader chemistry community. They were chosen from the entire community of chemistry that is represented by the ACS membership. **Bill Heineman** (co-founder and first President of SEAC) is a Distinguished Research Professor at the University of Cincinnati, where his research focuses on spectroelectrochemistry, chemical sensors, analytical chemistry of radiopharmaceuticals, polymer modified electrodes, electrochemical immunoassay, and microfluidic systems for chemical analysis. **Allen Bard** needs no introduction to electrochemists. Al currently holds the Norman Hackerman-Welch Regents Chair in Chemistry and Biochemistry at University of Texas, Austin and serves as the Faculty Director of the Center for Electrochemistry, recent recipient of major grants from the NSF and DOE to identify new materials that will efficiently absorb sunlight for production of hydrogen. There is scarcely a field of electrochemistry to which Al has not made major contributions, but he is presently most well-known for having developed electrochemical scanning microscopy. **Jeanne Pemberton** research currently focuses on the understanding of chemistry at interfaces important in electrochemistry and electrochemical devices, chromatography, organized molecular assemblies, and environmental systems, and she has been extremely active in the area of chemical education.

**Sam Kounaves** recently received the NASA Achievement Award for "outstanding performance in the planning and execution of the science for the Phoenix Mars mission" AND the Massachusetts Columbus Quincentennial Award, established in celebration of the spirit of exploration & discovery and awarded annually to a Massachusetts resident, for his work on the Mars Lander and, "in recognition of his innovative achievement and its significance to the Commonwealth."

## **NOMINATIONS FOR THE SEAC BOARD OF DIRECTORS AND OFFICERS**

It is nearly time to elect new officers and board members. The terms of office for the following SEAC Directors will expire after June 30, 2010:

Judith Faye Rubinson  
Stephen Creager  
Eric Bakker

As stated in the Society's Bylaws, these individuals are not eligible for immediate re-election as Directors.

The Nominating Committee (chaired by Kathy Ayers) is currently preparing a slate of candidates to fill three positions on the Board of Directors and for the Officers. This list, according to the Bylaws, will include any person nominated by at least 10 members of the Society together with others deemed appropriate by the nominating committee. **The list of candidates must be submitted to the Secretary by November 15** for the election to be held during the period

December 1 – January 15. You are hereby invited to submit your suggestion(s) directly to the Chair of the Nominating Committee.

Kathy Ayers - Chair  
SEAC Nominating Committee  
Proton Energy Systems  
[kayers@protonenergy.com](mailto:kayers@protonenergy.com)

The term for the new Board of Directors members will be from July 1, 2010 – June 30, 2015.

The President elect will serve the following terms:

July 1, 2010 – June 30, 2011 President Elect

July 1, 2011 – June 30, 2013 President

July 1, 2013 – June 30, 2014 Past President

The Secretary and Treasurer terms are from July 1, 2010 – June 30, 2012.

## CALL FOR NOMINATIONS - SEAC AWARDS FOR 2011

Nominations are open for the 2011 Reilley Award and the Young investigator Award. The Reilley Award recognizes an active researcher who has made a major contribution to the theory, instrumentation, or applications of electroanalysis. The Young Investigator Award recognizes accomplishments by researchers who are within the first ten years of their career.

Nominations for the Reilley Award should include a letter of nomination describing the individual's significant contributions to electroanalytical chemistry, at least two seconding letters of support, and a curriculum vitae for the individual. All nomination materials will be retained by SEAC. Once nominated, any individual will be considered for the Reilley Award for three years without being renominated. The submission of any additional supporting information or a renomination is welcome at any time; however, the **decision for the 2011 Award will be based upon the material that is available to the Award Committee by the 1st of March 2010.**

For the SEAC Young Investigator Award, nominees must be within ten years of obtaining their Ph.D. or other terminal degree at the time of nomination. Candidates may be nominated by any member of SEAC. Nominations should include a letter describing the individual's promise in the area of electroanalytical chemistry, at least one seconding letter of support, and a curriculum vitae for the individual. All nomination materials will be retained by SEAC. Candidates for the YI Award must be renominated each year during their period of eligibility. **Nominations for the 2011 YI award are due by the 1st of March 2010.**

SEAC Graduate Student Travel Grants are awarded to promising graduate students to offset the cost of travel to the Pittsburgh Conference to deliver an oral presentation in a Conference symposium. The presentation should be on a topic related to their Dissertation or Thesis, and in some area or application of electroanalytical chemistry. Because the costs in various venues of the Conference may vary, the amount of the award will be determined by SEAC and will be between \$250 and \$500. The value of all of the awards in any one year will be equivalent, but it may vary from year to year. The award will not exceed the reasonable cost of advance-purchase economy airfare and reasonable expenses for lodging, nor the awardee's actual expenses. In order to spread the travel money as equitably as possible, not more than two awardees will be selected from any one research group and no more than three awards will be made to students from any one educational institution. **Nominations for travel grants are due**

**to the SEAC awards committee chair by January 23rd.** The nomination shall consist of the student's current graduate transcript, a copy of the abstract submitted to the Pittsburgh Conference, a complete resume including publication list, and a letter of recommendation from the student's research advisor. The advisor's letter should include a statement of approximate graduation date and a short description of the student's speaking ability. A candidate shall be considered for an award for travel to Pittcon meetings occurring up to one year after the student's Ph.D. defense. Previous awardees will not be eligible for further consideration.

**Award nominations should be submitted as a single pdf file to:**

William R. Heineman  
Department of Chemistry 120 Crosley  
P.O. Box 210172  
University of Cincinnati  
Cincinnati, OH 45221-0172  
[William.Heineman@uc.edu](mailto:William.Heineman@uc.edu)

## **PITTCON 2010**

### **Symposium, Reception and Banquet**

The SEAC Awards Symposium honoring Richard Crooks, our Reilley Awardee, and Christy Haines, our Young Investigator Award recipient, has moved from its usual Wednesday slot to Monday afternoon, with the SEAC Membership Meeting immediately following. Then it will be time to head over to the awards reception and banquet. These will be held this year at Ming Court near the Orange County Convention Center. As usual, all are invited to attend the reception, which will be followed by dinner (\$50/person). **Reservations for the banquet should be sent to Shelley Minter ([minteers@slu.edu](mailto:minteers@slu.edu)) by February 1, 2010.**

### **Other SEAC programming at PITTCON**

SEAC will sponsor three organized invited sessions at Pittcon in 2010 as well as its traditional Poster sessions. The invited sessions and their organizers are:

Bioanalytical Applications of Electrochemistry I and II Jon Kirchhoff, University of Toledo  
Electrochemistry and Materials Richard A Durst, Cornell University

### **ACS Division of Analytical Chemistry Program**

The ACS Division of Analytical Chemistry will be sponsoring the following programming at Pittcon in 2010.

#### ***Contributed Oral Sessions***

##### ***Advances in Pharmaceutical and Biomedical Analysis (AIP)***

*Susan Lunte, University of Kansas, Lawrence, KS (organizer)*

*This session concerns new and evolving techniques for the analysis of drugs and biomolecules of medicinal interest in formulations and biological fluids.*

##### ***Innovations in Separation Science (IIS)***

*Lisa Holland, West Virginia University, Morgantown, WV (organizer)*

*New and evolving methods in separation science including novel applications*

**Bioanalytical Approaches to Study Cellular Communication (BAT)**

Christopher J. Easley, Auburn University, Auburn, AL (organizer)

Sensor, imaging and separation based methods for the investigation of cell-cell communication

**New Investigators in Analytical Chemistry (NII)**

Michael G. Roper, Florida State University, Tallahassee, FL (organizer)

Up and coming investigators in analytical chemistry and measurement science

**Innovative Approaches to Analytical Science Education (IAT)**

Carol Korzeniewski, Texas Tech, Lubbock, TX and Cindy Larive University of California

Riverside, Riverside, CA (organizers)

Papers on the innovative methods of teaching analytical chemistry, analytical sciences digital library and problem based learning

**New Frontiers in Electrochemical Energy Conversion and Storage (NFI)**

Stephen Maldonado, University of Michigan, Ann Arbor, MI (organizer)

Innovative electrochemistry based methods for storage and energy conversion

**Poster Session**

The Analytical Division Poster Session will take place on Monday, March 1, 2009.

**Invited Symposia and Organizers**

**New Approaches to Address Emerging Environmental Pollutants**

Organizer: Chuck Henry, Colorado State University, Fort Collins, CO

**Electrochemistry and Energy**

Organizer: Johna Leddy, University of Iowa, Iowa City, IA

**New Frontiers in Mass Spectrometric Analysis of Proteins**

Heather Desaire, University of Kansas, Lawrence, KS

**Microfluidic Systems with Electrochemical Detection for the Investigation of Biological Processes**

Susan Lunte, University of Kansas, Lawrence, KS

**Separation and Characterization of Large Macromolecules and Nanoparticles: There's Plenty of Room at the Top.**

Organizer: S. Kim R. William, Colorado School of Mines, Golden, CO

**Meeting of the Board of Directors**

The SEAC Board of Directors Meeting will be held **Monday at lunchtime**. The exact location and time will be given in the next issue of the Newsletter.

## OTHER UPCOMING MEETINGS

### **Gordon Kenan Research Seminar/Electrochemistry Gordon Conference**

Registration is open for the Electrochemistry Gordon Research Conference to be held January 10 – 15, 2010, and the affiliated Gordon-Kenan Research Seminar to be held January 9 – 10, 2010, both at the Four Points Sheraton Hotel in Ventura, CA. Details on the programs and registration are available at the GRC web site, at [www.grc.org](http://www.grc.org). For further details contact Steve Creager, Conference Chair, at [screage@clmson.edu](mailto:screage@clmson.edu). Come join your fellow electroanalytical chemists for a week of good science and fellowship!

### **Gordon Conference on Bioanalytical Sensors/Gordon Research Seminar**

The GRC on Bioanalytical Sensors will be held at Colby-Sawyer College (New London, NH) June 20-25, 2010. This year's conference is chaired by SEAC member Antje Baeumner and Weihong Tan. The 2010 GRC on Bioanalytical Sensors will present cutting-edge research in a highly multi-disciplinary atmosphere by leaders in the field. This GRC will serve as a conduit for collegial discussions of unpublished data in biochemistry, biology, chemistry, engineering, medicine, and physics as they apply to the development and application of bioanalytical sensors. This meeting will bring together a diverse group of participants ranging from technologists, who are at the forefront of developing novel sensing strategies, to engineers with cutting-edge integration concepts, to biologists with highly impactful application areas that demand new sensing systems. Research themes that will be discussed in the GRC include: 1) molecular recognition using antibodies, nucleic acid probes and alternative recognition elements, 2) recent advances in optical, electrochemical, and mechanical detection, 3) real-world applications including in vivo sensing, 4) use of nanotechnology to advance the understanding of molecular interactions and its integration into sensor design enabling novel applications, and 5) system integration technologies. Specific topical areas that will be covered include (but are not limited to) single molecule-based probes, intracellular sensing, biomaterials with enhanced optical or electronic properties, nanoparticles, biocompatibility and the biological/non-biological interface, miniaturization and automation, and multiplexed detection in complex matrices.

In addition, the Gordon Research Seminar (GRS) will convene immediately preceding the GRC (19-20 June 2010). Organized and conducted by graduate students and postdocs, the GRS will provide an opportunity for junior scientists to present their work in a formal, oral format, in front of their peers. These students will participate in the subsequent Bioanalytical Sensors GRC providing a unique opportunity to promote interactions between future researchers and established ones.

<b>Meeting</b>	<b>Location</b>	<b>Dates</b>	<b>Abstract</b>
8th ISE Spring Meeting, <a href="http://spring10.ise-online.org/">http://spring10.ise-online.org/</a>	Columbus OH	May 3-6, 2010	12/1/2009
61st ISE Annual Meeting, <a href="http://event10.ise-online.org/">http://event10.ise-online.org/</a>	Nice France	Sept. 26-Oct. 1, 2010	3/1/2010
2nd Regional Symposium on Electrochemistry - SE Europe, <a href="http://rse-see.net">http://rse-see.net</a>	Belgrade, Serbia,	June 6-10, 2010	2/15/2010
8th International Symposium on Electrochemical Impedance Spectroscopy,	Carvoeiro, Algarve, Portugal	June 6-11 2010	1/31/2010

<http://www.eis2010.org/>

International Conference on Electrified Interfaces, <http://www.eis2010.org/>

Geneva, New York, USA

June 20-25, 2010

217th ECS Meeting,  
<http://www.electrochem.org/meetings/biannual/217/217.htm>

Vancouver, BC, Canada

April 25-30, 2010

11/16/2009

## MEMBERSHIP NEWS

### NEW STUDENT MEMBERS

Ahmed S. Badowy, Cairo University  
Jennifer McKenzie, Vanderbilt University  
Rahul Thakar, Indiana University  
Ryan White, UC Santa Barbara

### NEW REGULAR MEMBERS

Peixin He, CH Instruments  
Tiffany Mathews, Wayne State University

### NEW LIFETIME MEMBERS

Lane Baker, Indiana University  
Philippe Buhlmann, University of Minnesota  
Richard Crooks, University of Texas, Austin  
Anando Devadoss, Hitachi Res Center  
(New, 1<sup>st</sup> installment)  
Royce Engstrom, University Montana  
Peter Lay, University of Sydney  
Nina Ronkainen, Benedictine University  
Ziling (Ben) Xue, University of Tennessee –  
Knoxville

## COMINGS AND GOINGS

Dennis Evans writes to say that he recently moved from Arizona to Purdue with his wife, Mary Wirth, the new W. Brooks Fortune Professor of Analytical Chemistry. Dennis can be reached at [evansd@purdue.edu](mailto:evansd@purdue.edu)

## NEWS FROM MEETINGS AND WORKSHOPS

The Analytical Sciences Digital Library (ASDL) convened a workshop on July 19-24, 2009 to develop eLearning Modules for the online eCourseware section of its journal, **JASDL**. The workshop was organized by Cynthia Larive, the PI of the supporting NSF DUE grant. The participants met at the conference centers of the Best Western and the Ralph N. Adams Bioscience Institute of the University of Kansas, Lawrence, KS, with Dr. Susan Lunte (immediate past president of SEAC) hosting the latter. A similar curriculum development workshop is planned for summer 2010. Funds are available to cover your cost to participate. If you are interested in attending, please contact: [clarive@ucr.edu](mailto:clarive@ucr.edu).



Potting party hosted by Amy Carlson, Webmaster



Showing off the pots from the *raku* firing ASDL



Participants at the ASDL workshop



ASDL strummers

## EMPLOYMENT OPPORTUNITIES



*Redefining Electrochemical Measurement*

**Position Available: Sales Engineer**

### Company Description

Gamry Instruments is a manufacturer of electrochemical laboratory instruments and software. Founded in 1989, Gamry develops and markets equipment worldwide to end users in various industries including batteries & fuel cells, corrosion prevention, materials, metals, biomaterials, sensors, and paints & coatings. Gamry is a small, closely held corporation.

**Job Description:** We are looking for a key member of our growing company. In this job, you may:

- Follow up on sales opportunities
- Identify and qualify likely users for our products
- Maintain customer contact and opportunity data

- Develop and execute marketing plans
- Participate in customer training
- Assist in first-level tech support

**Experience Level:** 3+ Years after receipt of academic degree.

**Requirements :** B.S. or M.S. in Chemistry or related science with a concentration in electrochemistry. Must have an interest in several items from this list:

- Potentiostat theory and electronics
- Software control of potentiostats
- Physical Electrochemistry/Electroanalytical Chemistry
- AC electrochemistry
- Corrosion science
- Mass transport and electrode kinetics
- Batteries and/or fuel cells
- Electrode and cell design

Must communicate well in spoken and written English and enjoy interaction with customers and co-workers. Other languages are a plus. Must be a US citizen or hold a Green Card.

**Rewards:** Salary will be commensurate with experience and education. Gamry provides a very good benefit package, including profit sharing.

**Contact:** Email your resume to [employment@gamry.com](mailto:employment@gamry.com)

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## Center for Electrochemical Sciences (CES)

The Center for Electrochemical Sciences (CES) at Ruhr-Universität Bochum, Germany, is regarded as a Center of Excellence with the task to ensure international competitive research in modern and future electrochemistry at a high standard.

CES invites applications for the positions of  
 4 Junior Group Leaders  
 Post docs  
 PhD Students

The junior group leader is expected to be an outstanding researcher with a doctoral degree in electrochemistry or related field. Ideally, the candidate should have undertaken initial steps in independent research during a postdoc stay. His/Her competence should be clear from publications in established international scientific journals. He/She will be responsible for a research group working on one or more of the following topics: electrocatalysis, corrosion, electrochemical surface modification, electroanalytics, bio-electrochemistry, photoelectrochemistry, photocatalysis and/or theoretical electrochemistry. These positions are initially funded for a period of 3 years. After positive evaluation the contract may be renewed for further 3 years. One or two additional researcher positions (PhD or Postdoc, depending on the qualification of the successful candidate), start-up investments and consumables will be provided to the Junior Group.

The post docs are expected to be outstanding junior researchers with a doctoral degree in electrochemistry or related field. The positions are initially funded for a period of 1 year with the possibility for prolongation.

PhD Students should have a master/diploma degree in chemistry or physics and should be highly motivated to work on a current research topic in electrochemistry. The positions will be funded for a period of 3 years.

Ruhr-Universität Bochum is committed to promoting the careers of women and therefore actively welcomes applications from female candidates. As an equal opportunities employer, we also encourage applications from suitably qualified disabled candidates and other groups.

Applications including a project outline, CV, diplomas, and a list of publications are to be submitted not later than the **7th of November 2009** to Dr. Sabine Seisel, Ruhr-Universität Bochum, Zentrum fuer Elektrochemie, Analytische Chemie - Elektroanalytik & Sensorik, Universitaetsstr. 150 NC04/123, D-44780 Bochum. Application by e-mail should be submitted to: [ces@rub.de](mailto:ces@rub.de) Further information on CES will be found at: [www.rub.de/ces](http://www.rub.de/ces)