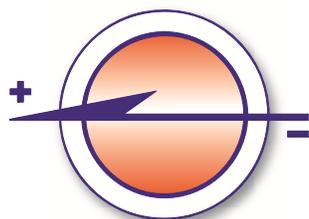


Breaking News! SciX abstract submission deadline extended to May 9! More on page 7.

May 2014
Volume 19, Issue 2



AES NEWSLETTER

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Contact **Matt Hoelter**,
AES Executive Director,
with any questions
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Atlanta, GA, culturally rich, hopping with 5.5 million people, is the site of the next American Electrophoresis Society Meeting, Nov 16- 21, 2014. Do not miss this one!

Spring is in the air, which means it's time to get your abstracts ready! The 2014 Annual Meeting of the AES Electrophoresis Society will be held in conjunction with AIChE on November 16-21 in Atlanta, GA. The program includes 13 comprehensive sessions on the fundamentals and applications of electrokinetics. Examples include sessions on 'Electrokinetics for Biosensing and Biomedical Applications,' 'Nanoscale Electrokinetics,' and many more. In addition, we have an outstanding lineup of invited speakers including Michael Hughes (University of Surrey), Brian Kirby (Cornell University), Sumita Pennathur (UC Santa Barbara), Jan Talbot (UC San Diego), and Orlin Velev (NC State University). The meeting will also include traditional AES staple programs including 'Lunch with Leaders,' in which students can interact with established AES members, and our annual banquet. The full program can be found at <http://www.aesociety.org/meetings/index.php>.

The characteristic intimate setting of the meeting encourages networking and idea exchange among international leaders in electrokinetics. You don't want to miss this meeting! **Abstracts can be submitted at <https://aiche.confex.com/aiche/2014/cfp.cgi>; the submission deadline is Monday, May 12, 2014.**

As your organizers for the 2014 meeting you may contact us at crb@mit.edu or rodrigm@clemson.edu with any questions or if you wish to get involved with AES programming. We look forward to seeing you in 'Hotlanta'!



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AES 2014 Meeting Chairs

T3004 Plenary Session: AES is pleased to announce the following outstanding lineup of speakers for this year's Plenary Session!



Michael Pycraft Hughes. Dr. Hughes was appointed Professor of Biomedical Engineering in 2008 after joining the University of Surrey as a lecturer in 1999. His 20-year research career has largely focused on the development of dielectrophoresis - primarily to the development of DEP-based assays. The main theme of Mike's research group has been the development of technology to enable DEP to be more widely used. He has written or co-written over 60 journal publications and two books, and has presented invited talks in the UK, US, France, Spain, Italy, Qatar, China and India. Since 2008, Mike has been Director of the Centre for Biomedical Engineering at the University of Surrey, one of the oldest positions in Biomedical Engineering (first appointment having been made in 1965). For the six years 2008-13 he was Editor in Chief of *IEEE Transactions on Nanobioscience*.



Brian Kirby. Dr. Kirby currently directs the Micro/Nanofluidics Laboratory in the Sibley School of Mechanical and Aerospace Engineering at Cornell University. He joined the School in August 2004. Previous to that, he was a Senior Member of the Technical Staff in the Microfluidics Department at Sandia National Laboratories in Livermore, California, where he worked from 2001-2004 on microfluidic systems, with applications primarily to counterbioterrorism. Professor Kirby has received a 2002 R&D Top 100 Invention award for work on microvalves for high pressure-fluid control, a 2004 JD Watson Investigator award for microdevices for protein production and analysis, and a 2006 Presidential Early Career Award for Scientists and Engineers (PECASE) award for nanoscale electrokinetics and bioagent detection. He received the 2008 Mr. and Mrs. Robert F. Tucker Excellence in Teaching Award, and was an invited participant at the 2008 National Academy of Engineering Frontiers of Engineering conference.



Sumita Pennathur. Dr. Pennathur is an Associate Professor in the Mechanical Engineering Department at UCSB. Her research focuses on using fundamental fluidics knowledge at both micro- and nano-scales to create novel devices for practical applications. Major efforts include general electrokinetics, developing enabling micro- and nanofluidic tools to identify and characterize chemical and biological compounds, improving current bioanalytical devices, and designing/engineering entire systems for point-of-care usage. Prior to coming to UCSB, Pennathur taught at University of Twente and held multiple positions at various companies and schools such as Sandia National Laboratories, Stanford University, National Institute of Standards and Technology, Tigris Corporation, Lockheed Martin, and MIT. She is the co-author of one textbook and general audience textbook on Nanotechnology, received recognition including the DARPA Young Faculty Award and the Presidential Early Career Award for Science and Engineers (PECASE).



Jan B. Talbot. Dr. Talbot joined the UCSD faculty in 1986 after receiving her Ph.D. in chemical engineering and materials science that same year from the University of Minnesota. In 2001-02, she was president of the Electrochemical Society, and previously served as editor of the society's Interface publication. She is a Fellow of the Electrochemical Society. She was the Chair of the UCSD Academic Senate in 2003-04. Talbot is Director of the Jacobs School's Chemical Engineering Program and Associate Dean of the Jacobs School of Engineering. From 1975-81, she worked as a development engineer at Oak Ridge National Laboratory. Professor Talbot's research includes electrophoretic deposition of phosphors and nanosized materials, chemical mechanical polishing, and thermochemical hydrogen production. She also studies synthesis and deposition of phosphors for solid state lighting, and electrodeposition of nanocomposite films.



Orlin Velev. Dr. Velev received M.Sc. and Ph.D. degrees from the University of Sofia, Bulgaria, while also spending one year as a researcher in Nagayama Protein Array Project in Japan. After graduating in 1996, Velev accepted a postdoctoral position with the Department of Chemical Engineering, University of Delaware and was promoted to research faculty in 1998. In 2001 he formed his new research group in the Department of Chemical and Biomolecular Engineering, North Carolina State University, where he is currently Invista Chaired Professor. He has contributed more than 135 publications, which have been cited more than 9000 times, and has presented more than 168 invited presentations at major conference and at universities and companies. Recent awards include NSF Career, Camille Dreyfus Teacher-Scholar, Sigma Xi, Ralph E. Powe, NC State Alcoa Distinguished Engineering Research, NC Innovator of the Year and election to an ACS Fellow. Velev is a member of the Editorial Advisory Boards of *Langmuir*, *Chemistry of Materials*, *Biomicrofluidics*, and *Particle*.

AES MEETING PROGRAM — 2014

T3000 Advances in Electrophoretic Protein Separation and Analysis

Studies of protein expression patterns play a vital role in understanding the complex responses of cells, tissues, and organisms to stimuli or mutations. While recent developments have allowed these patterns to be investigated at an unprecedented level of detail, further advances are needed in order to fully illuminate the interplay among the many factors governing cellular response. Specifically, new technologies are needed that provide quantitative information with high sensitivity and throughput. This session will focus on the development of such proteomic technologies and their applications. Of particular interest are papers describing advances in electrophoretic protein separations, novel means of detecting and quantifying proteins, methods of analyzing specific protein classes, mass spectroscopic methods, and other related technologies. Papers are also sought that present research on the proteomic analysis of post-translational modifications.



Chair: Tom Berkelman
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Co-Chair: Phil Beckett
Proteomics Applications
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T3001 Soft Matter Electrokinetics: Particles, Drops and Bubbles

An applied electric field can be used to manipulate colloids, for example in the directed assembly of nanoparticles or in the deformation of drops. A host of electrokinetic phenomena are at play during these processes. Direct and indirect manipulation of particles, droplets, and bubbles is possible with electrophoresis, electroosmosis, dielectrophoresis, electrothermal flows, induced charge electrokinetics, and other electrokinetic/electrohydrodynamic phenomena. Papers both fundamental and applied in nature pertaining to the assembly or transport of particles, drops and bubbles via these or related physical phenomena will be welcomed. Papers relating to the broad areas of microfluidics and colloidal crystallization are particularly desirable.



Chair: Stuart J. Williams
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Co-Chair: Christopher Wirth
Postdoctoral Scholar: Belgium
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T3002 Electrokinetics for Self-Assembly

This session deals with applications of electrokinetics to actuate assembly of species into organized morphological architectures. Contributions focusing on theory, experiments, and applications are welcome.



Chair: Eric M. Furst
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T3003 Electroporation and Electrophysiology

Electroporation is a technique, which employs pulsed electric fields to create nanopores across the lipid bilayer. The talks within this session will deal single cell analysis via micro-electroporation technology, cellular polarization, and in vivo applications of electroporation, such as gene therapy and electrochemotherapy.



Chair: Michael B. Sano
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Virginia Polytechnic Institute and State University
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T3005 Nanoscale Electrokinetics

The ability to manipulate and characterize nanostructures is of tremendous significance within biosensing, nanofabrication and surface modification schemes for cells and tissues. Electrokinetics is emerging as one of the leading means to spatially control nanostructures within microfluidic and nanofluidic device platforms. This session will focus on fundamental aspects of DC and AC electrokinetics at the nanoscale, such as elucidating the influence of streaming currents and surface conduction on nanostructures, as well as applied aspects, such as device platforms, scaling laws, fabrication and functionalization methodologies, and signaling and detection methodologies for particle manipulation and characterization.



Chair: Nathan Swami
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Co-Chair: Fernanda Camacho
Chemistry & Biochemistry Dept
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T3006 Poster Session: AES Electrophoresis Society

The AES poster session is a great platform for students to showcase their work; this is a very well attended session where a panel of judges composed by highly recognized researchers in all areas of electrophoresis and electrokinetics evaluates the posters, to select the first, second, and third place, plus an honorable mention. The organizers of this session invite poster submissions in the area of electrophoretic technology and development. Topics of interest include new experimental or theoretical research involving any aspect of electrophoresis at either the macro-, micro-, and / or nanoscales.



Chair: Blanca H. Lapizco-Encinas
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Co-Chair: Victor Ugaz
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T3007 Electrokinetics for Sample Preparation

Sample preparation is the link connecting the real-world with microfluidic analysis. Partially overlooked in the past years, robust on-chip sample preparation must be further developed to enable practical applications such as environmental monitoring and point-of-care clinical diagnostics. This session is aimed at presenting how electrokinetics is enhancing sample preparation. Modeling and experimental contributions are welcome.



Chair: Jörg Kutter
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Co-Chair: Stig Pedersen-Bjergaard
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University of Oslo
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T3008 Electrokinetics and Microfluidics in Bioanalytical Applications

Remarkable progress has been made in the fabrication micro- and nanoscale devices for the manipulation and detection of organisms and biomolecules. This session will focus on integration and detection aspects related to the emerging concept of a “chip-in-a-lab” as well as the more established “lab-on-a-chip” systems. Topics of interest include, but are not limited to, platforms for multi- and unicellular (biochemical or physical) analysis, immunosensors, electrochemical sensors, and various spectroscopic and separation tools in a microchip format. We are particularly interested in papers dealing with micro/nano scale systems and issues related to molecular, cellular, or systems biology. Both experimental and theoretical contributions are welcome.



Chair: Zachary R. Gagnon
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T3010 Electrokinetics in Non-Polar Media

This session welcomes experimental, computational, and theoretical papers on electrokinetic and electrostatic phenomena in non-polar media. Topics of interest include, but are not limited to, the origin, formation, and stabilization of charge carriers; double layer charging and transient currents; and electrophoresis in non-polar fluids.



Chair: Sven Behrens

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T3011 Electrokinetics: Advancing the Fundamentals

Electrokinetics involves the use of electrical fields and electrical forces (between surfaces and particles) to produce a motion of colloidal particles within a medium. This environment could be either a fluid, porous or fibrous medium. Notable applications include those related to environmental process such as the decontamination of water or a soil, the cleaning of water for drinking purposes and the decontamination of industrial effluents; electrostatics aspects in membrane-based separation processes is another excellent example as well as micro-filtration in electrically enhanced processes. Within this framework, a detailed analysis of particle-to-particle electrostatics forces, the experimental measurements of their magnitude and computer-based simulation approaches are relevant for the advance of processes and technology involving electrokinetics principles. Therefore, contributions with novel approaches related to fundamental principles, modeling, and experimental studies will be welcomed. We would like to have a balance between a given problem, the motivation, and the outcome related to the solution. However, purely experimental contributions describing new and novel aspects of electrokinetics will be welcomed as well as theories and computational efforts helping to improve understanding of outstanding fundamental problems.



Chair: Aditya S. Khair

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T3012 Electrokinetics for Biosensing and Biomedical Applications

Medical diagnostic kits encompass a wide variety of portable analytical devices used to monitor and screen for medical conditions. They are rapidly being developed for use on a single-test basis and show promise as indispensable tools for clinical research, medical laboratories, and at home self-testing. The terms "microdevice," "microchip," "lab-on-a-chip," and "micro-electromechanical systems" all refer to small, versatile, inexpensive, rapid-response devices that may be engineered for biomedical applications. Research in the areas of sample introduction, preparation, electrokinetic transport of biofluids, development of quantitative detection sensors, and the incorporation of genomic and proteomic biomarkers are needed to further the advancement of biomedical microdevices. Novel microanalytical tools are welcome, specifically those impacting applications such as genetic predisposition testing, rapid diagnosis of the presence of a particular disease or disorder, or those monitoring the efficacy of drug therapies. The goals of this session are to bring together researchers from academia, research labs, and industry to exchange ideas with the potential to revolutionize medical diagnostics.



Chair: Fatima Labeed

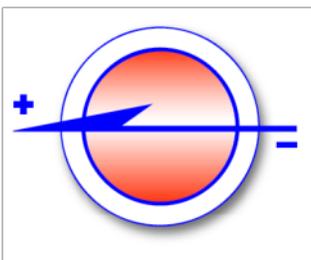
University of Surrey
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Co-Chair: Lisa A. Flanagan

Sue & Bill Gross Stem Cell Research Center
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AES Workshops during the 2014 Annual Meeting



Each year AES organizes technical workshops to be held on the Sunday before formal sessions begin. In the past these workshops have covered topics ranging from 2D electrophoresis to microfluidics.

More details coming soon!

Visit the AES website for the latest updates.

T3009 AES Award Session: AES invites you to join us in celebrating the distinguished contributions of Prof. Pier Giorgio Righetti



Pier Giorgio Righetti

Prof. Righetti earned his Ph.D. in Organic Chemistry from the University of Pavia in 1965. He then spent 3 years as a Postdoc at MIT and 1 year at Harvard University. He is full Professor of Proteomics at the Milan Polytechnic. He is on the Editorial Board of *Electrophoresis*, *J. Proteomics*, *BioTechniques*, *Proteomics*, *Proteomics Clinical Applications*. He has co-authored the book Boschetti, E. Righetti, P.G. *Low-Abundance Proteome Discovery; State of the Art and Protocols*, Elsevier, Amsterdam, 2013, pp. 1-341. He has developed isoelectric focusing in immobilized pH gradients, multicompartiment electrolyzers with isoelectric membranes, membrane-trapped enzyme reactors, temperature-programmed capillary electrophoresis, and combinatorial peptide ligand libraries for detection of the low-abundance proteome.

Of the 560 articles reviewed by the ISI Web of Knowledge (Thomson Reuters), Righetti scores 18.890 citations, with an average of 33 citations/article and with an H-index of 60. In the last eight years alone (2005-2012) he has received citations ranging from 1000 to 1200 per year. He has won the CaSSS (California Separation Science Society) award (October 2006), at that time in its 12th edition, and the Csaba Horvath Medal, presented on April 15, 2008 by the Connecticut Separation Science Council (Yale University). In 2011, he was nominated honorary member of the Spanish Proteomics Society and in 2012 he won the prestigious Beckman award and medal granted in February at the Geneva MSB meeting. Please join us as Prof. Righetti presents the following talk.

The Monkey King: a personal view of the long journey towards a proteomic Nirvana

The review covers about fifty years of progress in “proteome” analysis, starting from primitive two-dimensional (2D) map attempts in the early sixties of the last century. The polar star in 2D mapping arose in 1975 with the classical paper by O’Farrell in *J Biol. Chem.* It became the compass for all proteome navigators. Perfection only came, though, with the introduction of immobilized pH gradients, which fixed the polypeptides spots in the 2D plane. Great progress in proteome analysis came by introducing informatics tools and creating databases, among which Swiss Prot remains the site of excellence. Towards the end of the nineties, 2D chromatography, epitomized by coupling strong cation exchangers with C18 resins, began to be a serious challenge to electrophoretic 2D mapping, although up to the present both techniques are still much in vogue and appear to give complementary results. Yet the migration of “proteomics” into the third millennium was only made possible by mass spectrometry (MS), which today represents the standard analytical tool in any lab dealing with proteomic analysis. Another major improvement has been the introduction of combinatorial peptide ligand libraries (CPLL), which, when properly used, enhance the visibility of low-abundance species by 3 to 4 orders of magnitude. Coupling MS to CPLLs permits exploration at least 8 orders of magnitude in dynamic range on any proteome.

Adrienne Minerick named AAAS Fellow!

Adrienne Minerick, Past-President of AES, has been named a Fellow of the American Association for the Advancement of Science. Fellows are recognized for meritorious efforts to advance science or its applications. This is an honor bestowed upon members by their peers.

Dr. Minerick, Associate Professor of Chemical Engineering at Michigan Technological University, is among 388 individuals selected for this honor in Oct 2013 for their efforts to advance scientifically or socially distinguished science applications.



She was recognized “for leading contributions to the field of nonlinear electrokinetics, particularly discernment of surface molecules with electric fields in microdevices, and for leadership in the field as the AES Electrophoresis Society president.”

Dr. Minerick researches portable “lab on a chip” techniques, which use hand-held devices to analyze small samples of blood or other body fluids. She has developed a quick, easy, and accurate way to determine blood type by exposing small blood samples to an electrical field. Eventually, she hopes to be able to diagnose disease using related techniques. In one of her projects, she is working to detect oversized red blood cells, which are associated with a higher risk of heart attack and related cardiovascular problems.

The nomination was submitted by Nicholas Peppas, who holds the Fletcher Stuckey Pratt Chair in Engineering at the University of Texas at Austin and has received the Founders Award from the National Academy of Engineering. Kirk Schulz, president of Kansas State University and former chair of chemical engineering at Michigan Tech, supported her nomination. Congratulations, Adrienne!!



**The 2014 SciX meeting will be held at the
Grand Sierra Resort, Reno-Tahoe, NV
Sept 28 – Oct 3, 2014** www.scixconference.org

SciX Conferences are annual meetings hosted by The Federation of Analytical Chemistry and Spectroscopy Societies (FACSS) that focuses on analytical chemistry and related sciences. For the fifth year, AES Electrophoresis Society is co-organizing sessions with FACSS to include such topics as dielectrophoresis, micro- and nanofluidics, new applications of conventional electrophoresis, and next generation electric-field driven separations.

The organizers for the 2014 joint FACSS/AES session are [Alexandra Ros](#) of the Arizona State University Department of Chemistry and Biochemistry and [Edgar Goluch](#) of the Northeastern University Department of Chemical Engineering. This year, session topics include Microchip Electrophoresis and Related Applications, Electrophoresis and Droplets, Bioanalytical Dielectrophoresis, and Capillary Electrophoresis in addition to AES student poster, plenary, and award sessions.

Authors' Deadlines

- Jan 25: Abstract submission for SciX 2014 opens.
- **May 9: Deadline to be considered for an oral presentation.**
- Jul 31: Deadline for Late Breaking Poster Presentations; Last day to edit submitted abstracts.
- Aug 29: Early Bird registration rates deadline.

Networking Opportunities: One of the unique features of this meeting is the emphasis on networking. The conference begins with a welcome mixer on Sunday evening. Monday night features a reception to foster interactions between academia and industry. On Wednesday evening, there will be a dinner party with a wild west theme. Numerous activities are planned for smaller groups throughout the week. The business office collects resumes and puts attendees in contact with companies that are recruiting at the conference.

Student Poster Session: AES is sponsoring a student / postdoc poster session at SciX. First place prize is \$250 and Second place is \$100. Please select the "AES Electrophoresis Society Student Poster Award" box when on the submission page and uploading your poster abstract. There are numerous opportunities for students to receive discounted or free conference registration and travel reimbursements. Visit the awards section of the conference website for additional details.

Organizers and session information: Our session organizers include Doug Gilman (Louisiana State University), Christopher Harrison (San Diego State University), Bryan Presley (Trianja Technologies), Tzu-Chiao Chao (University of Regina), Alexandra Ros (Arizona State University) and Edgar Goluch (Northeastern University). The organized sessions consist of invited speakers and contributed submission from the general submission pool. AES sessions at SciX are typically held on Monday and Tuesday of the conference, with a speaker's dinner on Monday night.

Quick Links: [Area Attractions](#), [Organizers Information](#), [Abstract Submission](#), [Registration Instructions](#), [Program flyer](#)

You are invited to come, learn, and discuss the newest cutting edge work from the leaders in their fields in a dynamic cross-disciplinary environment that seeds innovation. FACSS (now SciX) has fostered an environment that encourages easy access to the speakers and spirited scientific exchange for over 40 years.

2014 AES Mid-Career Award

AES is pleased to announce that [Professor Kevin Dorfman](#), Associate Professor of Chemical Engineering and Materials Science at the University of Minnesota, is the recipient of the 2014 AES Mid-Career Award. This recognition is given for exceptional contributions to the field of electrophoresis, microfluidics, and related areas by an individual who is currently in the middle of his or her career.

Please [click here](#) for further information about the award.

