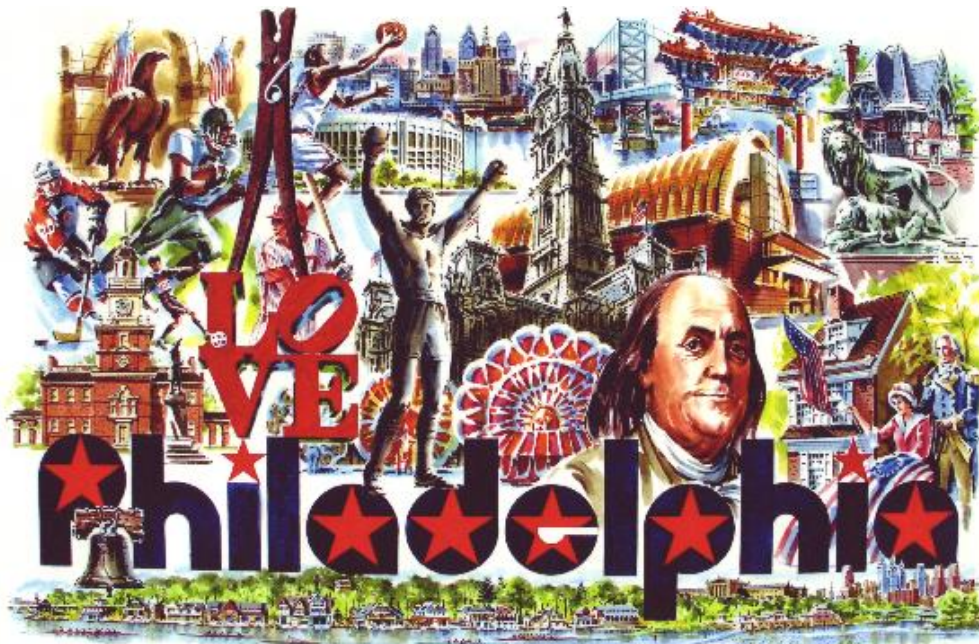




# AES NEWSLETTER



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Our traditionally strong meetings, with sessions strengthened by invited plenary speakers discussing state-of-the-art topics, would simply not be possible without help from sponsors. Their donations are greatly appreciated.

## Call for Papers! for the annual meeting of the American Electrophoresis Society in Philadelphia, November 16-21, 2008

The American Electrophoresis Society (AES), in association with the American Institute of Chemical Engineers (AIChE), is now soliciting oral and poster presentation abstracts for the 2008 Annual Meeting in Philadelphia, PA. *The deadline is May 11.* The overall goal of this conference is to provide a forum for the discussion of recent developments in electrophoretic separations and technologies relevant to the analysis of cells, proteins, nucleotides, and small molecules. Descriptions for the 14 sessions of the meeting are provided on the following pages to help members and interested parties decide where to submit abstracts. The meeting will include 5 sessions on Biomems and Microfluidics (T3001, T3002, T3008, T3010 and T3011), 3 sessions on Advances in Electrokinetics and Electrophoresis (T3003, T3009 and T3012), 2 on Advances in Proteomics (T3004 and T3005) and 1 on Advances in CE and Microdevice Technology (T3007). In addition, this year we are soliciting abstracts for two new sessions: Nanoscale Electrokinetics (T3013) and Advances in Electrophoresis Separation Media (T3014) to assess new developments in these areas.

Submissions for the **Poster Session, T3006**, are encouraged on any aspect of electrophoresis at both the macro and micro-scales. This year awards for the *best student posters*, based on judging by 3 members of the AES council, will be \$200 for First Place, \$100 for Second Place, \$50 for Third Place and \$25 for Honorable Mention for student members of the Society. Furthermore, GE Healthcare has generously funded three travel grants at \$500 each. Information on how to apply for the travel grants will be posted on the AES website soon.



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AES 2008 Meeting Co-Chairs

## AES MEETING PROGRAM - 2008

**T3001 Biomems and Microfluidics: Biomedical Diagnostics:** Medical diagnostic kits 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.



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**T3002 Biomems and Microfluidics: Sensing, Detection, and Integration:** Remarkable progress has been made to fabricate microscale and nanoscale devices for the detection and manipulation of biological cells and molecules. Furthermore, devices with different functions and of different materials have been integrated to form microscale and nanoscale systems for complex procedures. In this session, we invite contributions dealing with any aspects of micro/nanoscale sensors and actuators with biological applications. The interested topics include but are not limited to 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 integration. Both experimental and theoretical contributions are welcome.



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**T3003 Advances in Electrokinetics and Electrophoresis - Particles and Biomolecules:** Electrokinetic techniques continue to play a leading role in technologies ranging from nanoparticle characterization and directed electronics assembly to micro-pumps and micromixers to biosensors and DNA sequencing. In this session, we invite submissions related to the development of new technologies in any of these areas, from both the fundamental and applied perspectives. Suitable topics include: microfluidic networks and their applications (including mixing, reaction, separations, or transport processes); complex particles and surfaces (nanoparticles, heterogeneous particles, biological cells, soft particles); electrokinetically-directed assembly; electrokinetic effects in non-polar media; novel applications of electrokinetic phenomena (biosensors, displays, environmental or chemical assays); and novel measurement techniques (electrophoretic mobility, charge nonuniformity, forces, electro-acoustics, electro-optics).



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**T3004 Advances in Proteomics: New Technologies I:** 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 gel-free protein separations, novel protein stains, methods of analyzing membrane proteins, mass spectroscopic methods, and other related technologies. Papers are also sought that present research on the proteomic analysis of post-translational modifications.



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**T3005 Advances in Proteomics: New Technologies II:** Systematic studies of protein expression patterns play a vital role in understanding the complex interactions associated with the global response 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 with the capability of providing quantitative information with greatly enhanced levels of sensitivity and throughput. This session will focus on the development of these proteomic technologies and their application to biotechnology. Of particular interest are papers describing advances in high-throughput antibody creation and optimization, the development of protein-detecting microarrays, and other related technologies. Papers are also sought that present research on the application of proteomics to the study of bacterial, animal, and plant cell cultures.

**Chair: Janice Simler**  
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**T3006 AES Poster Session:** We invite submissions describing new experimental or theoretical work involving any aspect of electrophoresis at both the macro- and the micro-scale. This year awards for the *best student posters*, based on judging by 3 members of the AES council, will be \$200 for First Place, \$100 for Second Place, \$50 for Third Place and \$25 for Honorable Mention for student members of the society.



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**T3007 Advances in CE and Microdevice Technology for Genomic Analysis:** Microfluidic-based DNA and protein separation systems are beginning to emerge from the research laboratory and appear as commercially available products for use in a variety of genomic analysis applications. If sufficient miniaturization can be achieved, these microfabricated systems will enjoy a tremendous cost advantage over today's conventional macroscale systems, thereby ensuring a central role in future genomic analysis efforts such as the ambitious goal of sequencing a genome for \$1,000 or less. Strategies to develop improved sieving media based on a variety of polymeric and non-polymeric materials incorporating uniform and reproducible microstructures promise to generate tremendous improvements in the achievable level of separation performance. In addition, separation matrices composed of nanofabricated structures constructed directly on the surfaces of silicon, glass, and plastic substrates offer exciting possibilities in terms of exerting precise control over pore size and sieving properties. Novel techniques to analyze DNA and proteins by directly probing the motion of single molecules either through nanoscale fluidic channels or through membrane channel nanopores also show enormous potential. Chemical engineers continue to make important contributions in these areas, and we invite abstracts related to any aspect of the development or study of biomolecule separation technology at the microscale, or on miniaturized devices



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**T3008 Biomems and Microfluidics - Novel Applications:** Biological microsystems and microfluidic devices have developed significantly in recent years. Many of these systems have evolved beyond the technology development stage into applications in clinical and commercial areas. While the traditional application areas have primarily been within the realms of diagnostics and sensing, these technologies have advanced into other areas such as cell separation, platforms for tissue engineering, platforms to study stem cell behavior, implantable prosthetic devices, and drug delivery systems, to name only a few. This session aims to bring together researchers from academia, industry, and government working in a broad spectrum of novel application areas.



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**T3009 Advances in Electrokinetics and Electrophoresis - DNA Applications:** Electrokinetics continue to play a leading role in technologies ranging from nanoparticle characterization and directed electronics assembly to micropumps to biosensors and DNA sequencing. In this session, we invite submissions related to the development of new technologies in any of these areas, from both the fundamental and applied perspectives. Suitable topics include: microfluidic networks and their applications (including mixing, reaction, separations, or transport processes); complex particles and surfaces (nanoparticles, heterogeneous particles, biological

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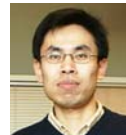
cells, soft particles); electrokinetically-directed assembly; electrokinetic effects in non-polar media; novel applications of electrokinetic phenomena (biosensors, displays, environmental or chemical assays); and novel measurement techniques (electrophoretic mobility, charge nonuniformity, forces, electro-acoustics, electro-optics).

**T3010 Biomems and Microfluidics: Proteome Analysis:** Microfluidic technology holds the promise of enabling novel, more efficient, and higher throughput proteomic and genomic analyses in a low-power portable format. As products based on microfluidics are introduced commercially, the promise is becoming a reality. This session seeks papers on chip-based novel methods for proteomic analysis including sample preparation, electrokinetic approaches in 1D and 2D, and microfluidic interfaces with downstream analytical instrumentation (e.g., mass spectrometry).

**T3011 Biomems and Microfluidics: Cell and Biomolecule Analysis:** Electrophoresis continues to be an integral tool for the analysis of biomolecules in both basic biology and medicine, and is now being adapted to the microfluidic device format. The ability to study processes at the single-cell level promises to provide a host of information with benefits in the area of therapeutics and drug discovery. In this session, we invite papers describing microfluidic technology to probe chemical and biochemical responses at the cellular and sub-cellular levels. In addition, we welcome contributions focused on any related aspects, including simulation and modeling studies, materials modification to improve system performance, and novel sample preparation protocols.



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**T3012 Advances in Electrokinetics and Electrophoresis - Fundamentals:** Electrokinetics involves the use of electrical fields and forces between surfaces and particles to produce a motion of colloidal particles within a fluid, porous or fibrous medium. Notable applications include environmental processes such as the decontamination of 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. 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.



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**Chair: Brian J. Kirby**  
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**T3013 Nanoscale Electrokinetics:** In nanometer-scale systems the electric double layer (EDL) thickness is comparable to characteristic length scale of the system. In these systems the EDLs can overlap and result in anomalous electrokinetic behavior. Recent reports have shown that microfabricated nanoscale systems can be used to sequence DNA, separate and concentrate biomolecules, and act as biological ion channels. This session focuses on theoretical, computational, or experimental studies of natural or engineered systems with nanoscale dimensions that exhibit electrokinetic behavior distinct from their microscale counterparts.



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**T3014 Advances in Electrophoresis Separation Media:** This session will bring together investigators working on different aspects of electrophoresis separation media.



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