

JUAN GABRIEL SANTIAGO
Department of Mechanical Engineering
Stanford University

Education

University of Illinois at Urbana-Champaign

Ph.D., Mechanical Engineering, August 1995, GPA: 4.00/4.00

Thesis: "An Experimental Study of the Velocity Field of a Transverse Jet Injected into a Supersonic Crossflow"

University of Illinois at Urbana-Champaign

M.S., Mechanical Engineering, August 1992, GPA: 4.00/4.00

Thesis: "Facility Design and Preliminary Experiments for an Endothermic Fuel Combustion Facility"

University of Florida at Gainesville

B.S., Mechanical Engineering, May 1990

Undergraduate GPA: 3.95/4.00 (High Honors, First in Graduating Class)

Work Experience

Stanford University, Stanford, California

Department of Mechanical Engineering

Associate Professor, 4/05-Present:

Interests include microfabricated fluidic devices for miniaturized bioanalytical systems, optical diagnostics for micro-scale fluid mechanics, and micro-electronics cooling systems. Teach undergraduate and graduate courses in fluid mechanics and electrokinetic phenomena.

Assistant Professor, 9/98-4/05.

Cooligy, Inc., Mountain View, California, <http://www.cooligy.com/>

Founder and Senior Consultant, 1/02-1/06:

Company aims to commercialize electroosmotically-pumped fluidic cooling loops for microelectronics. Consulting activities include development of electroosmotic pump models, designs, and evaluation methods, as well as cooling system integration efforts.

University of Illinois at Urbana-Champaign

Department of Electrical and Computer Engineering, Beckman Institute for Advanced Science and Technology, BioMEMS Laboratory.

Research Scientist/Postdoctoral Fellow, 3/97-9/98:

Conducted an experimental study of the physics of micro-electro-mechanical system (MEMS) fluidic devices using micron-resolution particle image velocimetry (PIV). In addition, studying the separation dynamics of MEMS devices for the separation and identification of biological macromolecules. Gained experience in proposal writing, MEMS course development, and graduate student guidance and mentoring.

The Aerospace Corporation, El Segundo, California

Senior Member of the Technical Staff, 10/95-3/97:

Worked as an applied research engineer in the field of thermal science. Developed spacecraft and launch vehicle thermal technology using Monte-Carlo thermal radiation modeling, finite-difference modeling, convective heat transfer analyses, and thermal system analyses. Designed a micro-resolution particle image velocimetry (PIV) system for investigations of micro-satellite thrusters.

University of Illinois at Urbana-Champaign
Department of Mechanical and Industrial Engineering

Graduate Research Assistant, 5/92-10/95:

Conducted a study of the mixing phenomena of a sonic jet injected into a supersonic crossflow. Used frequency pre-shifted laser Doppler velocimetry measurements of mean velocities and Reynolds stresses to study flow field structure and jet development. Investigated instantaneous mixing using planar laser-induced fluorescence (PLIF) imaging. This study provides guidance to supersonic combustor designers and helps validate numerical predictions.

Teaching Fellow, 8/94-12/94:

This departmental award offered the opportunity to teach a department course of my choice: the fluid mechanics lecture course. Solely responsible for the development of course syllabus, lecture notes, class handouts, homework assignments, and exams. Presented all lectures and assigned final grades. Graded homework and exams.

Graduate Research Assistant, 8/90-5/92:

Led the design, construction, and instrumentation of a high-speed combustion wind tunnel facility. A set of experiments, including turbulent flame speed measurements, was designed and conducted to demonstrate the performance of the combustor facility and supporting systems. The facility was designed to study the combustion characteristics of potential endothermic fuel mixtures at simulated Mach 6 flight conditions of a turboramjet burner.

Exxon Production/Eastern Division, New Orleans, LA

Graduate Summer Intern, 5/90-8/90: Researched and compiled reports of over 15 oil well production histories. Based on this study, presented recommendations for two well restorations and three well abandonments.

University of Florida at Gainesville

Tutor, 8/88-5/90: Self-employed tutor of thermodynamics and fluid mechanics for undergraduates. Developed class outlines to supplement class notes.

Academic Areas of Interest and Research Methods

Academic

Fluid mechanics; microfluids; electrokinetics, colloid science, experimental methods and random data analysis; microfabrication; heat transfer; analytical and numerical modeling of transport phenomena.

Fluid Mechanics and Optical Diagnostics Research

Particle image velocimetry, particle tracking velocimetry, caged-fluorescence imaging, bleached-fluorescence imaging, planar laser-induced fluorescence imaging; digital image processing (including particle tracking, pattern recognition, and filtering); CCD and ICCD camera/computer interfacing and imaging; flow seeding techniques; schlieren and shadowgraph techniques; laser Doppler velocimetry; experimental research facility design, construction, and instrumentation; surface flow visualization techniques; phase Doppler anemometry; and hot-wire anemometry.

Micro-Electro-Mechanical Systems (MEMS) and Microfluidics Research

Mask layout and drafting; photolithography; chemical etching of silicon wafers, glass, and epoxy-based photoresist; reactive ion etching; thermal oxide processing of silicon; anodic, thermal, and RTV bonding; thin film deposition; epifluorescent microscopy; scanning electron microscopy; and micro-fluidic system assembly, interconnect, and control.

Awards and Honors

Outstanding Alumnus Award from the Mechanical Engineering Department of the University of Florida, April 11, 2008.

Best Paper Award, "Physics of pumping Methanol/Water Solutions for Fuel Cell Applications", with Cullen Buie and Shawn Litster, ASME-IMECE Conference, 2007.

Mentorship Recognition, served as mentor to Terman Engineering (Undergrad) Scholastic Awardee David Fenning, 2008.

Outstanding Achievement in Academia Award from The National Consortium for Graduate Degrees for Minorities in Engineering and Science (GEM), 2006

Best Paper award, Conference of the Electrochemical Society, Cancun, Mexico, 2006

Most downloaded paper in the history of Experiments in Fluids journal (Santiago et al., 1998)

National Academy of Engineering invitation to "Frontiers in Engineering," 2004-2007

Elected Co-Chair of Gordon Conference on the Physics and Chemistry of Microfluidics, Oxford, England (planning for conference in August, 2007), 2005

Invited to Co-Chair the International Congress of Theoretical and Applied Mechanics (Adelaide, Australia, 2008).

Best Paper Award, ASME IMECE Conference, Advanced Energy Systems Division, 2006.

Best Poster Award, ASME IMECE Conference, 2005.

Best Poster in session award, Gordon Conference on the Physics and Chemistry of Microfluidics, Oxford England, 2005

Presidential Early Career Award for Scientist and Engineers (PECASE), 2004

Identified by the Hispanic Engineers National Achievement Awards Corp. as a Role Model for young Hispanic engineers, 2004

National Science Foundation Faculty Early Career Development (CAREER) Award, 2003

Best Paper Award, Symposium on Thermodynamics and the Design, Analysis, and Improvement of Energy Systems, 2005

Best Poster award Annual Meeting of the American Institute of Chemical Engineering and American Electrophoresis Society, San Francisco, California, 2003

Best Poster award Gordon Conference on the Physics and Chemistry of Microfluidics, Big Sky Montana 2003

National Inventors Hall of Fame: Collegiate Inventors Award, 2001

Best Paper award at SEMI-THERM XVII, San Jose, CA USA, 2001

Frederick Emmons Terman Fellow (Faculty) Award, Stanford University 1998-1999

Ford Foundation Post-Doctoral Fellowship 1997-1998

UIUC Mechanical Engineering Alumni Teaching Fellow Award, 1994 – 1995

National Science Foundation SURGE Fellowship, 1992 – 1995

UIUC Mechanical Engineering Departmental Dupont Fellowship 1990-1991

UIUC Mechanical Engineering Departmental Chevron Fellowship 1991-1992

Exxon Corporation Fellowship, 1990 - 1994

Philip O. Yeaton Award for Excellence in Undergraduate Mechanical Engineering, University of Florida, 1990

National Action Council for Minorities in Engineering Scholarship ('87-'90)

First in Graduating Class, University of Florida, 1990

Graduation with High Honors, University of Florida, 1990

Keynote and Named Lectures

1. Santiago, J.G., "Indirect Fluorescence Detection of Non Fluorescent Analytes Using Isotachophoresis," Plenary Speaker, Sixth International Conference on Nanochannels, Microchannels and Minichannels, June 23-25, Darmstadt, Germany May 15, 2008.
2. Santiago, J.G., "Electrokinetic Nanofluidic and Microfluidic Devices: Physics and Applications," the Distinguished Speaker at the Frontiers in Mechanical Engineering: NanoMechanical Engineering at University of Pennsylvania, Philadelphia, Pennsylvania, May 15, 2008.
3. Santiago, J.G., "Novel On-Chip Isotachophoresis Assays," the Linseth Lecture at Cornell University, January 29, 2008.

4. Santiago, J.G., "Making Shock Waves in Microfluidics: The Physics and Applications of Isotachopheresis," Keynote Address at the 60th Annual Meeting of the Division of Fluid Dynamics, Nov 18-20, Salt Lake City, Utah, 2007.
5. "Electrokinetic Microfluidics at Extreme Scales," Keynote Address at the Electrostatics Society Annual Meeting, Berkeley, CA 2006.
6. "Field Amplified Sample Stacking for On-Chip Capillary Electrophoresis," Keynote Address at the ASME International Mechanical Engineering Congress and Exposition, Irvine, California, November, 2004
7. "Electrokinetic Microfluidic Systems: Sample Stacking and Instabilities," Keynote Address at the International Electrokinetics Conference, June 13-17, Carnegie Mellon University, Pittsburgh, Pennsylvania, 2004
8. "Electrokinetic Microfluidic Systems," Keynote Address at the Seventh Annual Paul Flory Conference, Chemistry Department, Stanford University, 2004
9. "Electrokinetic Flow Instabilities in Microfluidic Systems," International Conference on Theoretical and Applied Mechanics (ICTAM '04), Plenary Lecture for Microfluidics Symposium, Warsaw, Poland 2004
10. "Electrokinetic Microfluidic Systems: Stacking and Instabilities," Massachusetts Institute of Technology, The Ronald J. Probst Lecture in Mechanical Engineering, Cambridge, Massachusetts, 2003
11. "Heterogenous Electrokinetic Systems," Keynote Address at the ASME International Mechanical Engineering Congress and Exposition, Washington D.C., November, 2003
12. "Electrokinetic Technology for Microfluidic Systems," Keynote Address of the IBC BioMEMS and Microfluidics, San Diego, CA, 2003
13. "Electrokinetic Microfluidic Systems," Keynote Address of the Joint American Institute of Chemical Engineering and American Electrophoresis Society Annual Meeting, Indianapolis, Indiana, 2002

(see also Other Invited Presentations below)

Activities and Service

External

Chair of 2009 Gordon Research Conference on Physics and Chemistry of Microfluidics. Includes organizing entire program, raising funds (including proposals to NIH, NSF, Philips Corp.), and invitations, 2007-2009.

DOE proposal review, 2006

Reviews of tenure cases for Mechanical Engineering at a major university, 2006, 2007 (2), 2008 (3)

NIH Study Section and Review Panel, 2006

Reviewer of Israeli national science foundation, 2006

Panel Moderator Silicom Corporation Ventures Conference, 2006

Mentorship Panel member at The National Consortium for Graduate Degrees for Minorities in Engineering and Science (GEM), 2006

Associated Editor of the journal Lab on a Chip, RSC Publishing, 2008 – Present

Member Editorial Board of the Journal of Microfluidics and Nanofluidics, Springer-Verlag, 2003 – Present

ASME Fluids Division Awards Committee, 2004 – 2005

Springer-Verlag book proposal review, 2005

Cambridge Press book proposal review, 2005

Tutorial for Materials Research Society on Microfluidics, April 2004

Tutorial on Micron-Resolution Particle Image Velocimetry, Sponsored by TSI, Inc. September 2003

Review Panel for NSF SBIR Proposals, October 2003
Review Panel for NSF CAREER Proposals, 2003, 2005
NSF proposal reviews 2002-2006
Tutorial for American Society of Mechanical Engineers on Microfluidics, October 2002
Founder of Cooligy, Inc., Mountain View, CA (www.cooligy.com); company aims to commercialize electroosmotic-pumped liquid cooling loops for microelectronics, 2002 - Present
Active supporter of the Foundation for a College Education (non-profit organization with a mission to promote access to college by students in traditionally underrepresented groups) 2001- Present
Chair of Minority Recruitment for the American Society of Mechanical Engineering's Micro-electro-mechanical Systems (MEMS) Sub-Division, 1999 – Present
Member of ASME, AIChE, IEEE, APS, 1998 – Present
Member American Institute of Aeronautics & Astronautics, 1999-2000
Member Pi Tau Sigma, Golden Key, American Society of Mechanical Engineers, Society of Hispanic Engineering Students, 1988-1990

Session Conference Chair and Proceedings Reviewer

Conference Chair, Gordon Research Conference on the Physics and Chemistry of Microfluidics, Bargo, Italy, July, 2009
Conference Vice Chair, Gordon Research Conference on the Physics and Chemistry of Microfluidics, Oxford, England, planning for conference in August, 2007
Plenary Session Chair, Micro-Total Analysis Systems, San Diego, 2008.
Session Chair, Gordon Conference on the Physics and Chemistry of Microfluidics, Oxford, England, August, 2005
International Conference for Theoretical and Applied Mechanics, ICTAM, Poland, August, 2004
Lab Automation Conference, Assoc. for Laboratory Automation, Microfluidics Applications Session, San Jose, February 1-5, 2004
International Mechanical Engineering Congress and Exposition, Applications of Fluid Mechanics to Microsystems Technology, Washington, D.C., November 15-21, 2003
Annual Meeting of American Institute of Chemical Engineers, San Francisco, CA, November 16-21, 2003
7th International Conference on Miniaturized Chemical and BioChemical Analysis Systems (μ TAS2003), Squaw Valley, California, October 5-9, 2003
Physics and Chemistry of Microfluidics, Gordon Conference, Big Sky Resort, Montana, August 24-29, 2003
19th Annual Joint Meeting of the Electrophoresis Society and the American Institute of Chemical Engineers, Indianapolis, Indiana, November 3-8, 2002
International Mechanical Engineering Congress and Exposition, Microfluidic Transport Phenomena, 1998 to 2006
ASME/JSME Fluids Engineering Conference, Microfluidic Devices for Liquids, 1998
Advisory Committee Member for the IEEE Aerospace Conference, 1997
ASME Fluids Engineering Division Summer Meeting, Separated and Complex Flows, 1997
AIAA 35th Aerospace Sciences Meeting, Thermophysics Technical Committee Session, 1997

Reviewer for Archived Journals

Journal of Microfluidics and Nanofluidics, 2004 – 2008
Journal of the Electrochemical Society, 2008
Fuel Cells, 2007
International Journal of Hydrogen Energy, 2008
Langmuir, 2007-2008
Biomedical Microdevices, 2007-2008
Lab on a Chip, 2006-2008
Journal of Power Systems, 2006, 2008
Physical Review E, 2004, 2005 – 2007
Physical Review Letters, 2005
Applied Physics Letters, 2005
Journal of Chemical Physics, 2005-2006

Experiments in Fluids, 2000 – 2006
Analytical Chemistry, 2000 – 2008
Journal of Microelectromechanical Systems, 2000 – 2004, 2006
Chemical Engineering Science, 2001, 2003 – 04
Sensors and Actuators B, 2001 – 2004
Journal of Fluid Mechanics, 2001 – 2006
Journal of Fluids Engineering, 2002 – 2005
Physics of Fluids, 2002 – 2005
Journal of Micromechanics and Microengineering 2003 –2006
Journal of Colloids and Interface Science, 2003, 2006-2008
Chemical Reviews, 2003
NSF Proposals, 2002 – 2003
Electrophoresis, 2002 – 2003, 2007
Journal of Microscale Thermophysical Engineering, 2003
Journal of Heat Transfer, 2003
Journal of Ophthalmology, 2003
Journal of Biomedical Microdevices, 2002
Science, 2001- 2002, 2005
Review of Optics Letters, 2000
AIAA Journal, 1999 - 2000
Journal of Thermophysics and Heat Transfer, 1997
Journal of Measurement Science and Technology, Institute of Physics, 1997
Optics Letters, Optical Society of America, 1997

Internal Service

Member Graduate Diversity Steering Committee, Office of Vice Provost for Graduate Education, 2007-Present
Member Stanford Campus Residential Leaseholders (SCRL) Residential Traffic Committee, 2007-Present
Member Committee of Graduate Studies, Stanford, 2006-2008
Active recruiter for minorities and women to the ME graduate program (including work with Office of Engineering Diversity Programs and associated talks, dinners, lunches, meetings, and gatherings), 1999-2008
Stanford Summer Engineering Academy (SSEA): Curriculum planning, student host,
Three-hour lecture on engineering and preparation for college, 2001-2008
Presentation and discussion with minority students taking enrolled in the Graduate Environment of Support (HUMSCI 201), 2006
Member of Mechanical Engineering Multiphysics Faculty Search Committee, 2005-2007
Member of Mechanical Engineering Biomechanics Faculty Search Committee, 2005-2006
Member of Stanford University Latino Faculty Committee, 2001-2006
Chair of promotion committee for Dr. Rainer Fasching (Sr. Research Assoc.), 2004-2005
Active Participation in Fluid Mechanics Search committee, 2004-2005
Presentation to Stanford Society of Chicano/Latino Engineers and Scientists (SSCLES), 2004, May 2005
Presentation and reception for Graduate Diversity Admit Weekend events, 1999, 2004, 2006, 2007, 2008
Presentation for Admit Weekend to incoming freshman, April 2005
Presentation to the Latino Engineering Graduate Organization, April 2005, 2006, 2008
Admit Weekend faculty panel member and presenter, 2003 – 2005
Talks and meetings with students at El Centro Chicano, Stanford Univ. 2002 - 2005
Coordination and participation in ME Department admit day tours and student interviews 2001-2008
Coordination and participation in star applicant visit day, including tours and interviews 2001 – 2008
Keynote speaker at Seoul National University/Mechanical Engineering (Thermal Sciences Group) Conference at Stanford, 2004
Center for Integrated Systems Advisory Committee Conference speaker, 2004
Presentation to Mechanical Engineering Visiting Committee (and tours), 2004
Reviewer for Stanford Office of Technology Licensing Awards, 2001, 2002, 2004

Current Ph.D. Candidate (Research) Advisees:

Moran Bercovici, M.S.c. Aerospace Eng. Technion, Israel
Cullen Buie, B.S. Mechanical Engineering, Ohio State University
Rob Chambers, B.S., Harvey Mudd U.
Tarun Khurana, M.S. Mechanical Engineering, IIT Madras, India
Shawn Litster, M.S. Mech. Eng., U. of Victoria, Canada
Alexandre Persat, M.S. Chem. Eng., Stanford
John Ramunas, B.S. Honors Biochemistry, U. of Waterloo, Canada
Dan Strickland, B.S., Seattle University
Tom Zangle, M.S. Mech. Eng., Stanford

Current M.S. Student Research Advisees

HyukMin Kwon, Seoul National University
Ray Sierra, University of Florida
Kai Sun, Shanghai Jiao Tong University
Matthew Suss, McGill University

Current Postdoctoral Researchers and Visiting Scientist Currently in Lab

Takashi Matsumura, visitor from Ebara Corp., Fujisawa, Japan
Dr. Reto Schoch, EPFL, Switzerland
Prof. Suman Chakraborty, IIT Kharagpur, India

Graduated Students (Stanford)

Karen Bletzer, M.S. Mech. Eng., June 2000	Consultant at Accenture
Brian Kidd, M.S. Mech. Eng., April 2001	Researcher, Stanford Medical School
Luis Garcia, M.S., Mech. Eng., May 03	Graduate student MSE
Bruce P. Mosier, Eng. Deg, Mech. Eng., May 2001	Research Scientist, Sandia Natl. Labs
Amy Herr, Ph.D., Mech. Eng, Sept. 2002	Professor, UC Berkeley
Josh I. Molho, Ph.D. Mech. Eng., Dec. 2001	R&D Engineer, Applied Biosystems
Shankar Devasenathipathy, Ph.D., Mech. Eng., Dec. 2003	Researcher Intel Corp., Stanford
Michael Oddy, Ph.D. Mech. Eng., December 2004	Finance Quant., Barclays Capital
Chuan-Hua Chen, Ph.D., Mech. Eng., Jan. 2004	Professor, Duke University
Sumita Pennathur, Ph.D. Mech. Eng., Dec. 2005	Professor, UC Santa Barbara
Rajiv Bharadwaj, Ph.D. Chem. Eng., June 2005	R&D Engineer, Caliper Technologies
Shuhuai Yao, Ph.D. Mech. Eng., Sept. 2005	Postdoc., Sandia Natl. Labs
David Huber, Ph.D. Mech. Eng., June 2006	Postdoc., Sandia Natl. Labs
Daejoong Kim, Ph.D. Mech.Eng., December 2006	Postdoc, U. Illinois Urbana-Champaign
David Hertzog, Ph.D. Mech. Eng., June 2006	Consultant, McKenzie Consulting
Byoungsok Jung, Ph.D., Mech. Eng., 2006	Postdoc, Lawrence Livermore Natl Labs Klint
Rose, Ph.D. Mech. Eng., March 2007	Scientist, Lawrence Livermore Natl Labs

Former Postdocs and Research Scientists

Jim Mikkelson, Ph.D. Chemistry, Brown Univ., June 2002	Scientist, Caliper Biosciences
Peng Zhou, Ph.D. Mech. Eng., Stanford, September 2003	R&D Engineer, Cooligy, Inc.
Shulin Zeng, Ph.D. Chem. Eng., Univ. of Colorado at Boulder	R&D Engineer, Cannon Corp.
Guiren Wang, Ph.D. Mech. Eng., Tech. Univ. of Berlin, Germany	Professor, U. South Carolina
Hao Lin, Ph.D., University of California at Berkeley	Professor, Rutgers University
Jonathan D. Posner, Ph.D., Univ. of California at Irvine	Professor, Arizona State Univ.
Fabio Baldessari, Ph.D., University of California at Santa Barbara	Finance Quant, Barclays Capital
Tibor Fabian, Ph.D., University of Vienna	CTO, Ardica Inc.

Recent Visitors

Dr. Yonggang Zhu, Commonwealth Scientific and Industrial Research Organization, Australia

Motohiko Nohmi, Ph.D., Ebara Corp., Fujisawa, Japan
Alan M. Meyers, Ph.D., Intel Corporation
Che-Wei Lin, M.S.M.E., Industrial Technology Research Inst., Taiwan
Prof. Bijan Mohammadhi, Montpellier University, France
Lilian Min, high school teacher from Etiwanda, CA
Tomoyuki Morita, Scientist, Ebara Corp., Fujisawa, Japan

Undergraduate Researchers Supervised:

Mac Schwager, B.S. Mechanical Engineering (1999)
Amanda Vicharelli, B.S. Mechanical Engineering, Stanford University (2000)
Daniel Hsu, B.S. Chemical Engineering, Stanford University (2000)
Daniel Braithwaite, B.S. Mechanical Engineering, Stanford University (2001)
Patricio Delgado, B.S. Mechanical Engineering, Stanford University (2001)
Ryan Hanson, B.S. Mechanical Engineering, Stanford University (2001)
Katrina Bell, B.S. Mechanical Engineering, Stanford University (2002-2003)
John A. Meier, B.S. Mechanical Engineering, Stanford University (2004-2005)
Anand Subrammani, B.S. Mechanical Engineering, Stanford University (2005-2006)
Cole Bennett, B.S. Mechanical Engineering, Stanford University (2007-2008)
David Fenning, B.S. Mechanical Engineering, Stanford University (2007-)
Soroush Salehian, B.S. Mechanical Engineering, Stanford University (2008-)
Viktor Skolnikov, B.S. Mechanical Engineering, Stanford University (2008-)

Archived Publications

(Students and postdoctoral researchers at Stanford in bold and italics type, respectively)

Submitted and Under Review

1. **Fabian, T.**, O'Hayre, R., **Litster, S.**, Prinz, F. and Santiago, J.G, "Active Water Management at the Cathode of a Planar Air-breathing PEM Fuel Cell," submitted to the *Journal of the Electrochemical Society*, 2008.
2. **Buie, C. R.** and J.G. Santiago, "Two Phase Hydrodynamics in a Miniature Direct Methanol Fuel Cell," submitted to the *International Journal of Heat and Mass Transfer*, 2008.
3. **Litster, S., C.R. Buie**, and J.G. Santiago, "Engineering model for coupling wicks and electroosmotic pumps with proton exchange membrane fuel cells for active water management," submitted to *Electrochimica Acta.*, 2008.

Published (and Accepted) Papers

1. **Zangle, T. A., A. Mani**, J.G. Santiago, "On the propagation of concentration polarization from microchannel-nanochannel interfaces. Part II. Numerical and experimental study," in press, *Langmuir*, 2008.
2. **Mani, A., T.A. Zangle**, J.G. Santiago, "On the propagation of concentration polarization from microchannel-nanochannel interfaces. Part I. Analytical model and characteristic analysis," in press, *Langmuir*, 2008.
3. **Khurana, T.**, and J.G. Santiago, "Effects of Carbon Dioxide on Peak Mode Isotachopheresis: Simultaneous Preconcentration and Separation" in press, *Lab on a Chip*, 2008.
4. **Bercovici, M.**, S.K. Lele, and J.G. Santiago, "Open source simulation tool for electrophoretic stacking, focusing, and separation", in press, *Journal of Chromatography A*, 2008.
5. **Rose, K.A., B. Hoffman, D. Saintillan**, E.S.G. Shaqfeh, and J.G. Santiago, "Hydrodynamic interactions in metal rod-like particle suspensions due to induced charge electroosmosis," in press, *Physics Review E*, 2008.
6. **Litster, S.** and J.G. Santiago, "Dry gas operation of proton exchange membrane fuel cells with parallel channels: Non-porous versus porous plates," in press, *Journal of Power Sources*, 2008.
7. **Khurana, T.**, and J.G. Santiago, "Sample Zone Dynamics in Peak Mode Isotachopheresis" in press, *Analytical Chemistry*, 2008.
8. **Lin, H.**, B.D. Storey and J.G. Santiago, "A depth-averaged electrokinetic flow model for shallow microchannels," 608, *Journal of Fluid Mechanics*, p. 43-70, 2008.
9. **Nohmi, M.** and JG Santiago, "Quick Measurement of Electroosmotic Flow Velocity," *Lab on a Chip*, Chips & Tips, March 2008.
10. **Khurana, T.**, and J.G. Santiago, "Pre-Concentration, Separation, and Indirect Detection of Non-Fluorescent Analytes using Fluorescent Mobility Markers" 80, 1, *Analytical Chemistry*, pp. 279-286, 2008.
11. **Lin, F., F. Baldessari, R. Chambers**, C. Crenguta Gyenge, T. Sato, J.G. Santiago, E.C. Butcher, Lymphocyte Electraxis in vitro and in vivo," 181, 4, p. 2465-2471, *Journal of Immunology*, 2007.
12. **Huber, D.E.**, and J.G. Santiago, "Ballistic Dispersion in Temperature Gradient Focusing," 464, 2091, p.595-612, *Proceedings of the Royal Society A*, 2007.
13. Piorek, B., S.J. Lee, M. Moskovits, S. Banerjee, J.G. Santiago, and C. Meinhart, "Microfluidic Control of Nanoparticle Aggregation for Surfaced Enhanced Raman Spectroscopy," 104, 48, *Proceedings of the National Academy of Science Journal*, p.18898-18901, 2007.
14. **Persat, A., T. Zangle, J. Posner**, and J. Santiago "Chips & Tips: On-chip Electrophoresis Devices: Do's, Don'ts, and Dooms," *Lab on a Chip*, Chips & Tips, March 2007.
15. **Strickland, D.G., S. Litster**, and J.G. Santiago, "Current Distribution in Polymer Electrolyte Fuel Cell with Active Water Management," 174, pp. 272-281, *Journal of Power Sources*, 2007.
16. **Pennathur, S., F. Baldessari, M. Kattah, J. Steinman**, P.J. Utz, and J.G. Santiago, "Free-Solution Oligonucleotide Separation in Nanoscale Channels," 79, 21, *Analytical Chemistry*, p.8316-8322, 2007.
17. **Devasenathipathy, S., R. Bharadwaj**, J.G. Santiago, "Investigation of internal pressure gradients generated in electrokinetic flows with axial conductivity gradients," 43, 6, *Experiments in Fluids*, p.959-967, 2007.

18. **Kim, D., J.D. Posner,** and J.G. Santiago “High Flow Rate per Power Electroosmotic Pumping using Low Ion Density Solvents,” *Sensors and Actuators A: Physical*, 141, pp. 201-212, 2008.
19. **Fabian, T. R. O’Hayre, F.B. Prinz,** and J.G. Santiago, “Measurement of Temperature and Reaction Species in the Cathode Diffusion Layer of a Free-Convection Fuel Cell,” *J. Electrochem. Soc.* 154, B910, 2007.
20. **Buie, C. R., D. Kim, S. Litster** and J.G. Santiago, “An Electroosmotic Fuel Pump for Direct Methanol Fuel Cells.,” *Electrochemical and Solid State Letters*, 10, 11, pp. B196-B200, 2007.
21. **Lin, C.W., S. Yao, J.D. Posner,** A.M. Meyers, and J.G. Santiago, “Toward Orientation Independent Design for as Recombination in Closed-Loop Electroosmotic Pumps,” v.128, no.1, p.334-339, *Sensors and Actuators B*, 2007.
22. **Litster, S., C.R. Buie, T. Fabian,** J.K. Eaton and J.G. Santiago, "Active Water Management for PEM Fuel Cells," 154, 10, *Journal of The Electrochemical Society*, pp. b1049-b1058, 2007.
23. Santiago, J.G., “Comments on the Conditions for Similitude in Electroosmotic Flows,” 310, 2, p. 675-677, *Journal of Colloids and Interface Science*, 2007.
24. **O’Hayre, R., T. Fabian, S. Litster,** F.B. Prinz, and J.G. Santiago, “Engineering Model of a Passive Planar Air Breathing Fuel Cell Cathode,” 167, 1, *Journal of the Electrochemical Society*, p. 118-129, May 2007.
25. **Huber, D.E.,** and J.G. Santiago, “Taylor-Aris dispersion in temperature gradient focusing ,” 28, 14, *Electrophoresis*, p. 2333-2344, 2007.
26. Kenny, T.W., Goodson, K.E., Santiago J.G., **Wang, E., Koo, J.-M., Jiang, L., Pop, E., S. Sinha, S. Zhang, L., Fogg, D. et al.** “Advanced cooling technologies for microprocessors,” *International Journal of High Speed Electronics and Systems*, March 2006, 16, 1, p. 301-313.
27. **Baldessari, F.** and J.G. Santiago, "Electrophoresis in nanochannels: brief review and speculation," 4, 12 *Nanobiotechnology Journal*, doi 10.1186/1477-3155-4-12, 2006.
28. **Jung, B.,** Zhu, Y., and J.G. Santiago, "Detection of 100 attomolar Fluorophores Using a High Sensitivity On-Chip CE System and Transient Isotachophoresis," *Analytical Chemistry*, 79, 1, p. 345-349, 2007.
29. **Hertzog, D.E.,** B. Ivorra, B. Mohammadi, O. Bakajin, and J.G. Santiago, “Optimization of a Fast Microfluidic Mixer for Studying Protein Folding Kinetics,” *Analytical Chemistry*, 78, 13, p.4299-4306, 2006.
30. **Rose, K.A., J.A. Meier,** G.M. Dougherty, and J.G. Santiago, “Rotational Electrophoresis of Striped Metallic Microrods,” *Physics Review E – Statistical, Nonlinear, and Soft Matter Physics*, 75, 1, 2007.
31. **Buie, C.B., Posner, J.D., Fabian, T., Cha, S.W., Kim, D.,** Prinz, F.B., Eaton, J.K., and Santiago, J.G., “Water Management in Proton Exchange Membrane Fuel Cells using Integrated Electroosmotic Pumping,” 161, *Journal of Power Sources*, p. 191-202, 2006.
32. **Fabian, T., Posner, J.D., O’Hayre, R., Cha, S.W.,** Eaton, J.K., Prinz, F.B., Santiago, J.G.," The role of ambient conditions on the performance of a planar, air-breathing hydrogen PEM fuel cell", *Journal of Power Sources*, 161, 1, pp. 168-182, October 2006
33. **Jung, B., Bharadwaj, R.,** Santiago, J.G., "On-Chip Million-Fold Sample Stacking Using Transient Isotachophoresis," 78, 7, *Analytical Chemistry*, pp. 2319-2327, 2006.
34. **Yao, S., Myers, A.M, Posner, J.D., Rose, K.A.,** and Santiago, J.G., “Electroosmotic Pumps Fabricated from Porous Silicon Membranes,” 15, 3, *Journal of Microelectromechanical Systems*, pp. 717-728, 2006.
35. **Wang, E.N., Devasenathipathy, S., Lin, H., Hidrovo, C.H.,** Santiago, J.G., Goodson, K.E., and Kenny, T.W., "A Hybrid Method for Bubble Geometry Reconstruction in Two-Phase Microchannels," 40, 6, *Experiments in Fluids*, p. 847-858, 2006.
36. **Pennathur, S.** and Santiago, J.G. “Electrokinetic transport in nanochannels: 1. Theory,” 77, 21, *Analytical Chemistry*, pp. 6772-6781, 2005.
37. **Pennathur, S.** and Santiago, J.G. “Electrokinetic transport in nanochannels: 2. Experiments,” 77, 21, *Analytical Chemistry*, pp. 6782-6789, 2005.
38. **Posner, J.D.** and Santiago, J.G., "Convective Instability of Electrokinetic Flows in a Cross-Shaped Microchannel, " 555, *Journal of Fluid Mechanics*, pp. 1-42, 2006.
39. Ivorra, **D.H., Hertzog,** B. Mohammadi, B., J.G. Santiago, “Semi-deterministic and Genetic Algorithms for Global Optimization of Microfluidic Protein Folding Devices,” 66, 2, *International Journal for Numerical Methods in Engineering*, p. 319-333, 2006.
40. **Huber, D.E.** and Santiago, J.G., “Temperature Gradient Focusing in a Microfluidic Device,” *Journal of Heat Transfer*, 127, 8, pp. 806, 2005.

41. **Oddy, M.H.**, and J.G. Santiago, "A Multiple-Species Model for Electrokinetic Instability," Vol.17, 6, *Physics of Fluids*, 2005.
42. **Bharadwaj, R.** and J.G. Santiago, "Dynamics of Field Amplified Sample Stacking," *Journal of Fluid Mechanics*, 543, 57-92, 2005.
43. **Chen, C.-H., Lin, H.**, Lele, S.K. & Santiago, J.G., "Convective and absolute electrokinetic instability with conductivity gradients", *Journal of Fluid Mechanics*, 524, pp. 263 – 303, 2005.
44. **Hertzog, D.E.**, X. Michalet, M. Jager, X. Kong, J. Santiago, S. Weiss, and O. Bakajin, "Femtomole Mixer for Microsecond Kinetic Studies of Protein Folding," *Analytical Chemistry*, 76, 24, 2004.
45. Storey, B.D., B.S. Tilley, **H. Lin**, and J.G. Santiago, "Electrokinetic Instabilities in Thin Microchannels," *Physics of Fluids*, 17, 1, p.1922-1935, 2004.
46. **Wang, E.N., Devasenathipathy, S., Lin, H., Hidrovo, C.H.**, Santiago, J.G., Goodson, K.E., and Kenny, T.W., "Nucleation and growth of vapor bubbles in a heated silicon microchannel," *Journal of Heat Transfer*, 126, p. 497, 2004.
47. Tripp, J.A., F. Svec, J.M.J. Frechet, **S. Zeng, J.C. Mikkelsen**, and J.G. Santiago, "High-Pressure Electroosmotic Pumps Based on Porous Polymer Monoliths," *Sensors and Actuators B*, 99, pp. 66-73, 2004
48. **Lin, H.**, Storey, B., **M. Oddy, Chen, C.-H.**, and J.G. Santiago, "Instability of Electrokinetic Microchannel Flows with Conductivity Gradients," *Physics of Fluids*, 16, 6, 2004
49. **Wang, G.R.**, J. G. Santiago, M.G. Mungal, B. Young, S. Papademetriou, "A laser-induced cavitation pump," *Journal of Micromechanics and Microengineering*, 14, 7, pp. 1037-1046, 2004.
50. **Laser, D.** and J.G. Santiago, "A Review of Micropumps," *Journal of Micromechanics and Microengineering*, 14, 6, 2004
51. Matta, A., O.M. Knio, R.G. Ghanem, **C.-H. Chen**, J.G. Santiago, B. Debusschere, and H.N. Najm, "Computational Study of Band Crossing Reactions," *Journal of Microelectromechanical Systems*, 13, 2, pp. 310-322, 2003.
52. Alexis-Alexandre, G., B. Mohammadi, J.G. Santiago, and **R. Bharadwaj**, "Microfluidic Flow Simulations: Stacking One-Dimensional Study," *Houille Blanche-Revue Internationale De Leau*, 5, pp. 18-23, 2003.
53. **Yao, S.** and J.G. Santiago , "Porous Glass Electroosmotic Pumps: Theory," *Journal of Colloid and Interface Science*, 268, pp. 133-142, 2003
54. **Yao, S., D.E. Hertzog, S. Zeng, J.C. Mikkelsen**, and J.G. Santiago , "Porous Glass Electroosmotic Pumps: Design and Experiments," *Journal of Colloid and Interface Science*, 268, pp. 143-153, 2003
55. **Oddy, M.** and J.G. Santiago, "A method for determining electrophoretic and electroosmotic mobilities using AC and DC electric field particle displacements," *Journal Colloid and Interface Science*, 269, pp. 192-204, 2004
56. Mohammadi, B. and J.G. Santiago, "Incomplete Sensitivities in Design and Control of Fluidic Channels," *Computer Assisted Mechanics and Engineering Sciences*, 10, pp. 201-210, 2003
57. **Jung, B., R. Bharadwaj**, and J.G. Santiago, "Thousand-Fold Signal Increase using Field Amplified Sample Stacking for On-Chip Electrophoresis," *Electrophoresis*, 24, 19-20, pp. 3476-3483, 2003
58. **Herr, A.E., J.I. Molho, K.A. Drouvalakis, J.C. Mikkelsen**, P.J. Utz, J.G. Santiago, and T.W. Kenny, "On-Chip Coupling of Isoelectric Focusing and Free Solution Electrophoresis for Multi-Dimensional Separations," *Analytical Chemistry*, 75, 5, pp. 1180-1187, 2003.
59. **Devasenathipathy, S.**, J.G. Santiago, S.T. Wereley, and C.D. Meinhart, "Particle Tracking Techniques for Microfabricated Fluidic Systems," *Experiments in Fluids*, 34, 4, pp. 504-513, 2003
60. **Chen, C.-H.** and J.G. Santiago, "A Planar Electroosmotic Micropump," *Journal of Microelectromechanical Systems*, 11, No.6, pp. 672-683, 2002
61. **Bharadwaj, R.**, J.G. Santiago, and B. Mohammadi, "Design and Optimization of On-Chip Capillary Electrophoresis," *Electrophoresis*, 23, pp. 2729-2744, 2002
62. **Mosier, B.P., J.I. Molho**, and J.G. Santiago, "Bleached-Fluorescence Imaging of Microflows," *Experiments in Fluids*, 33, 4, pp. 545-554, 2002
63. **Devasenathipathy, S.**, J.G. Santiago, and K. Takehara, "Particle Tracking Techniques for Electrokinetic Microchannel Flows," *Analytical Chemistry*, 74, 15, pp. 3704-3713, 2002

64. Mohammadi, B., **Molho, J.I.**, and J.G. Santiago, "Incomplete sensitivities for the design of minimal dispersion fluidic channels," *Computer Method in Applied Mechanics and Engineering*, 192, 37-38, pp. 4131-4145, 2002
65. **Jiang, L., J.C. Mikkelsen, J.-M. Koo, D. Huber, S. Yao, L. Zhang, P. Zhou**, Maveety, R. Prasher, J.G. Santiago, T.W. Kenny, and K.E. Goodson, "Closed-Loop Electroosmotic Microchannel Cooling System for VLSI Circuits," *IEEE Transactions on Components & Packaging Technologies*, 25, 3, pp.347-355, 2002
66. **Zhang, L., J.M. Koo, L. Jiang, M. Ashegi**, K.E. Goodson, **J.G. Santiago**, T.W. Kenny, "Measurements and Modeling of Two-Phase Flow in Microchannels with Nearly Constant Heat Flux Boundary Conditions," *Journal of Microelectromechanical Systems*, 11, 1, pp. 12-19, 2002
67. Mohammadi, B. and J.G. Santiago, "Simulation and Design of Extraction and Separation Fluidic Devices," *Mathematical Modelling and Numerical Analysis*, 35, 3, pp. 513-523, 2002
68. **Zeng, S.**, J.G. Santiago, J.-R. Chen, R.N. Zare, F. Svec, J.M.J. Frechet, "Electroosmotic Flow Pumps with Polymer Frits," *Sensors and Actuators B*, 82, Nos. 2-3, pp. 209-212, 2001
69. **Oddy, M.H.**, J.G. Santiago, and **J.C. Mikkelsen**, "Electrokinetic Instability Micromixing," *Analytical Chemistry*, 73, pp. 5822-5832, 2001
70. **Zeng, S., C.-H. Chen, J. C. Mikkelsen**, J.G. Santiago, "Fabrication and Characterization of Electroosmotic Micropumps," *Sensors and Actuators B*, 79, pp. 107-114, 2001
71. Santiago, J.G., "Electroosmotic Flows in Microchannels with Finite Inertial and Pressure Forces," *Analytical Chemistry*, 73, 10, pp. 2353-2365, 2001
72. **Molho, J.I., A.E. Herr, B.P. Mosier**, J.G. Santiago, T.W. Kenny, R.A. Brennen, G.B. Gordon, B. Mohammadi, "Optimization of Turn Geometries for On-Chip Electrophoresis," *Analytical Chemistry*, 73, 6, pp. 1350-1360, 2001
73. **Herr, A.H., J.I. Molho**, J.G. Santiago, M.G. Mungal, T.W. Kenny, and M.G. Garguilo, "Electroosmotic Capillary Flow with Non-Uniform Z-Potential," *Analytical Chemistry*, 72, 5, pp. 1053-1057, 2000
74. Liu, R. H., K. V. Sharp, M. G. Olsen, M. Stremler, J. G. Santiago, R. J. Adrian, H. Aref, D. J. Beebe, "Passive Mixing in a Three-Dimensional Serpentine Microchannel," *Journal of Microelectromechanical Systems*, 9, 2, pp. 190-197, 2000
75. Meinhart, C.D., S.T. Wereley, and J.G. Santiago, "A PIV Algorithm for Estimating Time-Averaged Velocity Fields," *Journal of Fluids Engineering*, 122, 2, pp. 285-289, 2000
76. Meinhart, C.D. , S.T. Wereley, and J.G. Santiago, "PIV Measurements of a Microchannel Flow," *Experiments in Fluids*, 27, 5, pp. 414-419, 1999
77. VanLerberghe, W.M., J.G. Santiago, J.C. Dutton, and R.P. Lucht, "Mixing of a Sonic Transverse Jet Injected into a Supersonic Flow," *AIAA Journal*, 38, 3, pp. 470-479, 1999
78. Santiago, J.G. , S.T. Wereley, C.D. Meinhart, D.J. Beebe, and R.J. Adrian, "A Particle Image Velocimetry System for Microfluidics," *Experiments in Fluids*, 25, 4, pp. 316-319, 1998
79. Santiago, J.G. and J.C. Dutton, "Crossflow Vortices of a Jet Injected into a Supersonic Crossflow," *AIAA Journal*, 35, 5, pp. 915-917, 1997
80. Santiago, J.G. and J.C. Dutton, "Velocity Measurements of a Jet Injected into a Supersonic Crossflow," *Journal of Propulsion and Power*, 13, 2, pp. 264-273, 1997

Books and Book Chapters

1. **Bharadwaj, R., D.E. Huber, T. Khurana**, and Juan G. Santiago, "Taylor Dispersion in Sample Pre-Concentration Methods," Chapter 38, *CRC Handbook of Electrophoresis*, James Landers (editor), 3rd Edition, CRC Press, pp. 1085-1120, 2008.
2. Sharp, K.V., R.J. Adrian, J.G. Santiago, and **J.I. Molho**, "Liquid Flows in Microchannels," *CRC Handbook of MEMS*, M.Gad-el-Hak (editor), CRC Press, 2nd Edition, New York, pp. 6-1 to 6-38, 2005
3. **Devasenathipathy, S.** and J.G. Santiago, "Electrokinetic Flow Diagnostics," *Micro- and Nano-Scale Diagnostic Techniques*, Editor K. Breuer, New York, Springer Verlag, 2004
4. Sharp, K.V., R.J. Adrian, J.G. Santiago, and **J.I. Molho**, "Liquid Flows in Microchannels," *CRC Handbook of MEMS*, M.Gad-el-Hak (editor), CRC Press, New York, pp. 6-1 to 6-38, 2001

- Meinhart, C.D. , S.T. Wereley, and J.G. Santiago, "Diagnostic Techniques for Microfluidics Research," Developments in Laser Techniques and Applications to Fluid Mechanics, R.J. Adrian, D.F.G. Durao, F. Durst, and M. Heitor, Springer-Verlag, Berlin, 1999

Theses

- Santiago, J.G., "An Experimental Study of the Velocity Field of a Transverse Jet Injected into a Supersonic Crossflow," Ph.D. Thesis, Department of Mechanical and Industrial Engineering, UIUC, 1995
- Santiago, J.G., "Facility Design and Preliminary Experiments for an Endothermic Fuel Combustion Facility," M.S. Thesis, Department of Mechanical and Industrial Engineering, UIUC, 1992

Refereed Conference Proceedings (Page numbers are not included for proceedings published only on CD)

- Zangle, T.A., A.H. Talasaz,** and J.G. Santiago, "Nanopore Concentration Polarization," ASME International Mechanical Engineering Congress and Exposition(IMECE) 2008, Boston, MA, October 31- November 6, 2008.
- Bercovici M.,** Lele S.K. and Santiago J.G., "A fast and accurate isotachopheresis simulation tool", *Proceedings of the 12th international conference on miniaturized systems for chemistry and life sciences (microTAS2008)*, San Diego, USA, October 12-16, 2008.
- Khurana T.,** Santiago J.G., " On-Chip Separation and Detection of Non-Fluorescent Toxins in Water Using Fluorescent Mobility Markers", *Proceedings of the Twelfth International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS2008)*, San Diego, USA, October 12-16, 2008.
- Zangle, T. A., A.H. Talasaz,** R.W. Davis and J.G. Santiago, "The Effects of Concentration Polarization on Molecule Translocation in a Nanopore Device", *Proceedings of the Twelfth International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS2008)*, San Diego, USA, October 12-16, 2008.
- Persat, A.** and J.G. Santiago, "On-Chip Device for Isothermal, Chemical Cycling Polymerase Chain Reaction", *Proceedings of the Twelfth International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS2008)*, San Diego, USA, October 12-16, 2008.
- Khurana T., Bercovici M.,** Santiago J.G., "Indirect Fluorescence Detection of Non Fluorescent Analytes using Isotachopheretic Mobility Markers". *The Sixth International Conference on Nanochannels, Microchannels, and Minichannels, June 23-25, 2008; Darmstadt, Germany.*
- Khurana T.,** Santiago J.G., "Indirect Detection and Separation of Non-Fluorescent Analytes Using Fluorescent Isotachopheretic Spacers". *Proceedings of the microTAS 2007 Conference, Oct 7-11 2007; Paris, France*
- Persat, A. T. Morita** and J.G. Santiago, "Toward On-Chip Isothermal Polymerase Chain Reaction", *Proceedings of the Eleventh International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS2007)*, Paris, France, October 7-11, 2007.
- Khurana T., Persat A.,** Santiago J.G., "On-chip Preconcentration and Separation of Simple and Complex Analytes using Isotachopheresis". *Proceeding of ASME-IMECE 2007 Conference, Nov 11-15 2007, Seattle, Washington, USA.*
- Buie, C.R.,** Litster, S., and J.G. Santiago, "Physics of Pumping Methanol/Water Solutions for Fuel Cell Applications," published in the *Proceedings of the ASME International Mechanical Engineering Conference and Exposition, Seattle, WA, IMECE2007-42579, November 11-15, 2007.*
- Khurana T.,** Santiago J.G., "On-Chip Indirect Detection Of Non-Fluorescent Analytes using Fluorescent Spacers". *Proceeding of ASME-IMECE 2007 Conference, Nov 11-15 2007, Seattle, Washington, USA.*
- Persat, A. T. Morita** and J.G. Santiago, "On-Chip Isothermal Polymerase Chain Reaction", *Proceedings of the International Mechanical Engineering Conference and Exposition, Seattle, WA, IMECE2007-43070, November 11-15, 2007.*
- Zangle, T.A., A. Mani,** and J.G. Santiago, "Novel Device for Electrophoretic Focusing and Separation at a Microchannel-Nanochannel Interface," published in the *Proceedings of the Eleventh International Conference on Miniaturized Systems for Chemistry and Life Sciences (μ TAS2007), Paris, France, p. XX., October 7-11, 2007.*
- Talasaz, A.H., **T.A. Zangle,** C. Tropini, F. Pease, R.W. Davis, and J.G. Santiago, "Real-Time Control of Nanopore Wall Potential for Single-Molecule Analysis," published in the *Proceedings of the Eleventh*

- International Conference on Miniaturized Systems for Chemistry and Life Sciences (μ TAS2007), Paris, France, p. XX., October 7-11, 2007.
15. **Litster, S., B. Ha, D. Kim**, and J.G. Santiago, "A Two-Liquid Electroosmotic Pump for Portable Drug Delivery Systems," *Proceedings of the International Mechanical Engineering Conference and Exposition*, Seattle, WA, IMECE2007-42583, November 11-15, 2007.
 16. **Zangle, T.A., A. Mani**, and J.G. Santiago, "Experimental Study of Concentration Polarization at a Microchannel-Nanochannel Interface," *Proceedings of the International Mechanical Engineering Conference and Exposition*, Seattle, WA, IMECE2007-42583, November 11-15, 2007.
 17. **T. Fabian**, R. O'Hayre, F. Prinz and J.G. Santiago, "Spatial and Temporal Measurements of Temperature and Reaction Species in the Cathode Diffusion Layer of a Planar Air-Breathing PEM Fuel Cell", Symposium on Proton Exchange Membrane Fuel Cells, 212th Meeting of the Electrochemical Society, Washington, DC, October 7-12, 2007. X
 18. **Pennathur S, Baldessari F, Kattah M**, Utz PJ, Santiago JG, "Electrophoresis in nanochannels." *Proceedings of the ASME Joint US - European Fluids Engineering Summer Meeting; July 17-20, 2006; Miami, FL*. 2006
 19. **Khurana T**, Santiago JG, "On-Chip isotachopheresis using electrophoretic spacers". *Proceedings of the microTAS 2006 Conference, Nov 5-9 2006; Tokyo, Japan*
 20. **Khurana T**, Santiago JG, "Analytical Model of Concentration Boundaries in Single Interface Isotachopheresis" *Proceeding of AIChE 2006 Annual Meeting, Nov. 12-17 2006; San Francisco, CA, USA*.
 21. **Buie, C.R., Banin, Y., Tang, C.**, Santiago, J.G., Prinz, F.B., and Pruitt, B.L., "A Microfabricated Direct Methanol Fuel Cell with Integrated Electroosmotic Pump," *Proceedings of the 19th IEEE International Conference on Micro Electro Mechanical Systems*, Istanbul, Turkey, January 22-26, pp. 938 to 941, 2006.
 22. **O'Hayre, R., T. Fabian, S. Litster**, F. Prinz and J.G. Santiago, "Combined Heat and Mass Transfer Model of a Passive Air Breathing Fuel Cell Cathode," Symposium on Proton Exchange Membrane Fuel Cells, *210th Meeting of The Electrochemical Society*, 2006 Joint International Meeting, ECS Transactions, 3, pp. 1125, Cancun, Mexico, 2006.
 23. **O'Hayre, R., T. Fabian, S. Litster**, F. Prinz, J.G. Santiago, "Passive Air Breathing Fuel Cells For Portable Applications: What are the Limits to Cathode Performance?" Fall Meeting of the Materials Research Society, Portable Power Symposium, Boston, MA, 2006.
 24. **Fabian T, Posner JD, O'Hayre R, Cha SW**, Eaton JK, Prinz FB, Santiago JG, "The role of ambient conditions on the performance of a planar, air-breathing fuel cell", *proceedings of Small Fuel Cells 2006 - Small fuel cells for portable applications*, April 2 - 4, 2006, Washington, DC USA
 25. **Fabian, T., R. O'Hayre, S. Litster**, F. Prinz and J.G. Santiago, "Water Management at the Cathode of a Planar Air-Breathing Fuel Cell with an Electroosmotic Pump," Symposium on Proton Exchange Membrane Fuel Cells, *210th Meeting of The Electrochemical Society*, 2006 Joint International Meeting, 3, pp. 949, Cancun, Mexico, 2006.
 26. **Kim, D.J., C. Buie** and J.G. Santiago, "Toward Electroosmotic Flow-Driven Air Pumps for Miniaturized PEM Fuel Cells," Symposium on Proton Exchange Membrane Fuel Cells, *210th Meeting of The Electrochemical Society*, 2006 Joint International Meeting, Cancun, Mexico, October 28-November 3, 2006.
 27. **Buie, C., D.J. Kim, S. Litster** and J.G. Santiago, "Free Convection Direct Methanol Fuel Cells Powered by Electroosmotic Pumps," Symposium on Proton Exchange Membrane Fuel Cells, *210th Meeting of The Electrochemical Society*, 2006 Joint International Meeting, 3, pp. 949, Cancun, Mexico, October 28-November 3, 2006.
 28. **Pennathur, S.** and J.G. Santiago, "1.5d Electrophoresis in Nanochannels," published in the *Proceedings of the Ninth International Conference on Miniaturized Systems on Miniaturized Chemical and BioChemical Analysis Systems (μ TAS2005)*, Boston, MA, No. 0724, October 9-14, 2005.
 29. **Buie, C.R.**, Posner, J.D., Fabian, T., Cha, S.W., Prinz, F.B., Eaton, J.K. and J.G. Santiago, "Water Removal from Proton Exchange Membrane Fuel Cells via Electroosmotic Pumping," published in the *Proceedings of the 208th Meeting of the Electrochemical Society*, Los Angeles, CA, October 16-21, 2005.
 30. **Rose, K.A.**, G. Dougherty, and J.G. Santiago, "Flow-based Detection of Bar Coded Particles," published in the *Proceedings of the Ninth International Conference on Miniaturized Systems for Chemistry and Life Sciences (μ TAS2005)*, Boston, Massachusetts, p. 779-781, October 9-13, 2005.

31. **Buie, C.B., Posner, J.D., Fabian, T., Cha, S.W.,** Prinz, F.B., Eaton, J.K. and J.G. Santiago, "Active Water Management for Proton Exchange Membrane Fuel Cells Using an Integrated Electroosmotic Pump," published in the *Proceedings of the International Mechanical Engineering Conference and Exposition*, Orlando, FL, IMECE2005-79728, November 5-11, (Best Student Paper Award), 2005.
32. **Lin, H., R. Bharadwaj,** J.G. Santiago and B. Mohammadi, "A High Fidelity Electrokinetic Flow Model for the Prediction of Electrophoregrams in On-chip Electrophoresis Applications," published in the *Proceedings of the International Mechanical Engineering Congress and Exposition*, Orlando, FL, IMECE2005-79439, November 5-11, 2005.
33. **D. Kim, J. D. Posner,** and J. G. Santiago, "High Flow Rate per Power Pumping of Aqueous Solutions and Organic Solvents with Electroosmotic Pumps", published in the *Proceedings of the International Mechanical Engineering Conference and Exposition*, Orlando, FL, IMECE2005-81198, November 5-11, pp. 311-314, 2005.
34. **Lin, H., M.H. Oddy,** and J.G. Santiago, "Electrokinetic Instabilities and Sample Stacking," published in the *Proceedings of the Nanotechnology Conference*, Anaheim, CA, , May 8-12, 2005.
35. **Huber, D.E.** and Santiago, J.G. "Non-linear Stacking Effects in Microfluidic Temperature Gradient Focusing," *Proceedings of the International Mechanical Engineering Congress and Exposition*, Anaheim, CA, IMECE2005-82156, November 5-11, 2005.
36. **Posner, J.D.** and J.G. Santiago, "Convective Electrokinetic Flow Instabilities in a Cross-Shaped Microchannel," published in the *Proceedings of the International Mechanical Engineering Conference and Exposition*, Anaheim, CA, IMECE2004-61042, November 13-19, 2004.
37. **Lin, H.,** B.D. Storey, and J.G. Santiago, "A depth-averaged model for electrokinetic flows in A thin microchannel geometry," published in the *Proceedings of the International Mechanical Engineering Conference and Exposition*, Anaheim, CA, IMECE2004-61017, November 13-19, 2004.
38. **Yao, S.,** Myers, A.M., **Posner. J.D.,** and Santiago, J.G., "Electroosmotic pumps fabricated from porous silicon membranes," published in the *Proceedings of the International Mechanical Engineering Conference and Exposition*, Anaheim, CA, IMECE2004-61350, November 13-19, 2004.
39. **Hertzog, D. ,** J.G. Santiago, and Olgica Bakajin, "Microfluidic Mixers for UV Studies of Unlabeled Proteins," published in the *Proceedings of the Eighth International Conference on Miniaturized Systems on Miniaturized Chemical and BioChemical Analysis Systems (μ TAS2004)*, Malmo, Sweden, September 26-30, 2004.
40. **Lin, H., M. Oddy,** and J.G. Santiago, "Electrokinetic Flow Instabilities in Microchannel Flows with Conductivity Gradients," *Proceedings of the International Conference on Theoretical and Applied Mechanics (ICTAM '04)*, Warsaw, Poland, August 15-21, 2004.
41. **Posner, J.D.** and J.G. Santiago, "Convective Electrokinetic Flow Instabilities in a Cross-Shaped Microchannel," published in the *Proceedings of the Eighth International Conference on Miniaturized Systems on Miniaturized Chemical and BioChemical Analysis Systems (μ TAS2004)*, Malmo, Sweden, p. 623., September 26-30, 2004.
42. **Huber, D.** and J.G. Santiago, "Focusing Dynamics of Temperature Gradient Focusing," published in the *Proceedings of the International Mechanical Engineering Conference and Exposition*, Anaheim, CA, IMECE2004-62108, November 13-19, 2004.
43. **Pennathur, S.** and J.G. Santiago, "Separation and Dispersion Mechanisms in Electrokinetic Nanochannels," published in the *Proceedings of the International Mechanical Engineering Conference and Exposition*, Anaheim, CA, IMECE2004-61356, November 13-19, 2004.
44. **Bharadwaj, R.** and J.G. Santiago, "Nonlinear Effects in Field Amplified Sample Stacking," presented at the Annual Meeting of the American Institute of Chemical Engineers, Austin, TX, USA, November 7-12, 2004.
45. **Pennathur, S.** and J.G. Santiago, "Electrokinetic Transport and Dispersion in Nanoscale Channels," published in the *Proceedings of the Eighth International Conference on Miniaturized Systems on Miniaturized Chemical and BioChemical Analysis Systems (μ TAS2004)*, Malmo, Sweden, No. A30340, September 26-30, 2004.
46. Alexis-Alexandre, G., B. Mohammadi, J.G. Santiago, and **R. Bharadwaj,** "Microfluidic flow simulations: Stacking one-dimensional study," *Houille Blanche-Revue Internationale De Leau*, No. 5, pp. 18-23, 2003.

47. **Wang, E., S. Devasenathipathy, C. Hidrovo, D.W. Fogg, J.-M. Koo,** J.G. Santiago, K.E. Goodson, T.W. Kenny, 3rd International Symposium on Two-Phase Flow Modeling and Experimentation, Pisa, Italy, 2004
48. **Devasenathipathy, S.,** Yamamoto, T., Sato, Y., Santiago, J.G., and Hishida, K., "Electrokinetic Particle Separation," Proceedings of the 7th International Conference on Miniaturized Chemical and BioChemical Analysis Systems (μ TAS2003), Squaw Valley, California, pp. 845 – 848, October 5-9, 2003
49. **Devasenathipathy, S.,** and Santiago, J.G., "Particle Stacking Dynamics in Heterogeneous Electrolytes," Physics and Chemistry of Microfluidics, Gordon Conference, Big Sky Resort, Montana, August 24-29, 2003
50. **Devasenathipathy, S.,** T. Yamamoto, Y. Sato, K. Hishida, and J.G. Santiago, "Electrokinetic Particle Migration in Heterogeneous Electrolyte Systems," Proceedings of the International Mechanical Engineering Congress and Exposition, Applications of Fluid Mechanics to Microsystems Technology, Washington, D.C., IMECE 2003 – 43966, November 15-21, 2003
51. **Chen, C.H., H. Lin,** B.D. Storey, S.K. Lele, J.G. Santiago, "Electrokinetic Microflow Instability with Conductivity Gradients," Proceedings of the 7th International Conference on Miniaturized Chemical and BioChemical Analysis Systems (μ TAS2003), Squaw Valley, California, October 5-9, pp. 983-987, 2003
52. **Chen, C.H., H. Lin,** S.K. Lele, J.G. Santiago, "Electrokinetic Microflow Instability with Conductivity Gradients," ASME International Mechanical Engineering Congress and Exposition, Washington D.C., November 15-21, IMECE2003-55007, 2003
53. **Hertzog, D.E.,** J.G. Santiago, and O. Bakajin, "Microsecond Microfluidic Mixing for Investigation of Protein Folding Kinetics," Proceedings of the 7th International Conference on Miniaturized Chemical and BioChemical Analysis Systems, Squaw Valley, CA, October 5-9, 2003
54. **Huber, D.E.** and J.G. Santiago, "Analysis of Dispersion in Temperature Gradient Focusing," 20th Joint American Institute of Chemical Engineering and American Electrophoresis Society Annual Meeting, San Francisco, CA, November 16-21, 2003
55. **Jung, B.,** J.G. Santiago, "Working Toward On-Chip CE with Single Molecule Sensitivity," 2003 Annual Meeting of American Institute of Chemical Engineers, San Francisco, CA, November 16-21, 2003
56. **Oddy, M.H.,** and J. G. Santiago, "An Electrophoretic and Electroosmotic Mobility Measurement Technique using AC and DC Electric Field Particle Displacements," The 7th International Conference on Miniaturized Chemical and BioChemical Analysis Systems, Lake Tahoe, CA, pp. 587-590, Oct. 5-9, 2003
57. **Yao, S., S. Zeng,** and J. G. Santiago, "Thermodynamic Efficiency of Porous Glass Electroosmotic Pumps," Proceedings of the Pacific Rim/ASME International Electronic Packaging Technical Conference and Exhibition, Maui, Hawaii, InterPACK2003-35178, July 6-11, 2003
58. **Chen, C.H.,** and J.G. Santiago, "Electroosmotic Pumps with Sub-Micron Flow Channels," from MEMS to NEMS Workshop, 5th Annual BioMEMS Conference, San Jose, CA, 2003
59. **Laser, D.J. ,** A.M. Myers, **S. Yao, K.F. Bell,** K.E. Goodson, J.G. Santiago, and T.W. Kenny, "Silicon Electroosmotic Micropumps for Integrated Circuit Thermal Management," Proceedings 12th International Conference on Solid State Sensors and Actuators, 151-155, Boston, MA, June 8-12, 2003
60. **Bharadwaj, R.** and J.G. Santiago, "On-Chip Field Amplified Sample Stacking under Suppressed Electroosmotic Flow Conditions," Proceedings of the 7th International Conference on Miniaturized Chemical and BioChemical Analysis Systems (μ TAS2003), Squaw Valley, CA, USA, October 5-9, 2003
61. **Bharadwaj, R.** and J.G. Santiago, "Study of the Dynamics of Field Amplified Sample Stacking under Suppressed Electroosmotic Flow Conditions," 20th Annual Joint Meeting of the Electrophoresis Society and the American Institute of Chemical Engineers, San Francisco, CA, USA, November 16-21, 2003
62. **Jung, B., R. Bharadwaj,** and J. G. Santiago "Thousand-Fold Signal Increase using Field-Amplified Sample Stacking for On-Chip Electrophoresis," 19th Annual Joint Meeting of the Electrophoresis Society and the American Institute of Chemical Engineers, Indianapolis, Indiana, November 3-8, 2002
63. **Devasenathipathy, S., R. Bharadwaj,** and J.G. Santiago "Investigation of Field Amplified Sample Stacking with Particle Image Velocimetry," Proceedings of the International Mechanical Engineering Congress and Exposition, Seventh Micro-Fluidic Symposium, New Orleans, Louisiana, IMECE 2002-33556, November 17-22, 2002
64. **Chen C.-H.,** Santiago J.G., "Electrokinetic Instability in High Concentration Gradient Microflows," Proceedings of the International Mechanical Engineering Congress and Exposition, Seventh Micro-Fluidic Symposium, New Orleans, Louisiana, November 17-22, CD 1, No. 33563, 2002

65. **Yao, S., S. Zeng**, Santiago, J.G., "Temporal Response of Porous Glass Electroosmotic Pumps," Proceedings of the International Mechanical Engineering Congress and Exposition, Seventh Micro-Fluidic-Symposium, New Orleans, Louisiana, IMECE2002-33679, November 17-22, 2002
66. **Jiang L., Mikkelsen J., Koo J-M, Zhang L., Huber D., Yao S., Bari A., Zhou P.**, Santiago J., Kenny T., and Goodson K.E., "Transient and Sub-Atmospheric Performance of a Closed-Loop Electroosmotic Microchannel Cooling System," Proceedings of the International Mechanical Engineering Congress and Exposition, Seventh Micro-Fluidic Symposium, New Orleans, Louisiana, November 17-22, 2002
67. **A.E. Herr, J.C. Mikkelsen**, J.G. Santiago, and T.W. Kenny, "Two-Dimensional Chip-Based Protein Analysis using Coupled Isoelectric Focusing and Capillary Electrophoresis," Proceedings, 2002 Workshop on Solid State Sensors, Actuators and Microsystems, Hilton Head P. 366, 2002
68. **D.J. Laser**, K.E. Goodson, J.G. Santiago, and T.W. Kenny, "High-Frequency Actuation with Silicon Electroosmotic Micropumps," Proceedings, 2002 Workshop on Solid State Sensors, Actuators and Microsystems, Hilton Head P. 231, 2002
69. **E.N. Wang, L. Zhang, L. Jiang, J-M. Koo**, K.E. Goodson, and T.W. Kenny, "Micromachined Jet Arrays for Liquid Impingement Cooling of VLSI Chips," Proceedings, 2002 Workshop on Solid State Sensors, Actuators and Microsystems, Hilton Head, p. 46, 2002
70. **Bharadwaj, R.** and J.G. Santiago, "Dynamics of Field Amplified Sample Stacking," Proceedings of the International Mechanical Engineering Congress and Exposition, Sixth Micro-Fluidic Symposium, New York, New York, November 11-16, 2001
71. **Garcia, L.D., L.C. Cheung, J.C. Mikkelsen, Jr.**, J.G. Santiago, A.F. Bernhardt, and V. Malba, "A Sub-Millimeter Solenoid Device for Trapping Paramagnetic Microbeads," Proceedings of the International Mechanical Engineering Congress and Exposition, Sixth Micro-Fluidic Symposium, New York, New York, November 11-16, 2001.
72. **Oddy, M.H.**, J.G. Santiago, and **J.C. Mikkelsen, Jr.**, "An Electrokinetic Instability Micromixer," Proceedings of the International Mechanical Engineering Congress and Exposition, Sixth Micro-Fluidic Symposium, New York, New York, IMECE2001/MEMS-23882, November 11-16, 2001
73. **Herr, A.E., J.I. Molho, R. Bharadwaj**, J.G. Santiago, and T.W., Kenny, "Miniaturized Isoelectric Focusing as a Component of a Multi-dimensional Separation System," Fifth International Symposium on Micro Total Analysis Systems (μ TAS) Monterey, California, pp. 51-53, 2001
74. **Bharadwaj, R.** and J.G. Santiago, "Optimization of Field Amplified Sample Stacking on a Microchip," Fifth International Symposium on Micro Total Analysis Systems (μ TAS) Monterey, California, pp. 613-614, 2001
75. **Oddy, M.H.**, J.G. Santiago, and **J.C. Mikkelsen**, "Electrokinetic Instability Micromixing," Fifth International Symposium on Micro Total Analysis Systems (μ TAS) Monterey, pp. 34-36, California, 2001
76. **Laser, D.**, K.E. Goodson, J.G. Santiago, and T.W. Kenny, "Impact of Pumping Surface Separation Distance on Micromachined Electroosmotic Pump Performance," Proceedings of the International Mechanical Engineering Congress and Exposition, Sixth Micro-Fluidic Symposium, New York, New York, MEMS-23876, Proceedings 2, 2001
77. **Yao, S., D. E. Huber, J.C. Mikkelsen**, J.G. Santiago, "A Large Flowrate Electroosmotic Pump with Micron Pores," Proceedings of the International Mechanical Engineering Congress and Exposition, Sixth Micro-Fluidic Symposium, New York, New York, November 11-16, 2001
78. **Zhang, L., E. N. Wang, J. D. Koch, J. T.C. Liu, J. Koo, L. Jiang**, K. E. Goodson, J. G. Santiago, T. W. Kenny, "Microscale Liquid Impingement Cooling," Proceedings of the International Mechanical Engineering Congress and Exposition, MEMS Symposium, MEMS-23820, New York, New York, 2001
79. **Laser, D.J.**, K.E. Goodson, J.G. Santiago, and T.W. Kenny, "A Low-Voltage Silicon Micromachined Parallel-Plate Electrokinetic Pump," 11th International Conference on Solid-State Sensors and Actuators, Transducers '01 / Eurosensors XV, Munich, Germany, pp. 920-923, June 2001. 11th
80. **Jiang, L., J-M. Koo, S. Zeng, Mikkelsen J.C., Zhang L., Zhou P.**, Maveety J., Quan A.T., Kenny T.W., Santiago J.G., and Goodson K.E., "Two-Phase Microchannel Heat Sinks for an VLSI Cooling System," Seventeenth Annual IEEE Semiconductor Thermal Measurement and Management Symposium, San Jose, CA USA, March 20-22, pp.153-157, 2001
81. **Zhang, L., J-M. Koo, L. Jiang**, K.E. Goodson, J.G. Santiago, T.W. Kenny, "Study of Boiling Regimes and Transient Signal Measurements in Microchannels," Proceedings of

Transducers '01, Solid State Sensors and Actuators Workshop, Munich, Germany, pp. 1514-1517, Jun 2001

82. **Koo, J.-M., L. Jiang, L. Zhang, P. Zhou, S.S. Banerjee,** T.W. Kenny, J.G. Santiago, and K.E. Goodson, "Modeling of Two-Phase Microchannel Heat Sinks for VLSI Chips," Proceedings of the 14th Annual IEEE International MEMS Conference, Interlaken, Switzerland, Jan. 21-25, pp. 442 - 426, 2001
83. **Chen, C.-H., J.C. Mikkelsen,** J.G. Santiago, "Electrophoretic Band Crossing for Measurements of Biomolecular Binding Kinetics," Technical Digest of International Forum on Biochip Technologies, Beijing, China, pp. 441-442, Oct 11-14, 2000
84. **Herr, A.E., J.C. Mikkelsen,** J.G. Santiago, T.W., Kenny, "Electroosmotic Flow Suppression and its Implications for a Miniaturized Full-Field Detection Approach to Capillary Isoelectric Focusing (cIEF)," Proceedings of ASME 2001 Winter Annual Meeting, Fifth Micro-Fluidic Symposium, International Mechanical Engineering Congress and Exposition, Orlando, Florida, MEMS 2, pp. 513-518, 2001
85. **Mosier, B.P., J.C. Mikkelsen,** J.G. Santiago, "A Novel Bleached Fluorescence Imaging Technique for Microfluidics," Fifth Micro-Fluidic Symposium, International Mechanical Engineering Congress and Exposition, Orlando, Florida, 2000
86. **Molho, J.I., C.C. Hung, J.G. Santiago,** " Velocity Measurements and Visualizations of the Flow Driven by Laser-Induced Cavitation Bubbles in a Blood-Like Liquid," Fifth Micro-Fluidic Symposium, International Mechanical Engineering Congress and Exposition, Orlando, Florida, 2000
87. **Devasenathipathy, S., J.I. Molho, J.C. Mikkelsen,** J.G. Santiago, "Electroosmotic Flow Field Measurements with Particle Image Velocity," Fifth Micro-Fluidic Symposium, International Mechanical Engineering Congress and Exposition, Orlando, Florida, pp. 251-258, November 5-10, 2000
88. **Herr, A.E., J.I. Molho,** J.G. Santiago, T.W. Kenny, D. A. Borkholder, G. J. Kintz, P. Belgrader, M. A. Northrup, "A Miniaturized Full-Field Array Detection Approach to Protein Separations using Capillary Isoelectric Focusing (cIEF)," Proceedings of the Micro Total Analysis Systems Symposium, Enschede, The Netherlands, pp. 367-370, 2000
89. **Herr, A.E., J.I. Molho,** J.G. Santiago, T.W. Kenny, D.A. Borkholder, G. J. Kintz, P. Belgrader, M. A. Northrup, "Optimization of a Miniaturized Capillary Isoelectric Focusing (cIEF) System Using a Full-Field Detection Approach," Solid-State Sensor and Actuator Workshop, Hilton Head Island, SC, pp. 115-119, 2000
90. **Molho, J.I., A.E. Herr, B.P. Mosier,** J.G. Santiago, T.W. Kenny, R. A. Brennen, G. Gordon, "A Low Dispersion Turn for Miniaturized Electrophoresis," Solid-State Sensor and Actuator Workshop, Hilton Head Island, SC, pp. 132-137, 2000
91. **Molho, J.I., A.E. Herr, B.P. Mosier,** J.G. Santiago, T.W. Kenny, R. A. Brennen, G. Gordon, "Designing Corner Compensation for Electrophoresis in Compact Geometries," Proceedings of the Micro Total Analysis Systems Symposium, Enschede, The Netherlands, pp. 287-290, 2000
92. **Zhang, L., S.S. Banerjee, J.M. Koo, D.S. Laser, M. Ashegi,** K.E. Goodson, J.G. Santiago, and T.W. Kenny, "A Micro Heat Exchanger with Integrated Heaters and Thermometers," Proceedings 2000 Hilton Head Workshop on Sensors and Actuators, 275-280, June 2000
93. **Zhang, L., J.-M. Koo, S. Banerjee, L. Jiang, D. Laser, M. Ashegi,** K. E. Goodson, J.G. Santiago, T. W. Kenny, "Measurements and Modeling of Two-Phase Flow in Microchannels with Nearly-Constant Heat Flux Boundary Conditions," 2000 International Mechanical Engineering Congress and Exposition Orlando, Florida, November 5-10, pp. 129-135, 2000
94. **Chen, C.H., S. Zeng, J. C. Mikkelsen,** J.G. Santiago, "Design and Characterization of a Planar Microfabricated Electrokinetic Pump," Abstracts of Papers of the American Chemical Society, 219th National Meeting San Francisco, California, March 26-30, pp. 431-Coll., 2000
95. **Chen, C.H., S. Zeng, J. C. Mikkelsen,** J.G. Santiago, "Development of a Planar Electrokinetic Pump," Proceedings of ASME 2000, MEMS 1, International Mechanical Engineering Congress and Exposition Orlando, Florida, November 5-10, MEMS 1, pp. 523-528, 2000
96. **Devasenathipathy, S., J.C. Mikkelsen,** J.G. Santiago, "Particle Image Velocimetry Measurements in Electrokinetic Flow," American Chemical Society, 219th National Meeting, San Francisco, California, . 219, pt. 1, pp. U578 - U578. March 26-30, 2000
97. **Zeng, S., C. Chen, J. C. Mikkelsen,** and J. G. Santiago, "Fabrication and Characterization of Electrokinetic Micro Pumps," Seventh Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems, Las Vegas, NV, May 23-26, 2000

98. **Zhegami, R., D. Laser, M. Asheghi,** J. G. Santiago, and K.E. Goodson, "Experimental Investigation of Flow Transition in Microchannels using Nanoparticle Tracking," Seventh Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems, Las Vegas, NV, May 23-26, 2000
99. **King, W.P.,** J.G. Santiago, T.W. Kenny, and K.E. Goodson, "Modeling and Prediction of Sub-Micrometer Heat Transfer during Thermomechanical Data Storage," Proc. 1999 IMECE MEMS Symposium, 1999
100. **Herr, A.E., J.I. Molho,** T.W. Kenny, J.G. Santiago, M.G. Mungal, M.G. Garguilo, "Variation of Capillary Wall Potential in Electrokinetic Flow," 10th International Conference on Solid-State Sensors and Actuators (Transducers '99), Sendai, Japan, pp. 710-713, June 1999
101. Liu, R.H., K. Sharp, M. Olsen, J.G. Santiago, R.J. Adrian and D. Beebe, "Passive Enhancement of Mixing by a Serpentine Microchannel," 12th Annual International Conference on Micro Electro Mechanical Systems, MEMS'99, Orlando, Florida, January 17-21, 1999
102. Meinhart, C. D., S.T. Wereley, and J.G. Santiago, "A PIV Algorithm for Estimating Time-Averaged Velocity Fields," Proceedings of Optical Methods and Image Processing Fluid Flow, 3rd ASME/JSME Fluids Engineering Conference, July 18-23, Conference, San Francisco, CA, 1999
103. Meinhart, C.D., J.G. Santiago, and R.J. Adrian, "Velocimetry for MEMS Applications," Application of Microfabrication to Fluid Mechanics," ASME International Mechanical Engineering Congress and Exposition, Anaheim, CA, Nov. 15-20, 1998
104. Meinhart, C.D., J.G. Santiago, S.T. Wereley, and R.J. Adrian, "Diagnostic Techniques for Microfluidics Research," Proceedings of the Ninth International Symposium on Applications of Laser Techniques to Fluid Mechanics, Lisbon, Portugal, July 13-16, 1998
105. Santiago, J.G., S.T. Wereley, C.D. Meinhart, D.J. Beebe, and R.J. Adrian, "A Micron-Resolution Particle Image Velocimetry System," 8th International Symposium on Flow Visualization, Sorrento, Italy, September 1-5, 1998
106. Wereley, S.T., J.G. Santiago, C.D. Meinhart, and R.J. Adrian, "Velocimetry for High-Speed Micronozzles," 1998 International Engineering Congress and Exposition, Micro-Fluidics Symposium, Anaheim, CA, 1998
107. Wereley, S.T., J.G. Santiago, R. Chiu, and C.D. Meinhart, "Micro-Resolution Particle Image Velocimetry," SPIE BIOS '98 International Biomedical Optics Symposium, Micro- and Nano- Fabricated Structures and Devices for Biomedical and Environmental Applications, San Jose, California, January 24-30, 1998
108. Lam, T.T., J.G. Santiago, and W.D. Fischer, "Minimal Thermal Resistance of a Convectively Cooled Orthotropic Plate with a Uniform Heat Flux," ASME InterPACK, Thermal Considerations for Satellite/Spacecraft Electronic Packaging, Honolulu, Hawaii, 1997
109. Santiago, J.G. and J.C. Dutton, "Velocity Measurements of a Sonic, Underexpanded Transverse Jet Injected into a Supersonic Flow," AIAA 33rd Aerospace Sciences Meeting, Reno, Nevada, 1995
110. Santiago, J.G. and J.C. Dutton, "Preliminary Study of the Velocity Field of an Underexpanded Transverse Jet Injected into a Supersonic Flow," National Science Foundation Conference for Diversity in the Scientific and Technological Workforce, Washington, D.C., 1994
111. Santiago, J.G., W.M. VanLerberghe, and J.C. Dutton, "Sonic Transverse Jet Injection into a Supersonic Flow," 79th Meeting of the Supersonic Tunnel Association, University of Texas at Arlington, Arlington, Texas, 1993

Published Abstracts, Non-Refereed Proceedings, Posters, and Presentations (Page numbers are not included for proceedings published only on CD)

1. **Schoch R. B.,** Ronaghi M., Santiago J. G., "Rapid and Sensitive Separation, Preconcentration, and Extraction of MicroRNA from Lysate using On-Chip Isotachopheresis", *Stanford Genome Technology Center Site Visit*, Palo Alto, USA, December 12, 2008.
2. **Bercovici, M.** and J.G. Santiago, "Dispersion in Isotachopheresis", *61st Annual Meeting of the American Physical Society/Division of Fluid Dynamics (APS/DFD)*, San Antonio, Texas, November 23-25, 2008.
3. **Chamber, R. D., Khurana, T., Schoch, R. B., Persat, A., Sierra, R. G.** and Santiago, J. G. "Fast, High-sensitivity Preconcentration, Separation, and Detection of Protein, DNA, and RNA via Isotachopheresis," *Twelfth NHLBI Proteomics Investigator Meeting*, Rockwell, MD, USA, September 17, 2008.

4. **Mani A., T.A. Zangle, J.G. Santiago**, "Concentration polarization in microchannel-nanochannel interfaces using method of characteristics," *61st Annual Meeting of the American Physical Society Division of Fluid Dynamics*. San Antonio, TX, Nov. 2008
5. **Persat, A.** and J.G. Santiago, "On-chip Isothermal, Chemical Cycling Polymerase Chain Reaction (ccPCR)", *61st Annual Meeting of the APS Division of Fluid Dynamics*, San Antonio, TX, November 23-25, 2008.
6. **M. Bercovici, S.K Lele and J.G. Santiago**, "Simulation and Optimization of Isotachopheresis", *Thermal and Fluid Sciences Affiliates and Sponsors Conference*, Stanford, CA, February 6-8, 2008.
7. **Khurana T., Santiago J.G.**, "Isotachophoretic Electrophoretic Spacers: Indirect Fluorescence Detection of Non-Fluorescent Analytes" *4th Gordon Research Conference on Physics and Chemistry of Microfluidics, 2007*.
8. **S. Litster, B. Ha, D. Kim,** and J.G. Santiago, "A Two-Liquid Electroosmotic Pump for Portable Drug Delivery," *ASME IMECE*, Seattle, WA, Nov. 11-15, 2007.
9. **Baldessari, F.** and J.G. Santiago, "Generalized Electrokinetic Transport of Ions in Nanochannels," presented at the 60th Annual Meeting of the Division of Fluid Dynamics, November 18-20; Salt Lake City, Utah, 2007.
10. **Zangle, T.A., A. Mani,** and J.G. Santiago, "Concentration Polarization and Focusing at a Microchannel-Nanochannel Interface," presented at the Gordon Research Conference on Microfluidics, Physics & Chemistry Of, Waterville Valley, NH, July 15-20, 2007.
11. **Buie, C.R., Litster, S.E.,** and J.G. Santiago, "In Situ Visualization of Liquid Water Removal in an Operating Proton Exchange Membrane Fuel Cell," presented at the 5th International ASME Fuel Cell Science, Engineering, and Technology Conference, New York, NY, June 18-20, 2007.
12. **Litster, S., C.R. Buie, T. Fabian,** J.K. Eaton and J.G. Santiago, "Active Water Management in PEM Fuel Cells using Electroosmotic Pumps," *ASME's 5th International Conference on Fuel Cell Science, Engineering, and Technology*, New York, NY, June 18-20, 2007.
13. **Litster, S., C.R. Buie, T. Fabian, J.D. Posner,** F.B. Prinz, J.K. Eaton and J.G. Santiago, "Fuel Cell Water Management using Electroosmotic Pumps," *2007 Thermal and Fluid Sciences Affiliates and Sponsors Conference*, Stanford, CA, February 7-8, 2007.
14. **Litster, S., C.R. Buie, T. Fabian,** J.K. Eaton and J.G. Santiago, "Enhanced Water with Electroosmotic Pumps for PEM Fuel Cells," *Cleantech 2007*, Santa Clara, CA, May 23-24, 2007.
15. **Zangle, T.A., A. Mani,** J.G. Santiago, "Electrophoretic Separation and Preconcentration at Microchannel-Nanochannel Interfaces," Center for Integrated Systems Poster Session, Stanford, CA, May 16, 2007.
16. **T. Zangle, A. Mani** and J.G. Santiago, "Concentration Polarization at a Microchannel-Nanochannel Interface," *2008 Thermal and Fluid Sciences Affiliates and Sponsors Conference*, Stanford, CA, February 6-8, 2007.
17. **Litster, S., C.R. Buie, T. Fabian,** J.K. Eaton and J.G. Santiago, "Enhanced Water with Electroosmotic Pumps for PEM Fuel Cells," *Young Scientists Workshop on Transport Phenomena in Fuel Cells*, University of Victoria, Canada, May 4-5, 2007.
18. **Litster S, Buie CR, Fabian T, Posner JD,** and Santiago JG, "Water Management in a 25 cm² PEM Fuel Cell with Electroosmotic Pumping." *Proceedings of the AIChE Annual Meeting*; November 12-17, 2006; San Francisco, CA. 2006.
19. **Fabian, T., R. O'Hayre, S. Litster,** F. Prinz and J.G. Santiago, "Water Management at the Cathode of a Planar Air-Breathing Fuel Cell with an Electroosmotic Pump," presented at Symposium on Proton Exchange Membrane Fuel Cells, 210th Meeting of The Electrochemical Society, 2006 Joint International Meeting, Cancun, Mexico, 2006.
20. **Zangle, T.A., S. Pennathur,** J.G. Santiago, "Micro-Nano Channel Interface Sample Stacking," presented at Sandia National Laboratory, Livermore, CA, August 24, 2006.
21. **J.D. Posner** and J.G. Santiago, "Quantification of convective electrokinetic instability micromixing using ion indicating dyes," presented at the 15th U.S. National Congress on Theoretical and Applied Mechanics, Boulder, Colorado, June 25-30, 2006.
22. **Baldessari, F., J. Sellier, T. Khurana** and J. G. Santiago, "Isotachopheresis in nanochannels," presented at the symposium on Transport Processes in Nanoscale Systems III, 2006 Annual Meeting of the American Institute of Chemical Engineers, San Francisco, California, November 12-17, 2006.

23. **Baldessari, F., T. A. Zangle, S. Pennathur, M. Kattah, J. Steinman**, P.J. Utz and J.G. Santiago, "Electrophoresis and Preconcentration Techniques in Nanochannels," presented at the 8th NHLBI Proteomics Investigator Meeting, Bethesda, Maryland, September 20-21, 2006.
24. **Buie, C.R., Kim, D., Litster, S.**, and J.G. Santiago, "Electroosmotic Pumps for Fuel Delivery to Direct Methanol Fuel Cells," 2006 AIChE Annual Meeting, San Francisco, CA, November 12-17, 2006.
25. **Litster S, Buie CR, Posner JD, Fabian T, Cha SW**, Prinz FB, Eaton JK, and Santiago JG, "Water Removal in a 25 cm² PEM Fuel Cell using Electroosmotic Pumps." Proceedings of the *Seoul National Univ. -Stanford Univ. Student Joint Workshop*; June 27-28, 2006; Stanford, CA. 2006
26. **Cha, S.W.; Fabian, T.; Posner, J.;** Prinz, F. B.; **Buie, C.;** Eaton, J. K.; **Kim, D. J.;** and J.G. Santiago, "Direct water removal in gas diffusion layer of proton exchange membrane fuel cells by a flexible electroosmotic pump," Proceedings of the 4th International ASME Conference on Fuel Cell Science, Engineering and Technology, 2006.
27. **Ryan O'Hayre, Tibor Fabian, Shawn Litster**, Fritz Prinz, and Juan Santiago, "Passive Air Breathing Fuel Cells For Portable Applications: What are the Limits to Cathode Performance?," presented at the fall meeting of the Materials Research Society, Portable Power Symposium, November 27-December 1, 2006 - Hynes Convention Center & Sheraton Boston Hotel, Boston, MA. USA.
28. **Fabian, T., Posner, J.D., O'Hayre, R., Cha, S.W.**, Eaton, J.K., Prinz, F.B., Santiago, J.G., "The role of ambient conditions on the performance of a planar, air-breathing fuel cell", presented at Small Fuel Cells 2006 -Small fuel cells for portable applications, April 2 - 4, 2006 - L'Enfant Plaza Hotel Washington, DC USA
29. **Posner, J.D.** and J.G. Santiago. "Nonlinear Dynamics of Electrokinetic Instabilities," Meeting of American Physical Society, Division of Fluid Dynamics, Microfluidics: Mixing, Chicago, IL, Nov 20–22, 2005.
30. Meinhart, C.D., S. Bradford, **J.D. Posner**, and J.G. Santiago, "Electrokinetic Flow Instabilities in Microfluidics," FEMLAB (COMSOL) 2005 User Conference, Burlington, MA, October 24, 2005.
31. **Huber, D., Pennathur, S.**, Utz, P.J., and Santiago, J.G., "Microfluidic Temperature Gradient Focusing and Separation of eTags," National Heart, Lung, and Blood Institute (NHLBI) Proteomics Meeting, Bethesda, MD, September 27-28, 2005.
32. **Huber, D.**, and Santiago, J.G., "Temperature Gradient Focusing in Microchannels," presentations at Ebara Research Corporation and Tokyo University, Tokyo, Japan, September 19 and 20, 2005.
33. **Huber, D.**, and Santiago, J.G., "Temperature Gradient Focusing: Dynamics and Applications," LabAutomation Conference, San Jose, CA, January 30 - February 3, 2005.
34. **Huber, D.E.**, and Santiago, J.G, "Non-linear Stacking Effects in Microfluidic Temperature Gradient Focusing," presented in the Physics and Chemistry of Microfluidics, Gordon Research Conference, Oxford, England, August 21-26, 2005.
35. **Pennathur, S** and Santiago, J.G., "DNA separation in Nanoscale Channels," to be presented at the 9th annual European conference on Micro & Nanoscale Technologies for the Bioscience (Nanotech-montreux), November 15-17th, 2005.
36. **Pennathur, S**, and Santiago, J.G., "Introduction to Nanofluidics," presented at Osmania University, Hyderabad, India, Sept. 13th 2005.
37. **Pennathur S**, and Santiago, J.G., "Electrokinetic Separation by Ion Valence," presented in the Physics and Chemistry of Microfluidics, Gordon Research Conference, Oxford, England, August 21-26, 2005.
38. Storey, B.D., B.S. Tilley, **H. Lin**, J.G. Santiago, "Electrokinetic Instabilities in Thin Microchannels," presented at the 2nd Conference on Frontiers in Applied and Computational Mathematics (FACM '05), Newark, NJ, May 13-15, 2005.
39. **Lin, H., R. Bharadwaj, B. Jung**, and J.G. Santiago, "Electrokinetic Microfluidics Systems: Sample Stacking Instabilities," American Physical Society Meeting, March 21-25, 2005.
40. Santiago, J.G. and **S. Pennathur**, "Electrophoretic separations in nanochannels," Microfluidics Workshop, Banff International Research Station, Banff, Canada, April 30-May 3, 2005.
41. **Hertzog, D.E.**, Bakajin, O., "Microsecond Mixer for Measuring the Kinetics of Protein Folding," presented at the National Institute of Biomedical Imaging and Bioengineering– U.S. Department of Energy (NIBIB-DOE) Workshop on Biomedical Applications of Nanotechnology. Bethesda, Maryland, March 17-18, 2005.

42. **Hertzog, D.E.**, Michalet, X., Jager, M., Kong, X., Santiago, J.G., Weiss, S., Bakajin, O., "Microsecond Mixer for Kinetic Studies of Protein Folding," presented at the 49th Annual Meeting of the Biophysical Society, Long Beach, CA, February 12-16, 2005.
43. **Posner, J.D.** and J.G. Santiago, "Convective Electrokinetic Flow Instabilities in a Cross-Shaped Microchannel," 57th Meeting of American Physical Society/Division of Fluid Dynamics (APS/DFD), Seattle, Washington, November 21-23, 2004.
44. **Posner, J.D.** and J.G. Santiago, "Convective Electrokinetic Flow Instabilities in a Cross-Shaped Microchannel," Association for Laboratory Automation LabFusion, Boston, MA, June 12-16, 2004.
45. **Bharadwaj, R.**, and J. G. Santiago, "A Generalized Dispersion Theory Model for Field Amplified Sample Stacking," LabAutomation, San Jose, CA, USA, February 1-5, 2004.
46. **Huber, D.**, and J.G. Santiago, "Temperature Gradient Focusing, Modeling and Experiments," LabAutomation, San Jose, CA, February 1-5, 2004.
47. **Lin, H.**, B.D. Storey, **M.H. Oddy, C.H. Chen**, J.G. Santiago, "Temporal Electrokinetic Instability and Mixing in Microchannels with Conductivity Gradients," 56th Meeting of American Physical Society/Division of Fluid Dynamics (APS/DFD), Washington D.C., 2003
48. **Devasenathipathy, S.** and J.G. Santiago "Particle Stacking in Electrokinetic Systems with Conductivity Gradients," Gordon Research Conference on the Physics and Chemistry of Microfluidics, Big Sky, MT, August 24-29, 2003
49. **Chen, C.H., H. Lin**, B.D. Storey, S.K. Lele, J.G. Santiago, "Electrokinetic Microflow Instability With Conductivity Gradients," presented at Gordon Research Conference on the Physics and Chemistry of Microfluidics, Big Sky, MT, August 24-29, 2003
50. **Chen, C.H., H. Lin**, S.K. Lele, J.G. Santiago, "Convective Electrokinetic Microflow Instability with Conductivity Gradients," American Physical Society Division of Fluid Dynamics Annual Meeting, East Rutherford, NJ, 2003
51. **Bharadwaj, R.**, J.G. Santiago, and B. Mohammadi, "Investigation of Dispersive Effects in Field Amplified Sample Stacking," Second Gordon Research Conference on the Physics and Chemistry of Microfluidics, Big Sky, MT. USA, August 24-29, 2003
52. **Huber, D.E.** and J.G. Santiago, "Dispersion Model for Temperature Gradient Focusing," Gordon Research Conference on the Physics and Chemistry of Microfluidics, Big Sky, MT, August 24-29, 2003
53. **Oddy, M.H.**, and J. G. Santiago, "Using AC and DC Electric Field Particle Displacements for Measuring Electrophoretic and Electroosmotic Mobility Distributions," Gordon Research Conference on the Physics and Chemistry of Microfluidics, Big Sky, MT, Aug. 24-29, 2003
54. **Oddy, M.H.**, Santiago, J.G., "Electrokinetic Flow Instabilities," American Institute of Chemical Engineers – Annual Meeting, San Francisco, CA, Nov. 16-21, 2003
55. Santiago, J.G., "Electrokinetic Microfluidic Systems," Joint American Institute of Chemical Engineering. and American Electrophoresis Society Annual Meeting, Indianapolis, Indianapolis, Indiana, 2002
56. **Jung, B., R. Bharadwaj**, and J.G. Santiago, "Thousand-Fold Signal Increase using Field Amplified Sample Stacking for On-Chip Electrophoresis," Joint American Institute of Chemical Engineering. and American Electrophoresis Society Annual Meeting, Indianapolis, Indianapolis, Indiana, 2002
57. **Devasenathipathy, S., R. Bharadwaj**, and J.G. Santiago, "Dynamics of Microchip-Based Field Amplified Sample Stacking," Microfluidics 2002, San Francisco, California, September 18-20, 2002
58. Santiago, J.G., **S. Yao, C.-H. Chen**, "Electroosmotic Pumps with Sub-Micron Pores," Integrated Nanosystems, Berkeley, CA, September, 2002
59. **Wang, G.R.**, J.G. Santiago, M.G. Mungal, "Some Visualization Observations of Laser-Induced Cavitation Flow," Bulletin of American Physics Society, Division of Fluid Dynamics, San Diego, California, Vol 46, 2000
60. **Devasenathipathy, S.** and J.G. Santiago "Particle Tracking in Electrokinetic Flows," Bulletin of American Physics Society, Division of Fluid Dynamics, San Diego, California, Vol 46, 2001
61. Santiago, J.G. "Diagnostics for Electrokinetic Flow," presented at the LabAutomation '01, Palm Springs, CA, 2001
62. **Oddy, M., A. Kumar**, and J.G. Santiago, "Microfluidic Micromixers," presented at the Lab Automation 2000, Palm Springs, CA, 2000

63. Santiago, J.G., " Microfluidic Processes: The Role of Micro-Scale Fluid Dynamics in BioMEMS," BioMEMS '98: Spanning the Frontiers of Engineering and Biology, University of California at San Francisco, October, 1998
64. Santiago, J.G., D.J. Beebe, C.D. Meinhart, and R.J. Adrian, "Particle Image Velocimetry for Microfluidics," Thirteenth U.S. National Congress on Applied Mechanics, Gainesville, FL, 1997
65. Meinhart, C.D., J.G. Santiago, and S.T. Wereley, "On Interrogation Algorithms for Micro-PIV," Thirteenth U.S. National Congress on Applied Mechanics, Gainesville, FL, 1998
66. Santiago, J.G., C.D. Meinhart, D.J. Beebe, and R.J. Adrian, "Micro-Imaging for Microfluidic Bioanalysis Systems," poster session presented at the Sixteenth Annual Conference, of Ford Fellows, Washington D.C., 1997
67. Santiago, J.G., C.D. Meinhart, D.J. Beebe, and R.J. Adrian [1997], "Particle Image Velocimetry for Microfluidic Bioanalysis Systems," presented at American Physical Society 50th Annual Meeting of the Division of Fluid Dynamics, San Francisco, CA, 1997

Magazine Article

Goodson, K. E., Santiago, J. G., Kenny, T., **Jiang, L., Zeng, S., Koo, J.-M., Zhang, L., Yao, S.** and Wang, E., 2002, "Electroosmotic microchannel cooling system for microprocessors," *Electronics Cooling*, **8**, pp. 46-47.

Patents

Patent Applications

1. Khurana, T., M. Ronaghi, J.G. Santiago, "Apparatus Using Electric Field for Improved Biological Assays," S06-449 Provisional Patent Application Filing, July 2007.
2. Khurana, T. and J.G. Santiago, "Method of detecting directly undetectable analytes using directly detectable spacer molecules," US Patent Application No. 11/880479.
3. Piorek, B., C.D. Meinhart, J.G. Santiago, J. Lee, M. Moskovits, and S. Banerjee, "SERS-based Microfluidic Sensor," Provisional Patent Application 2007-499, 1034462-000008.
4. Santiago, J.G., Jung, B.S., R. Bharadwaj, and T. Khurana, "Electrophoretic Sample Analysis and Approach Therefor," US Patent Application SO5-338, 11/755449.
5. Persat, A. and J.G. Santiago, "Methods and Apparatus for Controlled Chemical Cycling Isothermal Polymerase Chain Reaction," Oct. 2008.
6. Ramunas, J., J.G. Santiago, D. Fenning, "Peristaltic Pump with Constrictions at Fixed Locations," US Patent Application, Oct. 2008.
7. Myers, A.M., Santiago, J.G., Yao, S., and Posner, J.D. "Controlling electrolytically generated gas bubbles in in-plane electroosmotic pumps," US Application No. 20070009366, January 11, 2007.
8. Myers, A.M., Santiago, J.G., Yao, S., and Posner, J.D. "Orientation independent pump," US Application No. 20060254913, Nov. 16, 2006.
9. Meinhart, C.D., J. G. Santiago, S. T. Wereley, and R. J. Adrian 1999. "Depth-of-field micron resolution velocimetry with pulsed images of injected solid particles," US Application No. 20060049369, March 9, 2006.
10. Santiago, J.G.; Jung, B.; Bharadwaj, R.; "Microfluidic electrophoresis chip having flow-retarding structure," US Application No. 20060042948, March 2, 2006.
11. Santiago, J.G., and Khurana T., "Directly Detectable Spacers for Indirect Detection of Analytes," Provisional Application No. 60/832332, 2006.
12. Santiago J.G., B. Jung, and R. Bharadwaj, "Microfluidic Sample Stacking Method Using Single-Interface Isotachophoresis," Provisional Application No. S05-338(STFD.128P1), 2006.
13. Santiago, J.G., J. D. Posner, F. B. Prinz, T. Fabian, J. K. Eaton, S. W. Cha, C. Buie, D. Kim, H. Tsuru, and J. Sasahara, "Fuel Cell with Electroosmotic Pump," U.S. Application No. 20060029851, February 9, 2006.
14. Zhou, P., K. Goodson, T. Kenny, J. Santiago, "Boiling temperature design in pumped microchannel cooling loops," US Application No. 20040182551, September 23, 2004.
15. T. Fabian, S. Litster, J.G. Santiago, C. Buie, T. Hideaki, J. Sasahara, T. Kubota, "Fuel Cell Water Management," US Patent Application, 2007.
16. T. Fabian, S. Litster, J.G. Santiago, C. Buie, J. Sasahara, T. Kubota, "Heat and Water Management Device and Method in Fuel Cells," US Patent Application, 2007.

Assigned Patents (26) (Arranged Below by Specification)

17. Huber, David, Yao, Shuhuai, Santiago, Juan G., "Electroosmotic micropumps with Applications to Fluid Dispensing and Field Sampling," US Patent No. US **7,231,839** B2, June 19, 2007.
18. Goodson, K.E., Chen, C.-H., D.E. Huber, L. Jiang, T.W. Kenny, J-M Koo, D. Laser, J.C. Mikkelsen, J.G. Santiago, E. Wang, S. Zheng, L. Zhang, Closed-Loop Microchannel Cooling System, US Patent Nos. **6,942,018** (9/13/05); **6,991,024** (1/24/06); **7,131,486**; **7,185,697**, **7,334,630**(3/6/07).
19. Kenny, T.W., K.E. Goodson, J.G. Santiago, G. K. Everett, Apparatus for Conditioning Power and Managing Thermal Energy in an Electronic Device, US Patent Nos. **7,019,972**, **7,061,114** and **6,882,543**.
20. Zeng, S. and J.G. Santiago, "Control of Electrolysis Gases in Electroosmotic Pump Systems," Patent No. US **7,134,486 B2**, November 14, 2006.
21. Goodson, KE, TW Kenny, JG Santiago, DJ Laser, and Chuan-Hua Chen, "Electroosmotic Micropump with Planar Features," US Patent Nos. **7,134,543** and **7,316,543**.
22. Kenny, T.W., J.G. Shook, S. Zeng, D.J. Lenehan, and J. Santiago, Microfabricated Electrokinetic Pump with On-Frit Electrodes, , J. Lovette, US Patent No. **7,086,839**, August, 8, 2006.
23. Corbin, D., Goodson, K., Kenny, T.W., Santiago, J., Zeng, S. Micro-fabricated electrokinetic pump, US Patent No. **6,881,039**.
24. Kenny, T.W., K.E. Goodson, J.G. Santiago, and C. K. Everett, Power Conditioning Module, US Patent No. **7,050,308**, May 23, 2006.
25. Goodson, K.E., D.E. Huber, L. Jiang, T.W. Kenny, J-M Koo, J.C. Mikkelsen, J.G. Santiago, E. Wang, S. Zheng, L. Zhang, D. Laser, H. Chen, Electroosmotic Microchannel Cooling System, US Patent Nos. **6,942,018** (9/13/05); **6,991,024** (1/24/06); **7,131,486** (11/7/06).
26. Goodson, K.E., C.-H. Chen, D.E. Huber, L. Jiang, T.W. Kenny, J-M Koo, D.J. Laser J.C., Mikkelsen, J.G. Santiago, E. N.-Y. Wang, S. Zheng, and L. Zhang, "Closed Loop Microchannel Cooling System," **7,334,630**.
27. Meinhart, C.D., J. G. Santiago, S. T. Wereley, and R. J. Adrian 1999. "Micron Resolution Particle Image Velocimeter," Patent Nos. **6,653,651** and **7,057,198**.
28. Santiago, J.G., M. Oddy, and J.C. Mikkelsen, 2001. "Electrokinetic Instability Micromixer," US Patent No. **7,070,681**, July 4, 2006.
29. Santiago, J.G., K.E. Goodson, and T.W. Kenny, "Electroosmotic Micropumps with Planar Features," D. Laser, US Patent No. **7,316,543**.
30. Kenny, T.W., K.E. Goodson, J.G. Santiago, C. K. Everett, R. Chaplinsky, J. Kim, "System Including Power Conditioning Module," US Patent Nos. **6,606,251**; **6,678,168**.
31. Huber, D., S. Yao, J.G. Santiago, "Electroosmotic micropumps with applications to fluid dispensing and field sampling," Patent No. US **7,231,839**, June 19, 2007.

Other Invited Presentations

1. Stanford University Fluid Mechanics Seminar, Stanford, CA, 2008
2. Ebara Corporation, Tokyo, Japan, 2008.
3. University of Florida, Gainesville, 2008.
4. Stanford University Mechanical Engineering Advisory Committee, 2007

5. Bosch Inc., Stanford, CA 2007
6. General Electric Corp. Research, Nis Cayuna, NY, 2007
7. University of Twente, Twente, The Netherlands, Dec. 2006
8. Spanish Society of Chromatography and Related Techniques, SECyTA, Vigo, Spain, Nov. 2006
9. Univ. California at Santa Cruz, Biochemistry Dept., 2006
10. 30th Annual GEM Conference, Chicago, IL, 2006
11. Institute for Pure and Applied Mathematics, UCLA, 2006
12. Biodesign Group, Stanford University, Stanford, CA 2005
13. Applied Biosystems, Foster City, CA, 2005
14. BIRS Research Conference on Micro- and Nano-fluidics, Banff, Canada 2005
15. American Physical Society Conference, Los Angeles, March 2005
16. Florida International University, Miami, Florida, 2005
17. Hewlett-Packard Laboratories, Palo Alto, 2004
18. Seoul National University/Stanford University Conference, Stanford, 2004
19. Predicant Biosciences, South San Francisco, 2004
20. Research Center International Conference on Theoretical and Applied Mechanics (ICTAM '04), Warsaw, Poland 2004
21. University of Illinois at Urbana-Champaign, Mech. Engineering Department, 2004
22. University of California at Santa Barbara, Mech. Engineering Department, 2004
23. Lab Automation Conference, Association for Laboratory Automation, San Jose, 2004
24. Annual American Chemical Society Meeting, Anaheim, CA 2004
25. Lab Automation Conference, Association for Laboratory Automation, San Jose, California, 2004
26. American Society of Mechanical Engineering IMECE, Washington, Microfluidics Symposium, Washington D.C., 2003
27. University of Minnesota, Mech. Engineering Department, Minneapolis, MN, 2003
28. University of California at Berkeley, Mech. Engineering Department, Berkeley, CA, 2003
29. University of California at Davis, Mech. Engineering Department, Davis, CA, 2003
30. Carnegie-Mellon University, Chemical Engineering Department, Pittsburg, PA, 2003
31. National Institute of Standards and Technology, Gaithersburg, Virginia, 2003
32. Gordon Conference on the Physics and Chemistry of Microfluidics, Big Sky, Montana, 2003
33. Joint American Institute of Chemical Engineering and American Electrophoresis Society, San Francisco, California, 2003
34. University of Pennsylvania, Mechanical Engineering Department, Philadelphia, Pennsylvania, 2003
35. California Institute of Technology, Mechanical Engineering Department, 2003
36. Gordon Conference on the Physics and Chemistry of Microfluidics, Big Sky, Montana, 2003
37. Joint American Institute of Chemical Engn. and American Electrophoresis Society, San Francisco, CA, 2003
38. University of Tokyo, Tokyo, Japan, 2003
39. Keio University, Tokyo, Japan, 2003
40. IBC BioMEMS and Microfluidics, Keynote Address, San Diego, CA, 2003
41. Joint American Institute of Chemical Engineering and American Electrophoresis Society, Indianapolis, Indiana, Keynote Address, 2002
42. Target Discovery, Palo Alto, California, 2002
43. Integrated Nanosystems, Berkeley, California, 2002
44. ASME Microfluids Mini-Course, Boston, Massachusetts, 2002
45. Sandia National Laboratories, Albuquerque, New Mexico, 2002
46. Intel Corporation Thermal Research, Chandler, 2002
47. Gordon Research Conference on the Physics and Chemistry of Microfluidics, Oxford, England, 2001
48. Poa Sana Corporation, San Jose, California, 2001
49. Lawrence Livermore National Laboratories, Livermore, California, 2001
50. Sandia National Laboratories, Livermore, California, 2001
51. Zyomix Corporation, Hayward, California, 2001
52. Agilent Corporation, Palo Alto, California, 2001
53. LabAutomation '01, Palm Springs, California, 2001

54. Intel, Portland, Oregon, 2000
55. Endovasix Corporation, Redwood, California, 2000
56. LabAutomation '00, Palm Springs, California, 2000
57. Committee on Microfluidic Interconnects, ASME International ME Congress and Exposition, Nashville, Tennessee, 1999
58. ACLARA Biosystems: Flow Visualization for Electrokinetic Flow, Menlo Park, California 1999
59. Hewlett-Packard Laboratories, Palo Alto, California, 1999
60. Endovasix Corporation, Redwood City, California, 1999
61. BioMEMS '98: Spanning the Frontiers of Engineering and Biology, University of California at San Francisco, 1998
62. 3M Corporate Research, St. Paul, Minnesota, 1998
63. University of Florida, Gainesville, FL, 1997, 1998.
64. University of California at Santa Barbara, CA, 1998.
65. University of Maryland at College Park, MD, 1998.
66. Stanford University, Stanford, CA, 1998.
67. University of Illinois at Urbana-Champaign, Urbana, IL, 1998.
68. Harvard University - Division of Engineering and Applied Sciences, 1998.
69. University of Minnesota, Minneapolis, MN, 1998.
70. Carnegie Mellon University, Pittsburgh, PA, 1998.
71. University of Illinois at Urbana-Champaign, Urbana, IL, 1995, 1997.
72. Harvard University - Medical School, Boston, MA, 1996.
73. The Aerospace Corporation, El Segundo, CA, 1995, 1996.
74. Air Products Corporation, Allentown, PA, 1995.
75. Exxon Production Research, Houston, TX, 1995.

Other Presentations

1. DARPA MicroFlumes Contractors Meeting, June 1998.
2. DARPA CCAD Contractors Meeting, September 1998.
3. DARPA MicroFlumes Contract Update, February 1999.
4. DARPA CCAD Contract Update, February 1999.
5. DARPA CCAD Contract Update, September, 1999.
6. DARPA HERETIC Contractors Meeting, June 1999.
7. DARPA CCAD Contractors Meeting, October 1999.
8. DARPA MicroFlumes PI Meeting, January 2000.
9. DARPA CCAD PI Meeting, August 2000.
10. DARPA MicroFlumes PI Meeting, August 2000.
11. DARPA Bioflips PI Meeting, August 2000.
12. DARPA HERETIC Contractors Meeting, November 2000.
13. DARPA Bioflips PI Meeting, February 2001.
14. DARPA CCAD PI Meeting, May 2001.
15. DARPA HERETIC Contractors Meeting, May 2001.
16. DARPA Simbiosys PI Meeting, August 2001.
17. DARPA Simbiosys PI Meeting, February 2002.
18. DARPA Simbiosys Contractors Meeting, September 2002.
19. DARPA Simbiosys Contractors Meeting, February 2003.
20. Intel Contract Meeting, December 2002.
21. Intel Contract Meeting, July 2003.
22. Honda Contract Meeting, September 2003.
23. DARPA Simbiosys Contractors Meeting, September 2003.
24. NIH Contract Meeting, October 2003.
25. Honda Contract Meeting, December 2003.
26. DARPA Simbiosys Contractors Meeting, January 2004.
27. Honda Contract Meeting, December 2004

28. DARPA Simbiosys Contractors Meeting, January 2005.
29. Honda Contract Meeting, October 2005
30. Honda Contract Meeting, January 2006
31. Honda Contract Meeting, August, 2006
32. DARPA MF3 Center PI Meeting, November, 2006
33. Honda Contract Meeting, November, 2006
34. Honda Contract Meeting, February 2007