Jacob (Jack) Brouwer

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Education

Degree	*Year Conferred*	*Department*	*Institution*
Ph.D.	1993	Mechanical Engineering	Massachusetts Institute of Tech. (MIT)
M.S.	1989	Mechanical Engineering	University of California, Irvine (UCI)
B.S.	1987	Mechanical Engineering	University of California, Irvine (UCI)

Research Interests

Science and engineering of energy conversion with coupled mass, energy and momentum conservation, chemical and electrochemical reaction and heat transfer; steady-state and dynamic modeling of fundamental processes that govern energy conversion devices such as fuel cells, electrolyzers, and gas turbine engines; solid state ionics and electrochemistry; fuel processing; synthesis and experimental investigation of novel fuel cell materials sets; analyses of integrated energy systems comprising fuel cells, photovoltaics, fuel processing, gas turbines, and wind turbines; experimental analyses and model validation; renewable energy; life cycle analyses of energy conversion technologies.

Academic Appointments

7/08 – present **Associate Adjunct Professor**, Mechanical and Aerospace Engineering Department, University of California, Irvine: Lead regular classroom instruction, co-supervise graduate students, and conduct independent research in dynamic simulation, hydrogen and electricity co-production, fuel cell systems analyses, novel solid oxide fuel cell materials science, and air quality and greenhouse gas impacts of future energy infrastructure.

7/04 – 6/08 **Assistant Adjunct Professor**, Mechanical and Aerospace Engineering Department, University of California, Irvine: Lead regular classroom instruction, co-supervise graduate students, and conduct independent research in dynamic simulation, hydrogen and electricity co-production, aerospace fuel cell systems, and related fuel cell science.

1/02 – 6/04 **Lecturer,** Mechanical and Aerospace Engineering Department, University of California, Irvine: Substantially contribute to development of curricula, course descriptions, problem sets, syllabi, and other materials for regular course instruction at UCI (MAE 110, 117, and 214). Instruct students in Combustion and Fuel Cell Systems course (MAE 110), and prepare for and lead instruction for the Fuel Cell Fundamentals and Technology course (MAE 214) in Spring quarter of 2003, and 2004.

6/93 – 7/97 **Research Assistant Professor**, University of Utah, Mechanical Engineering Department: Advised and supervised undergraduate and graduate students performing university research. Investigated turbulent reacting flows and modeling, chemical kinetic models, coal combustion, waste incineration, and emissions control through academic computational and experimental research and development.

1/93 - 5/93 **Post-Doctoral Researcher**, M.I.T., Chemical Engineering Department: Advanced and applied lithium lamp method for measurement of hydroxyl radicals in a plug flow reactor.

9/89 - 12/92 **Research Assistant**, M.I.T., Chemical Engineering Department: Investigated the effects of turbulent mixing and the presence of chlorine on combustion efficiency, reaction stability, and product distribution through experiments in jet-stirred and plug flow reactors and detailed theoretical modeling of turbulence and chemistry. Experiments used laser Rayleigh scattering and laser induced fluorescence (LIF).

7/87 - 9/89 **Graduate Researcher**, U.C. Irvine, Mechanical Engineering Department: Designed and built a fast response optical sensor, new test facility, and applied active feedback control technology to gas turbine combustion experiments. Conducted experiments in model gas turbine combustors using advanced laser diagnostics and conventional analyzers to enhance the understanding of combustor performance.

Professional Appointments

8/97 – present **Associate Director**, National Fuel Cell Research Center (NFCRC), University of California, Irvine: Direct and conduct fuel cell, fuel cell hybrid, fuel cell systems and components, micro-turbine, and advanced power generation technology research, development and demonstration activities. Lead the development of experimental and simulation capabilities for investigation of fuel cells and other advanced power and energy technologies. Take overall responsibility for the operations of the center including external relations, project management, faculty liaison, and supervision of technical and administrative staff. Develop curricula and instruct students in the fundamental science and technology of fuel cells. Develop the NFCRC concept in cooperation with the insight and leadership of Professor Scott Samuelsen and work cooperatively with other colleagues demonstrating technical expertise in fields related to fuel cells and advanced alternative energy conversion devices.

7/96 – 7/97 **Program Manager, Research and Development**, Reaction Engineering International: Managed and led the design, development, construction and operation of the University Combustion Research Center (UCRC), a new center for combustion research at the University of Utah. Managed and performed computational fluid dynamic (CFD) analyses of combustion and other systems with reacting and/or multi-phase flow. Advanced chemically reacting flow computational strategies for simulating pollutant emissions and emissions reduction strategies for energy systems.

6/93 - 6/96 **Senior Engineer**, Reaction Engineering International (REI): Performed research and analyses in combustion, thermodynamics, heat transfer and fluid mechanics using and developing detailed turbulent reacting flow modeling to study pollutant emissions, burner design, multi-phase flow problems, and post-combustion emissions control. Directed and performed experimental research for the U.S. Department of Energy's High Performance Power System (HIPPS) program on low NOx coal combustion. Directed and performed research for the SouthEast Regional Biomass Energy Program's (SERBEP) wood reburning program. Principal Investigator for a U.S. Environmental Protection Agency Phase II SBIR for research and development of an augmented selective non-catalytic NO reduction technology. Principal Investigator for the Department of Energy's Low Emissions Boiler System (LEBS) program for research and development of a low-NOx burner and an optimal coal reburning injection system.

6/91 - 9/91 **Staff Scientist**, Sandia National Laboratories, Livermore, California: Developed and tested a turbulent reacting flow model that incorporates detailed chemical kinetics with Dr. Alan Kerstein.

4/86 - 6/87 **Undergraduate Research Assistant,** U.C.I., Combustion Laboratory: Designed and constructed test facilities, conducted experiments using laser velocimetry and thermometry, analyzed data, prepared presentations and papers.

Publications

Books and Book Chapters:

B1. Brouwer, J., Fuel Cells, Chapter 10, in "Distributed Generation," Jan Kreider, and Ann-Marie Borbeley, eds., CRC Press, Inc., Boca Raton, Florida, 2001.

B2. Brouwer, J., and Samuelsen, G.S., Hybrid Fuel Cell Systems, in "Hybrid Handbook," Lou Berkshire, ed., U.S. Department of Energy, DOE/NETL-2001/1145, Morgantown, West Virginia, May, 2001.

B3. Brouwer, J., Hybrid Gas Turbine Fuel Cell Systems, Chapter 4, in "The Gas Turbine Handbook," Richard A. Dennis, ed., U.S. Department of Energy, DOE/NETL-2006/1230, Morgantown, West Virginia, 2006.

B4. Samuelsen, Scott, and Brouwer, Jack, Fuel Cell Gas Turbine Hybrid Systems, Chapter in "Encyclopedia of Electrochemical Power Sources," C.K. Dyer et al., eds., 4538 pages, ISBN-13: 978-0-444-52093-7, Elsevier, 2009.

Refereed Journal Articles:

J1. Cameron, C.D., Brouwer, J., Wood, C.P., and Samuelsen, G.S., *A Detailed Characterization of Velocity and Thermal Fields in a Model Can Combustor with Wall Injection*, ASME Journal for Gas Turbines and Power, pp. 107 ff., January, 1989.

J2. Brouwer, J., Longwell, J.P., Sarofim, A.F., Barat, R.B., and Bozzelli, J.W., *Chlorocarbon-Induced Incomplete Combustion in a Well-Stirred Reactor*, Combustion Science and Technology, Vol. 85, pp. 87-100, 1992.

J3. Brouwer, J., Sacchi, G., Longwell, J.P., Sarofim, A.F., Kerstein, A.R., *A Turbulent Reacting Flow Model that Incorporates Detailed Chemical Kinetics*, Combustion Science and Technology, Vol. 101, pp. 361-382, 1994.

J4. Brouwer, J., Sacchi, G., Longwell, J.P., Sarofim, A.F., *Mixing and Chemical Kinetic Constraints on PIC Production During Chlorocarbon Combustion*, Combustion and Flame, Vol. 99, No. 2, pp. 231-239, 1994 (presented at the 25th Symposium (International) on Combustion).

J5. Spinti, J.P., Pershing, D.W., Brouwer, J., and Heap, M.P., *Influence of Near Burner Combustion Modifications on NOx Formation from an All-Axial Multifuel Burner*, Combustion Science and Technology, Vol. 126, 1-21,1997.

J6. Brouwer, J., Samuelsen, G.S., and Washington, K., *Convergence of Fuel Cells and Advanced Engine/Energy Technologies for Power Generation and Transportation*, Engine Technology, Volume 3, Number 1, January, 2001.

J7. Yi, Y., Rao, A.D., Brouwer, J., and Samuelsen, G.S., *Analysis and Optimization of a Solid Oxide Fuel Cell and Intercooled Gas Turbine (SOFC-ICGT) Hybrid Cycle*, Journal of Power Sources, Volume 132, pp. 77-85, 2004.

J8. Roberts, R.A., Brouwer, J., Liese, E., Gemmen, R.S., *Dynamic Simulation of Carbonate Fuel Cell-Gas Turbine Hybrid Systems*, ASME Journal of Engineering for Gas Turbines and Power, Volume 128, Issue 2, pp. 294-301, April, 2006.

J9. Yi, Y., Rao, A.D., Brouwer, J., and Samuelsen, G.S., *Fuel Flexibility Study of a 25kW SOFC Reformer System*, Journal of Power Sources, Vol. 144, Issue 1, pp. 67-76, June, 2005.

J10. Roberts, R.A., and Brouwer, J., *Dynamic Simulation of a 220kW Solid Oxide Fuel Cell Gas Turbine Hybrid System with Comparison to Data*, ASME Journal of Fuel Cell Science and Technology, Volume 3, Issue 1, pp. 18-25, February, 2006.

J11. Leal, E.M., and Brouwer, J., *A Thermodynamic Analysis of Electricity and Hydrogen Co-Production using a Solid Oxide Fuel Cell*, ASME Journal of Fuel Cell Science and Technology, Volume 3, Issue 2, pp. 137-143, May, 2006.

J12. Mueller, F., Brouwer, J., Jabbari, F., and Samuelsen, G.S., *Dynamic Simulation of an Integrated Solid Oxide Fuel Cell System Including Current-Based Fuel Flow Control*, ASME Journal of Fuel Cell Science and Technology, Volume 3, Issue 2, pp. 144-154, May, 2006.

J13. Meacham, J.R., Jabbari, F., Brouwer, J., Mauzey, J.L., and Samuelsen, G.S., *Analysis of Stationary Fuel Cell Dynamic Ramping Capabilities and Ultra Capacitor Energy Storage using High Resolution Demand Data*, Journal of Power Sources, Volume 156, Issue 2, pp. 472-479, July, 2006.

J14. Brouwer, J., Jabbari, F., Leal, E.M. and Orr, T., *Analysis of a Molten Carbonate Fuel Cell: Numerical Modeling and Experimental Validation*, Journal of Power Sources, Volume 158, Issue 1, pp. 213-224, July, 2006.

J15. Rodriguez, M.A., Carreras, M., Medrano, M., Brouwer, J., Samuelsen, G.S., and Dabdub, D., *Air Quality Impacts of Distributed Power Generation in the South Coast Air Basin of California 1: Scenario Development and Modeling Analysis*, Atmospheric Environment, Volume 40, Issue 28, pp. 5508-5521, 2006.

J16. Maclay, J.D., Brouwer, J., and Samuelsen, G.S., *Dynamic Analyses of Regenerative Fuel Cell Power for Potential use in Renewable Residential Applications*, International Journal of Hydrogen Energy, Volume 31, pp. 994-1009, 2006.

J17. Carreras, M., Rodriguez, M.A., Brouwer, J., and Dabdub, D., *Air Quality Modeling in the South Coast Air Basin of California: What do numbers really mean?*, Journal of the Air and Waste Management Association, Volume 56, pp. 1184-1195, 2006.

J18. Medrano, M., Brouwer, J., Carreras, M., Rodriguez, M.A., Dabdub, D., and Samuelsen, G.S., *A Methodology for Developing Distributed Generation Scenarios in Urban Areas using*

Geographical Information Systems, International Journal of Energy Technology and Policy, Volume 6, Number 4 pp. 413 – 434, 2008.

J19. Medrano, M., Brouwer, J., McDonell, V., Mauzey, J., and Samuelsen, S., *Integration of Distributed Generation Systems Into Generic Types of Commercial Buildings in California*, Energy and Buildings, Volume 40, pp. 537-548, 2008.

J20. Roberts, R.A., Brouwer, J., Jabbari, F., Junker, T., and Ghezel-Ayagh, H., *Control Design of an Atmospheric Solid Oxide Fuel Cell/Gas Turbine Hybrid System: Variable versus Fixed Speed Gas Turbine Operation*, Journal of Power Sources, Volume 161, pp. 484-491, 2006.

J21. Kaneko, T., Brouwer, J., and G.S. Samuelsen, *Power and Temperature Control of Fluctuating Biomass Gas Fueled Solid Oxide Fuel Cell and Micro Gas Turbine Hybrid System*, Journal of Power Sources, Volume 160, Issue 1, pp. 316-325, 2006.

J22. Page, S.C. Anbuky, A.H., Krumdieck, S.P., and Brouwer, J., *Test Method and Equivalent Circuit Modeling of a PEM Fuel Cell in a Passive State*, in press, IEEE Transactions on Energy Conversion, Volume 22, Number 3, pp. 764-773, 2007.

J23. Traverso, A., Massardo, A., Roberts, R.A., Brouwer, J., and Samuelsen, G.S., *Gas Turbine Assessment for Air Management of Pressurized SOFC/GT Hybrid Systems*, ASME Journal of Fuel Cell Science and Technology, Volume 4, pp. 373-383, November, 2007.

J24. Pratt, J.W., Brouwer, J., and Samuelsen, G.S., *Performance of a Proton Exchange Membrane Fuel Cell at High Altitude Conditions*, AIAA Journal of Propulsion and Power, Volume 23, Number 2, pp. 437-444, 2007.

J25. Rodriguez, M.A., Brouwer, J., Samuelsen, G.S., and Dabdub, D., *Air Quality Impacts of Distributed Power Generation in the South Coast Air Basin of California 2: Model Uncertainty and Sensitivity Analysis*, Atmospheric Environment, Volume 41, Issue 27, pp. 5618-5635, 2007.

J26. Maclay, J.D., Brouwer, J., and Samuelsen, G.S., *Dynamic Modeling of Hybrid Energy Storage Systems Coupled to Photovoltaic Generation in Residential Applications*, Journal of Power Sources, Volume 163, Issue 2, pp. 916-925, 2007.

J27. Mueller, F., Brouwer, J., Kang, S.G., Kim, H.-S., and Min, K.D., *Quasi-Three Dimensional Dynamic Model of a Proton Exchange Membrane Fuel Cell for System and Controls Development*, Journal of Power Sources, Volume 163, Issue 2, pp. 814-829, 2007.

J28. Roberts, Rory A., Brouwer, Jacob, and Samuelsen, G. Scott, *Fuel Cell/Gas Turbine Hybrid System Control for Daily Load Profile and Ambient Condition Variation*, ASME Journal of Engineering for Gas Turbines and Power, Volume 132, pp. 1-7, 2010.

J29. Mueller, F., Jabbari, F., Brouwer, J., Roberts, R.A., Junker, T., and Ghezel-Ayagh, H., *Control Design for a Bottoming Solid Oxide Fuel Cell Gas Turbine Hybrid System*, ASME Journal of Fuel Cell Science and Technology, Volume 4, pp. 221-230, 2007.

J30. Qin, G.Y., Lu, X., Brouwer, J., and Mumm, D.R., *Electrocatalytic Properties of Intermediate Temperature-SOFC Cathode/LSGMC Interfaces*, in Solid Oxide Fuel Cells X, Volume 7, J. Mizusaki, H. Yokokawa, K. Eguchi, and S. C. Singhal, Transactions of The Electrochemical Society, Volume 7, Issue 1, pp. 329-338, 2007.

J31. Pine, T.S., Do, A-T.V., Lu, X., Mumm, D.R., and Brouwer, J., *Operation of an LSGMC electrolyte supported SOFC with composite ceramic anode and cathode*, Electrochemical and Solid State Letters, Volume 10, Issue 10, pp. B183-B185, 2007.

J32. Lu, X., Pine, T.S., Mumm, D.R., and Brouwer, J., *Modified Pechini synthesis and characterization of Y-doped strontium titanate perovskite*, Solid State Ionics, Volume 178, Issue 1, pp. 1195-1199, 2007.

J33. Pine, T.S., Lu, X., Mumm, D.R., Brouwer, J., and Samuelsen, G.S., *Emission of Pollutants from Glycine-Nitrate Combustion Synthesis Processes*, Journal of the American Ceramic Society, Volume 90, Issue 12, pp. 3735-3740, 2007.

J34. Mueller, F., Jabbari, F., Gaynor, R.M., and Brouwer, J., *Novel solid oxide fuel cell system controller for rapid load following*, Journal of Power Sources, Volume 172, pp. 308–323, 2007.

J35. Mueller, F., Gaynor, R.M., Auld, A.E., Brouwer, J., Jabbari, F., and Samuelsen, G.S., *Synergistic Integration of a Gas Turbine and Solid Oxide Fuel Cell for Improved Transient Capability*, Journal of Power Sources, Volume 176, Issue 1, Pages 229-239, 2008.

J36. Min, K.D., Kang, S.G., Mueller, F., Auckland, J., and Brouwer, J., *Dynamic Simulation of a Stationary Proton Exchange Membrane Fuel Cell System*, ASME Journal of Fuel Cell Science and Technology, Volume 6, Pages 041015-1 – 041015-10, November, 2009.

J37. Martinez, A.S., and Brouwer, J., *Percolation Modeling Investigation of TPB Formation in a Solid Oxide Fuel Cell Electrode-Electrolyte Interface*, Electrochimica Acta, Volume 53, Issue 10, Pages 3597-3609, 2008.

J38. Carreras-Sospedra, M., Dabdub, D., Brouwer, J., Knipping, E., Kumar, N., Darrow, K., Hampson, A., and Hedman, B., *Air Quality Impacts of Distributed Energy Resources Implemented in the Northeastern United States*, Journal of the Air and Waste Management Association, Volume 58, Number 7, Pages 902-912, 2008.

J39. Gaynor, R., Mueller, F., Jabbari, F., and Brouwer, J., *On Control Concepts to Prevent Fuel Starvation in Solid Oxide Fuel Cells*, Journal of Power Sources, Volume 180, Issue 1, Pages 330-342, 2008.

J40. Brown, T.M., Brouwer, J., and Samuelsen, G.S., *Unique Fuel Cell Test Fixture Allowing Independent Control of Gas Sealing and Electrical Contact Pressure*, Transactions of The Electrochemical Society, Volume 12, Issue 1, pp. 139-146, 2008.

J41. Brown, T.M., Brouwer, J., Samuelsen, G.S., Holcomb, F.H., and King, J., *Dynamic first principles model of a complete reversible fuel cell system*, Journal of Power Sources, Volume 182, Issue 1, pp. 240-253, 2008.

J42. Auld, A.E., Mueller, F., Smedley, K.M., Samuelsen, S., and Brouwer, J., *Applications of one-cycle control to improve the interconnection of a solid oxide fuel cell and electric power system with a dynamic load*, Journal of Power Sources, Volume 179, Issue 1, pp. 155-163, 2008.

J43. Do, A.V., Guo, J., Lu, X., Pine, T.S., Bae, J.M., and Brouwer, J., *Electrochemical Investigation of LSGMC-Composite Cathodes on LSGM-Substrate*, Transactions of The Electrochemical Society, Volume 13, Issue 26, pp. 165-180, 2008.

J44. Brown, Tim M., Brouwer, Jacob, Samuelsen, G. Scott, Holcomb, Franklin H., King, Joel, *Accurate simplified dynamic model of a metal hydride tank*, International Journal of Hydrogen Energy, Volume 33, Pages 5596 – 5605, 2008.

J45. Mueller, F., Tarroja, B.J., Maclay, J.D., Jabbari, F., Brouwer, J., and Samuelsen, G.S., *Design, Simulation and Control of a 100 Megawatt Class Solid Oxide Fuel Cell Gas Turbine Hybrid System*, Journal of Fuel Cell Science and Technology,.Volume 7, pp. 03107-1-11, June, 2010.

J46. Auld, Allie E., Brouwer, Jack, Smedley, Keyue M., and Samuelsen, Scott, *Internal and External Strategies for Evolution of Solid Oxide Fuel Cells into Model Citizens of the Grid*, IEEE Transactions on Energy Conversion, Volume 24, Issue 3, pp. 617-625, 2009.

J47. Mueller, Fabian, Jabbari, Faryar, Brouwer, Jacob, Junker, S. Tobias, and Ghezel-Ayagh, Hossein, *Linear Quadratic Regulator for a Bottoming Solid Oxide Fuel Cell Gas Turbine Hybrid System*, Journal of Dynamic Systems, Measurement, and Control, Volume 131, Pages 051002-1-9, September, 2009.

J48. Mueller, Fabian, Jabbari, Faryar, Brouwer, Jacob, *On the intrinsic transient capability and limitations of solid oxide fuel cell systems*, Journal of Power Sources, Volume 187, Issue 2, pp. 452-460, 2009.

J49. Auld, Allie E., Mueller, Fabian., Brouwer, Jack, Smedley, Keyue M., and Samuelsen, Scott, *Load-following active power filter for a solid oxide fuel cell supported load*, Journal of Power Sources, Volume 195, Issue 7, pp. 1905-1913, April, 2010.

J50. Li, Mu, Powers, Jim D., and Brouwer, Jacob, *A Finite Volume SOFC Model for Coal-Based Integrated Gasification Fuel Cell System Analysis*, Journal of Fuel Cell Science and Technology, Volume 7, pp. 041017-1-12, August, 2010.

J51. Eichman, Joshua D., Brouwer, Jacob, and Samuelsen, G. Scott, *Exploration and prioritization of fuel cell commercialization barriers for use in the development of a fuel cell roadmap for California*, Journal of Fuel Cell Science and Technology, Volume 7, pp. 051017-1-12, October, 2010.

J52. Kang, Sanggyu, Min, Kyoungdoug, Mueller, Fabian, Brouwer, Jacob, *Configuration effects of air, fuel, and coolant inlets on the performance of a proton exchange membrane fuel cell for automotive applications*, International Journal of Hydrogen Energy, Volume 34, Issue 16, pp. 6749-6764, 2009.

J53. Stephens-Romero, Shane; Carreras-Sospedra, Marc; Brouwer, Jack; Dabdub, Donald; Samuelsen, G. Scott, *Determining Air Quality Impacts of Hydrogen Infrastructure and Fuel Cell Vehicles*, Environmental Science & Technology, Volume 43, No. 23, pp. 9022-9029, 2009.

J54. Brouwer, Jacob, *On the role of fuel cells and hydrogen in a more sustainable and renewable energy future*, Current Applied Physics, Volume 10, pp. S9-S17, 2010.

J55. Auld, Allie E., Brouwer, Jack, Smedley, Keyue M., and Samuelsen, Scott, *Effects of Distributed Generation on Voltage Levels in a Radial Distribution Network without Communication*, Journal of Fuel Cell Science and Technology, Volume 7, pp. 061011-1-8, December, 2010.

J56. Brouwer, Jacob, *Letter to the Editor: Support for the high efficiency, carbon separation and internal reforming capabilities of solid oxide fuel cell systems*, Journal of Power Sources, Volume

195, Issue 15, pp. 5150–5151, 2010.

J57. Nanaeda, Kimihiro, Mueller, Fabian, Brouwer, Jacob, and Samuelsen, Scott, *Dynamic modeling and evaluation of solid oxide fuel cell – combined heat and power system operating strategies*, Journal of Power Sources, Volume 195, pp. 3176-3185, May, 2010.

J58. Marc Carreras-Sospedra, Satish Vutukuru, Jacob Brouwer, Donald Dabdub, *Central power generation versus distributed generation – An air quality assessment in the South Coast Air Basin of California*, Atmospheric Environment, Volume 44, Issue 26, pp. 3215-3223, August, 2010.

J59. Li, Mu, Rao, Ashok D., Brouwer, Jacob , and Samuelsen, G. Scott, *Design of highly efficient coal-based integrated gasification fuel cell power plants*, Journal of Power Sources, Volume 195, Issue 17, pp. 5707-5718, September, 2010.

J60. Margalef, Pere, Brown, Tim, Brouwer, Jacob, and Samuelsen, Scott, *Short communication: Efficiency of poly-generating high temperature fuel cells*, Journal of Power Sources, in press, available on-line: doi:10.1016/j.jpowsour.2010.10.046, October, 2010.

J61. Martinez, Andrew S., and Brouwer, Jacob, *Modeling and comparison to literature data of composite solid oxide fuel cell electrode–electrolyte interface conductivity*, Journal of Power Sources, Volume 195, Issue 21, pp. 7268-7277, November, 2010.

J62. Maclay, James D., Brouwer, Jacob, and Samuelsen, G. Scott, *Diurnal Temperature and Pressure Effects on Axial Turbo-Machinery Stability in Solid Oxide Fuel Cell-Gas Turbine Hybrid Systems*, Journal of Fuel Cell Science and Technology, accepted for publication, November, 2010.

Refereed Archival Conference Proceedings:

R1. Cameron, C.D., Brouwer, J., and Samuelsen, G.S., *A Model Gas Turbine Combustor with Wall Jets and Optical Access for Turbulent Mixing, Fuel Effects and Spray Studies*, Twenty-Second Symposium (International) on Combustion, pp. 465-474, 1988.

R2. Brouwer, J., Ault, B.A., Bobrow, J.E., and Samuelsen, G.S., *Active Control for Gas Turbine Combustors*, Twenty-Third Symposium (International) on Combustion, pp. 1087-1092, 1990.

R3. Brouwer, J., Heap, M.P., Pershing, D.W., and Smith, P.J., *A Model for Prediction of Selective Non-Catalytic Reduction of Nitrogen Oxides by Ammonia, Urea, and Cyanuric Acid with Mixing Constraints in the Presence of CO*, Twenty-Sixth Symposium (International) on Combustion, pp. 2117 ff., 1997.

Refereed Conference Publications:

C1. Brouwer, J., Ault, B.A., Bobrow, J.E., Edwards, D.K., and Samuelsen, G.S., *Active Performance Control in a Spray-Fired, Axisymmetric Model Gas Turbine Combustor*, AIAA Paper 90-0039, presented at AIAA 28th Aerospace Sciences Meeting, Reno, NV, January, 1990.

C2. Lighty, J.S., Burton, B., Sirdeshpande, A., Inkley, D., Pershing, D., Brouwer, J., Kemp, G., Heap, M.P., Fisher, J., and Pisharody, S., "Waste Incineration for Resource Recovery in a

Bioregenerative Life Support System," 27th International Conference on Environmental Systems, SAE Technical Paper No. 972429, July 1997.

C3. Gemmen, R, Liese, E., Rivera, J., Jabbari, F, and Brouwer, J., *Development of Dynamic Modeling Tools for Solid Oxide and Molten Carbonate Hybrid Fuel Cell Gas Turbine Systems*, ASME Paper Number 2000-GT-554, May, 2000.

C4. Yi, Y., Smith, T.P., Brouwer, J., and Rao, A.D., *Simulation of a 220 kW Hybrid SOFC Gas Turbine System and Data Comparison*, Proceedings of SOFC-VIII, The Electrochemical Society, April, 2003.

C5. Medrano, M., Brouwer, J., Carreras, M., Dabdub, D., and Samuelsen, G.S., *Urban Air Quality Impacts of Distributed Generation*, ASME Paper Number 2003-GT-38309, June, 2003.

C6. Chen, Y., Smedley, K., Vacher, F., and Brouwer, J., "A New Maximum Power Point Tracking Controller for Photovoltaic Power Generation," Proceedings of the IEEE Applied Power Electronics Conference, Miami Beach, Feb. 9-13, 2003.

C7. Roberts, R., Mason, J., Jabbari, F., Brouwer, J., Samuelsen, S., Liese, E. and Gemmen, R., *Inter-Laboratory Dynamic Modeling of a Molten Carbonate Fuel Cell*, ASME Paper Number 2003-GT-38774, June, 2003.

C8. Freeh, J.E., Pratt, J.W., and Brouwer, J., "Development of a Solid-Oxide Fuel Cell / Gas Turbine Hybrid System Model for Aerospace Applications," ASME Paper Number GT2004-53616, June, 2004.

C9. Roberts, R.A., Brouwer, J., Liese, E., Gemmen, R.S., "Dynamic Simulation of Carbonate Fuel Cell-Gas Turbine Hybrid Systems," ASME Paper Number GT2004-53653, June, 2004.

C10. Yuan, L., Brouwer, J., and Samuelsen, G.S., "Dynamic Simulation of an Autothermal Methane Reformer," 2nd International Conference on Fuel Cell Science, Engineering and Technology, ASME Paper Number FuelCell2004-2518, June, 2004.

C11. Leal, E.M, Jabbari, F., and Brouwer, J., "Dynamic Numerical Modeling and Experimental Validation of a Molten Carbonate Fuel Cell," Proceedings of the 3rd International Conference on Fuel Cell Science, Engineering and Technology, ASME Paper Number FC2005-74104, May, 2005.

C12. Elisângela Martins Leal and Jacob Brouwer, "A Thermodynamic Analysis of Electricity and Hydrogen Co-Production Using a Solid Oxide Fuel Cell," Proceedings of the 3rd International Conference on Fuel Cell Science, Engineering and Technology, ASME Paper Number FC2005-74136, May, 2005.

C13. Fabian Mueller, Jacob Brouwer, Faryar Jabbari, and Scott Samuelsen, "Dynamic Simulation of an Integrated Solid Oxide Fuel Cell System Including Current-Based Fuel Flow Control," Proceedings of the 3rd International Conference on Fuel Cell Science, Engineering and Technology, ASME Paper Number FC2005-74107, May, 2005.

C14. Roberts, R.A., Brouwer, J., Liese, E., Gemmen, R.S., "Development of Controls for Dynamic Operation of Carbonate Fuel Cell Gas Turbine Hybrid Systems," ASME Paper Number GT2005-68774, June, 2005.

C15. Leal, E.M., and Brouwer, J. “Thermodynamic Analysis of Production of Hydrogen Using High Temperature Fuel Cells,” 2005 ASME International Mechanical Engineering Congress and Expo, Paper Number IMECE2005-81912, November 5-11, 2005.

C16. Leal, E.M., and Brouwer, J., "Production of Hydrogen Using a High-Temperature Fuel Cell: Energy and Exergy Analysis," Proceedings of 18th International Congress of Mechanical Engineering, Paper Number COBEM05-1514, November 6-11, 2005.

C17. A. Traverso, A. Massardo, R. Roberts, S. Samuelsen, J. Brouwer, “Gas Turbine Assessment for Air Management of Pressurized SOFC/GT Hybrid Systems”, First European Fuel Cell Conference, EFC2005-86228, December, 2005.

C18. Rory A. Roberts, Jack Brouwer and G. Scott Samuelsen, “Fuel Cell/Gas Turbine Hybrid System Control for Daily Load Profile and Ambient Condition Variation,” ASME Paper GT2006-90741, May, 2006.

C19. Fabian Mueller, Faryar Jabbari, Jacob Brouwer, Rory Roberts, Tobias Junker, and Hossein Ghezel-Ayagh, “Control Design for a Bottoming Solid Oxide Fuel Cell Gas Turbine Hybrid System,” ASME Paper FC2006-97150, June, 2006.

C20. Yaofan Yi, Ashok Rao, Jacob Brouwer, and Scott Samuelsen, “Ammonia as a Contaminant in the Performance of an Integrated SOFC Reformer System,” ASME Paper FC2006-97037, June, 2006.

C21. Sanggyu Kang, Han-sang Kim, Taehun Ha, Kyoungdoug Min, Fabian Mueller, and Jack Brouwer, “Dynamic Cell Level Modeling and Experimental Data from a Proton Exchange Membrane Fuel Cell,” ASME Paper FC2006-97238, June, 2006.

C22. Tim M. Brown, Jacob Brouwer, G. Scott Samuelsen, Franklin H. Holcomb, and Joel King, “Two-Dimensional Dynamic Simulation of Hydrogen Storage in Metal Hydride Tanks,” ASME Paper FC2006-97140, June, 2006.

C23. Kyoungdoug Min, Jack Brouwer, John Auckland, Fabian Mueller, and Scott Samuelsen, “Dynamic Simulation of a Stationary PEM Fuel Cell System,” ASME Paper FC2006-97039, June, 2006.

C24. Fabian Mueller, Faryar Jabbari, Jacob Brouwer, Tobias Junker, and Hossein Ghezel-Ayagh, “Linear Quadratic Regulator for a Solid Oxide Fuel Cell / Turbine Hybrid System,” ASME Paper ICEPAG2006-24018, September, 2006.

C25. Mueller, Fabian, Faryar Jabbari, Jacob Brouwer, and G. Scott Samuelsen “Synergistic Integration of a Gas Turbine and Solid Oxide Fuel Cell for Improved Transient Capability,” Proceedings of 5th International ASME Conference on Fuel Cell Science, Engineering and Technology, June, 2007.

C26. Brendan Shaffer, Michael Hunsuck and Jacob Brouwer, “Quasi-3-D Dynamic Model of an Internally Reforming Planar Solid Oxide Fuel Cell for Hydrogen Co-Production,” Proceedings of the 6th International Conference on Fuel Cell Science, Engineering and Technology, ASME Paper Number FC08-65193, May, 2008.

C27. Tarroja, Brian, Fabian Mueller, Jim Maclay, and Jacob Brouwer, Parametric Thermodynamic Analysis of a Solid Oxide Fuel Cell Gas Turbine System Design Space, ASME Paper GT2008-51518, May, 2008.

C28. Mueller, Fabian, Brian Tarroja, James Maclay, Faryar Jabbari, Jacob Brouwer, and Scott Samuelsen Design, Simulation, and Control of a 100 Megawatt-Class Solid Oxide Fuel Cell Gas Turbine Hybrid System, ASME Paper FC2008-65194, June, 2008.

C29. Carreras, Marc, Donald Dabdub, Jacob Brouwer, and G. Scott Samuelsen, "Determining relative air quality impacts of future personal vehicle options," ASME Paper ICEPAG2009-1058, February, 2009.

C30. Eichman, Josh, Jack Brouwer, and Scott Samuelsen, "Exploration and prioritization of fuel cell commercialization barriers for use in the development of a fuel cell roadmap and action plan for California," ASME Paper FuelCell2009-85065, June, 2009

C31. Martinez, Andrew, and Jacob Brouwer, "Monte Carlo Investigation of Particle Properties Affecting TPB Formation and Conductivity in Composite Solid Oxide Fuel Cell Electrode-Electrolyte Interfaces," ASME Paper FuelCell2009-85191, June, 2009.

C32. Nanaeda, Kimihiro, Fabian Mueller, Jacob Brouwer, Scott Samuelsen, "Dynamic modeling of a solid oxide fuel cell combined heat and power system with thermal storage for commercial building applications," ASME Paper FuelCell2009-85169, June, 2009.

C33. Maclay, James D., Jacob Brouwer, G. Scott Samuelsen, "Diurnal temperature and pressure effects on axial turbo-machinery stability in solid oxide fuel cell-gas turbine hybrid systems," ASME Paper FuelCell2009-85057, June, 2009.

C34. Li, Mu, Jacob Brouwer, James D. Powers, G. Scott Samuelsen, "A finite volume sofc model for coal-based integrated gasification fuel cell system analysis," ASME Paper F uelCell2009-85247, June, 2009.

C35. Shaffer, Brendan and Jacob Brouwer, "Dynamic model for understanding spatial temperature and species distributions in internal-reforming solid oxide fuel cells," ASME Paper FuelCell2009-85095, June, 2009.

C36. Pine, Thomas, Anh-Tuan V. Do, Li Zhao, and Jacob Brouwer, "Operation of a novel dry hydrocarbon tolerant intermediate temperature solid oxide fuel cell," ASME Paper FuelCell2009-85094, June, 2009.

C37. Auld, Allie E., Jack Brouwer, Scott Samuelsen, and Keyue M. Smedley, "Effect of distributed generation on voltage levels in a radial distribution network without communication," ASME Paper FuelCell2009-85192, June, 2009.

C38. Mueller, Fabian, Fardadi, Mahshid, Brouwer, Jack, and Jabbari, Faryar, "Transient Performance of Integrated SOFC System Including Spatial Temperature Control," ASME Paper FuelCell2010-33304, June, 2010.

C39. McLarty, Dustin F., Samuelsen, Scott, and Brouwer, Jack "Hybrid Fuel Cell Gas Turbine System Design and Optimization for MCFC and SOFC," ASME Paper FuelCell2010-33329, June, 2010.

C40. McLarty, Dustin F., Samuelsen, Scott, and Brouwer, Jack "Novel dynamic quasi-3-dimensional high temperature fuel cell model with internal manifolding," ASME Paper FuelCell2010-33328, June, 2010.

Conference Papers:

P1. Brouwer, J., Heap, M.P., Bales, F., Inkley, D., Lighty, J., and Pershing, D.W., "The Use of Wood as a Reburning Fuel in Combustion Systems," Proceedings of BioEnergy '94 Conference, Reno, Nevada, October, 1994.

P2. Brouwer, J., Owens, W.D., Harding, N.S., and Heap, M.P., "Co-Firing Waste Fuels and Coal for Emissions Reduction," Proceedings of the Second Biomass Conference of the Americas, pp. 390-399, Portland, Oregon, August, 1995.

P3. Brouwer, J., Eddings, E.G., Heap, M.P., Pershing, D.W., and Smith, P.J., "The Effects of Mixing and Thermal Quenching on Selective Non-Catalytic Reduction of NO in the Presence of CO," Proceedings of the American Flame Research Committee Fall Meeting, Monterey, California, October, 1995.

P4. R. Beittel, E. Reicker, G. Gielda, J. Brouwer, and E.G. Eddings, "U-Fired Test Facility and Analyses for application to a High Temperature Air Furnace (HITAF) in a Low Emission Boiler System(LEBS)," proceedings of the International Joint Power Generation Conference, October, 1995.

P5. Brouwer, J., Heap, M.P., Bales, F., Inkley, D., Lighty, J., and Pershing, D.W., "Co-Firing of Biofuels and Coal in Combustion Systems," Paper presented at the 101st American Chemical Society Meeting, Anaheim, California, 1995.

P6. Eddings, E.G., Brouwer, J., Heap, M.P., Overacker, D.W. and Pershing, D.W., "Determination of Organic Emissions From Raw Materials and Waste Feedstocks in Cement Kilns," Waste Combustion in Boilers and Industrial Furnaces, Air & Waste Management Association Specialty Conference, St. Louis, MO, April 8-10, 1997.

P7. Brouwer, J., Kemp, G.S., Heap, M.P., Lighty, J.S., and Pershing, D.W., "Waste Incineration for Resource Recovery in a Space-Based Life Support System," Western States Section of the Combustion Institute, Spring Meeting, Livermore California, April, 1997.

P8. K.A. Davis, J.R. Valentine, E.G. Eddings, J Brouwer, M.P Heap, R.H. Hurt, R. Hardman and N. Grigas, "Advanced Prediction of Unburned Carbon Levels in Two Utility Boilers Retrofitted for In-Furnace NOx Reduction," Third Annual Conference on Unburned Carbon in Utility Fly Ash, Pittsburgh, May 13-14, 1997.

P9. E.G. Eddings, J Brouwer and F.E. Spokoyny, "Modeling Urea-Based SNCR in a Gas-Fired Utility Boiler," First Conference on Selective Catalytic & Non-Catalytic Reduction for NOx Control, Pittsburgh, May 15-16, 1997.

P10. Liese, E.A., Gemmen, R.S., and Brouwer, J., "Dynamic Modeling of Solid Oxide and Molten Carbonate Hybrid Fuel Cell Gas Turbine Systems," Joint U.S. DOE, EPRI, GRI Fuel Cell Meeting, Chicago, August 2-4, 1999.

P11. Brouwer, J., White, D.J, and Samuelsen, G.S., "Advances in Solid Oxide and Molten Carbonate Hybrid Fuel Cell Systems for Distributed Power Generation," Power-Gen International, New Orleans, November 30-December 2, 1999.

P12. Brouwer, J., Samuelsen, G.S., Lee, S.W., and O'Connor, T., "Power Park Application of Fuel Cells and Advanced Energy Technologies," Proceedings of the 92nd International District Energy Association Conference, Las Vegas, NV, May 14, 2001.

P13. Smugeresky, C.S., Mason, J.O., Jabbari, F., Brouwer, J., and Liese, E., and Gemmen, R., "Inter-Laboratory Comparison of Molten Carbonate Hybrid Fuel Cell System Dynamic Modeling," International Gas Turbine Institute meeting of the American Society of Mechanical Engineers, June 4-6, 2001.

P14. Williams, M.C., Brouwer, J., and Samuelsen, G.S., "Development of Fuel Cells and Other Clean Energy Technologies Supported by the U.S. Department of Energy, Office of Fossil Energy," Proceedings of the US-China Clean Energy Technology Forum and Equipment Exhibition, August 29 – September 1, 2001.

P15. Brouwer, J., Jabbari, F., Smugeresky, C.S., Mason, J.O., and Samuelsen, G.S., "Fuel Cell Systems Simulation and Critical Factors for Success," Proceedings of the 2002 F-Cell Symposium, Stuttgart, Germany, October 14-16, 2002.

P16. Pratt, J.W., Brouwer, J., and Samuelsen, G. S. "Experimental Evaluation and Computer Simulation of an Air-Breathing PEM Fuel Cell at Aircraft Flight Altitudes," Proceedings of 2003 Fuel Cell Seminar, Nov. 3-6, Miami Beach, FL, pp. 114-118, 2003.

P17. Maclay, J.D., Brouwer, J., and Samuelsen, G.S., "Measurements and Dynamic Simulation of Regenerative Fuel Cell Systems in Residential Power Applications," First Industrial Conference on Power Electronics for Distributed and Co-Generation, Irvine, CA, March 22-24, 2004.

P18. Meacham, J.R., Brouwer, J., Jabbari, F., and Samuelsen, G.S., "Simulation of Control and Dispatch Scenarios for Distributed Energy Resources," First Industrial Conference on Power Electronics for Distributed and Co-Generation, Irvine, CA, March 22-24, 2004.

P19. Maclay, J.D., Brouwer, J., and G.S. Samuelsen, "Understanding the Dynamics of Renewable Reversible Fuel Cell Power for Residential Applications," 15th National Hydrogen Association Conference, Paper # 76522, April 27, 2004.

P20. Pratt, J.W., and Brouwer, J., "Experimental Performance of an Air-Breathing PEM Fuel Cell at High Altitude Conditions," 43rd AIAA Aerospace Sciences Meeting, Paper Number AIAA-2005-0953, August 30, 2004.

P21. Brouwer, J., Roberts, R.A., and Samuelsen, G.S., "Dynamic Simulation of Hybrid Fuel Cell Gas Turbine Systems," Proceedings of the International Hybrid Fuel Cell Gas Turbine Workshop, Shibaura Institute of Technology, October 23-24, 2004.

P22. Mauzey, J.L., Brouwer, J., and Samuelsen, G.S., "Fuel Cell Vehicle Deployment and Hydrogen Infrastructure Development in Southern California," Proceedings of the 2004 Fuel Cell Seminar, pp. 185-189, November, 2004.

P23. Page, S.C., Krumdieck, S.P., Anbuky, A., and Brouwer, J., “Condition Assessment Monitoring (CAM) Test for PEM Back-up Power Systems,” Proceedings of 2004 Fuel Cell Seminar, November, 2004.

P24. Roberts, R.A., Brouwer, J., and Samuelsen, G.S., “Dynamic Simulation of a Solid Oxide Fuel Cell/Gas Turbine Hybrid and Comparison to Data,” Proceedings of the 2004 Fuel Cell Seminar, November, 2004.

P25. Yi, Y., Brouwer, J., Rao, A.D., and Samuelsen, G.S., “Fuel Flexibility Study of an Integrated 25 kW SOFC Reformer System,” Proceedings of the 2004 Fuel Cell Seminar, November, 2004.

P26. Meacham, J.R., Brouwer, J., and Samuelsen, G.S., “Dynamic Simulation of Control and Dispatch Scenarios for Fuel Cell Systems in the Built Environment,” Proceedings of the 2004 Fuel Cell Seminar, November, 2004.

P27. Lim, D., Neylon, M., Fleckner, K., Finlayson, B., Loffler, D., and Brouwer, J., “Novel Integrated Use of Femlab and Simulink to Understand the Dynamics of an SOFC Reformer System for Aeronautical Applications,” Proceedings of the 2004 Fuel Cell Seminar, November, 2004.

P28. Maclay, J.D., Brouwer, J., and Samuelsen, G.S., “Regenerative Fuel Cell Power for Solar-Hydrogen Residential Applications,” Proceedings of the 2004 Fuel Cell Seminar, Paper # FC2004-000079,November, 2004.

P29. Brown, T.M., Brouwer, J., and Samuelsen, G.S., “Development of a Dynamic Model of Metal Hydride Storage for U.S. DoD Fuel Cell Applications,” 16th National Hydrogen Association Meeting, April, 2005.

P30. Mauzey, J.L., Brouwer, J., and Samuelsen, G.S., “Fuel Cell Vehicle Testing and Hydrogen Refueling in Southern California,” 16th National Hydrogen Association Meeting, April, 2005.

P31. Leal, E.M., and Brouwer, J., "A Thermodynamic Analysis of Hydrogen Co-Production Using a Molten Carbonate Fuel Cell," ENPROMER, 2nd Mercosur Congress on Chemical Engineering, Rio de Janeiro, Brazil, August 15-18, 2005.

P32. Brouwer, J., Medrano, M., Samuelsen, G.S., Lee, C.C., and Huffman, G.L., “Air Quality Impacts of Fuel Cell and Other Distribute Generation Installation in the United States,” Proceedings of the 2005 Fuel Cell Seminar, November, 2005.

P33. Maclay, J.D., Brouwer, J., Samuelsen, G.S., and J. Morrison, “Experiences with Dynamic Fuel Cell Operation and Dynamic Solar Hydrogen Production for Residential Applications” Proceedings of the 2005 Fuel Cell Seminar, Paper # FC2005-000494, November, 2005.

P34. Kang, S.K., Min, K., Mueller, F. and Brouwer, J. “Configuration Effect of Air, Fuel, and Coolant Inlets on the Performance of PEM Fuel Cell Stack,” Proceedings of the 2006 Fuel Cell Seminar, November, 2006.

P35. Pratt, J.; Brouwer, J.; Samuelsen, S., “High Altitude (Sub-Atmospheric Pressure) Performance of a 100 Watt Solid Oxide Fuel Cell Stack,” Proceedings of the 2006 Fuel Cell Seminar, November, 2006.

P36. Brouwer, J., Nogues, M., Samuelsen, S., Lee, C.C., and Huffman, G., “Life Cycle Analyses of Fuel Cell Technology for Assessment of Air Quality and Greenhouse Gas Emissions Impacts,” Proceedings of the 2006 Fuel Cell Seminar, November, 2006.

P37. Yi, Y., Brouwer, J., Rao, A.D., and Samuelsen, S., “Long Term Multi-Fuel Testing of an Integrated Tubular SOFC Reformer System,” Proceedings of the 2006 Fuel Cell Seminar, November, 2006.

P38. Brouwer, Jack, “University-Industry Interaction: Joint University-Industry Research Snippets,” Proceedings of the 2007 Fuel Cell Seminar, October 17, 2007.

P39. Brouwer, Jack, “Use of Fuel Cells to Maximize the Value of Solar, Wind and Biomass,” Proceedings of the 2010 Fuel Cell Seminar, San Antonio, TX, October 17, 2010.

Abstracts and Posters:

A1. Charles, R.E., Brouwer, J., and Samuelsen, G.S., The Effect of Inlet Conditions on the Performance and Flow Field Structure of a Non-Premixed Swirl-Stabilized Distributed Reaction, presented at AIAA Aerospace Sciences Conference, Reno, 1987.

A2. Brouwer, J., Cameron, C.D., and Samuelsen, G.S., A Parametric Investigation of a Model Gas Turbine Can Combustor with Discrete Wall Injection, presented at the 24th Joint Propulsion Conference, Boston, July, 1988.

A3. Ault, B.A., Brouwer, J., Bobrow, J.E., and Samuelsen, G.S., An Experimental Method for Active Soot Reduction in a Model Gas Turbine Combustor, presented at the American Controls Conference, San Diego, 1990.

A4. Brouwer, J., Heap, M.P., Bales, F., Lighty, J., and Pershing, D.W., The Influence of Biomass Properties on the Effectiveness of Wood for Reburning of NO, Poster presented at the 25th Symposium (International) on Combustion, Irvine, 1994.

A5. Lighty, J.S., B. Burton, A. Sirdeshpande, D. Inkley, D.W. Pershing, J. Brouwer, G. Kemp, M.P. Heap, J. Fisher and S. Pisharody, "Waste Incineration for Resource Recovery in a Bioregenerative Life Support System," presented at the 27th International Conference on Environmental Systems, Lake Tahoe, NV, July 14-17, 1997.

A6. Brouwer, J. and Samuelsen, G.S., "Stationary Fuel Cell Infrastructure Requirements and NFCRC Activities," F-Cells Infrastructure Forum, San Diego, California, November 30, 2000.

A7. Brouwer, J., Jabbari, F., Smugeresky, C.S., Mason, J.O., and Samuelsen, G.S., “Steady State and Dynamic Framework for Simulation of Hybrid Fuel Cell Gas Turbine Systems,” Fuel Cell Seminar, Poster #230, Palm Springs, California, November 21, 2002.

A8. Brouwer, J., Invited Keynote Lecture: "Fuel Cell Systems Overview, Modeling, and Critical Factors for Success," International Association of Science and Technology for Development, Power and Energy Systems, PES 2003, Palm Springs, California, February 24-26, 2003.

A9. Carreras, M., Brouwer, J. Dabdub, D., and Samuelsen, G.S., “Impact of deployed fuel cell technology on urban air quality,” ASME International Colloquium on Environmentally Preferred Advanced Generation (ICEPAG), Newport Beach, California, 2006.

A10. Maclay, J.D., Brouwer, J., and Samuelsen, G.S., "PV/Fuel Cell hybrid applications for distributed generation," ICEPAG, ASME ICEPAG, Newport Beach, California, September 8, 2006.

A11. Auld, A.E., Mueller, F., Smedley, K., Brouwer, J., and Samuelsen, G.S., "Power Electronics Application for Grid Friendly Connection of Distributed Generation," ASME ICEPAG, Newport Beach, California, September 8, 2006.

A12. Kuniba, Y., Mueller, F., Brouwer, J., and Samuelsen, G.S., "Dynamic operation and simulation of a 220kW solid oxide fuel cell gas turbine hybrid system," ASME ICEPAG, Newport Beach, California, September 6, 2006.

A13. Brouwer, J., Mueller, F., Li, M., and Powers, J., "Large Fuel Cell and Hybrid Technology," ASME ICEPAG, Newport Beach, California, January 29, 2008.

A14. Maclay, Jim D., Brouwer, J., and Samuelsen, S., "Strategies for Improved Dynamic Performance of Gas Turbines in Hybrid IGFC Systems Operating on Coal Syngas," ASME ICEPAG, Newport Beach, California, January 29, 2008.

A15. Lu, Xinyu, and Brouwer, J., "Materials and Manufacturing Considerations for Commercial SOFC Systems," ASME ICEPAG, Newport Beach, California, January 29, 2008.

A16. Mueller, Fabian, Jabbari, Faryar, and Brouwer, Jack, "Controls for Transient Load Following and Disturbance Rejection in Solid Oxide Fuel Cell Gas Turbine Hybrid Systems," ASME ICEPAG, Newport Beach, California, January 30, 2008.

A17. Auld, Allie E., Smedley, Keyue, Brouwer, Jack and Samuelsen, Scott, "Load-Following Active Power Filter for Support of a Solid Oxide Fuel Cell Supported Remote Non-Linear Load," ASME ICEPAG, Newport Beach, California, January 30, 2008.

A18. Margalef, Pere, Brouwer, Jack, and Samuelsen, Scott, "Tri-Generation of Electricity, Hydrogen and Heat on Demand from High-Temperature Fuel Cells," ASME ICEPAG, Costa Mesa, California, February 10, 2009.

A19. Powers, Jim D., Li, Mu, Rao, Ashok D., and Brouwer, Jack, "Evolution of IGFC Systems," ASME ICEPAG, Costa Mesa, California, February 11, 2009.

A20. Maclay, James D., Brouwer, Jacob, and Samuelsen, Scott, "Turbo-Machinery Stability During Ambient Temperature and Pressure Fluctuations," ASME ICEPAG, Costa Mesa, California, February 12, 2009.

A21. Martinez, Andrew S., Brouwer, Jacob, and Samuelsen, Scott, "Solid Oxide Fuel Cell/Gas Turbine Hybrid System Power for Long-Haul Locomotives: Insights on Present and Future Capabilities," ASME ICEPAG, Costa Mesa, California, February 12, 2009.

A22. Carreras-Sospedra, Marc, Brouwer, Jacob, and Dabdub, Donald, "Determining Relative Air Quality Impacts of Future Personal Vehicle Options," ASME ICEPAG, Costa Mesa, California, February 12, 2009.

A23. Pere Margalef, Pere, Brouwer, Jacob, and Samuelsen, Scott, "High-Temperature Fuel Cell Performance with Hydrogen Polygeneration," ASME ICEPAG, Costa Mesa, California, February 9, 2010.

A24. Zhao, Li, and Brouwer, Jacob, "Novel Ceramic Materials for Next Generation Large Fuel Cell Systems," ASME ICEPAG, Costa Mesa, California, February 9, 2010.

A25. Brouwer, Jack, Li, Mu, and Powers, Jim D., "First Principles Model for IGFC Applications," ASME ICEPAG, Costa Mesa, California, February 10, 2010.

A26. Li, Mu, Brouwer, Jack, Powers, Jim D., and Rao, Ashok D., "High Efficiency IGFC Plants," ASME ICEPAG, Costa Mesa, California, February 10, 2010.

A27. McLarty, Dustin F., Brouwer, Jacob, and Samuelsen, Scott, "Fuel Cell/Gas Turbine Power Block Optimization Operating on Syngas," ASME ICEPAG, Costa Mesa, California, February 11, 2010.

A28. Auld, Allie E., Brouwer, Jacob, and Samuelsen, Scott, "Connectivity of Distributed Generation to the Electric Grid," ASME ICEPAG, Costa Mesa, California, February 11, 2010.

Public Lectures & Technical Presentations (organization, event, location, date - by year):

1987-1997 (selected):

- AIAA Aerospace Sciences Conference, Reno, 1987.
- 24th Joint Propulsion Conference, Boston, July, 1988.
- American Controls Conference, San Diego, 1990.
- 23rd Symposium (International) on Combustion, Orleans, France, 1990.
- New Jersey Institute of Technology, Newark, New Jersey, June, 1992.
- 25th Symposium (International) on Combustion, Irvine, California, 1994
- BioEnergy '94 Conference, Reno, Nevada, October, 1994.
- Second Biomass Conference of the Americas, Portland, Oregon, August, 1995.
- 26th Symposium (International) on Combustion, Naples, Italy, 1996.
- California Alliance for Distributed Energy Resources, Annual Meeting, San Diego, California, September 15, 1997.
- Association to Commercialize Carbonate Technology, ACCT Annual Review Meeting, New Orleans, Louisiana, October 16, 1997.
- California Utility Research Council, Annual CURC Meeting, La Jolla, California, November 5, 1997.[IL]

1998:

- California Energy Commission, Commission Hearing on NFCRC Funding, Sacramento, California, January 7.
- South Coast Air Quality Management District, Technical Committee Presentation on NFCRC Funding, Diamond Bar, California, January 17
- South Coast Air Quality Management District, Board Hearing on NFCRC Funding, Diamond Bar, California, February 13.
- Institute of Electrical and Electronics Engineers, Power Generation Conference, Downey, California, February 28.[IL]

[IL] *Invited Lecture*

- U.S. Department of Energy, California Energy Commission, MOU Planning, Washington D.C., March 11-12.
- Electric Power Research Institute, Joint EPRI/GRI/DOE Fuel Cell Meeting, San Francisco, California, May 19.
- RAND Corporation, Advanced Transportation Industry Consortium, Santa Monica, California, July 29.[IL]
- National Renewable Energy Laboratory, NREL/NFCRC/NETL Coordination Meeting, Golden, Colorado, August 3.
- Solar Gas Turbines, California Alliance for Distributed Energy Resources Leadership Meeting, San Diego, California, August 17.
- Japan Journal of Environment, Latest Trends in PEM Fuel Cells, Tokyo, Japan, October 12.[IL, SC]
- Japan Journal of Environment, World Trends in PEM Fuel Cells, Osaka, Japan, October 13.[IL, SC]
- World Bank, Clean Air Initiative Meeting, Washington D.C., December 3.
- California Alliance for Distributed Energy Resources, Sacramento Municipal Utility District Leadership Meeting, Sacramento, California, December 16.

1999:

- Society of Automotive Engineers Auto Show, Horiba Instruments Dedication, Detroit, Michigan, March 3.
- International Colloquium on Environmentally Preferred Advanced Generation, Annual Colloquium, Tutorial, Newport Beach, California, March 22.[SC]
- California Public Utilities Commission, Notice of Intent for Rulemaking (NIR) Meeting, San Francisco, California, May 6.
- UC Extension, Fuel Cell Short Course, Irvine, California, May 15.[IL, SC]
- Plug Power, Incorporated, Off-site Workshop, Manchester, Vermont, May 20.
- American Society of Mechanical Engineers, International Gas Turbine Institute Meeting, Indianapolis, Indiana, June 9.
- Concurrent Technologies Corporation, Fuel Cell Center Coordination, Johnstown, Pennsylvania, July 14.
- U.S. Department of Energy, California Energy Commission, MOU coordination meeting, San Francisco, California, July 27.
- U.S Department of Energy, Joint DOE/EPRI/GRI Fuel Cell meeting, Chicago, Illinois, August 3.
- Minnesota Department of Public Works, Fuel Cell Short Course, Minneapolis, Minnesota, Aug. 17.
- National Energy Technology Laboratory, Cooperative Research and Development Authorization (CRADA) Meeting, Morgantown, West Virginia, August 23.
- Power-Gen, Power-Gen International Meeting, New Orleans, Louisiana, November 30.
- U.S. Department of Energy, Joint DOE-AIST meeting, Nagoya, Japan, December 2.[IL]
- Pacific Rim Consortium on Energy Combustion and the Environment, Kyoto, Japan, December 5.
- U.S. Fuel Cell Council, University of Hawaii Short Course, December 15.[IL, SC]

2000:

- Association of Energy Engineers, San Diego Chapter Meeting, San Diego, California, January 20.[IL]

[SC] *Session Chair/Organizer*

- Federal Energy Management Program, U.S. Department of Energy, Downey, California, February 24.[IL]
- School of Engineering, Corporate Affiliates Program, Irvine, California, March 20.
- American Society of Mechanical Engineers, CSU Long Beach Student Chapter, Irvine, California, March 24.
- International Colloquium on Environmentally Preferred Advanced Generation, Annual Colloquium, Tutorial, Newport Beach, California, April 5.[SC]
- U.S. Department of Energy, Combined Heat and Power Conference, Albuquerque, New Mexico, May 16.[IL]
- Solid State Energy Conversion Alliance, SOFC Short Course Instruction, Baltimore, Maryland, June 1.[IL]
- FuelCell Energy, Incorporated, MCFC Capabilities Meeting, Danbury, Connecticut, June 14.
- Association of Energy Engineers, AEE West Coast Conference, San Jose, California, June 21.[IL]
- International Quality & Productivity Center, F-Cells 2000, Palm Springs, California, June 24.
- U.S. Department of Energy, Office of Distributed Energy Resources, Washington D.C., July 18.
- FuelCell Energy, Incorporated, Direct Fuel Cell Commercialization Group, Torrington, Connecticut, July 26.
- Fuel Cell Center Coordination Committee, Technical Coordination Meeting, Irvine, California, July 28.
- Universities for Fuel Cells, Illinois Institute of Technology meeting, Chicago, Illinois, August 3.[SC]
- U.S. Department of Energy, Vision 21 Road-mapping Workshop, College Park, Maryland, August 31.[SC]
- University of California, Office of the President, UC Merced Energy Workshop, Irvine, California, September 11.
- American Flame Research Council, Fuel Cell Tutorial, Irvine, California, September 24.
- Fuel Cell Center Coordination Committee, Technical Coordination Meeting, Fairbanks, Alaska, September 27.
- U.S. Department of Energy, Joint DOE-AIST meeting at the Fuel Cell Seminar, Portland, Oregon, November 3.[IL]
- California Alliance for Distributed Energy Resources, Annual Meeting, San Diego, California, November 9.
- Hong Kong Polytechnic University, Fuel Cell Short Course, Hong Kong, China, November 13-14.[IL, SC]
- Pacific Rim Consortium on Energy Combustion and the Environment, Hybrid Fuel Cell Technology, Beijing, China, November 17.
- International Quality and Productivity Center, F-Cells Infrastructure Forum, San Diego, California, November 30.

2001:

- Parker Hannifin Corp., Fuel Cell Short Course, Racor Division, Merced, California, February 20.[IL]
- World Bank, Brown Bag Lunch, Washington D.C., March 14.
- Solid State Energy Conversion Alliance, Universities for Fuel Cells Meeting, Arlington, Virginia, March 28.[SC]
- Universities for Fuel Cells, Solid State Energy Conversion Alliance Meeting, Washington, D.C.,

March 29-31, 2001.

- California Energy Commission, Public Interest Energy Research Environmental Assessment Group, Sacramento, California, April 11.
- World Bank, Distributed Generation Infrastructure Forum, Washington D.C., May 9.[IL]
- International Quality and Productivity Center, F-Cells Week, Palm Springs, California, May 18.
- International Colloquium on Environmentally Preferred Advanced Generation, Annual Colloquium, Tutorial, Newport Beach, California, May 24.[SC]
- Fuel Cell Center Coordination Committee, Technical Coordination Meeting, Fairbanks, Alaska, June 12.
- International District Energy Association, 96th IDEA Conference, Las Vegas, Nevada, June 18.
- U.S. Environmental Protection Agency, Life Cycle Analyses for Fuel Cells Meeting, Cincinnati, Ohio, June 26.
- Capstone Turbines, Information Technology Meeting, Chatsworth, California, July 10.
- PennWell Corporation, Fuel Cell Technology Institute, Irvine, California, July 16-17.[IL, SC]
- Zero Emission Vehicle – Network Enabled Transportation, Station Car Summit, Irvine, California, July 19.[SC]
- Universities for Fuel Cells, Materials Workshop, Irvine, California, August 7.[SC]
- California Stationary Fuel Cell Collaborative, Demonstration Subcommittee, Sacramento, California, August 16.
- U.S. Department of Energy, U.S. China Clean Energy Technology Conference, Beijing, China, August 29.[IL]
- California Fuel Cell Partnership, Education and Outreach Meeting, Los Angeles, California, October 1.
- Sandia National Laboratories, Information Technology for DER, Albuquerque, New Mexico, October 11.
- International Association of Electrical Inspectors, Distributed Generation Meeting, Pheonix, Arizona, October 25.[IL]
- California Alliance for Distributed Energy Resources, Annual DER Meeting, San Diego, California, November 2.
- Solid State Energy Conversion Alliance, Core Technology Program Meeting, Pittsburgh, Pennsylvania, November 16.
- Pacific Rim Consortium on Energy Combustion and the Environment, California Energy and Transportation Issues, Kyoto, Japan, November 28.
- California Stationary Fuel Cell Collaborative, Fuel Cell Siting Meeting, Sacramento, California, December 6.

2002:

- Nu Element, Incorporated, Boeing Meeting, Renton, Washington, January 10.
- Calpine Corporation, CEO and Managers Retreat, January 16.
- California Stationary Fuel Cell Collaborative, Fuel Cell Siting and Training, Sacramento, California, January 29.
- International Colloquium on Environmentally Preferred Advanced Generation, Annual Colloquium, Tutorial, Newport Beach, California, February 9.[SC]
- Siemens Westinghouse Power Corporation, Pittsburgh, Pennsylvania, February 13.

- Air Products, Incorporated, Allentown, Pennsylvania, February 14.
- Fuel Cell Center Coordination Committee, Technical NFCRC update, Fairbanks, Alaska, March 5.
- Hawaiian Electric Company, Boeing and Nu Element Program Meeting, Honolulu, Hawaii, March 15.
- Solid State Energy Conversion Alliance, Program Review Meeting, Washington, D.C., March 22.
- California Stationary Fuel Cell Collaborative, Demonstration Committee Meeting, Sacramento, California, March 26.
- The Boeing Company, Aerospace Vehicle Systems Institute meeting, Seattle, Washington, April 23.
- Catalytica Energy Systems Incorporated, Fuel Cell Reformer Market Study, Mountain View, California, May 9.
- Allergan Energy Managers – Worldwide, Irvine, California, May 16.
- California Energy Commission, Air Quality Impacts of Distributed Generation Kitchen Cabinet Meeting, Diamond Bar, California, May 23.
- PennWell Corporation, Fuel Cell Technology Institute, Irvine, California, June 25.[SC]
- The Boeing Company, Fuel Cell Aerospace Applications Workshop, Seattle, Washington, July 9.[IL]
- Discovery Center for Science and Technology, Fund Raiser for Corporate Sponsors, Thousand Oaks, California, July 18.[IL]
- California Energy Commission, Critical Project Review, Steady State and Dynamic Modeling of Fuel Cell and Hybrid Systems, Sacramento, California, July 31.
- California Energy Commission, Air Quality Impacts of Distributed Generation Kitchen Cabinet Meeting, Diamond Bar, California, August 7.
- Universities for Fuel Cells, Power Electronics Workshop, Irvine, California, August 8.[SC]
- Electric Power Research Institute, Hybrid Workshop, Palo Alto, California, September 5.
- Distributed Generation Air Quality Workshop, NFCRC Multifunctional Room, Irvine, California, September 19.
- National Academy of Engineering, Frontiers of Engineering, Irvine, California, September 21.[IL]
- ChevronTexaco, California Stationary Fuel Cell Collaborative meeting, San Ramon, California, October 2.
- F-Cell Symposium, Stuttgart, Germany, October 15.[IL]
- California Energy Commission, Public Interest Energy Research Program Review, Sacramento, California, October 31.
- Association of Energy Engineers, McDonnell Douglas Auditorium, Irvine, California, November 14.[IL]
- Fuel Cell Seminar Organizing Committee, Fuel Cell Short Course, Convention Center, Palm Springs, California, November 18.[IL, SC]
- Fuel Cell Seminar, Poster Presentation #230, Convention Center, Palm Springs, California, November 21.
- Solid Oxide Commercialization Association, Hilton Hotel, Palm Springs, California, November 22.
- Pacific Rim Consortium on Energy Combustion and the Environment, Hydrogen Economy, Hong Kong, China, December 14.
- California Energy Commission, Air Quality Impacts of Distributed Generation, Sacramento, California, December 18.

2003:

- American Society of Heating, Refrigerating, and Air-Conditioning Engineers, San Diego, California, January 14.[IL]
- International Association of Science and Technology for Development, Power and Energy Systems, PES 2003, Palm Springs, California, February 24-26, 2003.[IL]
- Distributed Generation Air Quality Workshop, NFCRC Multifunctional Room, Irvine, California, May 17.
- Fuel Cell Technology Institute, Irvine, California, June 24.[SC]
- National Energy Technology Laboratory, Vision 21 and Hybrid Review Meeting, Pittsburgh, Pennsylvania, July 2.
- U.S. Department of Energy, Hybrid Planning Meeting, Pittsburgh, Pennsylvania, July 29.[IL]
- California Stationary Fuel Cell Collaborative, Industrial Meeting, Sacramento, California, September 10.
- California Energy Commission, Air Quality Impacts of DG, NGO Meeting, Sacramento, California, October 8.
- Fuel Cell Seminar Organizing Committee, Fuel Cell Short Course, Miami Beach, Florida, November 3.[IL, SC]
- Fuel Cell Seminar, Poster Presentation #385, Miami Beach, Florida, November 5.
- PowerGen International, PennWell Corporation, Fuel Cell Short Course, Las Vegas, Nevada, December 8. [IL, SC]
- Center for Urban Infrastructure, Hydrogen Tutorial, Alternative Fuels Conference, Costa Mesa, California, December 9. [IL, SC]

2004:

- Dynamic Fuel Processor Simulation, The Boeing Company, Seattle Washington, January 14.
- Military Fuel Processing Dynamics, NAVSEA, Patuxant River, Maryland, March 11.
- Industrial Review Team Meeting, Dynamic Modeling, NFCRC Multifunctional Room, Irvine, California, April 22.[SC]
- 15th Annual National Hydrogen Association Meeting, Hydrogen Storage, Hollywood, California, April 29.[SC]
- Seoul National University, Mechanical Engineering Seminar, May 11. [IL]
- Korean Aerospace Research Institute, Fuel Cell Gas Turbine Hybrids, May 13. [IL]
- Fuel Cell Technology Institute, Irvine, California, June 21-24.[SC]
- International Colloquium on Environmentally Preferred Advanced Generation, Annual Colloquium, Tutorial, Irvine, California, September 21.[SC]
- Fuel Cell Seminar Organizing Committee, Fuel Cell Short Course, San Antonio, Texas, November 1.[IL, SC]
- Shibaura Institute of Technology, International Fuel Cell Hybrid Workshop, October 23-24. [IL]
- Fuel Cell Seminar, Fuel Cell Vehicle Oral Presentation, San Antonio, Texas, November 4.
- National Academy of Engineering, Washington, D.C., November 10.[IL]

2005:

- Annex 42 of the International Energy Agency on Fuel Cells for Co-Generation, Liege, Belgium, April 12. [IL]

- California Energy Commission Combined Heating and Power Workshop, Sacramento, California, April 28.
- U.S. DOE Clean Cities Conference, Palm Springs, California, May 4.[IL, SC]
- Fuel Cell Technology Institute, Palm Springs, California, May 5.[SC]
- Pratt and Whitney, Fuel Processing for Aerospace Applications, Hartford, Connecticut, May 11.
- Chancellor's CEO Roundtable, Jackson Hole, Wyoming, May 13.[IL]
- ASME Fuel Cell Science, Engineering and Technology Conference, Hydrogen Co-Production, Ypsilanti, Michigan, May 23.[SC]
- ASME Fuel Cell Science, Engineering and Technology Conference, Session 4A, Ypsilanti, Michigan, May 24. [SC]
- Fuel Cell Fundamentals, Dayton, Ohio, June 6.[IL,SC]
- DG Air Quality Impacts in the San Joaquin Valley, Fresno, California, June 8.[SC]
- Ecole Polytechnique Federale de Lausanne, June 14.[IL]
- Media Hydrogen Presentation, California Fuel Cell Partnership, Los Angeles, California, September 1.[IL]
- International Colloquium on Environmentally Preferred Advanced Generation, Annual Colloquium, Tutorial, Irvine, California, September 6.[SC]
- International Colloquium on Environmentally Preferred Advanced Generation, Hybrid Fuel Cell Systems, Irvine, California, September 7.[SC]
- Fuel Cell Seminar Organizing Committee, Fuel Cell Fundamentals Short Course, Palm Springs, California, November 14.[IL, SC]

2006:

- Fuel Cell Dynamic Modeling Short Course, U.S. Army Corps of Engineers, Champaign-Urbana, Illinois, January 10-11. [IL, SC]
- California Energy Commission, Dynamic Fuel Cell Systems Modeling, Sacramento, California, January 31. [IL]
- New Mexico Hydrogen Business Council, Santa Fe, New Mexico, February 24. [IL]
- Ohio Fuel Cell Manufacturing Short Course, Edison Materials Technology Center, Dayton, Ohio, March 2. [IL, SC]
- National Hydrogen Association Meeting presentation, Long Beach, California, March 13.
- International Gas Turbine Institute Meeting, research presentation, Barcelona, Spain, May 8.
- ASME Fuel Cell Science, Engineering and Technology Conference, Session 2-1, Irvine, California, June 19.[SC]
- ASME Fuel Cell Science, Engineering and Technology Conference, Session 2-10, Irvine, California, June 21. [SC]
- ASME Fuel Cell Science, Engineering and Technology Conference, High Temperature Fuel Cell Dynamic Simulation and Control, Irvine, California, June 21.
- Air Quality Impacts of Distributed Generation, Kitchen Cabinet Meeting Presentation, Sacramento, California, July 11.
- Hydrogen and Fuel Cell Short Course, bTEC, Barcelona, Spain, July 24.[IL, SC]
- ASME International Colloquium on Environmentally Preferred Advanced Generation, Annual Colloquium, Hybrid Systems Tutorial, Irvine, California, September 5.[IL, SC]

- ASME International Colloquium on Environmentally Preferred Advanced Generation, Modeling and Simulation, Irvine, California, September 8.[SC]
- Annex 42 of the International Energy Agency on Fuel Cells for Co-Generation, NIST, Gaithersburg, Maryland, September 19.[IL]
- Electricity and Air Quality Conference, California Energy Commission, Sacramento, California, October 4.[IL]
- California Hydrogen Highway Network, Governor's Independent Advisory Panel, October 12.[IL]
- California Stationary Fuel Cell Collaborative Meeting, Technical Committee Presentation, October 24.[SC]
- 2006 ASME International Mechanical Engineering Congress and Exhibition (IMECE), Fuel Cell Technology, Chicago, Illinois, November 6.[SC]
- Fuel Cell Seminar Organizing Committee, Fuel Cell Fundamentals Short Course, Honolulu, Hawaii, November 13.[IL, SC]

2007:

- Electric Utility Environment Conference, Air Quality Impacts of Future Vehicle Types, Tucson, Arizona, January 24.[IL]
- Annex 42 of the International Energy Agency on Fuel Cells for Co-Generation, University of Wales, Cardiff, Wales, March 20.[IL]
- Advanced Brayton Cycles Project Update, U.S. Department of Energy, Morgantown, West Virginia, May 30.[IL]
- DG Air Quality Impacts in the San Joaquin Valley, Stakeholder Workshop, Fresno, California, April 24.[SC]
- SOFC-X International Conference, Nara, Japan, June 6.
- ASME Fuel Cell Science, Engineering and Technology Conference, Session 2-10, Brooklyn, New York, June 18.[SC]
- ASME Fuel Cell Science, Engineering and Technology Conference, High Temperature Fuel Cell Dynamic Simulation and Control, Brooklyn, New York, June 19.
- California Stationary Fuel Cell Collaborative Core Group, Sacramento, California, July 10.
- Boeing, Argonne National Lab, Nu Element Meeting, Seattle Washington, July 19.
- Membrane Electrode Assembly Manufacturing Forum, half-day short course, Dayton, Ohio, August 21.[IL,SC]
- National Energy Technology Laboratory, SOFC Modeling Meeting, Morgantown, West Virginia, August 27-28.[IL]
- Fuel Cell Seminar Organizing Committee, Fuel Cell Fundamentals Short Course, San Antonio, Texas, October 15.[IL, SC]
- Annex 42 of the International Energy Agency on Fuel Cells for Co-Generation, University of Porsgrunn, Norway, October 23-25.[IL]
- California Stationary Fuel Cell Collaborative, Industry Advisory Panel, Sacramento, California, November 1.
- ASME International Mechanical Engineering Congress and Exhibition, Seattle, Washington, November 13.[SC]
- University of California, Davis, Nuclear Magnetic Resonance Facility, Sacramento, California, December 14.[IL]

- California Hydrogen Business Council, Torrance, California, December 18.[IL]

2008:

- ASME International Colloquium on Environmentally Preferred Advanced Generation, Annual Colloquium, Hybrid Systems Tutorial, Newport Beach, California, January 28.[IL, SC]
- ASME International Colloquium on Environmentally Preferred Advanced Generation, Large Fuel Cells and Hybrid Systems, Newport Beach, California, September 8.[SC]
- California Energy Commission, Air Quality Workshop, Sacramento, California, March 5.[IL,SC]
- Seattle-Tacoma Port Authority, Airport Greenhouse Gas Reduction Workshop, Seattle, Washington, March 25.[IL]
- California Stationary Fuel Cell Collaborative, Industry Advisory Panel, Sacramento, California, April 3.
- Ohio Sustainable Energy Short Course, Edison Materials Technology Center, Dayton, Ohio, April 30.[IL, SC]
- Energy Symposium Fuel Cell Tutorial, The New Majority, Newport Beach, California, May 13.[IL]
- The Electrochemical Society, Annual Meeting, Phoenix, Arizona, May 20.
- ASME Fuel Cell Science, Engineering and Technology Conference, Session Chair, Denver, Colorado, June 17.[SC]
- ASME Fuel Cell Science, Engineering and Technology Conference, SOFC Dynamic Modeling, Denver, Colorado, June 18.
- National Transportation Safety and Emissions Laboratory, Plug-in Hybrid Electric Vehicle Presentation, Tokyo, Japan, July 30.[IL]
- California Energy Commission, Fuel Cell Research and Development Roadmap Workshop, Irvine, California, August 27.[SC]
- Renewable Energy 2008, Busan, South Korea, October 15.[IL]
- Korea Institute of Science and Technology, Seoul, South Korea, Seminar, October 16.[IL]
- Seoul National University, Seoul, South Korea, Mechnical Engineering Department Seminar, October 17.[IL]
- H2 Expo, Invited Plenary Lecturer, Hamburg, Germany, October 22.[IL]
- H2 Expo, Dynamic Simulation of Fuel Cells, Hamburg, Germany, October 23.
- Fuel Cell Seminar Organizing Committee, Fuel Cell Fundamentals Short Course, Phoenix, Arizona, October 27.[IL, SC]
- California Stationary Fuel Cell Collaborative, Industry Advisory Panel, Sacramento, California, November 18.
- Sandia National Laboratories, Invited Lecture, Albuquerque, New Mexico, November 20.[IL]

2009:

- Atmospheric Integrated Research for Understanding Chemistry at Interfaces (AirUCI), presentation at annual review meeting, Laguna Beach, California, January 27.[IL]
- Net Zero Energy Conference, Engineer Research and Development Center, Construction Engineering Research Laboratory, Colorado Springs, Colorado, February 3.[IL, SC]
- ASME International Colloquium on Environmentally Preferred Advanced Generation, Annual Colloquium, Large Fuel Cells, Newport Beach, California, Feburary 10-12.[IL, SC]
- Renewable Reversible Solar Fuel Cell Project, Joint Forces Training Base, Los Alamitos,

California, March 3.

- U.S. Department of Energy, Solid Oxide Fuel Cell Modeling Meeting, Pacific Northwest National Laboratory, Richmond, Washington, April 7-8. *IL, SC*
- California Stationary Fuel Cell Collaborative Meeting, Technology Hurdles Presentation, May 12.
- ASME 7th International Fuel Cell Science, Engineering and Technology Conference, Newport Beach, California, June 8-10.*SC*
- High Temperature Fuel Cell Hydrogen Co-Production Workshop, co-organized with the National Renewable Energy Laboratory, Irvine, California, June 11.*IL,SC*
- Solid State Energy Conversion Alliance, Annual Meeting, Solid Oxide Fuel Cell Model presentation, July 14. *IL*
- Integrated Energy Policy Report Workshop, Air Quality Impacts of Distributed Generation, California Energy Commission, August 10. *IL*
- Grove Fuel Cell Symposium, Potential Roles for Fuel Cells in the More Sustainable Energy Future, London, England, September 23. *IL*
- Fuel Cell Seminar Organizing Committee, Fuel Cell Fundamentals Short Course, Palm Springs, California, November 16.*IL, SC*
- Fuel Cell Seminar Organizing Committee, Biogas Panel Presentation and Discussion, Palm Springs, California, November 19.*IL*
- Southern California Edison, Agricultural Technology Applications Center (AGTAC), Biogas Operation of Fuel Cells, December 1. *IL*

2010:

- ASME International Colloquium on Environmentally Preferred Advanced Generation, Annual Colloquium, Large Fuel Cells, Newport Beach, California, Feburary 9-11.*IL, SC*
- University of Birmingham, High Efficiency IGFC, SOFC, and Fuel Cell Vehicle lecture series, Birmingham, United Kingdom, March 23-24. *IL, SC*
- Hydrogen and Fuel Cells for Clean Cities, Smart Energy and Power for California (and the World), Birmingham, United Kingdom, March 25.*IL*
- Orange County Sanitation District, Air Products and Chemicals, Inc. Project Kick-off Meeting, Poly-Generation Technology and Measurements, Fountain Valley, California, April 19. *IL*
- Renewable Hydrogen Workshop, Introduction to High Temperature Fuel Cell Poly-Generation, Long Beach, California, May 3.*IL*
- California Stationary Fuel Cell Collaborative, Industry Advisory Panel, Sacramento, California, May 11.
- National Energy Technology Laboratory, Low Emission Advanced Power (LEAP) Workshop, Dynamic hybrid fuel cell gas turbine systems simulation, Morgantown, West Virginia, July 21-22.*IL*
- International Conference for the Integration of Science and Technology into Society (ICISTS), Smart Energy and Power, KAIST, Daejeon, Korea July 27.*IL*
- CARE Foundation, Supporting all Capistrano Area Schools, San Onofre Nuclear Generating Station Energy Summit, Renewable Energy Presentation, October 30.*IL*
- Fuel Cell Seminar Organizing Committee, Fuel Cell Fundamentals Short Course, San Antonio, Texas, October 18.*IL, SC*
- Fuel Cell Seminar Organizing Committee, Renewable Fuel Workshop, San Antonio, Texas, October 18.*IL*

- California Stationary Fuel Cell Collaborative, Industry Advisory Panel, Sacramento, California, October 26.
- California Institute for Telecommunications and Information Technology (CalIT2), Igniting Technology event, Smart Grid presentation, Irvine, California, November 10.[IL]
- U.S. National Academies, US-Iran Workshop on Challenges in the Development of Solar Energy, Irvine, California, November 12.[IL]

Short Courses with Detailed Course Materials (1-2 days of instruction):

1. Brouwer, J., ICEPAG Fuel Cell Short Course, International Colloquium on Environmentally Preferred Advanced Generation, March 21, 1999.
2. Brouwer, J., "Fuel Cell Fundamentals, Fuel Cell Types, and recent Advances in Solid Oxide Fuel Cell Technology," Minnesota Fuel Cell Workshop, presented with the United States Fuel Cell Council, August 3, 1999.
3. Brouwer, J., University of Hawaii Fuel Cell Short Course, presented with the United States Fuel Cell Council, December 15, 1999.
4. Brouwer, J., ICEPAG Fuel Cell Short Course, International Colloquium on Environmentally Preferred Advanced Generation, April 4, 2000.
5. Brouwer, J., Solid Oxide Fuel Cell Instructional Course, Solid State Energy Conversion Alliance, Baltimore Workshop, U.S. Department of Energy, Morgantown, West Virginia, June 1-2, 2000.
6. Brouwer, J. and McDonell, V.G., Distributed Generation Short Course, Sponsored by City of Santa Monica, and Constructive Technologies Group, Santa Monica, California, October 10, 2000.
7. Brouwer, J., Samuelsen, G.S., Williams, M.C., and Binder, M.J., Fuel Cell Technology, Accomplishments and Impacts, The Hong Kong Polytechnic University, November 13-14, 2000.
8. Brouwer, J., Parker Hannifin Fuel Cell Short Course, at Racor Division, Merced, California, February 20, 2001.
9. Brouwer, J., ICEPAG Fuel Cell Short Course, International Colloquium on Environmentally Preferred Advanced Generation, May 23, 2001.
10. Brouwer, J., Fuel Cell Fundamentals, Fuel Cell Technology Institute, for Power Gen Publisher Pennwell Corporation, July 16-17, 2001.
11. Brouwer, J., ICEPAG Fuel Cell Short Course, International Colloquium on Environmentally Preferred Advanced Generation, February 7, 2002.
12. Brouwer, J., and McDonell, V.G., ICEPAG Distributed Generation Short Course, International Colloquium on Environmentally Preferred Advanced Generation, February 10, 2002.
13. Brouwer, J., Fuel Cell Fundamentals, Fuel Cell Technology Institute, for Power Gen Publisher Pennwell Corporation, June 24-25, 2002.
14. Brouwer J., "Fuel Cell Fundamentals and Fuel Cell Technology for Portable Power Applications," 2002 Fuel Cell Seminar, for the Fuel Cell Seminar Organizing Committee, Palm Springs, California, November 18, 2002.
15. Brouwer, J., Fuel Cell Fundamentals and Technology, for Power Gen Publisher Pennwell Corporation, June 24-25, 2002.
16. Brouwer, J., Fuel Cell Fundamentals and Transportation Technology, Fuel Cell Technology Institute, National Fuel Cell Research Center, June 24-25, 2003.

17. Brouwer, J., "Fuel Cell Fundamentals, Fuel Cell Types and Fuel Cell Systems Components," 2003 Fuel Cell Seminar, for the Fuel Cell Seminar Organizing Committee, Miami Beach, Florida, November 3, 2003.
18. Brouwer, J., "Fuel Cell Fundamentals, Fuel Cell Types and Fuel Cell Systems Components," PowerGen Meeting, for PennWell Corporation, Las Vegas, Nevada, December 8, 2003.
19. Brouwer, J., "Fuel Cell Fundamentals and Hybrid Fuel Cell Gas Turbine Technology," Fuel Cell Technology Institute, National Fuel Cell Research Center, Irvine, California, June 21-24, 2004.
20. Brouwer, J., and Rao, A.D., ICEPAG Hybrid Fuel Cell Short Course, International Colloquium on Environmentally Preferred Advanced Generation, September 20, 2004.
21. Brouwer, J., "Fuel Cell Fundamentals and Analysis Technology," 2004 Fuel Cell Seminar, for the Fuel Cell Seminar Organizing Committee, San Antonio, Texas, November 1, 2004.
22. Brouwer, J. Meacham, J.R., and Roberts, R.A., "Simulink Short Course," U.S. Army Corps of Engineers, Irvine, California, January 18-21, 2005.
23. Brouwer, J. Rao, A.D., Samuelsen, G.S., and others "Fuel Cell Technology and Applications," U.S. Department of Energy, Short Course for Chinese Nationals, Irvine, California, March 7-11, 2005.
24. Brouwer, J. "Fundamentals of Fuel Cell Technology," Edison Materials Technology Center, Dayton, Ohio, June 6, 2005.
25. Brouwer, J., Fuel Cell Fundamentals and Hybrid Fuel Cell Gas Turbine Technology, Fuel Cell Technology Institute, National Fuel Cell Research Center, Palm Springs, May 5-6, 2005.
26. Brouwer, J., "Hybrid Fuel Cell Technology Short Course," International Colloquium on Environmentally Preferred Advanced Generation, ICEPAG-2005, Irvine, California, September 6, 2005.
27. Brouwer, J., "Fuel Cell Fundamentals and Technology," 2005 Fuel Cell Seminar, for the Fuel Cell Seminar Organizing Committee, Palm Springs, California, November 14, 2005.
28. Brouwer, J. Mueller, F., and Brown, T.M., "Dynamic Fuel Cell Modeling Short Course," U.S. Army Corps of Engineers, Champaign-Urbana, Illinois, January 10-11, 2006.
29. Brouwer, J., and Zawodzinski, T., "Ohio Fuel Cell Manufacturing Short Course," Edison Materials Technology Center, Dayton, Ohio, March 2, 2006.
30. Brouwer, J., and Medrano, M., "Hydrogen and Fuel Cell Short Course," bTEC, 22 Abroba, Barcelona, Spain, July 24, 2006.
31. Brouwer, J., "Hybrid Fuel Cell Technology Short Course," International Colloquium on Environmentally Preferred Advanced Generation, ICEPAG-2006, Irvine, California, September 5, 2006.
32. Brouwer, J., "Fuel Cell Fundamentals and Technology," 2006 Fuel Cell Seminar, for the Fuel Cell Seminar Organizing Committee, Honolulu, Hawaii, November 13, 2006.
33. Brouwer, J. "Membrane Electrode Assembly Manufacturing Forum," half-day short course, Edison Materials Technology Center, Dayton, Ohio, August 21, 2007.
34. Brouwer, J., "Fuel Cell Fundamentals and Technology," 2007 Fuel Cell Seminar, for the Fuel Cell Seminar Organizing Committee, San Antonio, Texas, October 15, 2007.
35. Brouwer, J., "Hybrid Fuel Cell Technology Short Course," International Colloquium on Environmentally Preferred Advanced Generation, ICEPAG-2008, Newport Beach, California, January 28, 2008.

36. Brouwer, J. “Sustainable Energy Technologies,” half-day short course, Edison Materials Technology Center, Dayton, Ohio, April 30, 2008.
37. Brouwer, J., “Fuel Cell Fundamentals and Technology,” 2008 Fuel Cell Seminar, for the Fuel Cell Seminar Organizing Committee, Phoenix, Arizona, October 27, 2008.
38. Brouwer, J., “Hybrid Fuel Cell Technology Short Course,” International Colloquium on Environmentally Preferred Advanced Generation, ICEPAG-2009, Newport Beach, California, February 9, 2009.
39. Brouwer, J. “Introduction to Energy Storage for Alternative Energy,” half-day short course, Edison Materials Technology Center, Dayton, Ohio, April 29, 2009.
40. Brouwer, J., “Fuel Cell Fundamentals and Technology,” 2009 Fuel Cell Seminar, for the Fuel Cell Seminar Organizing Committee, Palm Springs, California, November 16, 2009.
41. Brouwer, J., “Hybrid Fuel Cell Technology Short Course,” International Colloquium on Environmentally Preferred Advanced Generation, ICEPAG-2010, Costa Mesa, California, February 8, 2010.
42. Brouwer, J. “Introduction to the Smart Grid and Related Alternative Energy Techhnology,” half-day short course, Edison Materials Technology Center, Dayton, Ohio, October 7, 2010.
43. Brouwer, J., “Fuel Cell Fundamentals and Technology,” 2010 Fuel Cell Seminar, for the Fuel Cell Seminar Organizing Committee, San Antonio, Texas, October 18, 2010.

Consulting Activities

C & C Technologies, Inc., 2010
Phoenix Analysis and Design Technologies, 2006-2007
Fuel Cell Seminar, Organizing Committee, 2006-2007
Edison Materials Technology Center, 2005-2007
Norwest Venture Partners, 2005-2008, 2009
b_TEC, 2006
Nanyang Technical University, Singapore, 2006
Honeywell, 2004-2005
Propane Education and Research Council, 2004-2005
ChevronTexaco, 2002-2005
CEA Associates, 2003-2004
The Boeing Company, 2001-2003
Parker Hannifin Corporation, 2000-2002
Nu Element, Incorporated, 2001-present
CH2M Hill, Incorporated, 1999-2000
Praxair, Incorporated, 1996-1997
John Zink Company, 1996
United Technologies Research Corporation, 1995-1997
Geneva Steel Company, 1996
Foster Wheeler Corporation, 1995-1996
Electric Power Research Institute, 1995
Hercules, Incorporated, 1995

Honors and Awards

International Who’s Who of Professionals, Honored Member, 2006
National Academy of Engineering, Invited Lecturer, 2004
Member, Sigma Xi Scientific Research Society, 1992

Summer Internship Award, Sandia National Laboratories, 1991
U.C. Regents Fellowship Recipient, 1987-1988
Summa Cum Laude, 1987
Member, Tau Beta Pi Association, 1986

Professional Association Memberships

American Society of Mechanical Engineers, current
American Institute of Aeronautics and Astronautics, current
Member-At-Large, Western States Section, Combustion Institute, 1995-1999

Professional Service and Activities

Editorial Board:

ASME Journal of Fuel Cell Science and Technology – Associate Editor

Reviewer:

ASME Journal of Engineering for Gas Turbines and Power (1999-present)
Energy Institute, University of California (2000-present)
Energy Innovations Small Grant Program (2001-present)
International Association of Science and Technology for Development (2001)
Journal of Power Sources (2002-present)
U.S. Department of Energy (2003-present)
South Coast Air Quality Management District (2003-present)
International Journal of Hydrogen Energy (2003-present)
ASME Journal of Fuel Cell Science and Technology (2004-present)
California Energy Commission, Public Interest Energy Research Program (2004-present)
U.S. Department of Defense Fuel Cell Program (2003-present)
Ecole Polytechnique Federale de Lausanne, External Thesis Examiner (2005, 2010)
Journal of Physics, Part D (2006-present)
University of Canterbury, Christchurch, New Zealand, External Thesis Examiner (2007)
Stanford, Global Climate and Energy Project (2010)

Session Chair:

International Colloquium on Environmentally Preferred Advanced Generation (1998, 1999, 2000, 2002, 2003, 2004, 2005, 2006, 2008, 2009, 2010)
Universities for Fuel Cells, Power Electronics Meeting (2002)
Universities for Fuel Cells, Fuel Cell Controls (2003)
United Nations/U.S. Department of Energy Hybrid Meeting (2001-2002)
Fuel Cell Technology Institute (2001, 2002, 2003, 2004, 2005)
Universities for Fuel Cells, Materials Meeting (2001)
California Stationary Fuel Cell Collaborative bi-annual meeting (2002-present)
National Hydrogen Association, 15th Annual Meeting (2004)
Association of Energy Engineers, World Energy Management Congress (2004)
ASME Fuel Cell Science, Engineering and Technology Conference (2005, 2006, 2007, 2008, 2009, 2010)
U.S. Department of Energy, Clean Cities Meeting (2005)
ASME International Mechanical Engineering Congress and Exposition (IMECE) (2006, 2007, 2008)
Fuel Cell Seminar (2007, 2008. 2009, 2010)

Conference Organizer:

International Colloquium on Environmentally Preferred Advanced Generation (1998, 1999, 2000, 2002, 2003, 2004, 2005, 2006, 2008, 2009, 2010)
Fuel Cell Technology Institute (2001, 2002, 2003, 2004, 2005, 2006)
Universities for Fuel Cells, Power Electronics Meeting (2002)
Universities for Fuel Cells, Fuel Cell Controls (2003)
U.S. DOE Fuel Cell Short Course for Chinese Nationals (2004)
ASME Fuel Cell Science, Engineering & Technology Conference (2005, 2006, 2007, 2008, 2009, 2010)

Ph.D. Students Co-Advised

Student Name	Research Topic	Primary Advisor(s)	Current Position
John M. Veranth	Measurement of Soot and Char in Pulverized Coal Fly-Ash	David Pershing	Univ. of Utah
Jennifer Spinti	Formation of NOx During Char Oxidation	David Pershing	Univ. of Utah
Rory A. Roberts	Dynamic Simulation and Control of Hybrid Fuel Cell Gas Turbine Systems	G. Scott Samuelsen	Rolls Royce Fuel Cell Systems
Shannon C. Page	Novel Passive Health Monitoring Technique for Proton Exchange Membrane Fuel Cells	Susan Krumdiek	University of Canterbury, New Zealand
Yaofan Yi	Solid Oxide Fuel Cell Fuel Flexibility	G. Scott Samuelsen	Chevron
Marc Carreras	Simulation of the Air Quality Impacts of Distributed Generation	Donald Dabdub	Post-Doc, U.C. Irvine
Satish Vutukuru	Air Quality Impacts of Distributed Generation in the San Joaquin Valley	Donald Dabdub	IFC International
Joseph W. Pratt	High Altitude Performance of Fuel Cells	G. Scott Samuelsen	Assistant Prof. U. of Michigan
Timothy M. Brown	Dynamic Simulation of Metal Hydride Hydrogen Storage	G. Scott Samuelsen	Senior Research Engr., APEP
Thomas S. Pine	New Integrated Materials Sets for Reversible Solid Oxide Fuel Cells	Daniel R. Mumm	Cogent Energy
James D. Maclay	Gas Turbine Dynamics in Hybrid Fuel Cell Applications	G. Scott Samuelsen	LPA, Inc.
Fabian Mueller	Solid Oxide Fuel Cell Systems Dynamics and Controls Development	G. Scott Samuelsen	Senior Research Engr., APEP
Andrew S. Martinez	Metal oxide electrode-electrolyte interface structure and performance modeling	G. Scott Samuelsen	Ph.D. Candidate, U.C. Irvine
Anh Duong	Triple phase boundary physics, chemistry & electrochemistry	Daniel R. Mumm	Ph.D. Candidate, U.C. Irvine
Grace Y. Qin	Novel intermediate temperature reversible solid oxide fuel cell cathode materials	Daniel R. Mumm	TBD
Allie E. Auld	Utility grid distributed generator interconnectivity, inversion, controls and power electronics	G. Scott Samuelsen	Post-doctoral researcher, U.C. Irvine

Li Zhao	Development of a novel anode-supported solid oxide fuel cell for intermediate temperature operation	G. Scott Samuelsen	Ph.D. Candidate, U.C. Irvine
Mu Li	Development of a detailed steady state model for solid oxide fuel cells and stack configurations	G. Scott Samuelsen	Ph.D. Candidate, U.C. Irvine
Pere Margalef-Valldeperez	High Temperature Fuel Cell Poly-Generation of Power, Heating, Cooling and Hydrogen	G. Scott Samuelsen	Ph.D. Candidate, U.C. Irvine
Anh-Tuan Do	Novel Solid Oxide Fuel Cell Cathode Materials for Combined Cooling Heating and Power Applications	G. Scott Samuelsen	Ph.D. Candidate, U.C. Irvine
Baoduo Jin	Dynamic Modeling of Building Integrated Combined Cooling Heating and Power Systems	G. Scott Samuelsen	Ph.D. Candidate, U.C. Irvine
Dustin F. McLarty	Hybrid Fuel Cell Gas Turbine Systems Integration, Dynamic Simulation and Control	G. Scott Samuelsen	Ph.D. Candidate, U.C. Irvine

M.S. Students Co-Advised

Student Name	Research Topic	Primary Advisor(s)	Current Position
James D. Maclay	Renewable Reversible Hydrogen Fuel Cell Technology	G. Scott Samuelsen	LPA, Associates
James R. Meacham	Integration of Fuel Cells in the Commercial Building Environment	G. Scott Samuelsen	CTG Energetics
Fabian Mueller	Solid Oxide Fuel Cell System Controls Development for Rapid Dynamic Response	G. Scott Samuelsen	Senior Scientist, APEP, UCI
Tomohiko Kaneko	Small-Scale Hybrid Fuel Cell Gas Turbine Engine Dynamic Models	T. Kaneko	Toyota
Joseph W. Pratt	Experimental Evaluation and Computer Simulation of a PEM Fuel Cell at High-Altitude	G. Scott Samuelsen	Sandia National Laboratories
William C. Livingood	Information Technology for Remote Monitoring of Fuel Cells	G. Scott Samuelsen	General Electric
William J. Skrivan	Parametric Testing and Analysis of a 25kW SOFC System	G. Scott Samuelsen	University of British Columbia
Yaofan Yi	Simulation of Hybrid Solid Oxide Fuel Cell/Gas Turbine Systems	G. Scott Samuelsen	Chevron
Craig S. Smugeresky	Transient Modeling of a Tubular Solid Oxide Fuel Cell System	G. Scott Samuelsen	Capstone Turbines
Patrick Lam	Development, Validation and Application of an MCFC Model	G. Scott Samuelsen	General Electric
Thomas P. Smith	Testing of a 220 kW SOFC Gas Turbine Hybrid System	G. Scott Samuelsen	Georgia Tech Ph.D. Candidate

Li Yuan	Dynamic Simulation of Reformers for use in High Temperature Fuel Cells	G. Scott Samuelsen	Toyota Motor Sales
Joan E. Morrison	Pressure Swing Absorption Dynamics for High Temperature Fuel Cell Hydrogen Co-Production	G. Scott Samuelsen	LynnTech
Yusuke Kuniba	Development and Analysis of Load-Following SOFC/GT Hybrid System Control Strategies for Commercial Building Applications	G. Scott Samuelsen	Okinawa Power Corporation
Allie E. Auld	Power Electronics Applications for Model Citizen Grid Connection of Distributed Generation	Keyue M. Smedley	U.C. Irvine Ph.D. program
Robert Gaynor	Dynamic Analysis and Control of Solid Oxide Fuel Cell Systems for Cogeneration in the Built Environment	G. Scott Samuelsen	Cogent Energy
Anh-Tuan V. Do	Novel synthesis and manufacturing of solid oxide materials sets for intermediate temperature solid oxide fuel cells	Daniel R. Mumm	U.C. Irvine Ph.D. program
Joshua D. Eichman	California fuel cell research and development planning	G. Scott Samuelsen	U.C. Irvine, Ph.D. program
Lucas A. White	The Performance and Degradation of a PEMFC Stack Operating on Purity Compromised Hydrogen Streams	G. Scott Samuelsen	Air Products and Chemicals, Inc.
Nobuyasu Tajima	Dynamic Modeling of a Direct Methanol Fuel Cell	G. Scott Samuelsen	Toshiba Corporation
Erik Turner	Dynamic Proton Exchange Membrane Fuel Cell System Model Development and Application	G. Scott Samuelsen	TBD
Brendan P. Shaffer	Nodal Solid Oxide Fuel Cell Dynamic Model for Evaluation of Hydrogen Co-Production	G. Scott Samuelsen	Research Engineer, APEP
Dustin F. McLarty	Dynamic Modeling of Hybrid High Temperature Fuel Cell Gas Turbine Systems	G. Scott Samuelsen	U.C. Irvine Ph.D. program
Sarah M. Kelly	Modeling of Absorption Chillers for Integration into the Built Environment	G. Scott Samuelsen	TBD
Bauduo Jin	Dynamic Optimization of a Central Chilling Plant with Thermal Energy Storage	G. Scott Samuelsen	TBD
Chris Hartley	Evaluation and Development of Energy Audit Protocols and Technology for Next-Generation Energy Monitoring	G. Scott Samuelsen	TBD
Roxana Bekemohammadi	High-Temperature Fuel Cell Dynamic Model for On-Demand Poly-Generation of Power, Heat and Hydrogen	G. Scott Samuelsen	TBD
Gia Nguyen	Advanced Optimization and Control Strategiesy for Distributed Energy Systems	G. Scott Samuelsen	TBD

Josh Payne	Smart Grid Primary Circuit Design, Simulation and Control	G. Scott Samuelsen	TBD
Renee Cinar	Smart Grid Secondary Circuit and Community Design, Simulation and Control	G. Scott Samuelsen	TBD
Robert Flores	Optimization and Control of Building Integrated Distributed Energy Resources	G. Scott Samuelsen	TBD

Extramural Funding

Reaction Engineering International/University of Utah (1993-1997):

Source:	Abbreviated Title:	Amount:	Dates:	Role:
U.S. EPA	Phase I SBIR on SNCR	$75K	1993	PI
U.S. EPA	Phase II SBIR on SNCR	$300K	1994-1996	PI
U.S. DOE	High Performance Power System	$600K	1996-2000	Collaborator*
U.S. DOE	Low Emission Boiler System	$1.97M	1996-2001	Co-PI[#]
SERBEP	Wood Reburning	$265K	1995-1999	Collaborator[#]
Praxair	Oxygen Combustion	$125K	1996-1998	PI
John Zink	Flare Combustion	$65K	1996	PI
U.S. DOE	PRDA – Coal Combustion	$333K	1997-2000	Collaborator[#]

* David W. Pershing, PI

[#] Michael P. Heap, PI

National Fuel Cell Research Center, University of California, Irvine (1997-2010):

Source:	Abbreviated Title:	Amount:	Dates:	Role:
CEC	Renewable Air Quality Impacts	$499K	2010-2013	AI[§]
CEC	Renewable Energy Secure Comm.	$949K	2010-2013	AI[§]
U.S. Army	Net Zero Energy Installations	$367K	2010-2013	PI
Plug Power	GenSys Blue Dynamics	$295K	2010-2012	AI[§]
CEC	CCHP Economic Dispatch	$413K	2010-2013	AI[§]
SoCalGas	GenSys Blue Installations	$180K	2010-2012	AI[§]
CEC	Building Energy & Controls	$300K	2010-2013	AI[§]
CEC	Fuel Cell Temp. Control	$75K	2009-2010	PI
U.S. DOE	Building Energy & Controls	$1.24M	2009-2012	AI[§]
U.S. EPA	GHG Air Quality Impacts	$600K	2009-2012	PI
U.S. DOE	Plug Power GenSys Blue	$840K	2009-2011	AI[§]
CARB	Plug-in Hybrid Vehicles	$1.2M	2007-2010	AI[§]
U.S. DOE	Intg'd Gasification Fuel Cell	$480K	2007-2009	AI[§]
U.S. DOE	Advanced Brayton	$150K	2006-2008	AI[§]
Toyota	Future Vehicle Air Quality	$50K	2007	PI
U.S. Army	DoD Fuel Cell Research	$905K	2007-2009	AI[§]
CEC	Fuel Cell RD&D Planning	$220K	2007-2008	AI[§]
Toshiba	Direct Methanol Fuel Cell	$135K	2005-2008	PI
EISG	Proton-conducting ceramics	$75K	2006-2007	PI
UCEI	Reference Governor Control	$35K	2005-2006	Co-PI[*]
Praxair	Pressure Swing Absorption	$43K	2005	PI

Honeywell	Advanced Aerospace Power	$40K	2005	PI
EMTEC	Reversible SOFC Mat'ls	$198K	2005-2006	PI
Nu Element	Micro-channel reformation	$48K	2004-2005	PI
NASA Glenn	Aerospace SOFC	$95K	2004-2006	PI
U.S. DOE	STTR (Fuel Cell Energy)	$225K	2004-2006	AI[§]
CARB	Air Quality & DG	$150K	2005-2006	AI[£]
CEC	San Joaquin Air Quality	$480K	2005-2008	AI[§]
U.S. EPA	National Air Quality – II	$50K	2004-2005	PI
U.S. EPA	National Air Quality – I	$50K	2003-2004	AI[§]
NSF	Information Tech. Research	$1.8M	2002-2004	Collaborator[†]
U.S. DOE	Vision 21	$1.3M	2000-2003	Collaborator[§]
U.S. DOE	Carpe Diem	$125K	2001-2003	AI[§]
U.S. DOE	Legacy	$85K	2001-2003	AI[§]
SCE	Hybrid	$712K	2000-2003	AI[§]
CEC	PVEA Technology Transfer	$210K	1997-1999	AI[§]
CEC	PIER Technology Transfer	$305K	1997-1999	AI[§]
CEC	Steady State Modeling	$306K	2000-2004	AI[§]
CEC	Dynamic Modeling	$498K	2000-2004	AI[§]
NASA Glenn	Boeing APU	$28K	2002-2003	AI[§]
U.S. Army	MCFC Modeling	$279K	1998-2000	AI[§]
U.S Army	DoD Fuel Cell Research	$719K	2002-2004	AI[§]
U.S. Army	DoD Fuel Cell Outreach	$399K	2002-2004	Collaborator[§]
GE-GR	Novel ACR Reformer	$475K	2003-2005	AI[§]
U.S. DOE	STTR (Fuel Cell Energy)	$33K	2002-2003	AI[§]
CEC	DG Air Quality	$699K	2001-2004	AI[£]
SCAQMD	Hydrogen Infrastructure	$677K	2002-2003	Collaborator[§]

AI: Associate Investigator
[§] G. Scott Samuelsen, PI
[*] Faryar Jabbari, Co-PI
[£] Donald Dabdub, PI
[†] Richard N. Taylor, PI

University Course/Curriculum Development

MAE 110 – Combustion and Fuel Cell Systems: Fundamentals of gaseous, liquid, and coal-fired combustion and fuel cell systems. Fuels, fuel-air mixing, aerodynamics, and combustion and fuel cell thermodynamics. Operating and design aspects of practical systems including engines, power generators, boilers, furnaces, and incinerators. (undergraduate level: 4 units, 2 design units)

MAE 117 – Solar and Renewable Energy Systems: Basic principles, design, and operation of solar and other renewable energy systems including solar photo-voltaic, solar thermal, hydroelectric, wind, and biomass gasification and combustion. Includes power generation and storage, and renewable fuels for transportation and stationary power generation. (undergraduate level: 4 units, 1 design unit)

MAE 214 – Fuel Cell Fundamentals and Technology: Fuel-cell systems design, operation, and materials. Electrochemistry and electro-catalysis, cell degradation, nature of fuel-cell electrodes and electrolytes, fuels, and fuel processing. Provides broad insight into fuel-cell science, technology, system design, and operation. (graduate level: 3 units)

University Courses Taught

Lead Instructor:

MAE 110 (2002)
MAE 214 (2005, 2006, 2007, 2008, 2009, 2010)

Co-Instructor:

MAE 214 (2003, 2004)
MAE 190 (2008)

Guest and/or substitute lecturer:

MAE 115 – Applied Engineering Thermodynamics (1999, 2000)
MAE 215 – Advanced Combustion Technology (2001)
MAE 260 – Current Issues Related to Tropospheric and Stratospheric Processes (1999)
EE 190 – Electric Vehicle Propulsion (1999, 2000, 2001, 2002).
CHFEN 3453 – Heat Transfer, University of Utah (1996)
CHFEN 3853 – Chemical Engineering Thermodynamics, University of Utah (1996)

Collaborators and Other Affiliations

Collaborator	Affiliation	Collaborative Activities
Prof. Faryar Jabbari	U.C. Irvine, Mechanical and Aerospace Engineering	Development and application of dynamic simulation capabilities and control system development to fuel cell systems sponsored by the California Energy Commission and U.S. DoD Fuel Cell Program; Joint proposal to the California Energy Commission
Prof. Donald Dabdub	U.C. Irvine, Mechanical and Aerospace Engineering	Investigating air quality impacts of distributed generation sponsored by California Energy Commission; Joint proposals to California Energy Commission, U.S. Environmental Protection Agency
Prof. Daniel R. Mumm	U.C. Irvine, Chemical Engineering and Materials Science	New solid oxide fuel cell materials investigations and metal interconnect oxidation studies sponsored by the U.S. DoD Fuel Cell Program; Joint proposals to: California Energy Commission, U.S. Department of Energy (3), Edison Materials Technology Center
Prof. G. Scott Samuelsen	U.C. Irvine, Mechanical and Aerospace Engineering	Co-Investigator on several research contracts; PI on several projects in which we collaborate; 4 joint proposals to the U.S. DOE; two proposals to U.S. DoD; one proposal to the California Energy Commission; co-supervising several students
Prof. Susan Krumdiek	Univ. of Canterbury, New Zealand, Mechanical Engineering	Novel fuel cell health monitoring technique and dynamic simulation of fuel cells; co-supervised visiting doctoral candidate, Shannon Page
Prof. Keyue Smedley	U.C. Irvine, Electrical and Computer Engr.	Fuel cell and photovoltaic power electronics experiments and joint papers; power quality and monitoring projects
Prof. Kyoungdoug Min	Seoul National University, Korea, Mechanical Engineering	Dynamic simulation of proton exchange membrane fuel cell systems for power generation and transportation applications; support of a one-year sabbatical for Prof. Min

Prof. Akula Venkatram	U.C. Riverside, Mechanical Engineering	Plume dispersion simulation of distributed generation in the vicinity of buildings in a urban setting.
Prof. Falko Kuester	U.C. Irvine, Mechanical and Aerospace Engineering	Joint proposal to California Energy Commission
Prof. Martha Mecartney	U.C. Irvine, Chemical Engineering and Materials Science	Joint proposal to National Science Foundation
Prof. Eric G. Eddings	University of Utah, Chemical Engineering	Joint research on simulation of combustion systems and post combustion NOx control
Prof. Joanne Lighty	University of Utah, Chemical Engineering	Joint research on NASA bio-regenerative system; joint papers and publications
Prof. David W. Pershing	University of Utah; Chemical Engineering	Research on coal combustion, burner design, reburning, and other combustion NOx controls
Prof. Philip J. Smith	University of Utah, Chemical Engineering	Development and application of computational fluid dynamics models
Prof. Adel F. Sarofim	University of Utah, M.I.T., Chemical Engineering	Research on hydrocarbon and chlorocarbon combustion, turbulent mixing, and chemical kinetics
Adj. Assoc. Prof. Vince McDonell	U.C. Irvine, Mechanical and Aerospace Engineering	Joint proposals to the U.S. Department of Energy and National Aerospace and Space Administration; joint Papers on remote monitoring of distributed generation; joint research on chemical kinetics

Community Service and Activities

CARE Foundation, Supporting all Capistrano Area Schools, San Onofre Nuclear Generating Station Energy Summit, Renewable Energy Presentation, October 30, 2010

Christ Lutheran Elementary School, 8th Grade Science Lecture on Fuel Cells and Hydrogen Technology, November 11, 2009.

Christ Lutheran Elementary School, 8th Grade Science Lecture on Alternative Energy, November 26, 2007.

San Joaquin Valley Air Pollution Control District, Stakeholder Workshop on Distributed Generation – April 24, 2007.

Shibaura Institute of Technology, fuel cell tutorial for social science majors – February 22, 2007

Governor's Independent Advisory Panel, California Hydrogen Highway Network – October 12, 2006

Community Forum on Hydrogen and Fuel Cells, La Mina, Barcelona, Spain – July 25, 2006

South Coast Air Quality Management District, Environmental Justice Community Hydrogen and Fuel Cell Tutorial – November 15, 2005

California Fuel Cell Partnership, Media Hydrogen and Fuel Cell Tutorial – September 1, 2005

University Club Lecture Series, Hydrogen and Fuel Cells – February 20, 2005

Young Presidents Organization, Why Hydrogen, Why Now? – October 20, 2004

California State University, Los Angeles, Fuel Cell Introduction – September 9, 2004

Diablo High School, Fuel Cell Lecture – May 19, 2004
Harvey Mudd College, Engineering Student Fuel Cell Lecture and Tour – October 4, 2002
National Academy of Engineering, U.S. Frontiers of Engineering, fuel cell lecture – September 21, 2002
Discovery Center for Science & Technology – invited lecture on fuel cell technology, July 18, 2002
Anaheim Union High School District, Transportation Academy, annual teacher instruction in fuel cells, 1998-present
LA Unified School District, elementary teacher and student instruction in fuel cells, 1999-present
Anaheim High School physics class, fuel cell instruction, March 24, 2000
Mathematics, Engineering, Science Achievement (MESA) Program, annual training institute lecturer on fuel cells, 1999, 2000
Light of Christ Lutheran Church, Irvine, California – Elder, 1998-2000

- Choir Member, soloist/cantor, 1999-present
- Chairman, Board of Outreach, 2001-2003
- Unification Task Force Chair, 2001-2002
- President, 2003-2007
- Elder, 2007-present

Television and Newspaper Appearances/Contributions

Venue:	**Date(s):**
Los Angeles Times	February 19, 1998; February 20, 1998; November 1, 2000; September 17, 2002; December 2, 2002; February 27, 2007; February 25, 2010
Technology Review	September 13, 2006
Fuel Cell Works	August 10, 2006
Fuel Cell Catalyst	April, 2004
National Public Radio	December 2, 2003
CBS News, 48 Hours	November 6, 2003
Orange County Register	February 26, 1998; October 26, 2000; May 10, 2001; May 13, 2002; December 3, 2002;
Ventura County Star (CA)	July 19, 2002
Scientific American	March 2, 2002
Wall Street Journal	July 19, 2001
USA Today	December 10, 2001; June 4, 2002
Popular Science	March 1, 2001; June 1, 2002
Irvine World News	January 21, 2002; November 14, 2002
Hartford Courant (CT)	November 17, 2001
PC Magazine	October 30, 2001
San Jose Mercury News (CA)	October 16, 2001
San Francisco Chronicle (CA)	August 1, 2001
Orange County Business Journal	August 16, 2001
New York Times – April 26, 2001	May 10, 2001
Union Leader (Manchester, NH)	March 12, 2001
Channel 4 News (San Diego NBC Affiliate)	September 27, 2000
TV Tokyo	February 28, 2000
Japan Journal of Environment	October 11, 1998
Japan Times	October 12, 1998
Fortune Magazine	March 30, 1998
Real Orange Television	February 25, 1998