

Curriculum Vitae

WILSON K. S. CHIU

Department of Mechanical Engineering
University of Connecticut

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PERSONAL INFORMATION

Citizenship: United States of America

Marital Status: Married, three children

EDUCATION

Ph.D., Mechanical Engineering, Rutgers University August 1999
Simulation, Design and Optimization of Chemical Vapor Deposition Systems for Advanced Materials
Advisor: Prof. Yogesh Jaluria
Co-Advisor: Prof. Nick G. Glumac

M.S., Mechanical Engineering, Rutgers University January 1997
Heat Transfer in Horizontal and Vertical Chemical Vapor Deposition Reactors
Advisor: Prof. Yogesh Jaluria

B.S., Mechanical Engineering (with Highest Honors), Rutgers University May 1994
Flow of Smoke and Hot Gases Across Horizontal Vents in Room Fires
James J. Slade Research Scholar Thesis Advisor: Prof. Yogesh Jaluria

PROFESSIONAL EXPERIENCE

Professor August 2010 – present
Department of Mechanical Engineering
University of Connecticut, Storrs, CT

Visiting Professor September 2016
Dipartimento di Ingegneria Industriale, Sezione di Energetica, Termofluidodinamica Applicata e
Condizionamenti Ambientali (DETEC)
University of Naples Federico II, Naples, Italy

Associate Professor (with tenure) August 2005 – August 2010
Department of Mechanical Engineering
University of Connecticut, Storrs, CT

Visiting Associate Professor (sabbatical leave) January 2006 – August 2006
Department of Medicine
Columbia University Medical Center, New York, NY

Assistant Professor August 1999 – August 2005
Department of Mechanical Engineering
University of Connecticut, Storrs, CT

AWARDS AND HONORS

Fellow, *The Electrochemical Society (ECS)*, 2022.

Fellow, *American Society of Thermal and Fluids Engineers (ASTFE)*, 2022.

Otto Mønsted Guest Professorship, Technical University of Denmark, awarded 2018.

Fellow, *American Society of Mechanical Engineers (ASME)*, 2013.

Connecticut Academy of Science and Engineering, elected member, 2013.

Medal of Excellence Award for Distinguished Young Alumnus, School of Engineering, Rutgers University, 2010.

United Technologies Corporation Professorship in Engineering Innovation, 2008-2010.

Research Excellence Award, Dept. of Mechanical Engineering, University of Connecticut, 2007.

ASME Bergles-Rohsenow Young Investigator Award in Heat Transfer, 2006.

Army Research Office Young Investigator (YIP) Award, 2005.

Outstanding Faculty Award, Dept. of Mechanical Engineering, University of Connecticut, 2004.

Outstanding Junior Faculty Award, School of Engineering, University of Connecticut, 2002.

Office of Naval Research Young Investigator (YIP) Award, 2001.

National Science Foundation Faculty Early Career Development (CAREER) Award, 2001.

U. S. Navy/ASEE Summer Faculty Research Fellow, 2001.

Harold K. Raisler Graduate Fellowship, 1994.

James J. Slade Research Scholar, School of Engineering, Rutgers University, 1994.

Dean's Honor List, School of Engineering, Rutgers University, all semesters (1990 – 1994).

Tau Beta Pi National Engineering Honor Society, 1993.

Golden Key National Honor Society, 1993.

Anne Sonnenblick Scholar, 1992.

New Jersey Garden State Scholar, 1990.

Keynote Speaker, *Huazhong University of Science and Technology, School of Mechanical Science and Engineering and State Key Lab of Digital Manufacturing Equipment and Technology*, Wuhan, Hubei, China, August 3, 2022.

Keynote Speaker, *39th UIT International Conference*, Gaeta, Italy, June 20-22, 2022.

Invited Speaker, *University Research Lecture Series*, Naval Undersea Warfare Center Division, Newport, RI, November 18, 2021.

Invited Speaker, *All India Council for Technical Education (AICTE) Faculty Development Program on "Fundamentals and Applications of Computational Fluid Dynamics in Fluid-Thermal Systems,"* National Institute of Technology Silchar, Silchar, India, March 15, 2021.

Keynote Speaker, *The 2nd Pacific Rim Thermal Engineering Conference*, Maui, HI, December 13-17, 2019.

Invited Speaker, *Molten Salt Reactor Workshop, Actinide Science Team, Nuclear Chemistry and Engineering Group, Pacific Northwest National Laboratory*, Richland, WA, October 3, 2019.

Invited Speaker, *Symposium on Thermodynamics of Materials in Extreme Environments, Materials Science & Technology (MS&T) Technical Meeting and Exposition*, Portland, OR, September 29 – October 3, 2019.

Invited Speaker, *Symposium on Molten Salt Chemistry, 258th National Meeting of the American Chemical Society*, San Diego, CA, August 25-29, 2019.

Invited Speaker, *Workshop on Molten Salt Properties, Structures and Interfaces Under Extreme Environments, 2019 NSLS-II & CFN Users' Meeting*, Brookhaven National Laboratory, NY, May 20-22, 2019.

Invited Speaker, Focused Session on *Materials Issues in Nuclear Waste Treatment and Disposal, 8th Forum on New Materials, 14th International Conference on Modern Materials and Technologies (CIMTEC 2018)*, Perugia, Italy, June 10-14, 2018.

Keynote Speaker, *7th International Symposium on Advances in Computational Heat Transfer (CHT-17)*, Naples, Italy, May 28-June 1, 2017.

Invited Speaker, *Indo-US Science and Technology Forum on Recent Advances in Multiscale, Multiphysics Analysis of Energy Conversion in Li-Ion Batteries*, Mumbai, India, June 17-19, 2016.

Invited Speaker, *12th International Conference on Durability of Composite Systems (DURACOSYS)*, Arlington, TX, June 12-15, 2016.

Invited Speaker, *Photon Science Seminar Series*, SLAC National Accelerator Laboratory, Stanford, CA, May 25, 2016.

Keynote Speaker, *13th Symposium on Modeling & Experimental Validation of Fuel Cells, Batteries & Electrolysers (MODVAL13)*, Lausanne, Switzerland, March 22-23, 2016.

Invited Speaker, *TMS 2016 145th Annual Meeting & Exhibition*, Nashville, TN, February 15, 2016.

Keynote Speaker, *International Conference on Computational & Experimental Engineering and Sciences (ICCES'15)*, Reno, NV, July 23, 2015.

Invited Speaker, *6th International Symposium on Computational Heat Transfer (CHT-15)*, Rutgers University, Piscataway, NJ, May 26, 2015.

Invited Speaker, *ASME-ATI-UIT 2015 – Thermal Energy Systems: Production, Storage, Utilization and the Environment*, Napoli, Italy, May 18, 2015.

Invited Speaker, *2015 Energy Forum – Nanotechnology and Energy Materials, MIT Club of Hartford*, Connecticut Clean Energy Finance and Investment Authority (Connecticut Green Bank), February 7, 2015.

Invited Speaker, *2nd International PhD Summer School – IMAGINE, DTU Energy Conversion, Technical University of Denmark*, Toruplund Hotel and Conference Center, August 25-29, 2014.

Invited Speaker, *Workshop on 4D Imaging Applications in Dynamic Studies, APS/CNM/EMC Users Meeting*, Argonne National Laboratory, May 12-15, 2014.

Invited Speaker, *Symposium on In-Situ Studies of Fuel Cell Materials and Devices, 247th American Chemical Society National Meeting & Exposition*, Dallas, TX, March 16-20, 2014.

Invited Speaker, *Symposium on Frontiers in Energy Conversion and Fuel Production, 246th American Chemical Society National Meeting & Exposition*, Indianapolis, IN, September 8-12, 2013.

Invited Speaker, *NSLS Workshop on Frontiers of X-ray and Electron Imaging, 2013 NSLS/CFN Users' Meeting*, Brookhaven National Laboratory, May 20-22, 2013.

Invited Speaker, *Symposium on Fuel Cell Science and Technologies, 245th American Chemical Society National Meeting & Exposition*, New Orleans, LA, April 7-11, 2013.

Plenary Lecture, *10th Edition of the International Conference on Durability of Composite Systems (Duracosys-2012)*, Brussels, Belgium, September 17-20, 2012.

Invited Speaker, *Cross-facility Thematic Workshop on Imaging at All Length and Time Scales, APS/CNM/EMC Users' Meeting*, Argonne National Laboratory, May 7-9, 2012.

Invited Speaker, *APS Workshop on Energy Materials and Energy Systems Applications of In Situ X-ray Microscopy, APS/CNM/EMC Users' Meeting*, Argonne National Laboratory, May 7-9, 2012.

Invited Speaker, "Next-Generation Transmission X-ray Microscopy and Nanotomography Program at APS," *APS Upgrade Beamline Proposal Scientific Reviews*, Advanced Photon Source, Argonne National Laboratory, March 7, 2011.

Invited Speaker, *Challenges in Image Processing in Tomographic Data Sets Workshop, 2010 LCLS / SSRL Annual Users' Meeting*, SLAC National Accelerator Laboratory, Menlo Park, CA, October 17-21, 2010.

Invited Speaker, *Multi-Scale Multi-Disciplinary Modeling of Electronic Materials Workshop*, Army Research Laboratory, Fairfax, VA, September 1-2, 2010.

Invited Speaker, *New Energy and Industrial Technology Development Organization*, Kyoto University, Japan, April 21, 2010.

Invited Speaker, *80th Meeting of the Solid Oxide Fuel Cell Society of Japan*, Tokyo, Japan, April 19, 2010.

Invited Speaker, *Symposium on Optical Science and Emerging Energy Technologies, 239th National Meeting of the American Chemical Society*, San Francisco, CA, March 21-25, 2010.

Invited Speaker, *ARO Workshop on Atomistic Interfaces '09: Ionic Solids*, Storrs, CT, August 24-26, 2009.

Invited Speaker, *NSF CMMI Workshop on Multifunctional Materials and Distributed Renewable Energy for Sustainable Infrastructure*, Honolulu, HI, June 22, 2009.

Invited Speaker, *NSF Division of Human Resource Development Joint Annual Meeting*, Washington, DC, June 8-11, 2009.

Invited Speaker, *IBM-BECAT Workshop on High Performance Computational Science and Engineering*, Booth Engineering Center for Advanced Technology, University of Connecticut, December 17, 2008.

Invited Speaker, *APS Renewal Project Workshop*, Advanced Photon Source, Argonne National Laboratory, IL, October 20-21, 2008.

Invited Speaker, *Ultra-High Temperature Ceramics: Materials for Extreme Environment Applications Conference*, Lake Tahoe, California, August 3-8, 2008.

Keynote Speaker, *16th Discrete Simulation of Fluid Dynamics: Micro, Nano and Multiscale Physics for Emerging Technologies Conference*, Banff, Canada, July 23-27, 2007.

PROFESSIONAL SOCIETIES

American Society of Mechanical Engineers (ASME)
American Society of Thermal and Fluids Engineers (ASTFE)
The Electrochemical Society (ECS)

PROFESSIONAL ACTIVITIES

Journal Editorial Activities

Editor-in-Chief, *ASME Journal of Electrochemical Energy Conversion and Storage*, 2016-2023.
Guest Editor, *Annual Review of Heat Transfer*, 2022-2023.
Guest Editor, *Journal of the Electrochemical Society*, 2022-2023, 2019-2020.
Editor, *ASME Journal of Fuel Cell Science and Technology*, 2015.
Associate Editor, *International Journal of Thermal Sciences*, 2007-2021.
Associate Editor, *ASME Journal of Heat Transfer*, 2012-2016.

Guest Editor, *ASME Journal of Heat Transfer*, 2009-2011.
Member, Editorial Board, *Sustainable Energy Technologies and Assessments*, since 2012.
Member, Editorial Board, *Reports in Electrochemistry*, since 2011.
Member, Editorial Board, *Renewable Bioresources*, since 2013.
Member, Editorial Board, *Scientific Reports*, Nature Publishing Group, 2015-2021.
Member, Editorial Board, *The Open Energy and Fuels Journal*, 2007-2017.
Member, Editorial Board, *The Open Renewable Energy Journal*, 2008-2015.

Technical Committee Activities

Current Positions:

Membership Officer, Executive Committee, *American Society of Thermal and Fluids Engineers*, since 2022.
Member, Executive Committee, *American Society of Thermal and Fluids Engineers*, since 2021.
Chair, ASTFE Energy and Sustainability Technical Group, since 2017.
Member-at-Large, Executive Committee, *ECS High-Temperature Energy, Materials, & Processes (H-TEMP) Division*, since 2013.
Member, *ECS High-Temperature Energy, Materials, & Processes (H-TEMP) Division Awards Committee*, since 2019.
Member, ASME Soichiro Honda Medal Award Committee, since 2015.
Member, ASME Edward F. Obert Award Committee, since 2011.
Member, *ASME Heat Transfer Division K-15 Technical Committee on Transport Phenomena in Manufacturing and Materials Processing*, since 1999.
Member, *ASME Advanced Energy Systems Division Technical Committee on Electrochemical Energy Conversion and Storage*, since 2011.

Past Positions:

Past Co-Chair, Executive Committee, *ASME Advanced Energy Systems Division*, 2015 – 2016.
Co-Chair, Executive Committee, *ASME Advanced Energy Systems Division*, 2014 – 2015.
Secretary & Treasurer, Executive Committee, *ASME Advanced Energy Systems Division*, 2013 – 2014.
Honors & Awards, Executive Committee, *ASME Advanced Energy Systems Division*, 2011 – 2013.
Member, Executive Committee, *ASME Advanced Energy Systems Division*, since 2009-2016.
Member, ASME Energy Conversion and Storage Segment Leadership Team, 2017-2019.
Chair, *ASME Advanced Energy Systems Division Technical Committee on Electrochemical Energy Conversion and Storage*, 2012-2014.
Chair, *ASME Heat Transfer Division K-15 Technical Committee on Transport Phenomena in Manufacturing and Materials Processing*, 2009-2012.
Advanced Energy Systems Division Representative, *ASME Energy Conversion Group*, 2010-2011.
Vice Chair, *ASME Advanced Energy Systems Division Technical Committee on Electrochemical Energy Conversion and Storage*, 2011-2012.
Vice Chair, *ASME Advanced Energy Systems Division Fuel Cell and Hydrogen Energy Technical Committee*, 2008-2011.
Member, Executive Committee, *ASME International Fuel Cell Science, Engineering and Technology Conference*, 2009.

Secretary, *ASME Advanced Energy Systems Division Systems Analysis and Fuel Cell Technical Committee*, 2008.

Vice Chair, *ASME Heat Transfer Division K-15 Technical Committee on Transport Phenomena in Manufacturing and Materials Processing*, 2007-2009.

Secretary, *ASME Heat Transfer Division K-15 Technical Committee on Transport Phenomena in Manufacturing and Materials Processing*, 2005-2007.

Member, *ASME Advanced Energy Systems Division Technical Committee on Fuel Cell and Hydrogen Energy*, 2008-2011.

Conference Organization Activities

Symposium Organizer, *Heterogeneous Functional Materials for Energy Conversion and Storage 3, 241st ECS Meeting*, Vancouver, Canada, May 29 – June 2, 2022.

American Scientific Committee, *The 2nd Pacific Rim Thermal Engineering Conference*, Maui, HI, December 13-17, 2019.

Topic Organizer, *The 2nd Pacific Rim Thermal Engineering Conference*, Maui, HI, December 13-17, 2019.

Symposium Organizer, *Heterogeneous Functional Materials for Energy Conversion and Storage 2, 235th ECS Meeting*, Dallas, TX, May 26-31, 2019.

Scientific Committee, *35th Unione Italiana Termofluidodinamica (UIT) Heat Transfer Conference*, Ancona, Italy, June 26-28, 2017.

International Scientific Committee, *7th International Symposium on Advances in Computational Heat Transfer (CHT-17)*, Naples, Italy, May 28 – June 1, 2017.

Topic Chair, Energy and Sustainability, *2nd Thermal and Fluids Engineering Conference*, Las Vegas, NV, April 2 – 5, 2017.

Scientific Advisory Committee, *2nd Thermal and Fluids Engineering Conference*, Las Vegas, NV, April 2 – 5, 2017.

Scientific Committee, *First International Conference on “Sustainable Materials Processing and Manufacturing,”* Skukuza, Kruger National Park, South Africa, January 23-25, 2017.

Conference Chair for the *ASME Fuel Cell Conference, ASME Power & Energy Conference and Exhibition*, Charlotte, NC, June 26 – 30, 2016.

Executive Advisory Committee, *ASME Power & Energy Conference and Exhibition*, Charlotte, NC, June 26 – 30, 2016.

Symposium Organizer, *Heterogeneous Functional Materials for Energy Conversion and Storage, 229th ECS Meeting*, San Diego, CA, May 29 – June 3, 2016.

Technical Program Co-Chair, *ASME 13th Fuel Cell Science, Engineering, and Technology Conference, ASME Power & Energy*, San Diego, CA, June 28 – July 2, 2015.

International Scientific Committee, *6th International Symposium on Advances in Computational Heat Transfer (CHT-15)*, Piscataway, New Jersey, May 25-29, 2015.

Scientific Committee, *ASME-ATI-UIT 2015 Conference on Thermal Energy Systems: Production, Storage, Utilization and the Environment*, Naples, Italy, May 17-20, 2015.

International Scientific Committee, *11th International Conference on Durability Analysis of Composite Systems (Duracosys2014)*, Tokyo, Japan, September 15-17, 2014.

Topic Organizer, Topic 7-4: Electrochemical Energy Conversion and Storage, *ASME International Mechanical Engineering Congress and Exposition*, 2013.

Topic Organizer, Topic 7-5: Fuel Cell System Design and Application, *ASME International Mechanical Engineering Congress and Exposition*, 2013.

Track Organizer, Track 2-4: Modeling, Design, and Optimization for High Temperature Fuel Cells, 11th *ASME International Fuel Cell Science, Engineering and Technology Conference*, 2013.

Topic Organizer, Topic 6-33: Electrochemical Energy Conversion and Storage, *ASME International Mechanical Engineering Congress and Exposition*, 2012.

Topic Organizer, Topic 6-27: Fuel Cells and Hydrogen Energy, *ASME International Mechanical Engineering Congress and Exposition*, 2012.

Scientific Committee, *Tenth International Conference on Durability of Composite Systems* (Duracosys 2012), Brussels, Belgium, September 17-19, 2012.

Symposium Co-Organizer, *PRiME Symposium on Renewable Fuels from Sunlight and Electricity*, 222nd *Electrochemical Society Meeting*, Honolulu, HI, October 7-12, 2012.

Track Organizer, Track 8: Transport Phenomena in Manufacturing and Materials Processing, *ASME Heat Transfer, Fluids, Nanochannel, Microchannel, and Minichannel Conference*, 2012.

Topic Organizer, Topic 2-8: Fuel Cells and Hydrogen Energy, *ASME International Mechanical Engineering Congress and Exposition*, 2011.

Symposium Co-Organizer, *B6 - Nanostructured Materials for Energy Storage and Conversion*, 219th *Electrochemical Society Meeting*, 2011.

Heat Transfer Division K-15 Technical Committee Representative (KCR), *ASME-JSME Thermal Engineering Joint Conference*, 2011.

Track Organizer, Track 7: Energy Systems: Analysis, Thermodynamics and Sustainability, *ASME International Mechanical Engineering Congress and Exposition*, 2010.

Conference Co-Organizer, 8th *ASME International Fuel Cell Science, Engineering and Technology Conference*, 2010.

Heat Transfer Division K-15 Technical Committee Representative (KCR), *AIAA/ASME Joint Thermophysics and Heat Transfer Conference*, 2010.

Organizer, *Celebratory Session in Honor of Professor Yogesh Jaluria's 60th Birthday*, *ASME International Mechanical Engineering Congress and Exposition*, 2009.

Organizer, *NSF Panel on Challenges and Opportunities in Manufacturing and Materials Processing*, San Francisco, CA, July 21, 2009.

Organizer, *NSF Symposium on Advanced Thermal Processing*, Boston, MA, November 5, 2008.

Topic Organizer, Computational Study of Nanostructures and MEMS, MicroElectroMechanical Systems (MEMS) Division, *ASME International Mechanical Engineering Congress and Exposition*, 2009.

Topic Organizer, Heat Transfer Division K-15 Technical Committee, *ASME International Mechanical Engineering Congress and Exposition*, 2009.

Track Co-Organizer, Advanced Energy Systems Division, *ASME International Mechanical Engineering Congress and Exposition*, 2009.

Topic Co-Organizer, Systems Analysis and Fuel Cell Technical Committee, Advanced Energy Systems Division, *ASME International Mechanical Engineering Congress and Exposition*, 2009.

Track Co-Chair, Fuel Cells and Hydrogen Energy Technologies, *ASME 3rd International Conference on Energy Sustainability*, 2009.

Track Chair, *ASME Summer Heat Transfer Conference*, 2009.

Member, Awards Sub-Committee, Systems Analysis and Fuel Cell Technical Committee, Advanced Energy Systems Division, *ASME International Mechanical Engineering Congress and Exposition*, 2008.

Heat Transfer Division K-15 Technical Committee Representative (KCR), *ASME International Mechanical Engineering Congress and Exposition*, 2008.

Co-Topic Organizer, Systems Analysis and Fuel Cell Technical Committee, Advanced Energy Systems Division, *ASME International Mechanical Engineering Congress and Exposition*, 2008.

Heat Transfer Division K-15 Technical Committee Representative (KCR), *AIAA/ASME Joint Thermophysics and Heat Transfer Conference*, 2006.

Program Committee, *Reliability of Optical Fiber Components, Devices, Systems, and Networks III, SPIE Photonics Europe*, 2006.

Heat Transfer Division K-15 Technical Committee Representative (KCR), *ASME International Mechanical Engineering Congress and Exposition*, 2005.

Program Committee, *Reliability of Optical Fiber Components, Devices, Systems, and Networks II, SPIE Photonics Europe*, 2004.

Session Chair, Chemistry and Transport Phenomena, *Workshop for the Molten Salt Thermal Properties Working Group*, University of South Carolina, November 15-17, 2021.

Session Chair, Fundamentals of Heat and Mass Transfer: Topic (a-2) Computational Heat and Mass Transfer^[SEP]- Optimization and Control, *The 2nd Pacific Rim Thermal Engineering Conference*, Maui, HI, December 13-17, 2019.

Session Chair, Low Temperature Fuel Cell Technologies III, *Track 3-1: Low Temperature Fuel Cell Technologies, ASME 2015 13th Fuel Cell Science, Engineering, and Technology Conference*, 2015.

Session Co-Chair, Low Temperature Fuel Cell Technologies II, *Track 3-1: Low Temperature Fuel Cell Technologies, ASME 2015 13th Fuel Cell Science, Engineering, and Technology Conference*, 2015.

Session Co-Chair, Low Temperature Fuel Cell Technologies I, *Track 3-1: Low Temperature Fuel Cell Technologies, ASME 2015 13th Fuel Cell Science, Engineering, and Technology Conference*, 2015.

Session Co-Chair, High Temperature Spectroscopy, *Symposium B7: High Temperature Experimental Techniques and Measurements, 224th Electrochemical Society Meeting*, 2013.

Session Co-Chair, Past, Present and Future of Transport Phenomena in Materials Processing and Manufacturing, *ASME Summer Heat Transfer Conference*, 2013.

Session Chair, *Materials for High Temperature Fuel Cells, 2011 Energy Sustainability Conference and Fuel Cell Conference*, 2011.

Session Chair, SOFC Modelling, *Symposium B7 - Solid Oxide Fuel Cells XII (SOFC-XII), 219th Electrochemical Society Meeting*, 2011.

Session Chair, Supercapacitors-2, *Symposium B6 - Nanostructured Materials for Energy Storage and Conversion, 219th Electrochemical Society Meeting*, 2011.

Session Co-Chair, *14th International Heat Transfer Conference*, 2010.

Session Chair, Alkaline Electrochemistry in Fuel Cells, *216th Electrochemical Society Meeting*, 2009.

Session Chair, *7th ASME International Fuel Cell Science, Engineering & Technology Conference*, 2009.

Session Chair, *ASME International Mechanical Engineering Congress and Exposition*, 2008.
Session Organizer, *ASME Summer Heat Transfer Conference*, 2008.
Session Chair, *ASME International Mechanical Engineering Congress and Exposition*, 2007.
Session Co-Chair, *ASME International Mechanical Engineering Congress and Exposition*, 2007.
Speaker, Research Funding & Proposal Writing, *Tips for Tenure and Promotion: A Symposium for New and Prospective Faculty sponsored by Mechanical Engineering Department Heads Committee*, *ASME International Mechanical Engineering Congress and Exposition*, 2007.
Session Chair, *16th Discrete Simulation of Fluid Dynamics: Micro, Nano and Multiscale Physics for Emerging Technologies Conference*, 2007.
Session Chair, *ASME-JSME Thermal Engineering Summer Heat Transfer Conference*, 2007.
Session Chair, *5th ASME International Fuel Cell Science, Engineering & Technology Conference*, 2007.
Session Chair, *AIAA/ASME Joint Thermophysics and Heat Transfer Conference*, 2006.
Panel Moderator, *NSF/NIH Workshop on Engineering Approaches to Energy Balance and Obesity*, Arlington, VA, 2006.
Session Co-Chair, *ASME International Mechanical Engineering Congress and Exposition*, 2005.
Session Co-Chair, *ASME International Mechanical Engineering Congress and Exposition*, 2002.
Session Chair, *ASME International Mechanical Engineering Congress and Exposition*, 2001.
Session Co-Chair, *ASME National Heat Transfer Conference*, 2001.
Session Co-Chair, *ASME International Mechanical Engineering Congress and Exposition*, 2000.

Advisory Boards / Review Committees

NSLS-II Microscopy and Imaging Proposal Review Panel, *National Synchrotron Light Source II, Brookhaven National Laboratory, NY*, 2017 – 2022 (Chair, 2019-2022).
NSLS-II Science Advisory Committee (SAC) Review Committee, Full-field X-ray Imaging (FXI) Triennial Beamline Review, *National Synchrotron Light Source II, Brookhaven National Laboratory, NY*, 2021.
NSLS-II Science Advisory Committee (SAC) Review Committee, Hard X-ray Nanoprobe (HXN) Triennial Beamline Review, *National Synchrotron Light Source II, Brookhaven National Laboratory, NY*, 2018.
Full field X-ray Imaging (FXI) Beamline Advisory Team, *National Synchrotron Light Source II, Brookhaven National Laboratory, NY*, 2012 – 2017 (Chair, 2017).
Imaging Beam Line Review Committee, *Stanford Synchrotron Radiation Lightsource, SLAC National Accelerator Laboratory, Stanford, CA*, 2015.
Oversight Committee, *Booth Engineering Center for Advanced Technologies*, 2009 – present.
Member, External Advisory Board, *Connecticut Global Fuel Cell Center*, 2006-2008.
Member, Technical Advisory Board, *American Specialty Products*, 2003-2004.

Reviewer for over 120 different *journals, publishers, academic programs, funding agencies, technical conferences and professional societies*:

Journals: ACS Applied Energy Materials, ACS Applied Materials & Interfaces, Advanced Functional Materials, Acta Materialia, Advanced Materials, Advanced Science, AIChE Journal, Annual Review of Heat Transfer, Applied Energy, Applied Physics Letters, Applied Thermal Engineering, AIAA Journal of Thermophysics and Heat Transfer, ASME Journal of Energy Resources Technology, ASME Journal of Engineering Materials and Technology, ASME Journal of Electrochemical Energy Conversion and Storage, ASME Journal of Fuel Cell Science and Technology, ASME Journal of Heat Transfer, ASME Journal of Manufacturing Science and

Engineering, Carbon, ChemElectroChem, Chemical Engineering and Processing, Chemical Engineering Journal, Chemical Engineering Science, Chemical Papers, Communications Chemistry, Computational Geosciences, Computational Materials Science, Computational Mechanics, Diamond and Related Materials, ECS Electrochemistry Letters, ECS Transactions, Electrochemical and Solid-State Letters, Electrochemistry Communications, Electrochimica Acta, Energy Systems, Energy Technology, Experimental Mechanics, Frontiers in Energy, Fuel Cells, Fuel Processing Technology, Functional Materials Letters, Fusion Engineering and Design, Heat Transfer Engineering, International Communications in Heat and Mass Transfer, Industrial and Engineering Chemistry Research, International Journal of Multiphase Flow, International Journal of Numerical Methods for Heat and Fluid Flow, International Journal of Green Energy, International Journal of Heat and Mass Transfer, International Journal of Hydrogen Energy, International Journal of Energy Research, International Journal of Sustainable Energy, International Journal of Thermal Sciences, International Journal of Thermophysics, Ionics, Journal of Aerospace Engineering, Journal of the American Ceramic Society, Journal of Analytical and Applied Pyrolysis, Journal of Electroanalytical Chemistry, Journal of Applied Electrochemistry, Journal of Applied Physics, Journal of Biomedical Optics, Journal of the Electrochemical Society, Journal of Enhanced Heat Transfer, Journal of the European Ceramic Society, Journal of Materials Science, Journal of Micromechanics and Microengineering, Journal of Microscopy, Journal of Nanoscience and Nanotechnology, Journal of Non-Crystalline Solids, Journal of Physical Chemistry, Journal of Physical Chemistry Letters, Journal of Physics: Condensed Matter, Journal of Physics D: Applied Physics, Journal of Porous Media, Journal of Power Sources, Journal of Raman Spectroscopy, Journal of Synchrotron Radiation, Journal of Undergraduate Chemistry Research, Langmuir, Materials, Materials Letters, Materials Research Bulletin, Materials Science and Engineering, Microscopy and Microanalysis, Modern Aspects of Electrochemistry, Nano Energy, Nanotechnology, npj Computational Materials, Numerical Heat Transfer, Optical Engineering, Optics Express, Optics and Laser Technology, Physica A: Statistical Mechanics and its Applications, Plasma Chemistry and Plasma Processing, PLOS ONE, Polymers, Polymer Composites, Powder Technology, Proceedings of the National Academy of Sciences, Progress in Energy and Combustion Science, Renewable Energy, Scientific Reports, Sensors and Actuators, Solid State Ionics, Surface and Coatings Technology, Sustainable Energy Technologies and Assessments, The Open Energy and Fuels Journal, The Open Fuels & Energy Science Journal, The Open Renewable Energy Journal, Thin Solid Films.

Publishers: Elsevier, Springer, Taylor & Francis.

Academic Programs: Technical University of Denmark (DTU) Master of Science in Engineering in Sustainable Energy.

Funding Agencies: American Chemical Society Petroleum Research Fund, Army Research Office, Austrian Science Fund, Canada 150 Research Chairs Program, Czech Republic Academy of Sciences, Department of Energy - Advanced Fuel Cycle Initiative, Department of Energy - Basic Energy Sciences, Department of Energy - Basic Energy Sciences Early Career Research Program, Department of Energy - EERE Building Technologies Office, Department of Energy – Nuclear Energy University Program, Hong Kong Innovation and Technology Commission, Israeli Ministry of Science and Technology, Israeli Pazy Foundation, Israel Science Foundation, Italian Ministry for Education, University, and Research, Knowledge Foundation of Sweden, National Research Foundation (South Africa), National Science Foundation, National Synchrotron Light Source II, Netherlands Organisation for Scientific Research, Office of Naval Research, ORAU Ralph E. Powe

Junior Faculty Enhancement Awards, Research Grants Council of Hong Kong, South Carolina EPSCoR/IDeA State Office, Stanford Synchrotron Radiation Lightsource, Swiss National Science Foundation, U. S. Civilian Research and Development Foundation, U. S. Navy ILIR Program, University of Connecticut Research Excellence Program, University of Connecticut Research Foundation.

Technical Conferences and Professional Societies: 6th International Symposium on Advances in Computational Heat Transfer (CHT-15), International Heat Transfer Conferences, ASME Fuel Cell Science, Engineering, and Technology Conferences, ASME International Conferences on Energy Sustainability, ASME IMECE Conferences, ASME 2015 Power and Energy Conversion Conference, ASME Summer Heat Transfer Conferences, AIAA/ASME Joint Thermophysics & Heat Transfer Conference, ASME-JSME Thermal Engineering Summer Heat Transfer Conference, American Ceramic Society, International Conference on Advanced Ceramics and Composites, International Conference on Durability of Composite Systems.

Reviewer for tenure and/or promotion: Brookhaven National Laboratory, Clemson University, Colorado School of Mines, Drexel University, McMaster University (for the Canada 150 Research Chairs Program), Missouri University of Science and Technology, New Jersey Institute of Technology, Politecnico di Torino, Rutgers University, Stanford Synchrotron Radiation Lightsource, Technical University of Denmark, Texas A&M University, University of North Carolina at Charlotte, Universidad de Guanajuato, University of Bridgeport, University of California, Irvine, University of Louisville, University of Massachusetts Amherst, University of Missouri^[L]_[SEP], University of South Carolina, University of Texas at Arlington, Washington State University, West Virginia University, Wright State University.

RESEARCH INTERESTS

My interests center on transport phenomena during synthesis and processing of nanostructured materials at the fundamental research and application level. Extensive analytical, experimental and numerical studies have been carried out to elucidate underlying physical mechanisms and important practical issues. Areas of particular interest include:

1. **Computational and Experimental Transport Phenomena:** Advanced algorithms for numerical modeling of heat transfer, mass transfer, charge transfer, and fluid flow with chemical reactions using lattice Boltzmann, Monte Carlo, finite difference, finite volume, finite element, and boundary element methods. Flow visualization, non-intrusive temperature, concentration and flux measurement. Non-intrusive and in-situ temperature and species measurement techniques. Materials characterization by electron and atomic force microscopy, Raman spectroscopy, electron and photon-based spectroscopy, and nanoindentation.
2. **Energy Conversion & Storage:** Heat, mass and charge transport in electrochemical cells (fuel cells, batteries, electrolyzers, reversible electrochemical cells, electrochemical separation membranes) and nuclear waste form material, electrochemical modeling, nanoscale functional grading of cell material, tailoring electrode structure to enhance material performance and durability. Influence of 3-D chemical microstructure on transport phenomena.
3. **Radiative Heat Transfer in Nanostructured Materials:** Radiative heat transfer in participating media containing pore size comparable to thermal radiation wavelength, with applications to photonic crystal and fuel cell manufacture.

4. **Nanomanufacturing:** Open-air carbon nanotube synthesis by laser-induced chemical vapor deposition, thus allowing for direct writing, continuous processing, and direct chemical conversion of nanotubes. Process control and functional grading of nanoscale structures.
5. **Chemical Vapor Deposition (CVD):** A successful technique used to create nanostructured materials and thin films, CVD is used in my group to create new nanostructured materials and nanomanufacturing techniques including open-air synthesis, selective deposition and ultra-fast growth rates.
6. **Photonics:** Numerical and experimental study of photonic crystal optical fiber manufacture and hermetic optical fiber coatings by chemical vapor deposition. Multiple free surface draw of ultra-pure fused silica glass containing nanometer to micron-sized voids, heat and gas transport with chemical reactions to hermetically coat a moving optical fiber.

RESEARCH FUNDING

(\$25.9M total, \$6.3M Chiu's portion, in collaboration with over 50 researchers in 10 countries)

36. **2022 University Base Award as a result of FOA Number DE-FOA-0002265** (for the University Nuclear Leadership Program's Scholarship and Fellowship Support at the University of Connecticut). Department of Energy - Nuclear Energy University Program (3/22-3/35, PI: W. K. S. Chiu, base award - no actual funding).
35. **Symposium on Heterogeneous Functional Materials for Energy Conversion and Storage 2022.** Army Research Office (5/22-4/23, sole PI, \$3,000).
34. **Triggering Thermal Runaway in Lithium Ion Batteries.** Office of Naval Research (5/22-5/24, PI: W. K. S. Chiu + 5 co-PIs, \$540,000).
33. **Internal Short Circuit and Thermal Runaway Triggers for Lithium Ion Batteries.** Office of Naval Research (10/20-12/22, PI: W. K. S. Chiu + 3 co-PIs, \$183,500).
32. **Safe Energy and Power System for Unmanned Underwater Vehicles.** Office of Naval Research (10/20-1/22, PI: U. Pasaogullari, co-PIs: W. K. S. Chiu + 2 others, \$550,500).
31. **System-Level Design and Analysis Tool for Air-Independent Propulsion System.** Office of Naval Research (1/20-12/21, PI: U. Pasaogullari, co-PIs: W. K. S. Chiu + 4 others, \$10,000).
30. **Safe, High Energy and Power Density Fuel Cells and Batteries, with Underwater Wireless Recharging Capability: Supplement for Fuel Cell Hardware Development.** Office of Naval Research (1/20-12/21, PI: U. Pasaogullari, co-PIs: W. K. S. Chiu + 4 others, \$100,000).
29. **Safe, High Energy and Power Density Fuel Cells and Batteries, with Underwater Wireless Recharging Capability.** Office of Naval Research (4/19-12/21, PI: A. Bose, co-PIs: W. K. S. Chiu + 4 others, \$400,000).
28. ***in situ* High Temperature Measurement and Validation of Uranium Molten Salt Properties.** Department of Energy - Nuclear Energy University Program (10/18-9/22, PI: W. K. S. Chiu, co-PIs: K. S. Brinkman and T. M. Besmann, \$799,979).
27. **Symposium on Heterogeneous Functional Materials for Energy Conversion and Storage.** Army Research Office (9/17-9/19, sole PI, \$3,000).

26. **Mini-Symposium: Multiphysics Coupling in Energy Storage, Houston, TX, November 11 - 19, 2015.** National Science Foundation (9/15-8/16, PI: P. Mukherjee, co-PI: G. Nelson, W. K. S. Chiu, \$5,046).
25. **A New Paradigm for Understanding Multi-phase Ceramic Waste Form Performance.** Department of Energy - Nuclear Energy University Program (10/14-9/17, PI: K. S. Brinkman, co-PIs: W. K. S. Chiu + 3 others, \$800,000).
24. **Carbonate and Hydroxide Ion Transport in Alkaline Anion Exchange Materials.** Army Research Office (9/14-8/18, sole PI, \$359,997).
23. **Predicting Carbonate Ion Transport in Alkaline Anion Exchange Materials.** Army Research Office Short Term Innovative Research Program (4/12-12/12, sole PI, \$50,000).
22. **In Situ Imaging and Analysis of Solid Oxide Fuel Cell Anodes during Degradation.** National Science Foundation (10/11-9/16, PI: W. K. S. Chiu, co-PI: G. J. Nelson, \$302,489).
21. **Carbon Film Coating Thickness Measurement.** OFS Specialty Photonics Division (3/11-6/11, sole PI, \$5,000).
20. **REU Site: Engineering Next Generation Energy Processes and Systems.** National Science Foundation (3/11-2/14, PI: K. D. Murphy, co-PI: M. W. Renfro, Investigators: W. K. S. Chiu + 8 others, \$299,242).
19. **The Effect of Airborne Contaminants on Fuel Cell Performance and Durability.** Department of Energy (1/11-3/15, PI: T. M. Molter, co-PIs: W. K. S. Chiu + 4 others, \$898,117).
18. **Full Field X-ray Imaging from Micron to Nanometer Scales.** Brookhaven National Laboratory: NSLS-II Beamline Development Proposal (1/11-12/12, PIs: J. Wang and J. Socha, co-PIs: W. K. S. Chiu + 24 others, \$1,800,000).
18. **High Resolution XRadia X-ray Micro-computed Tomography System.** University of Connecticut Provost Equipment Competition (7/10-6/11, PI: S. Kotha, co-PIs: W. K. S. Chiu + 35 others, \$530,000).
16. **High Pressure Electrolyzer Membrane Mass Transport.** Hamilton Sundstrand (1/10-12/11, Sole PI, \$75,635).
15. **Science Based Nano-Structure Design and Synthesis of Heterogeneous Functional Materials for Energy Systems.** Department of Energy - Energy Frontier Research Center (8/09-7/15, PI: K. L. Reifsnider, co-PIs: W. K. S. Chiu + 6 others, \$12,500,000).
14. **Pore-Scale Understanding of Ohmic Polarization in Solid Oxide Fuel Cell Electrodes.** National Science Foundation (10/08-9/11, PI: W. K. S. Chiu, co-PI: A. T. Crumm - industrial collaborator, \$96,000).
13. **Advanced Thermal Processing Workshop.** National Science Foundation (8/08-7/10, PI: W. K. S. Chiu, co-PI: C. P. Grigoropoulos, University of California Berkeley, \$10,000).
12. **Dual Beam FIB/SEM System for Nano Materials Research and other DOD-Related Activities.** Office of Naval Research (4/08-4/09, PI: E. H. Jordan, co-PIs: W. K. S. Chiu, S. Suib, F. Papadimitrakopoulos, and M. Aindow, \$727,093 + \$300,000 University Match).
11. **Carbon Nanotube Synthesis by Open-Air Laser-Induced Chemical Vapor Deposition.** National Science Foundation (9/07-8/11, Sole PI, \$388,284).
10. **Fuel Cell Performance Using Hydrogen Peroxide Reformate as the Oxidant.** Office of Naval Research (12/06-3/11, Sole PI, \$260,000).

9. **Effects of Impurities on Fuel Cell Performance and Durability.** Department of Energy (11/07-10/11, PI: T. M. Molter, co-PIs: W. K. S. Chiu + 19 others, \$1,900,000).
8. **Structural Imaging and Optimization of Microtubular Solid Oxide Fuel Cell Electrodes.** Army Research Office Young Investigator Program (4/05-3/09, Sole PI, \$150,000 + \$180,000 University of Connecticut Matching).
7. **Advanced Fuel Cell Research for Weapon Applications.** Office of Naval Research (10/04-9/07, Sole PI, \$192,000).
6. **Understanding Hole Pattern Formation During Microstructured Optical Fiber Draw.** National Science Foundation GOALI (10/03-9/07, PI: W. K. S. Chiu, co-PI: D. J. DiGiovanni - industrial collaborator, \$305,000).
5. **Electrochemical Modeling of Advanced Naval Fuel Cell Systems.** Office of Naval Research (6/02-5/05, Sole PI, \$180,000).
4. **Performance and Reliability of Optical Fibers for Use in Underwater Acoustic Arrays.** Office of Naval Research Young Investigator Program (6/01-9/04, Sole PI, \$330,025).
3. **Transport Phenomena in the Chemical Vapor Deposition of Hermetic Optical Fiber Coatings.** National Science Foundation CAREER Award (1/01-12/06, Sole PI, \$395,000).
2. **Laser Heating of Optical Fibers.** Lucent Technologies (9/00-6/01, Sole PI, \$25,000).
1. **Improving Coating Quality and Deposition Rate in the Optical Fiber Manufacturing Process.** University of Connecticut Research Foundation (7/00-6/01, Sole PI, \$14,140).

Department Senior Design Projects

28. **Thermocouple Heat Transfer Surface Error.** Pratt & Whitney (8/21-5/22, Mechanical Engineering Department Senior Design Project, \$9,000).
27. **3D Laser Scanner Cooling System - Refined Design and Testing.** Zachry Nuclear Engineering (8/20-5/21, Mechanical Engineering Department Senior Design Project, \$9,000).
26. **Densely-Packaged Electronic Circuits.** Collins Aerospace (8/20-5/21, Mechanical Engineering Department Senior Design Project, \$9,000).
25. **3D Laser Scanner Cooling System Design and Testing.** Zachry Nuclear Engineering (8/19-5/20, Mechanical Engineering Department Senior Design Project, \$9,000).
24. **Heat Exchanger For Electric Motorsport's Drivetrain.** University of Connecticut (8/19-5/20, Mechanical Engineering Department Senior Design Project, \$9,000).
23. **Electromagnetic Expulsion of Unmanned Underwater Vehicles (UUVs).** Naval Undersea Warfare Center Division Newport (8/18-5/19, Mechanical Engineering Department Senior Design Project, \$9,000).
22. **Analysis of Cogeneration Chiller System Performance in Off-Design Conditions.** Zachry Nuclear Engineering (8/18-5/19, Mechanical Engineering Department Senior Design Project, \$9,000).
21. **Study of Thermally Induced Currents in High Range Radiation Monitor Cables.** Zachry Nuclear Engineering (8/17-5/18, Mechanical Engineering Department Senior Design Project, \$9,000).
20. **The Prometheus.** UConn Electric Motorsports (8/17-5/18, Mechanical Engineering Department Senior Design Project, \$9,000).

19. **Contact Effects on Heat Transfer Coefficients.** Pratt & Whitney (8/16-5/17, Mechanical Engineering Department Senior Design Project, \$9,000).
18. **High Lift Boost Pump.** Triumph Engine Systems (8/15-5/16, Mechanical Engineering Department Senior Design Project, \$6,000).
17. **Validate Simsmart Simulation of Flow Through Fittings.** General Dynamics Electric Boat (8/15-5/16, Mechanical Engineering Department Senior Design Project, \$6,000).
16. **Phase Change Material Heat Sink For Cooling of an Electronics Ring.** United Technologies Aerospace Systems (8/14-5/15, Mechanical Engineering Department Senior Design Project, \$6,000).
15. **Sampling System During Bulk Polymerization.** Covidien (8/13-5/14, Mechanical Engineering Department Senior Design Project, \$6,000).
14. **Bi Directional - One Way Clutch Design for Tooling.** Belcan (8/13-5/14, Mechanical Engineering Department Senior Design Project, \$6,000).
13. **Mitigation of Baffle Plate Heat Transfer Effects for the AP 1000.** Westinghouse (8/12-5/13, Mechanical Engineering Department Senior Design Project, \$6,000).
12. **Air Void Transport Characterization in Typical Piping Systems.** Zachry Nuclear Engineering (8/12-5/13, Mechanical Engineering Department Senior Design Project, \$6,000).
11. **Self-Powered Nuclear Reactor Spent Fuel Storage Cask.** Westinghouse (8/11-5/12, Mechanical Engineering Department Senior Design Project, \$6,000).
10. **Lightweight Prototype Plastic or Composite Air-to-Air Heat Exchanger.** Hamilton Sundstrand (8/11-5/12, Mechanical Engineering Department Senior Design Project, \$6,000).
9. **Evaluation of a New Passive Containment Design Concept.** Westinghouse (8/10-5/11, Mechanical Engineering Department Senior Design Project, \$6,000).
8. **Air Cooling Options for the Advanced Passive Containment Design.** Westinghouse (8/09-5/10, Mechanical Engineering Department Senior Design Project, \$6,000).
7. **Determination of Heat Transfer Coefficients for Design and Optimization of the Ophthalmic Molding Process.** Gentex Optics (8/08-5/09, Mechanical Engineering Department Senior Design Project, \$6,000).
6. **Scoping Containment Analyses for the Westinghouse Large Passive Nuclear Power Plant.** Westinghouse (8/08-5/09, Mechanical Engineering Department Senior Design Project, \$6,000).
5. **Impact of Power Uprate on Advanced Passive Pressurized Water Reactor Containment Design.** Westinghouse (8/07-5/08, Mechanical Engineering Department Senior Design Project, \$6,000).
4. **Environmental Chamber for PEM Fuel Cell Membrane Characterization.** Fuel Cell Energy (8/06-5/07, Mechanical Engineering Department Senior Design Project, \$6,000).
3. **Applying Lubricious Coating for a Flexible Substrate.** United States Surgical (8/04-5/05, Mechanical Engineering Department Senior Design Project, \$5,000).
2. **Methods for Creating Swirl in an Air Stream.** Hamilton Sundstrand (8/03-5/04, Mechanical Engineering Department Senior Design Project, \$5,000).
1. **Fuel Cell “Hydrogen Economy” Powered Electric Go-Kart.** University of Connecticut (8/01-5/02, Mechanical Engineering Department Senior Design Project, \$5,000).

BOOK CHAPTERS & SPECIAL VOLUMES

8. W. K. S. Chiu, “Emerging Investigators in Electrochemical Energy Conversion and Storage 2022,” (11 technical and review articles) in *Journal of Electrochemical Energy Conversion and Storage*, vol. 19, iss. 4, 141 pages, 2022.
7. D. Datta, P. P. Mukherjee, and W. K. S. Chiu, “Mechanics of Electrochemical Energy Storage and Conversion,” (8 technical articles) in *Journal of Electrochemical Energy Conversion and Storage*, vol. 18, iss. 4, 84 pages, 2021.
6. W. K. S. Chiu, “Emerging Investigators in Electrochemical Energy Conversion and Storage 2020,” (13 technical and review articles) in *Journal of Electrochemical Energy Conversion and Storage*, vol. 17, iss. 4, 125 pages, 2020.
5. D. Aurbach, T. Fuller, D. Cliffler, W. K. S. Chiu, V. Di Noto, S. Gopalan, and A. Suroviec, “JES Focus Issue on Heterogeneous Functional Materials for Energy Conversion and Storage,” (35 technical, review and perspective articles) in *Journal of Electrochemical Society*, vol. 167, no. 5, 2020.
4. W. K. S. Chiu, “Emerging Investigators in Electrochemical Energy Conversion and Storage 2018,” (13 technical and review articles) in *Journal of Electrochemical Energy Conversion and Storage*, vol. 15, iss. 1, 126 pages, 2018.
3. M. B. DeGostin, A. P. Cocco, and W. K. S. Chiu, “Synchrotron-Based Transmission X-ray Microscopy: A Tool for Three-Dimensional Spectroscopic Imaging and Numerical Simulations,” *Annual Review of Heat Transfer*, vol. 19, chpt. 3, pp. 127-158, 2016.
2. W. K. S. Chiu, C. P. Grigoropoulos, and B. Q. Li, “Special Issue on Advanced Thermal Processing,” (12 technical and review articles) in *ASME Journal of Heat Transfer*, vol. 133, iss. 3, 124 pages, 2011.
1. F. Barbir, W. K. S. Chiu and N. Fekrazad, “Chapter 7: Fuel Cell Modeling,” in *PEM Fuel Cells: Theory and Practice*, by F. Barbir, Elsevier Inc., Burlington, MA, 2005.

JOURNAL PUBLICATIONS

(Google Scholar: 4657 citations; h-index = 39; i10-index = 99)

Journal Publications – to be submitted

128. T. J. Lynch, B. N. Cassenti, K. Iwamatsu, B. Layne, B. M. Ocko, L. Wiegart, A. Fluerasu, A. A. Peracchio, J. F. Wishart, and W. K. S. Chiu, “Silica Nanoparticles Suspended in a Molten LiCl-KCl Eutectic Salt,” manuscript in preparation, 2022.

Journal Publications – submitted

127. E. Gurra, M. Iasiello, V. Naso and W. K. S. Chiu, “Heat Conduction in an Architected Foam: Numerical Analysis and Correlations,” submitted, 2021.

Journal Publications

126. M. Ge, X. Huang, H. Yan, D. Gursoy, Y. Meng, W. K. S. Chiu, K. S. Brinkman and Y. S. Chu, “Three-dimensional Imaging of Grain Boundaries in a Mixed Ionic-Electronic Conductor System via Quantitative Fluorescence X-ray Tomography Analysis,” *Communications Materials*, vol. 3, article no. 37, 2022.
125. M. S. Christian, T. J. Lynch, J. Schorne-Pinto, A. M. Mofrad, N. R. Birkner, K. S. Brinkman, W. K. S. Chiu and T. M. Besmann, “Modeling Metallic Halide Local Structures in Salt Melts Using a Genetic Algorithm,” *Journal of Physical Chemistry C*, vol. 126, pp. 9239–9247, 2022.

124. T. J. Lynch, N. R. Birkner, M. S. Christian, J. A. Wrubel, J. Schorne-Pinto, A. Van Veelen, J. R. Bargar, T. M. Besmann, K. S. Brinkman and W. K. S. Chiu, "In situ Determination of Speciation and Local Structure of NaCl-SrCl₂ and LiF-ZrF₄ Molten Salts," *Journal of Physical Chemistry B*, vol. 126, pp. 1539-1550, 2022.
123. G. M. Mauro, M. Iasiello, N. Bianco, W. K. S. Chiu and V. Naso, "Mono-and Multi-Objective CFD Optimization of Graded-Foam Filled Channels," *Materials*, vol. 15, article no. 968, 2022.
122. M. Iasiello, N. Bianco, W. K. S. Chiu and V. Naso, "The Effects of Variable Porosity and Cell Size on the Thermal Performance of Functionally-Graded Foams," *International Journal of Thermal Sciences*, vol. 160, article no. 106696, 2021.
121. K. N. Grew and W. K. S. Chiu, "Stability & Kinetics of the Bipolar Membrane Interface: Implications for Electrochemical Technologies," *Journal of the Electrochemical Society*, vol. 167, article no. 164513, 2020.
120. M. Iasiello, N. Bianco, W. K. S. Chiu and V. Naso, "Anisotropic Convective Heat Transfer in Open-Cell Metal Foams: Assessment and Correlations," *International Journal of Heat and Mass Transfer*, vol. 154, article no. 119682, 2020.
119. J. A. Wrubel, A. A. Peracchio, B. N. Cassenti, T. J. Omasta, W. E. Mustain, K. N. Grew and W. K. S. Chiu, "Predicting the Effects of Carbon Dioxide on the Conductivity of Electrospun and Radiation-Grafted Anion Exchange Membranes," *Journal of the Electrochemical Society*, vol. 166, pp. F1047-F1054, 2019.
118. G. Rinaldi, A. Nakajo, P. Burdet, M. Cantoni, W. K. S. Chiu and J. Van herle, "Characterization of Local Morphology and Availability of Triple-Phase Boundaries in Solid Oxide Cell Electrodes," *Acta Materialia*, vol. 178, pp. 194-206, 2019.
117. J. A. Wrubel, A. J. Peracchio, B. N. Cassenti, K. N. Grew and W. K. S. Chiu, "Anion Exchange Membrane Fuel Cell Performance in the presence of Carbon Dioxide: An Investigation into the Self-Purging Mechanism," *Journal of the Electrochemical Society*, vol. 166, pp. F810-F820, 2019.
116. M. Faghri, R. Amano, P. Cheng, W. K. S. Chiu, N. Djilali, S. Ekkad, B. Farhanieh, J.-C. Han, Y. Jaluria, S. Kabelac, S. Kakac, T. Karayiannis, R. Karvinen, R. Lewis, O. Manca, P. Menguc, W. J. Minkowycz, A. Muley, D. Murray, C.-O. Olsson, J. Szmyd, W. Tao, L. Wang, Q. Wnag, J. Wei, Z. Wu, G. Xie, Y. Xuan, J. Yuan, and T. Zhao, "In Celebration: Professor Bengt Sundén on his 70th Birthday," *International Journal of Heat and Mass Transfer*, vol. 141, pp. 1315-1317, 2019.
115. S. Acharya, C. Amon, P. Ayyaswamy, F. Battaglia, A. Bejan, G. Chen, P. Cheng, W. K. S. Chiu, A. Bar Cohen, R. Cotta, L. Dombrovsky, M. Faghri, P. George, Y. Joshi, B. H. Kang, M. Karwe, J. F. Klausner, S. Lele, G. Lorenzini, O. Manca, W. J. Minkowycz, E. Papanicolaou, S. V. Patankar, D. Pepper, G. P. Peterson, V. Prasad, B. Sunden, W. Tao, L.Q. Wang, and T. S. Zhao, "In Celebration: Professor Yogesh Jaluria on his 70th Birthday," *International Journal of Heat and Mass Transfer*, vol. 140, pp. 1106-1107, 2019.
114. P. J. C. Damian, A. P. Cocco, J. A. Wrubel, T. Hong, R. Bordia, Y. Liu, P. Pianetta, J. Amoroso, K. S. Brinkman, and W. K. S. Chiu, "Simultaneous Three-Dimensional Elemental Mapping of Hollandite and Pyrochlore Material Phases in Ceramic Waste Form Materials," *Journal of the American Ceramic Society*, vol. 102, pp. 5620-5631, 2019.

113. M. Iasiello, N. Bianco, W. K. S. Chiu, V. Naso, "Thermal Conduction in Open-Cell Metal Foams: Anisotropy and the Representative Volume Element," *International Journal of Thermal Sciences*, vol. 137, pp. 399-409, 2019.
112. H. Yan, N. Bouet, J. Zhou, X. Huang, E. Nazaretski, W. Xu, A. P. Cocco, W. K. S. Chiu, K. S. Brinkman, Y. Chu, "Multimodal Hard X-ray Imaging with Resolution Approaching 10 nm for Studies in Material Science," *Nano Futures*, vol. 2, pp. 011011, 2018.
111. A. P. Cocco and W. K. S. Chiu, "Analytical Transport Network Theory to Guide the Design of 3-D Microstructural Networks in Energy Materials: Part 2. Flow with Reactions," *Journal of Power Sources*, vol. 372, pp. 312-324, 2017.
110. A. P. Cocco, A. Nakajo, and W. K. S. Chiu, "Analytical Transport Network Theory to Guide the Design of 3-D Microstructural Networks in Energy Materials: Part 1. Flow without Reactions," *Journal of Power Sources*, vol. 372, pp. 297-311, 2017.
109. J. A. Wrubel, A. A. Peracchio, B. N. Cassenti, T. D. Myles, K. N. Grew, and W. K. S. Chiu, "Anion Exchange Membrane Ionic Conductivity in the Presence of Carbon Dioxide under Fuel Cell Operating Conditions," *Journal of the Electrochemical Society*, vol. 164, pp. F1063-F1073, 2017.
108. K. Shah, N. Balsara, S. Banerjee, M. Chintapalli, A. P. Cocco, W. K. S. Chiu, I. Lahiri, S. Martha, A. Mistry, P. Mukherjee, V. Ramadesigan, C. Sharma, V. Subramanian, S. Mitra, and A. Jain, "State-of-the-art and Future Research Needs for Multiscale Analysis of Li-ion Cells," *ASME Journal of Electrochemical Energy Conversion and Storage*, vol. 14, article no. 020801, 2017.
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106. S. Cunsolo, R. Coquard, D. Baillis, W. K. S. Chiu, and N. Bianco, "Radiative Properties of Irregular Open Cell Solid Foams," *International Journal of Thermal Sciences*, vol. 117, pp. 77-89, 2017.
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104. M. Iasiello, S. Cunsolo, N. Bianco, W. K. S. Chiu, V. Naso, "Developing Thermal Flow in Open-Cell Foams," *International Journal of Thermal Sciences*, vol. 111, pp. 129-137, 2017.
103. Y. Zhang, Y. Chen, Y. Lin, M. Yan, W. M. Harris, W. K. S. Chiu, M. Ni, and F. Chen, "Electrochemical Fields within 3D Reconstructed Microstructures of Mixed Ionic and Electronic Conducting Devices," *Journal of Power Sources*, vol. 331, pp. 167-179, 2016.
102. A. Nakajo, A. P. Cocco, M. B. Degostin, A. A. Peracchio, B. N. Cassenti, M. Cantoni, J. Van herle, W. K. S. Chiu, "Accessible Triple-Phase Boundary Length: A Performance Metric to Account for Transport Pathways in Heterogeneous Electrochemical Materials," *Journal of Power Sources*, vol. 325, pp. 786-800, 2016.
101. G. Ambrosio, N. Bianco, W. K. S. Chiu, M. Iasiello, V. Naso, M. Oliviero, "The Effect of Open-Cell Metal Foams Strut Shape on Convection Heat Transfer and Pressure Drop," *Applied Thermal Engineering*, vol. 103, pp. 333-343, 2016.

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98. X. Ren, T. D. Myles, K. N. Grew, and W. K. S. Chiu, "Carbon Dioxide Transport in Nafion 1100 EW Membrane and in a Direct Methanol Fuel Cell," *Journal of the Electrochemical Society*, vol. 162, pp. F1221-F1230, 2015.
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96. M. B. DeGostin, A. Nakajo, B. N. Cassenti, A. A. Peracchio, G. J. Nelson, and W. K. S. Chiu, "Geometric Sensitivity of Electrochemical Fin Shape on Three Dimensional Microstructure Network Conductivity Analysis," *Journal of Power Sources*, vol. 291, pp. 181-194, 2015.
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93. W. M. Harris and W. K. S. Chiu, "Determining the Representative Volume Element Size for Three-Dimensional Microstructural Material Characterization, Part 2: Application to Experimental Data," *Journal of Power Sources*, vol. 282, pp. 622-629, 2015.
92. A. M. Kiss, W. M. Harris, A. Nakajo, S. Wang, J. Vila-Comamala, A. Deriy, and W. K. S. Chiu, "in situ Heater Design for Nanoscale Synchrotron-Based Full- Field Transmission X-ray Microscopy," *Microscopy and Microanalysis*, vol. 21, pp. 290-297, 2015.
91. T. D. Myles, A. A. Peracchio, and W. K. S. Chiu, "Extension of Anisotropic Effective Medium Theory to Account for an Arbitrary Number of Inclusion Types," *Journal of Applied Physics*, vol. 117, article no. 025101, 2015.
90. S. Cunsolo, M. Oliviero, W. M. Harris, A. Andreozzi, N. Bianco, W. K. S. Chiu, and V. Naso, "Monte Carlo Determination of Radiative Properties of Metal Foams: Comparison Between Idealized and Real Cell Structures," *International Journal of Thermal Sciences*, vol. 87, pp. 94-102, 2015.
89. M. Iasiello, S. Cunsolo, M. Oliviero, W. M. Harris, N. Bianco, W. K. S. Chiu, and V. Naso, "Numerical Analysis of Heat Transfer and Pressure Drop in Metal Foams for Different Morphological Models," *ASME Journal of Heat Transfer*, vol. 136, article no. 112601 (10 pages), 2014.
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CONFERENCE PRESENTATIONS, PROCEEDINGS AND ABSTRACTS

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 192. M. Iasiello, A. Andreozzi, N. Bianco, V. Naso and W. K. S. Chiu, “Functionally-Graded Foams for Volumetric Solar Receivers,” *38th International Conference on Heat and Mass Transfer (UIT)*, Gaeta, Italy, June 21-23, 2021.
 191. M. Christian, A. M. Mofrad, T. J. Lynch, N. R. Birkner, J. Schorne-Pinto, K. S. Brinkman, W. K. S. Chiu, T. M. Besmann, “Modeling Local-Structure of Salt Melts Using a Structure Predictor Algorithm,” *ANS Virtual Annual Meeting*, June 14-16, 2021.
 190. W. K. S. Chiu, “The Role of 3-D Structure on Heat, Mass and Charge Transfer at the Nanoscale,” Invited Presentation, *All India Council for Technical Education (AICTE) Faculty Development Program on “Fundamentals and Applications of Computational Fluid Dynamics in Fluid-Thermal Systems,”* National Institute of Technology Silchar, Silchar, India, March 15, 2021.
 189. M. Ge, X. Huang, H. Yan, W. K. S. Chiu, K. S. Brinkman and Y. Chu, “Quantitative X-ray Fluorescence Nanotomography,” *TMS 2021 Annual Meeting & Exhibition*, Orlando, FL, March 14-18, 2021.
 188. K. B. Yapp, C. J. Patrissi, J. M. Moyer, R. E. Chamberlin, U. P. Pasaogullari, and W. K. S. Chiu, “Multi-Physics Modeling for Characterization of Latent Thermal Runaway,” *Symposium on Advancement of Lithium-Based High-Energy Density Batteries at Multiple Scales, Factoring in Safety, Virtual MRS Fall Meeting & Exhibit*, Presentation no. F.EN06.06.06, November 27 – December 4, 2020.
 187. M. Christian, J. S. Pinto, T. M. Besmann, T. J. Lynch, W. K. S. Chiu, N. R. Birkner and K. S. Brinkman, “Effect of Physically Determined Coordination-numbers for Modeling

- Molten Salt Fuels Using the Modified Quasi-chemical Model (MQM),” *Symposium on Thermodynamics of Materials in Extreme Environments, Materials Science & Technology (MS&T) Technical Meeting and Exposition*, Pittsburgh, PA, October 4-8, 2020.
186. J. S. Pinto, M. Christian, T. J. Lynch, W. K. S. Chiu, and T. M. Besmann, “The LiF–ZrF₄ System Revisited - An Updated Thermodynamic Description Using New Information Data,” *Symposium on Thermodynamics of Materials in Extreme Environments, Materials Science & Technology (MS&T) Technical Meeting and Exposition*, Pittsburgh, PA, October 4-8, 2020.
 185. M. S. Christian, T. M. Besmann, T. J. Lynch, W. K. S. Chiu, N. R. Birkner and K. S. Brinkman, “Effect of Physically Determined Coordination-Numbers for Modeling Molten Salt Fuels Using the Modified Quasi-Chemical Model (MQM),” *Symposium on Thermodynamics of Materials in Extreme Environments, Materials Science & Technology (MS&T) Technical Meeting and Exposition*, October 4-8, 2020, Pittsburgh, PA.
 184. M. S. Christian, T. M. Besmann, N. R. Birkner, K. S. Brinkman, J. A. Wrubel, T. J. Lynch, and W. K. S. Chiu, “Multi-Scale Modeling of Molten Salts for Molten Salt Reactors,” *Symposium on Molten Salt Chemistry, American Chemical Society Fall 2020 National Meeting*, August 16-20, 2020, San Francisco, CA.
 183. W. K. S. Chiu, T. M. Besmann, K. S. Brinkman, S. R. Bare, J. R. Barger, and J. W. McMurray, “In-situ Measurement and Validation of Uranium Molten Salt Properties at Operationally Relevant Temperatures,” *Department of Energy Molten Salt Chemistry PI Meeting*, Germantown, MD, January 13, 2020.
 182. W. K. S. Chiu, “Three-Dimensional Heat and Species Transport in Energy Materials,” Keynote Lecture, *The 2nd Pacific Rim Thermal Engineering Conference*, Maui, HI, December 13-17, 2019.
 181. W. K. S. Chiu, J. A. Wrubel, T. J. Lynch, T. M. Besmann, K. S. Brinkman, S. R. Bare, J. R. Barger, J. W. McMurray, “In situ X-ray Absorption Fine Structure Measurement of Molten Salts using Synchrotron Radiation,” Invited Presentation, *Molten Salt Reactor Workshop, Actinide Science Team, Nuclear Chemistry and Engineering Group, Pacific Northwest National Laboratory*, Richland, WA, October 3, 2019.
 180. W. K. S. Chiu, J. A. Wrubel, T. J. Lynch, T. M. Besmann, K. S. Brinkman, S. R. Bare, J. R. Barger, J. W. McMurray, “Measurement of Molten Salts Properties at Operationally Relevant Temperatures,” Invited Presentation, *Symposium on Thermodynamics of Materials in Extreme Environments, Materials Science & Technology (MS&T) Technical Meeting and Exposition*, Portland, OR, September 29 – October 3, 2019.
 179. W. K. S. Chiu, J. A. Wrubel, T. J. Lynch, T. M. Besmann, K. S. Brinkman, S. R. Bare, J. R. Barger, J. W. McMurray, “Measuring the Property of Molten Salts at Operationally Relevant Temperatures,” Invited Presentation, *Symposium on Molten Salt Chemistry, 258th National Meeting of the American Chemical Society*, Paper No. 3205145, San Diego, CA, August 25-29, 2019.
 178. W. K. S. Chiu, T. M. Besmann, K. S. Brinkman, S. R. Bare, J. R. Barger, J. W. McMurray, “Measuring the Property of Molten Salts at Operationally Relevant Temperatures,” Invited Presentation, *Workshop on Molten Salt Properties, Structures and Interfaces Under Extreme Environments, 2019 NSLS-II & CFN Users’ Meeting*, Brookhaven National Laboratory, May 20-22, 2019.
 177. J. A. Wrubel, A. A. Peracchio, B. N. Cassenti, K. N. Grew, W. K. S. Chiu, “An Investigation into the Self-Purging Mechanism of Anion Exchange Membrane Fuel Cells

- Exposed to Carbon Dioxide,” *235th Electrochemical Society Meeting*, Abstract No. 118507, Dallas, TX, May 26-31, 2019.
176. M. Iasiello, A. Andreozzi, N. Bianco, W. K. S. Chiu, V. Naso, “The Effect of Porosity on Representative Volume Element for Pressure Drop on Open-Cell Foams,” *4th Thermal and Fluids Engineering Conference (TFEC)*, Paper No. TFEC-2019-27687, Las Vegas, NV, April 14–17, 2019.
175. G. Rinaldi, A. Nakajo, M. Cantoni, W. K. S. Chiu, and J. Van herle, “Characterisation of the Local Morphology at Triple-Phase Boundaries after SOFC/SOEC Operation,” *13th European SOFC & SOE Forum*, Paper No. B0304, Lucerne, Switzerland, July 3-6, 2018.
174. M. Iasiello, C. Savarese, P. J. Damian, N. Bianco, A. Andreozzi, W. K. S. Chiu, and V. Naso, “Modeling Heat Conduction in Open-Cell Metal Foams by Means of the Three-Dimensional Thermal Fin Theory,” *36th Unione Italiana Termofluidodinamica (UIT) Heat Transfer Conference*, Catania, Italy, June 25-27, 2018 (*Journal of Physics: Conf. Series* 1224: 012009, 2019).
173. W. K. S. Chiu, “Synchrotron-Based Three-Dimensional X-ray Imaging of Crystalline Ceramic Waste Form Materials,” Invited Presentation, *Focused Session FK-10: Materials Issues in Nuclear Waste Treatment and Disposal, Symposium on Materials Challenges for Sustainable Nuclear Fission and Fusion Technologies, 8th Forum on New Materials, 14th International Conference on Modern Materials and Technologies (CIMTEC 2018)*, Paper No. FK-10.3:IL03, Perugia, Italy, June 10-14, 2018.
172. J. A. Wrubel, P. J. Damian, A. P. Cocco, T. Hong, Y. Xu, K. S. Brinkman, W. K. S. Chiu, “Synchrotron-based 3-D Characterization of Crystalline Ceramic Waste Form Materials,” *Annual Thermo Fisher Scientific Meeting*, University of Connecticut, Storrs, CT, June 12, 2018.
171. J. A. Wrubel, A. J. Peracchio, B. N. Cassenti, K. N. Grew and W. K. S. Chiu, “Predicting Electrospun Anion Exchange Membrane Conductivity in the Presence of Carbon Dioxide,” *233rd Electrochemical Society Meeting*, Abstract No. 108354, Seattle, WA, May 13-27, 2018.
170. A. P. Cocco, A. Nakajo, K. N. Grew and W. K. S. Chiu, “The Analytical Transport Network Model for Diffusive-Reactive Flow in 3-D Microstructural Networks: A Computationally Economical Model for Potential Use in Multi-Scale Modeling Efforts,” *233rd Electrochemical Society Meeting*, Abstract No. 108886, Seattle, WA, May 13-27, 2018.
169. K. S. Brinkman, W. K. S. Chiu and J. W. Amoroso, “Advanced Characterization of Model Multiphase Ceramic Waste Forms,” *Symposium on Materials Issues in Nuclear Waste Management, Materials Science & Technology (MS&T) Technical Meeting and Exposition*, Pittsburgh, PA, October 8-12, 2017.
168. J. A. Wrubel, A. J. Peracchio, B. N. Cassenti, T. D. Myles, K. N. Grew and W. K. S. Chiu, “Anion Exchange Membrane Ionic Conductivity in the Presence of Carbon Dioxide under Fuel Cell Operating Conditions,” *232nd Electrochemical Society Meeting*, Abstract No. 105132, National Harbor, MD, October 1-6, 2017 (*ECS Trans.*, 80(8): 983-1003, 2017).
167. A. P. Cocco, A. Nakajo, K. N. Grew and W. K. S. Chiu, “Analytical Models for Diffusive-Reactive Flow in 3-D Microstructural Networks to Guide the Design of Electrochemical Materials,” *232nd Electrochemical Society Meeting*, Abstract No. 104760, National Harbor, MD, October 1-6, 2017.

166. M. Ge, X. Huang, H. Yan, E. Nazaretski, L. Li, P. Ilinski, W. K. S. Chiu, K. S. Brinkman and Y. S. Chu, "Self-absorption Correction in X-ray Fluorescence Nanotomography," *Conference OP316: X-Ray Nanoimaging: Instruments and Methods III, SPIE Optics + Photonics 2017*, San Diego, CA, August 6-10, 2017.
165. A. Nakajo, A. P. Cocco, M. B. Degostin, P. Burdet, A. A. Peracchio, B. N. Cassenti, M. Cantoni, J. Van herle, W. K. S. Chiu, "Evolution of 3-D Transport Pathways and Triple-Phase Boundaries in the Ni-YSZ Hydrogen Electrode upon Fuel Cell or Electrolysis Cell Operation," *Fifteenth International Symposium on Solid Oxide Fuel Cells (SOFC-XV)*, Paper No. 101192, Hollywood, FL, July 23-28, 2017 (*ECS Trans.*, 78(1): 3205-3215, 2017).
164. M. Iasiello, N. Bianco, W. K. S. Chiu, and V. Naso, "Anisotropy Effects on Convective Heat Transfer and Pressure Drop in Kelvin's Open-Cell Foams," *35th Unione Italiana Termofluidodinamica (UIT) Heat Transfer Conference*, Ancona, Italy, June 26-28, 2017.
163. W. K. S. Chiu, "The Role of 3-D Structure on Heat and Mass Transfer in Energy Materials," Keynote Presentation, *Proceedings of the 7th International Symposium on Advances in Computational Heat Transfer (CHT-17)*, Paper No. CHT-17-017, Naples, Italy, May 28-June 1, 2017.
162. M. Iasiello, S. Cunsolo, N. Bianco, W. K. S. Chiu, and V. Naso, "Thermally Developed Flow in Open-Cell Foams: A Pore-Scale Analysis," *Proceedings of the 7th International Symposium on Advances in Computational Heat Transfer (CHT-17)*, Paper No. CHT-17-049, Naples, Italy, May 28-June 1, 2017.
161. A. Nakajo, A. P. Cocco, M. B. Degostin, P. Burdet, A. A. Peracchio, B. N. Cassenti, M. Cantoni, J. Van herle, and W. K. S. Chiu, "Accessible Triple-Phase Boundary Length in Solid Oxide Fuel Cell Anodes," *12th European SOFC & SOE Forum*, Paper No. B1303, Lucerne, Switzerland, July 5-8, 2016.
160. W. K. S. Chiu, "Three-Dimensional Transport to Triple Phase Boundaries and its Role in Electrochemical Device Performance," Invited Presentation, *Indo-US Science and Technology Forum on Recent Advances in Multiscale, Multiphysics Analysis of Energy Conversion in Li-Ion Batteries*, Mumbai, India, June 17-19, 2016.
159. A. P. Cocco, A. Nakajo, M. B. DeGostin, A. A. Peracchio, B. N. Cassenti, M. Cantoni, J. Van herle, and W. K. S. Chiu, "Accessible Triple Phase Boundary Length: A Performance Metric to Account for Transport Pathways in Heterogeneous Electrochemical Materials," Poster Presentation, *Indo-US Science and Technology Forum on Recent Advances in Multiscale, Multiphysics Analysis of Energy Conversion in Li-Ion Batteries*, Mumbai, India, June 17-19, 2016.
158. W. K. S. Chiu, "Quantitative 3-D Phase Imaging at the Nanoscale by Synchrotron-Based Hard X-Ray Microscopy," Invited Presentation, *12th International Conference on Durability of Composite Systems (DURACOSYS)*, Arlington, TX, June 12-15, 2016.
157. A. P. Cocco, A. Nakajo, A. V. Virkar, and W. K. S. Chiu, "Three-Dimensional Analysis of Coarsening Dynamics in Porous Materials for Electrochemical Energy Conversion and Storage: Direct Measurement and Visualization of Changes in Local Surface Curvature," *229th Electrochemical Society Meeting*, Paper No. 1507, San Diego, CA, May 29 – June 2, 2016.
156. W. K. S. Chiu, "The Role of Three-Dimensional Microstructure in Electrochemical Device Performance," Invited Presentation, *Photon Science Seminar Series*, SLAC National Accelerator Laboratory, Stanford, CA, May 25, 2016.

155. W. K. S. Chiu, "The Role of Three-Dimensional Microstructure in Electrochemical Electrode Performance," Keynote Presentation, *13th Symposium on Modeling & Experimental Validation of Fuel Cells, Batteries & Electrolysers (MODVAL13)*, Lausanne, Switzerland, March 22-23, 2016.
154. W. K. S. Chiu, "Synchrotron-Based X-ray Imaging of Energy Conversion and Storage Materials," Invited Presentation, *TMS 2016 145th Annual Meeting & Exhibition*, Nashville, TN, February 14-18, 2016.
153. W. K. S. Chiu, "Three-Dimensional Microstructural Imaging and Analysis of Energy Materials," *23rd International Congress on X-ray Optics and Microanalysis (ICXOM23)*, Brookhaven, NY, September 14-18, 2015.
152. M. B. DeGostin, A. Nakajo, G. J. Nelson, B. N. Cassenti, A. A. Peracchio, and W. K. S. Chiu, "Closed Form Solutions to Investigate Ionic Conductivity in Porous Fuel Cell Electrode Microstructures," *Proceedings of the 1st Thermal and Fluid Engineering Summer Conference*, Paper No. TFESC-12642, New York, NY, August 9-12, 2015.
151. A. Nakajo, A. M. Kiss, A. P. Cocco, W. M. Harris, M. B. DeGostin, F. Greco, G. J. Nelson, A. A. Peracchio, B. N. Cassenti, A. Deriy, S. Wang, Y.-C. K. Chen-Wiegart, J. Wang, J. Van herle, and W. K. S. Chiu, "Characterization of Cracks and their Effects on the Effective Transport Pathways in Ni-YSZ Anodes after Reoxidation using X-Ray Nanotomography," *Fourteenth International Symposium on Solid Oxide Fuel Cells (SOFC-XIV), 227th Electrochemical Society Meeting*, Paper No. A-0231, Glasgow, Scotland, July 26-31, 2015.
150. M. B. DeGostin and W. K. S. Chiu, "Predicting Ionic Conductivity in Three-Dimensional Porous Electrochemical Electrode Microstructures," Keynote Presentation, *Symposium on Predictive Methods for Heterogeneous Material Design, International Conference on Computational & Experimental Engineering and Sciences (ICCES'15)*, Paper No. ICCES1520150325062, Reno, NV, July 20-24, 2015.
149. W. K. S. Chiu, "Microstructure-Induced Transport Losses in Electrochemical Electrodes," Invited Presentation, *6th International Symposium on Computational Heat Transfer (CHT-15)*, Paper No. CHT-15-189, Rutgers University, Piscataway, NJ, May 25-29, 2015.
148. W. K. S. Chiu, "Recent Advances in Synchrotron-Based X-ray Imaging of Energy Materials," Invited Presentation, *ASME-ATI-UIT 2015 – Thermal Energy Systems: Production, Storage, Utilization and the Environment*, Napoli, Italy, May 17-20, 2015.
147. G. Ambrosio, N. Bianco, W. K. S. Chiu, M. Iasiello, V. Naso, M. Oliviero, "The Effect of Open-Cell Metal Foams Strut Shape on Convective Heat Transfer and Pressure Drop," *ASME-ATI-UIT 2015 – Thermal Energy Systems: Production, Storage, Utilization and the Environment*, Paper No. 244, Napoli, Italy, May 17-20, 2015.
146. W. K. S. Chiu, "Three-Dimensional Microscopy of Energy Materials using Synchrotron Radiation," Invited Presentation, *2015 Energy Forum – Nanotechnology and Energy Materials, MIT Club of Hartford*, Connecticut Clean Energy Finance and Investment Authority, February 7, 2015.
145. A. Nakajo, M. Cantoni, M. B. DeGostin, A. P. Cocco, G. J. Nelson, A. A. Peracchio, B. N. Cassenti, W. K. S. Chiu, J. Van herle, "Degradation of LSM-YSZ Cathodes during Exposure Tests analyzed by Focused Ion Beam–Scanning Electron Microscopy," *65th Annual Meeting of the International Society of Electrochemistry (ISE)*, Lausanne, Switzerland, August 31 - September 5, 2014.

144. W. K. S. Chiu, "Synchrotron-based Transmission X-ray Microscopy of Solid Oxide Fuel Cell Materials," Invited Presentation, *2nd International PhD Summer School – IMAGINE, DTU Energy Conversion, Technical University of Denmark*, Toruplund Hotel and Conference Center, August 25-29, 2014.
143. W. K. S. Chiu and F. Chen, "An Analytical Performance Assessment Tool for Complex Reticulated 3-D Electrochemical Electrode Microstructures," Minisymposium on *Advanced Materials: Computational Analysis of Properties and Performance, 11th World Conference on Computational Mechanics (WCCM XI)*, Paper No. 716, Barcelona, Spain, July 20-25, 2014.
142. T. D. Myles, K. N. Grew, A. A. Peracchio, and W. K. S. Chiu, "Predicting Carbonate/Bicarbonate Formation in Anion Exchange Membranes in the Presence of Carbon Dioxide," *Proceedings of the 46th Power Sources Conference*, Paper No. 19.5, Orlando, FL, June 9-12, 2014.
141. N. Bianco, M. Iasiello, S. Cunsolo, W. M. Harris, V. Naso, M. Oliviero and W. K. S. Chiu, "Forced Convective Heat Transfer in Metal Foams: The Characteristic Length Issue", *Third International Conference on Computational Methods for Thermal Problems*, Lake Bled, Slovenia, June 2-4, 2014.
140. W. K. S. Chiu, "The Role of Material Interfaces and 3-D Morphology in the Solid Oxide Fuel Cell: Towards 4D Tomography," Invited Presentation, *Workshop on 4D Imaging Applications in Dynamic Studies, APS/CNM/EMC Users Meeting*, Argonne National Laboratory, May 12-15, 2014.
139. W. K. S. Chiu, W. M. Harris, A. M. Kiss, A. P. Cocco, J. J. Lombardo, J. R. Izzo, Jr., K. N. Grew, A. Nakajo, G. J. Nelson, B. N. Cassenti, and A. A. Peracchio, "In situ Synchrotron-based Transmission X-ray Microscopy of Solid Oxide Fuel Cells," Invited Presentation, *Symposium on In-Situ Studies of Fuel Cell Materials and Devices, 247th American Chemical Society National Meeting & Exposition*, Paper no. 432, Dallas, TX, March 16-20, 2014.
138. W. M. Harris, J. J. Lombardo, B. Lai, G. J. Nelson, S. Wang, J. Vila-Comamala, M. Liu, M. Liu, and W. K. S. Chiu, "Examining Effects of Sulfur Poisoning on Ni/YSZ Solid Oxide Fuel Cell Anodes Using Synchrotron-Based X-ray Imaging Techniques," *Proceedings of the ASME 2013 International Mechanical Engineering Congress & Exposition*, Paper No. IMECE2013-63972, San Diego, CA, November 15-21, 2013.
137. T. D. Myles, X. Ren, K. Grew, and W. K. S. Chiu, "Interaction and Transport of Carbon Dioxide in Alkaline Anion Exchange Membranes," *224th Electrochemical Society Meeting*, Paper No. B11-1317, San Francisco, CA, October 24 – November 1, 2013 (*ECS Trans.*, 58(1): 431-439, 2013).
136. A. M. Kiss, W. M. Harris, A. Nakajo, S. Wang, J. Vila-Comamala, A. Deriy, and W. K. S. Chiu, "Observation of Nickel Oxidation and Reduction Using Transmission X-ray Microscopy," *224th Electrochemical Society Meeting*, Paper No. B7-0778, San Francisco, CA, October 24 – November 1, 2013 (*ECS Trans.*, 58(3): 55-62, 2013).
135. W. K. S. Chiu, A. Nakajo, M. B. DeGostin, W. M. Harris, A. P. Cocco, G. J. Nelson, B. N. Cassenti, and A. A. Peracchio, "A Rapid 3-D Microstructure Performance Assessment Tool for Electrochemical Energy Devices," Invited Presentation, *Symposium on Frontiers in Energy Conversion and Fuel Production, 246th American Chemical Society National Meeting & Exposition*, Paper no. 20733, Indianapolis, IN, September 8-12, 2013.

134. W. K. S. Chiu, "Challenges and Opportunities in Solid Oxide Fuel Cells," Invited Presentation, *NSLS-II First-Experiments Workshop*, Brookhaven National Laboratory, August 12-13, 2013.
133. M. Oliviero, W. K. S. Chiu, S. Cunsolo, W. M. Harris, M. Iasiello, V. Naso, and N. Bianco, "Microtomography-Based Analysis of Pressure Drop and Heat Transfer through Open Cell Metal Foams," *ASME Summer Heat Transfer Conference*, Paper No. HT2013-17237, Minneapolis, MN, July 14-19, 2013.
132. N. Bianco, S. Cunsolo, W. K. S. Chiu, V. Naso, A. Migliozzi, and M. Oliviero, "Analysis of Heat Transfer and Pressure Drop through Idealized Open Cell Ceramic Foams: Comparison between Kelvin and Weaire-Phelan Cell Structures," *ASME Summer Heat Transfer Conference*, Paper No. HT2013-17234, Minneapolis, MN, July 14-19, 2013.
131. W. K. S. Chiu, "Transmission X-ray Microscopy of Energy Materials: Progress, Challenges and Opportunities," Invited Presentation, *NSLS Workshop on Frontiers of X-ray and Electron Imaging, 2013 NSLS/CFN Users' Meeting*, Brookhaven National Laboratory, May 20-22, 2013.
130. W. K. S. Chiu, A. Nakajo, W. M. Harris, A. M. Kiss, A. P. Cocco, B. N. Cassenti, and A. A. Peracchio, "Microstructure-Induced Transport in Energy Materials," Invited Presentation, *Symposium on Fuel Cell Science and Technologies, 245th American Chemical Society National Meeting & Exposition*, Paper No. 823, New Orleans, LA, April 7-11, 2013.
129. K. L. Reifsnider (speaker), W. K. S. Chiu, K. S. Brinkman, Q. Liu, F. Rabbi, "Role of Micromorphology and Interfacial Mismatch in the Design of Heterogeneous Functional Materials for Fuel Cell Applications," Invited Presentation, *Symposium on Fuel Cell Science and Technologies, 245th National Meeting of the American Chemical Society*, Paper No. 733, New Orleans, LA, April 7-11, 2013.
128. G. J. Nelson, B. N. Cassenti, A. A. Peracchio, and W. K. S. Chiu, "Microstructural Influence on Electronic Transport in Li-Ion Battery Cathodes," *Proceedings of the ASME 2012 International Mechanical Engineering Congress & Exposition*, Paper No. IMECE2012-86996, Houston, TX, November 9-15, 2012.
127. A. Nakajo, G. J. Nelson, M. B. DeGostin, T. D. Myles, A. A. Peracchio, and W. K. S. Chiu, "Characterization of Solid Oxide Fuel Cell Materials Based on Microstructural Skeletonization," *Proceedings of the ASME 2012 International Mechanical Engineering Congress & Exposition*, Paper No. IMECE2012-86133, Houston, TX, November 9-15, 2012.
126. K. L. Reifsnider, Y. Du, W. K. S. Chiu, and K. Brinkman, "Integrative Multiphysics Development of Material Systems for a Renewable Future: the HeteroFoam Story," *222nd Electrochemical Society Meeting*, Paper No. 2552, Honolulu, HI, October 7-12, 2012.
125. A. M. Kiss, T. D. Myles, K. N. Grew, A. A. Peracchio, G. J. Nelson and W. K. S. Chiu, "Carbonate and Bicarbonate Ion Transport in Alkaline Anion Exchange Membranes," *222nd Electrochemical Society Meeting*, Paper No. 3107, Honolulu, HI, October 7-12, 2012.
124. W. K. S. Chiu, "Three-Dimensional Degradation of the Solid Oxide Fuel Cell Anode Nanostructure during Operation," Plenary Lecture, *10th Edition of the International Conference on Durability of Composite Systems (Duracosys-2012)*, Brussels, Belgium, September 17-20, 2012.

123. J. J. Lombardo, B. Lai, W. M. Harris, G. J. Nelson, S. Wang, M. Liu, M. Liu, and W. K. S. Chiu, "The Role of Sulfur in the Porous Cermet Solid Oxide Fuel Cell Anode Microstructure," *ASME Summer Heat Transfer Conference*, Paper No. HT2012-58375, Rio Grande, Puerto Rico, July 8-12, 2012.
122. A. M. Kiss, T. D. Myles, K. N. Grew, A. A. Peracchio, G. J. Nelson and W. K. S. Chiu, "Predicting Carbonate Species Ionic Conductivity in Alkaline Anion Exchange Membranes," *Proceedings of the 45th Power Sources Conference*, Paper No. 18.22, Las Vegas, NV, June 11-14, 2012.
121. A. P. Cocco, W. M. Harris, G. J. Nelson, J. J. Lombardo and W. K. S. Chiu, "X-Ray Methods for Composition-Sensitive 3D Mapping of Solid Oxide Fuel Cell Electrode Microstructures," *Proceedings of the 45th Power Sources Conference*, Paper No. 18.12, Las Vegas, NV, June 11-14, 2012.
120. W. K. S. Chiu, "Full-field 3D Imaging and Analysis of Heterogeneous Functional Materials (HeteroFoMs) for Energy Systems," Invited Presentation, *Cross-facility Thematic Workshop on Imaging at All Length and Time Scales, APS/CNM/EMC Users' Meeting*, Argonne National Laboratory, May 7-10, 2012.
119. W. K. S. Chiu, "In situ Hard X-ray Microscopy of Fuel Cells: Progress, Challenges and Opportunities," Invited Presentation, *APS Workshop on Energy Materials and Energy Systems Applications of In Situ X-ray Microscopy, APS/CNM/EMC Users' Meeting*, Argonne National Laboratory, May 7-10, 2012.
118. G. J. Nelson, B. N. Cassenti, A. A. Peracchio, and W. K. S. Chiu, "Investigation of the Impact of Sintering on SOFC Charge Transfer," *Proceedings of the ASME 2011 International Mechanical Engineering Congress & Exposition*, Paper No. IMECE2011-65239, Denver, CO, November 11-17, 2011.
117. W. M. Harris, G. J. Nelson, J. J. Lombardo, A. P. Cocco, J. R. Izzo, Jr., W. K. S. Chiu, P. Tanasini, J. Van herle, C. Comminellis, J. C. Andrews, Y. Liu, P. Pianetta, and Y. Chu, "Analysis of Solid Oxide Fuel Cell LSM-YSZ Composite Cathodes with Varying Starting Powder Sizes," *Proceedings of the ASME 2011 International Mechanical Engineering Congress & Exposition*, Paper No. IMECE2011-64237, Denver, CO, November 11-17, 2011.
116. A. M. Kiss, T. D. Myles, K. N. Grew, A. A. Peracchio, G. J. Nelson, and W. K. S. Chiu, "Calculating Hydroxide Conductivity in Alkaline Anion Exchange Membranes," *220th Electrochemical Society Meeting*, Paper No. 1118, Boston, MA, October 9-14, 2011 (*ECS Trans.* **41**(1): 1827, 2011).
115. T. D. Myles, G. J. Nelson, A. A. Peracchio, W. K. S. Chiu, R. J. Roy, B. L. Murach, and G. A. Adamson, "Species Transport in the High Differential Pressure Oxygen Generating Electrolyzer Membrane," *220th Electrochemical Society Meeting*, Paper No. 1525, Boston, MA, October 9-14, 2011.
114. W. K. S. Chiu, A. V. Virkar, K. L. Reifsnider, F. Rabbi, and Q. Liu, "HeteroFoMs: Electrode Modeling in Nano-Structured Heterogeneous Materials for Energy Systems," *2011 Energy Sustainability Conference & Fuel Cell Conference*, Paper No. ESFuelCell2011-54950, Washington DC, August 7-10, 2011.
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14. C. A. Taylor and W. K. S. Chiu, "Characterization of Carbon CVD Coatings Deposited at Near Atmospheric Pressure," *SPIE Photonics Fabrication Europe*, vol. 4940, pp. 101-107, 2002.
13. K. H. Kwok and W. K. S. Chiu, "Graphitic Carbon Coatings on Fused Quartz by Laser-Induced Chemical Vapor Deposition," *12th International Heat Transfer Conference*, vol. 4, pp. 825-830, 2002.

12. C. A. Taylor and W. K. S. Chiu, "Hermetic Chemical Vapor Deposition Coatings for Environmental Sensors," *Proceedings of SPIE Photonics West*, vol. 4639, pp. 152-159, 2002.
11. P. O. Iwanik and W. K. S. Chiu, "Heat Transfer in Chemical Vapor Deposited Optical Fiber Coatings," *ASME International Mechanical Engineering Congress and Exposition*, CD-ROM vol. 1, Paper No. HTD-24371, 2001.
10. W. K. S. Chiu and Y. Jaluria, "Flow Visualization and Heat Transfer Analysis in a Horizontal Channel Heated from Below: Applications to CVD," *ASME International Mechanical Engineering Congress and Exposition*, Orlando, FL, 2000.
9. W. K. S. Chiu, Y. Jaluria and N. G. Glumac, "Control of Thin Film Growth in Chemical Vapor Deposition Manufacturing Systems," *ASME National Heat Transfer Conference*, Pittsburgh, PA, 2000.
8. W. K. S. Chiu, C. J. Richards and Y. Jaluria, "Experimental and Numerical Study of Conjugate Heat Transfer in a Horizontal Channel Heated from Below: Applications to CVD Processing," *ASME International Mechanical Engineering Congress and Exposition*, Nashville, TN, 1999.
7. W. K. S. Chiu, Y. Jaluria and N. G. Glumac, "Validity of the Constant Property Approximations in CVD Reactor Modeling," *ASME National Heat Transfer Conference*, Albuquerque, NM, 1999.
6. W. K. S. Chiu, C. J. Richards and Y. Jaluria, "Mixed Convection Flow in Horizontal CVD Reactors," *The 51st Annual Meeting of the Division of Fluid Dynamics, American Physical Society*, Philadelphia, PA, 1999 (abstract in *Bull. Amer. Phys. Soc.*, vol. 43, Nov. 1998).
5. W. K. S. Chiu and Y. Jaluria, "Continuously Moving Finite Thickness Susceptor in CVD Processing," *ASME International Mechanical Engineering Congress and Exposition*, Anaheim, CA, 1998.
4. W. K. S. Chiu and Y. Jaluria, "Heat and Mass Transfer in Continuous CVD Reactors," *Proceedings of the 11th International Heat Transfer Conference*, Kyongju, Korea, vol. 5, pp. 187-191, Taylor & Francis, Philadelphia, PA, 1998.
3. W. K. S. Chiu and Y. Jaluria, "Heat Transfer in Horizontal and Vertical CVD Reactors," *ASME National Heat Transfer Conference*, Baltimore, MD, 1997.
2. Y. Jaluria, W. K. S. Chiu and S. H.-K. Lee, "Flow of Smoke and Hot Gases Across Horizontal Vents in Room Fires," *4th ASME/JSME Thermal Engineering Joint Conference*, Maui, HI, 1995.
1. S. H.-K. Lee, W. K. S. Chiu and Y. Jaluria, "Experimental Study of Enclosure Fires with Horizontal Vents," *Combustion Institute Eastern States Meeting*, Princeton, NJ, 1993.

TECHNICAL REPORTS

2. W. K. S. Chiu, G. H. Ames and M. J. Berliner, "Design Considerations in Reduced-Diameter Single-Mode Optical Fibers," *NUWC-NPT Technical Report 11,390*, Naval Undersea Warfare Center Division, Newport, RI, September 2002.
1. W. K. S. Chiu, J. M. Maguire and M. J. Berliner, "Phase Sensitivity of Conventional Single-Mode, Polarization-Maintaining and Absorption-Reducing, and Holey Optical Fibers: A

Comparison Study,” *NUWC-NPT Technical Report 11,391*, Naval Undersea Warfare Center Division, Newport, RI, September 2002.

PATENTS and DISCLOSURES

5. W. K. S. Chiu, “Dry Hydrogen Generation by High Differential Pressure Electrolysis,” U. S. Patent Disclosure, filed April 19, 2010.
4. W. K. S. Chiu and K. N. Grew, “Self Hydrating Water Electrolysis Membrane,” U. S. Patent Disclosure, filed March 16, 2010.
3. W. K. S. Chiu and K. H. Kwok, “Method and Apparatus for Open-Air Coatings by Laser-Induced Chemical Vapor Deposition,” U. S. Patent No. 7404983, July 29, 2008.
2. W. K. S. Chiu and K. H. Kwok, “Method and Device for Producing Carbon Nanotubes,” U. S. Patent Application No. US2008/0199389, August 21, 2008.
1. A. J. DeMaria and W. K. S. Chiu, “Extruded Plastic Waveguides for Far Infrared Laser Sources,” U. S. Patent Disclosure, filed July 30, 2004.

INVITED PRESENTATIONS

Universities

City College of New York – Department of Mechanical Engineering

Clemson University – Department of Materials Science and Engineering

Columbia University – Department of Mechanical Engineering

Drexel University – Department of Mechanical Engineering and Mechanics

École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland

École Polytechnique Fédérale de Lausanne (EPFL) Valais-Wallis, Sion, Switzerland

Huazhong University of Science and Technology, School of Mechanical Science and Engineering and the State Key Lab of Digital Manufacturing Equipment and Technology, Wuhan, Hubei, China

Kyoto University, Japan

Lehigh University – Department of Chemical and Biomolecular Engineering

Lund University, Sweden – Department of Energy Engineering

Mount Sinai School of Medicine – Institute for Translational and Molecular Imaging, New York, NY

National Institute of Technology Silchar, India – Department of Mechanical Engineering

New Jersey Institute of Technology – Department of Mechanical and Industrial Engineering

Purdue University – Department of Mechanical Engineering

Rutgers University – Department of Mechanical and Aerospace Engineering

Rutgers University – Department of Materials Science and Engineering

Seconda Università degli Studi di Napoli – Department of Mechanical and Aerospace Engineering

State University of New York at Stony Brook – Department of Mechanical Engineering

Stevens Institute of Technology – Department of Mechanical Engineering

Stony Brook University – Department of Materials Science and Chemical Engineering

Stony Brook University – Department of Mechanical Engineering

Technical University of Denmark – Department of Energy Conversion and Storage (2014, 2017)

University of Bridgeport – School of Engineering

University of Calgary – Department of Mechanical and Manufacturing Engineering

University of California, Berkeley – Laser Thermal Laboratory

University of California, Irvine – Department of Mechanical and Aerospace Engineering

University of California, Los Angeles – Department of Mechanical and Aerospace Engineering

University of Central Florida – Florida Solar Energy Center
University of Connecticut – Department of Chemical, Materials and Biomolecular Engineering
University of Connecticut – Department of Materials Science and Engineering
University of Connecticut – Department of Mechanical Engineering
University of Connecticut – Institute of Materials Science
University of Connecticut – Booth Engineering Center for Advanced Technology
University of Delaware – Department of Mechanical Engineering
University of Houston – Department of Mechanical Engineering
University of Louisville – Department of Mechanical Engineering
University of Maryland – Department of Mechanical Engineering
Università degli Studi di Napoli Federico II – Department of Mechanical Engineering
University of North Texas – Department of Mechanical Engineering
University of Southern California – Optical Communications Laboratory
University of South Carolina – Department of Mechanical Engineering
University of Virginia – Department of Chemical Engineering
Warsaw University of Technology, Poland
West Virginia University – Department of Mechanical and Aerospace Engineering

Research Laboratories

Advanced Photon Source, Argonne National Laboratory, IL
Air Force Research Laboratory, Wright-Patterson Air Force Base, OH
Army Research Laboratory, Adelphi, MD
Forschungszentrum Jülich – IEK-1 Materials Synthesis and Processing, Institute of Energy and Climate Research, Jülich, Germany
National Energy Technology Laboratory, Morgantown, WV
National Synchrotron Light Source, Brookhaven National Laboratory, NY
National Synchrotron Light Source II, Brookhaven National Laboratory, NY
Naval Undersea Warfare Center, Newport, RI
Navy MANTECH Applied Research Laboratory, State College, PA
NIST – Building and Fire Research Laboratory, Gaithersburg, VA
NIST – Fire Science Division and Process Measurements Division, Gaithersburg, VA
Pacific Northwest National Laboratory, Richland, WA
Paul Scherrer Institute, Zurich, Switzerland
OFS Laboratories (formerly Bell Laboratories), Murray Hill, NJ
Saint-Gobain Research and Development Center, Northboro, MA
Sandia National Laboratories – Combustion Research Facility, Livermore, CA
SLAC National Accelerator Laboratory, Stanford, CA
Stanford Synchrotron Radiation Lightsource, Stanford, CA
SPring-8 Synchrotron Radiation Facility, Hyōgo Prefecture, Japan
Swiss Light Source, Paul Scherrer Institute, Zurich, Switzerland

Government Agencies

Advanced Research Projects Agency – Energy, U.S. Department of Energy, Washington, DC
National Science Foundation, Arlington, VA
New Energy and Industrial Technology Development Organization, Japan
Office of Naval Research, Arlington, VA

Industries and Associations

Adaptive Materials, Inc., Ann Arbor, MI

Cidra Corporation, Wallingford, CT
ConocoPhillips Bartlesville Technology Center, OK
Duracell Technical Center, Bethel, CT
Exa Corporation, Burlington, MA
General Dynamics Electric Boat, Groton, CT
Giner Electrochemical Systems, Newton, MA
Hamilton Sundstrand, South Windsor, CT
Lucent Technologies, Avon, CT
MIT Club of Hartford, CT
Millstone Nuclear Power Station, Waterford, CT
NanoSciences Corporation, Oxford, CT
NexTech Materials, Inc., Lewis Center, OH
Northrop Grumman, Linthicum, MD
OFS Specialty Photonics Division, Avon, CT
Pratt & Whitney, East Hartford, CT
Precision Combustion, Inc., North Haven, CT
Sippican, Inc., Marion, MA
United Technologies Research Center, East Hartford, CT
Xradia, Inc., Concord, CA
Zygo Corporation, Middlefield, CT

INTERACTION WITH INDUSTRY AND RESEARCH LABORATORIES

Duracell, Bethel, CT, 2015-2016. Consulted on battery technologies.

Hamilton Sundstrand, Windsor Locks, CT, 2010-2012. Develop models to predict polymer electrolyte membrane performance in electrochemical cells.

Zygo Incorporated, Middlefield, CT, 2009. Consulted on laser-induced chemical vapor deposition.

Naval Undersea Warfare Center, Newport, RI, 2006. Air independent direct borohydride hydrogen peroxide fuel cells.

NexTech Materials, Lewis Center, OH, 2005 – 2008. Modeling and experimental validation of functionally graded solid oxide fuel cell electrodes.

Xradia, Concord, CA, 2008 – present. Three-dimensional x-ray tomographic imaging of solid oxide fuel cell electrodes at the nanometer level.

Advanced Photon Source, Argonne National Laboratory, Argonne, IL, 2005 – present. Structural imaging and characterization of energy materials.

Stanford Synchrotron Radiation Lightsource, SLAC, Palo Alto, CA, 2009 – present. Structural imaging and characterization of energy materials.

National Synchrotron Light Source, Brookhaven, NY, 2009 – present. Part of team that acquired a transmission x-ray microscope beamline to study energy materials.

National Synchrotron Light Source-II, Brookhaven, NY, 2009 – present. Development of next generation synchrotron-based nanopores.

Adaptive Materials, Inc., Ann Arbor, MI, 2005 – present. Manufacture/performance relationships of microtubular solid oxide fuel cell electrodes.

Naval Undersea Warfare Center, Newport, RI, 2004. Evaluate carbon nanotubes and its derivatives for use in fuel cells.

Underground Systems, Inc., Armonk, NY, 2004. Consulted on thermal management of wireless high voltage overhead conductor monitors.

Dow Corning, Midland, MI, 2004 – 2006. Evaluation of advanced precursors for chemical vapor deposition of nanostructured materials.

Naval Undersea Warfare Center, Newport, RI, 2003 – 2005. Evaluated and analyzed specialty semi-fuel cells as undersea power sources.

OFS Labs (formerly Bell Labs), Murray Hill, NJ, 2003 – 2007. Photonic crystal optical fiber manufacture and applications.

DDL Omni Engineering, Waterford, CT, 2002 – 2003. Photonic crystal optical fibers for undersea acoustic sensing.

Saint-Gobain Research and Development Center, Northboro, MA. 2002. Consultant to developed scaling laws for a chemical vapor deposition process.

Sandia National Laboratories, Albuquerque, NM, 2001 – 2003. Geothermal well fiber-optic sensors.

Naval Undersea Warfare Center, Newport, RI, 2001 – 2003. Fiber-optic sensors for undersea applications.

OFS Specialty Photonics Division, Avon, CT, 2001 – present. Chemical vapor deposition of carbon-coated optical fibers.

Lucent Technologies, Avon, CT, 2001. Consulted on high speed inline coating of specialty optical fibers.

THESIS ADVISING ACTIVITIES

Doctor of Philosophy:

12. Jacob A. Wrubel, “Anion Exchange Membrane Fuel Cell Performance in the Presence of Carbon Dioxide,” May 2019.
11. Alex P. Cocco, “Three-Dimensional Imaging Methods and Analytical Transport Network Theory to Guide the Characterization and Design of Energy Materials,” December 2016.
10. Andrew M. Kiss, “Transport-Induced Losses in Alkaline Anion Exchange Membranes and Solid Oxide Fuel Cell Anodes,” July 2014.
9. William M. Harris, “Synchrotron-based X-ray Imaging to Characterize Structural and Chemical Changes in Energy Materials,” July 2014.
8. Timothy D. Myles, “Applicability of Effective Medium and Transport Theories to Fuel Cell Materials,” July 2014.
7. Jeffrey J. Lombardo, “Synthesis, Imaging and Characterization of Energy Materials at the Nanoscale,” September 2012.
6. John R. Izzo, Jr.[#], “Microstructural Imaging and Characterization of Solid Oxide Fuel Cell Electrodes,” May 2011.
5. Kyle N. Grew^{‡,†}, “Gas Transport and Reactive Flow in Porous Media using the Lattice Boltzmann Method,” May 2010.
4. Srinath S. Chakravarthy, “Thermal Processing and Failure of Microstructured Optical Fibers,” May 2007.
3. Eric S. Greene[#], “Modeling and Experimental Validation of Parametric Changes on the Polarization Characteristics of Solid Oxide Fuel Cells,” May 2007.
2. Weixue Tian, “Radiative Transfer Modeling: Numerical Techniques and Applications in Fiber Optics Manufacturing,” December 2005.

1. King Hong Kwok, “Synthesis of Nanostructured Carbon Materials by Open-Air Laser-Induced Chemical Vapor Deposition,” December 2005.

#*ONR Naval Research Enterprise Intern Program (NREIP) Summer Internship.*

‡*ASEE National Defense Science and Engineering Graduate Fellowship, 2007 – 2010.*

‡ *University of Connecticut School of Engineering Outstanding Graduate Thesis Award, 2011.*

Master of Science:

12. Maxwell Bartlett, “Intelligent Design of Architected Open-Cell Foams,” expect 2023.
11. Chris John, “Triggering Thermal Runaway in Lithium-Ion Batteries,” expect 2023.
10. Benjamin Tuffy, “X-ray Spectroscopy of Molten Salts,” expect 2023.
9. Bailey Fryer, “Novel Thermal Runaway Triggers for Lithium-Ion Batteries,” expect 2023.
8. Timothy J. Lynch, “in-situ High Temperature Measurement and Validation of Molten Salt Properties,” May 2022.
7. Peter J. Damian, “Development of a Matlab-Based Characterization Suite – Application to Metal Foam and Composite Ceramic Waste Form Microstructures,” December 2018.
6. Matthew B. DeGostin, “Microstructural Design Models for Electrochemical Electrodes,” August 2015.
5. Andrew C. Lysaght, “Role of Surface Species and Thermophoresis in the Carbon Nanotube Chemical Vapor Deposition Process,” 2008.
4. Christopher J. Jensen, “Carbon and Silicon Carbide-Derived Nanotube Structures by Open-Air Laser-Induced Chemical Vapor Deposition,” 2005.
3. Craig A. Taylor, “Growth, Characterization and Analysis of Pyrolytic Carbon Films Deposited by Chemical Vapor Deposition,” 2002.
2. Patricia O. Iwanik, “Numerical Heat Transfer Study of an Inline Optical Fiber Chemical Vapor Deposition Coating Process,” 2002.
1. King Hong Kwok, “Laser-Induced Chemical Vapor Deposition of Carbon on Moving Fused Quartz Substrates,” 2002.

Master of Engineering:

1. Lucas Julian, “Metamaterials for Potential Space Cryogenic Applications,” 2021.

Research/ Visiting Professors, and Post Doctoral Researchers:

7. Jacob A. Wrubel, “Synchrotron-based X-ray Absorption Fine Structure Measurement of Molten Salt Properties,” 2019.
6. Maria del Mar Perez-Fortes, Visiting Post Doctoral Researcher (from University of California, Irvine), “Thermodynamic and Dynamic Systems Modeling,” 2012-2013.
5. Arata Nakajo, Post Doctoral Researcher, “The Role of Porous Media Microstructure in Energy Materials,” 2011 – 2013.
4. George J. Nelson, Assistant Research Professor, “Nano/Microstructural Design of Electrochemical Cell Electrodes,” 2009 – 2012.
3. Brice N. Cassenti, Professor in Residence, “Analytical Theory in Charge Transfer,” 2009 – present.
2. Aldo A. Peracchio, Visiting Scientist, “Transport Phenomena in Energy Materials,” 2005 – present.
1. Abhijit S. Joshi, Post Doctoral Researcher, “Lattice Boltzmann Methods in Fuel Cell Modeling,” 2005 – 2007.

Associate Thesis Advising:

University of Connecticut: Kirsten Yapp (M.S. 2021), Bifen Wu (Ph.D. 2020), Sajad Yazdani (Ph.D. 2018), Charles Banas (Ph.D. 2018), Richard Fu (Ph.D. 2012), Swetaprovo Chaudhuri (Ph.D. 2011), Robert Paul Brooker (Ph.D. 2009), Gregory Quinn (Ph.D. 2009), Niloufar Fekrazad (Ph.D. 2007), Fuzheng Yang (Ph.D. 2002), Yanyan Zhang (Ph.D. 2007), Mathew Andel (M.S. 2004), Andres A. Chaparro (M.S. 2004), Alper Ata (M.S. 2003), Qibo Jiang (M.S. 2004), David Nielson (M.S. 2001).

Politecnico Di Torino: Daniele Ferrario (Laurea Magistrale 2016), Flavio Caciuffo (Laurea Magistrale 2013).

University of Alberta: Junfeng Zhang (Ph.D. 2005).

University of Naples Federico II: Alessandro Costa (Laurea Magistrale, 2023), Alessandro Anacreonte (Laurea Magistrale, 2022), Giuseppe Scarpati (Laurea Magistrale, 2022), Roberta De Falco (Laurea Magistrale, 2020), Luigi Pecoraro (Laurea Magistrale, 2020), Giuseppe Mirra (Laurea Magistrale, 2020), Carlo Savarese (Laurea Magistrale, 2018), Alessandro Giglio (Laurea Magistrale, 2018), Fabrizio Caiazzo (Laurea Magistrale, 2017), Gabriele Guastaferrò (Laurea Magistrale, 2017), Paolo Salierno (Laurea Magistrale, 2016), Giuseppe Ambrosio (Laurea Magistrale 2015), Vincenzo Vitello (Laurea Magistrale 2014), Christian Loggia (Laurea Magistrale 2014), Marcello Iasiello (Laurea Magistrale 2013), Salvatore Cunsulo (Laurea Magistrale 2013), Andrea Migliozzi (Laurea Magistrale 2012), Raffaele Capuano (Laurea Magistrale 2012).

External Examiner, Faculty Opponent, or Reader:

Lund University, Sweden: Hedvig Paradis (Ph.D. 2013).

École Polytechnique Fédérale de Lausanne (EPFL), Switzerland: Giorgio Rinaldi (Ph.D. 2019), Quentin Jeangros (Ph.D. 2014), Pietro Tanasini (Ph.D. 2011).

Princeton University: Ryan S. Davis (Ph.D. 2017).

Technical University of Denmark: Sofie Colding-Jørgensen (Ph.D. 2020), Salvatore De Angelis (Ph.D. 2017).

Undergraduate (all Research Projects):

Najeh Adib, Thomas Aitkin, Jason Allmaras, Kyle R. Bagshaw, Maxwell Bartlett*, David Borgeson, Brandon Chalifoux, Alex P. Cocco^{†,*}, Michael Collins, Peter J. Damian*, Matthew B. DeGostin*, Christine Dinan, Kurt Doughty, Eric S. Greene^{†,*}, Eva Gurra, Daniel Gynther, William M. Harris*, James E. L. Hormann[†], Patricia O. Iwanik*, John R. Izzo, Jr.*, Christopher J. Jensen*, Chris John^{†,*}, Hyun Young Kim, Andrew M. Kiss*, King Hong Kwok, Sean Kelley, Jeffrey J. Lombardo^{†,*}, Timothy J. Lynch*, Andrew C. Lysaght*, Ryan Murphy, Timothy D. Myles*, Stephen Olenski, Keith Russell, Craig A. Taylor*, Joshua Thomas, Mark F. Wayne, Timothy Webb, Samuel Wiggins.

[†]*University Honors Research Scholar.*

^{*}*Accelerated Master of Science degree candidate.*

High School (all Research Projects):

Anthony J. Franco, Jonathan Russell.

COURSES TAUGHT

Undergraduate Courses

ME 205 Introduction to Mechanical Engineering (Spring 2000)

ME 3242/242 Heat Transfer (Fall 1999–2003, 2005; Spring 2004, 2007, 2009, 2011, 2019, 2020, 2022)

ME 3250 Fluid Dynamics (Fall 2011; Spring 2013)

ME3264 Applied Mechanical Engineering Laboratory (Spring 2017; Spring 2018)
ME 3295 Radiation Heat Transfer (Spring 2021)
ME 3295/3268 Three Dimensional Imaging of Materials (Fall 2014; Spring 2016)

Graduate Courses

ME 312 Laminar Viscous Flow (Spring 2001; Fall 2004)
ME 5130/320 Advanced Heat and Mass Transfer (Fall 2006–2010, 2012, 2013, 2015, 2017, 2019, 2020, 2021)
ME 323 Convection Heat Transfer (Spring 2002)
ME 5341/324 Radiation Heat Transfer (Spring 2001, 2003, 2005, 2008, 2010, 2012, 2021; Fall 2014, 2016, 2018)
ME 5895 Three Dimensional Imaging of Materials (Fall 2014; Spring 2016)

Short Courses

Three Dimensional Imaging of Materials, *University of Naples Federico II*, Naples, Italy, September 15-20, 2016.
Modeling Methods for PEM and SOFC Analysis, *First International Conference on Fuel Cell Development and Deployment*, Storrs, CT, March 6, 2004.

COURSES DEVELOPED/REVISED

ME3295/5895 Three Dimensional Imaging of Materials

Developed a new course on fundamentals of 3-D imaging and discuss the latest state-of-the-art developments in methods for averaged and local measurement of material microstructure.

ME262 Thermo-Fluids Laboratory

Revised curriculum, developed new experiments and designed new a new undergraduate laboratory, workspace and scheduling with 5 Mechanical Engineering faculty.

ME205 Introduction to Mechanical Engineering

Revised this introductory course with Prof. E. H. Jordan to address contemporary mechanical engineering fields in nanotechnology, energy generation, electronics and photonics.

Short Course: Fuel Cell Modeling

Developed a new short course on modeling of transport phenomena, chemical reactions, electrochemistry and charge transfer in PEM and solid oxide fuel cells.

NEW INITIATIVES IN THE UNDERGRADUATE PROGRAM

- Involved 39 undergraduate and high school students from several engineering (Mechanical, Biomedical, Chemical, Electrical, Civil) and science (physics, materials) disciplines in my laboratory during the summer and academic year. Approximately 55% of undergraduate research assistants trained in my lab pursued graduate study.
- Collaborated with local high schools to recruit high school students for summer research internships.
- Involved senior undergraduate students in my laboratory as part of their senior design project.

NEW INITIATIVES IN THE GRADUATE PROGRAM

- Involved 16 undergraduate students in the *Accelerated Master's Program*, which is designed to recruit top-level undergraduate students to begin their Master's thesis and graduate course

requirements during their last year of their undergraduate study, allowing them to reduce the time needed for their Master's degree by one year. Approximately 75% of candidates recruited into my lab pursued their Ph.D. degree.

- Assisted in developing an informational video highlighting the department's graduate program and research facilities.

UNIVERSITY ACTIVITIES

Department of Mechanical Engineering

ABET Objectives and Outcomes, Fall 2019 – Spring 2020.

Advanced Manufacturing Faculty Search Committee, Fall 2012 – Spring 2013.

Bio-engineering Faculty Search Committee, Fall 2011 – Spring 2012.

Computing Committee, Chair: Fall 2004 – Fall 2005; Fall 1999 – Spring 2007.

Course Offering Advisory Committee, Fall 2019 – Spring 2023.

Courses and Curriculum Committee, Fall 2007 – Spring 2019; Fall 2004 – Summer 2005.

Design and Bio-engineering Faculty Search Committee, Fall 2010 – Spring 2011.

Faculty Awards Committee, Chair, Fall 2020 – Spring 2023.

Graduate Admissions Committee, Fall 2008 – Spring 2009; Fall 1999 – Summer 2002; Fall 2005.

Lab Development Committee, Spring 2000 – Summer 2003; Fall 2005 – Spring 2007.

Ph.D. Qualifying Exam Committee, Chair: Fall 2003 – Spring 2004; Fall 1999 – Fall 2005, Fall 2006 – present.

Promotion, Tenure, and Reappointment (PTR) Committee, Chair: Fall 2014; Fall 2013 – Spring 2016, Fall 2008 – Spring 2009.

School of Engineering Sustainability Energy \$2M Initiative Mechanical Engineering Department Search Sub-Committee, Fall 2008 – Spring 2011.

Seminar Coordinator, Fall 2000 – Spring 2002.

Space Allocation Committee, Fall 2006 – Spring 2019.

Student Recruitment and Student Awards, Fall 2009 – Spring 2019; Fall 2020 – Spring 2023.

Teaching Load and Merit Raise Policies Committee, Spring 2007.

Thermal Fluids Group Chair, Fall 2015 – Spring 2018.

Thermal Fluids Faculty Search Committee, Fall 2018 – Spring 2019; Fall 2015 – Spring 2017; Fall 2013 – Spring 2014; Summer 2009 – Spring 2010; Chair: Fall 2007 – Spring 2008; Fall 1999 – Summer 2002, Fall 2003 – Spring 2005.

Undergraduate Advising and Counseling, Fall 2009 – present.

Department of Civil & Environmental Engineering

Environmental GeoMechanics Faculty Search Committee (Civil & Env. Engineering), Fall 2006 – Spring 2007.

School of Engineering

School of Engineering Promotion, Tenure, and Reappointment (PTR) Council, Fall 2022 – Spring 2023.

Mechanical Engineering Department Head Search Committee, Summer 2015 – Spring 2016.

School of Engineering Sustainability Energy \$2M Initiative Search Committee, Fall 2007 – Spring 2011.

Connecticut Global Fuel Cell Center Director Search Committee, Fall 2007 – Fall 2008.

School of Engineering Computing Advisory Committee, Fall 1999 – Summer 2002, Fall 2003 – Fall 2005.

Oversight Committee, *Booth Engineering Center for Advanced Technologies*, 2009.
Academic Information Technology Working Group on High Performance Computing, 2010.
Multiscale Computational Science and Engineering Working Group, 2010.

University of Connecticut

Established a *Memorandum of Agreement* between the Università degli Studi di Napoli Federico II (ITALY) and the University of Connecticut, 2021-2026.
Established a *Cooperation Agreement* between the University of Naples Federico II (ITALY) and the University of Connecticut, 2010-2020.
Established a *Cooperation Agreement* between the Second University of Naples (ITALY) and the University of Connecticut, 2009-2014.
Established an *Educational Partnership Agreement* between the Naval Undersea Warfare Center and the University of Connecticut on *Undersea Technology*, June 2007.
Steering Committee and Session Chair, *NSF ERC Proposal Workshop on Systems-Based Fuel Cell Design and Manufacturing (SbFCDMC)*, May 2-3, 2005.
Steering Committee, *NSF ERC Pre-Proposal Workshop on Systems-Based Fuel Cell Design and Manufacturing*, August 31, 2004.
Established an *Educational Partnership Agreement* between the Naval Undersea Warfare Center and the University of Connecticut on *Fiber Optic Sensors*, March 2003.
Established an *Educational Partnership Agreement* between the Naval Undersea Warfare Center and the University of Connecticut on *Electrochemical Modeling*, April 2002.

Revised: September 23, 2022.