USC Aiken Research Affiliates are highly successful and experienced professionals who are volunteers and attached to USC Aiken to provide expertise, mentoring, and research opportunities for various departments on campus. If you would like to more about the affiliate program or if you are interested in becoming a research affiliate, please contact Dr. Scott McKay at scott.mckay@usca.edu.

Ragaiy Zidan, Ph.D. Physics
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Dr. Zidan is presently the CTO of FuelX Innovation Inc. Prior to this he was at the Savannah River National Laboratory, Aiken, SC as an Advisory Scientist. His research is in the area of hydrogen storage research and development, involving development and characterizing novel materials such as Alanates, Doped Carbon nanotubes, Amorphous metal hydrides and conventional metal hydrides. He is also interested in the development of hydrogen separation membrane. Areas of interest include non-linear diffusion and chaotic behavior in non-linear systems, computational physics, molecular dynamics, Monte Carlo Methods and Percolation Theory, and computer simulation of fractal-like systems.

Maximilian Gorensek, Ph.D. PE
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Dr. Max Gorensek retired from the Savannah River National Laboratory as a Senior Fellow in 2022, where he still works part-time. He holds BS and MS degrees from Case Western Reserve University and a PhD from Princeton, all in chemical engineering, and is a registered Professional Engineer. Most recently Max was co-Principal Investigator for the RAPID Center for Process Modeling, an AIChE-sponsored joint project with Texas Tech, Georgia Tech, and three software companies that developed chemical process models in support of process intensification efforts. At SRNL, his areas of research included modeling and simulation of a broad range of chemical processes, from biomass pyrolysis to carbon capture to high-temperature water-splitting hydrogen production to nuclear materials processing and waste treatment, and in support of initiatives ranging from process development to nuclear nonproliferation. Before joining SRNL in 2002, he worked in the commercial chemical industry, where his experience spanned the range from bench and pilot-scale process development and catalyst testing, through steady-state and dynamic modeling and simulation of plant processes and flowsheet development, to plant and licensing technical support. Max has been an adjunct professor at the University of South Carolina (Columbia) and is a former Associate Editor of the International Journal of Hydrogen Energy. He has 4 patents and about 40 peer-reviewed scientific publications and book chapters. Dr. Gorensek is a Fellow of the AIChE. He was a director and past Chair of the Nuclear Engineering Division, and a recipient of its Robert E. Wilson Award.

Claudio Corgnale, Ph.D. Mechanical Engineering
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Dr. Corgnale has a PhD in mechanical engineering and is known internationally for his experience and expertise in renewable energy systems, with particular emphasis on hydrogen systems and thermal energy storage systems. He has been involved in the design, assessment and testing of hydrogen production processes. Dr. Corgnale has also been working on hydrogen

storage, thermochemical energy storage systems and hydrogen compression and delivery systems. He has been carrying out techno-economic-financial studies, material development research and he has coordinated experimental tests for cryogenic adsorbent systems, high temperature materials and high-pressure hydrogen absorption systems. Dr. Corgnale was part of the US Department of Energy (DOE) Hydrogen Storage Engineering Center of Excellence, where he developed techno-economic analysis models for solid state hydrogen storage systems and detailed transport models for carbon and metal organic framework adsorption materials. He has been the principal investigator of several multi-million private and DOE funded projects, including renewable energy driven hydrogen production plants (e.g. wind electrolysis plants, photoelectrochemical hydrogen production systems, thermochemical hydrogen production systems), alternative hydrogen compression systems (metal hydride compressors) and stationary regenerative fuel cell systems

Dr. Bruce Hardy, Ph.D. Nuclear Engineering
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My research has primarily involved mathematical modeling of a wide range of physical processes and, to a lesser extent, experiments used to obtain parameters for, and to validate, numerical models. Briefly, my interests and research center about the modeling of coupled mass, momentum and energy transport (i.e., fluid mechanics, diffusion and heat transfer), chemical thermodynamics, chemically reacting flows, porous media flows, chemical engineering, electromagnetic fields, and applications of heat transfer and neutronics specific to nuclear engineering. In addition to continuum scale processes, I have done some work with atomistic modeling. Most of my publications can be found in either ResearchGate or Google Scholar by searching on "bruce hardy srnl publications."

For the past several years I have led a collaboration between the University of South Carolina, Columbia, and SRNL on development of machine learning algorithms for interrogating very large files of microscopic images for identification of surface defects in containers for nuclear materials. I have previously led, or been involved with, collaborative efforts between SRNL and the California Institute of Technology, the University of California, Berkeley, the Georgia Institute of Technology, the University of Michigan, Ann Arbor, the University of Quebec, Trois Rivieres, Los Alamos National Laboratory, Argonne National Laboratory, Pacific Northwest National Laboratory, the National Renewable Energy Laboratory, the Oregon State University-Microproducts Breakthrough Institute, Corvallis, GM, Ford, United Technologies and the NASA Jet Propulsion Laboratory.

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- Savannah River National Laboratory (SRNL) for more than 34 years., 1989-2024.
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- U.S. Army Construction Engineering Research Laboratory, Champaign, IL
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