Applications for ecohydraulics in the design of green infrastructure and ecosystem restoration to enhance climate resilience

As climatic hazards related to sea level rise and a changing hydrosphere intensify, societal interest is burgeoning to capture ecosystem services of natural and nature-based features. This talk will highlight the application of environmental fluid mechanics within complex three-dimensional canopies. Improved understanding of flow resistance and sediment transport mechanisms within natural systems benefit the design of green infrastructure for applications such as shoreline protection, ecosystem restoration and remediation of non-point source pollution.

Dr. Kibler is a faculty fellow of UCF’s Center for Global Economic and Environmental Opportunity. She earned her Ph.D. from Oregon State University and worked with the United Nations’ Environmental, Scientific and Cultural Organization (UNESCO) before joining UCF. Dr. Kibler’s Ecohydraulics Laboratory undertakes research at the crossroads of engineering and aquatic ecology and has been funded by the NSF (including a NSF CAREER Award), Environmental Protection Agency, National Oceanic and Atmospheric Administration, Florida Department of Environmental Protection and Florida Department of Transportation.

Enhanced Capabilities for Human Space Exploration Research

In this talk, Dr. Beltran will present two projects. The first is a NASA-REVEALS study on radiation mitigation and integration of organ specific distribution of the novel polymers according to their sensitivity and risk mitigation priorities. The research aims to decrease the risk of space radiation, thermal, hypoxia. She will also cover overall integration systems for new space surface exploration concepts enhancing extravehicular activities’ operations and crew safety. The second project is NASA biomolecular research on bioprinted 3D constructs to study the effects of microgravity and space radiation.

Dr. Beltran is a medical doctor and an expert on humans living and working in extreme environments. She is the chief scientist for human space exploration at the Florida Space Institute and deputy director of REVEALS, a NASA-SSERVI program aiming to study novel composites and their integration of radiation-effective shielding materials and thermal protection for spacesuits by using novel integration approaches to mitigate the effects of space radiation. Dr. Beltran also conducts research in biomanufacturing and its applications to space research.
Simulating, Comforting, and Assisting Patients

While Dr. Welch does not only pursue research related to healthcare, he will present several healthcare-related projects, including some work that is relatively mature and some that is envisioned. Specifically, he will overview work and ideas for a physical-virtual patient simulator, tactile telepresence for isolated patients and live-in embodied healthcare agents.

Dr. Welch received his B.S. in electrical engineering technology from Purdue, earning highest distinction honors, and his M.S. and Ph.D. in computer science from the University of North Carolina (UNC), Chapel Hill. Previously, he was a research professor at UNC, and worked for NASA on Voyager projects and at Northrop in electronic countermeasures. His current research interests include human-computer interaction and virtual/augmented reality. His awards include an IEEE VR Technical Achievement Award and an IEEE ISMAR Long Lasting Impact Paper Award. He currently serves on the World Economic Forum’s Global Future Council on virtual and augmented reality.

A journey across Nanostructured Rare-Earth Oxide

In this talk, Dr. Seal with discuss surface-engineered rare earth oxides, particularly cerium oxide nanoparticles to combat harmful reactive oxygen and nitrogen species responsible for cellular dysfunctions. The redox kinetics of regenerative ceria nanoparticles can be controlled with the type of medium and their implications in nano biomedicine will be presented. He will also share a brief focus on his team’s research output into commercialization.

Dr. Seal’s research is focused on synthesizing rare earth and transition oxides and metal/oxide nanoparticles and their tunable surface chemistry for a wide range of biomedical to energetic applications. He joined UCF in fall of 1997 after a brief postdoc with Lawrence Berkeley National Laboratory at the University of California, Berkeley. From 1990-1991, worked as engineer for TATA Steel, India. Dr. Seal is a former director of AMPAC and NSTC, and a fellow of FASM, FAVS, FloN, FECS, FAIMBE, FNAI, FAAAS, FMRS, FRSC, FIIM, FACERS.