UCF

COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

FACULTY RESEARCH TALKS

LISTEN. LEARN. COLLABORATE.

Zoom talk | Friday, Sept. 17, 2021 | Noon to 1 p.m.

CO-PRESENTER 1:

JAY KAPAT

Pegasus Professor and Trustee Chair, Mechanical and Aerospace Engineering

CO-PRESENTER 2:

GRACE BOCHENEK

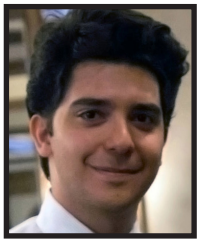
Director, UCF School of Modeling, Simulation and Training

Holistic Global Decarbonization – True Cost and One Potential Solution: Hydrogen

With the launch of Energy Earthshots, fashioned after President Kennedy's Moonshot program, a whole new set of discussions have started among federal agencies, as well as innovators and researchers in industry and academia. This presentation shares the primary focus of this overall program: decarbonization. Any complete solution to decarbonization must affect every aspect of human society and civilization as we know today, and it must involve all areas of the globe. As a result, there is no proverbial "silver bullet" that can provide holistic and global decarbonization. However, there is one potential technical solution that comes to close to being the "silver bullet" in most situations: hydrogen, which can help provide decarbonization across industry sectors and across the geographic/economic divides of the world. This topic is quite timely, since the infrastructure bill and the proposed budget have made decarbonization as the topmost priority of federal government, with heavy investment in hydrogen.

Dr. Kapat is the founding director of the Center for Advanced Turbomachinery and Energy Research. He obtained his Sc.D. in mechanical engineering from Massachusetts Institute of Technology. He joined UCF in 1997 as an assistant professor, and was promoted to the ranks of associate professor and professor in 2001 and 2005, respectively. Since the mid-2000s, Dr. Kapat has fully focused his research activities on turbo-machineries and associated technologies for power generation, aviation and space propulsion, and created partnerships with a number of OEMs in these industries.

Dr. Bochenek served as the Director of the National Energy Technology Laboratory and, in the Department of Army, as the Chief Technology Officer of the U.S. Army Materiel Command and the Director of the Tank Automotive Research, Development and Engineering Center. She served as the U.S. Acting Secretary of Energy in 2017. Dr. Bochenek earned a Ph.D. in industrial and systems engineering from UCF in 1998. She is well-versed in science, technology investment strategies, commercialization and performance, technology maturation and integration, and performance analyses with an emphasis on strategic alliances, partnerships and global/international programs. Dr. Bochenek has been recognized with numerous awards, including the Presidential Rank Award of Meritorious Executive, a silver medal from the National Defense Industry Association and Decorations for Exceptional Civilian Service from the Department of the Army and Department of Energy.



PRESENTER 3:

MAHDI ASSEFZADEH

Assistant Professor, Electrical and Computer Engineering

Integrated Circuits and Systems for Terahertz Signal Processing

THz signal processing encompasses analog operations to synthesize, analyze and modify broadband THz signals. The fundamental processes include arbitrary waveform generation, real-time sampling, linear and non-linear filtering, wavefront modulation, time-reversal, correlation and convolution. Integrating such functionalities in a low-cost semiconductor platform could lead to the proliferation of advanced THz technologies for upcoming communications, sensing and artificial intelligence revolutions. In this talk, Dr. Assefzadeh will present his research on active non-linear interferometers that can process broadband THz signals with significantly higher power efficiency and processing density than conventional continuous-wave or pulse-based signal processors.

Dr. Assefzadeh is the director of the UCF Terahertz Integrated Circuits Laboratory. Prior to joining UCF, he was a postdoctoral scholar at the University of California, Los Angeles in 2018, and completed his MS and Ph.D. in electrical and computer engineering at Rice University in 2014 and 2018, respectively. He received the IEEE SSCS Predoctoral Achievement Award in 2018, the IEEE Microwave Graduate Fellowship in 2016 and Best Paper Awards from the IEEE Instrumentation and Measurement Society and Radio and Wireless Symposium conferences. He was also the gold medal recipient at the 38th International Physics Olympiad in 2007.

ZOOM LINK: bit.ly/35unuVe | PREVIOUS TALKS: www.cecs.ucf.edu/faculty-research-talks