



NASA Next-Generation Sensing Technologies for Earth & Planetary Science

Dr. Ved Chirayath's seminar will highlight new sensing technologies and airborne platforms he is developing for Earth & Space Science as director of the NASA Silicon Valley Laboratory for Advanced Sensing. His talk will feature recent work on Fluid Lensing, the first remote sensing technology capable of imaging through ocean waves in 3D at sub-cm resolutions, MiDAR, a next-generation active hyperspectral remote sensing and optical communications instrument, airborne gas sensing of multipollutant combustion sources, and a plasma actuated unmanned aerial vehicle (UAV) that utilized high-voltage dielectric discharge devices to achieve the first plasma controlled flight in history.



Fluid Lensing and the NASA FluidCam instrument have been used extensively to provide distortion-free 3D multispectral imagery from UAVs of shallow marine systems around the world. MiDAR is being deployed on aircraft and underwater remotely operated vehicles (ROVs) as a new method to remotely sense living and nonliving structures in extreme environments as an analog for future Ocean Worlds robotic exploration missions. Finally, Chirayath will present preliminary results from NeMO-Net, a supercomputer-based neural network that uses a citizen science video game for global multimodal coral reef benthic habitat mapping, fusing remote sensing data from Fluid Lensing, MiDAR, NASA's Earth Observing System, and commercial satellites, to better understand the present and past dynamics of shallow marine systems.

Together, these maturing technologies present promising new ways in which to explore terrestrial, marine, and aerial systems on Earth, and, ultimately, aid in the search for extraterrestrial life within our solar system and beyond.