Wednesday, September 14, 2022

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SPEX: Combining Spectroscopy and Polarimetry for Remote Sensing

Wednesday, September 28, 2022 10:00 AM - 11:00 AM EDT

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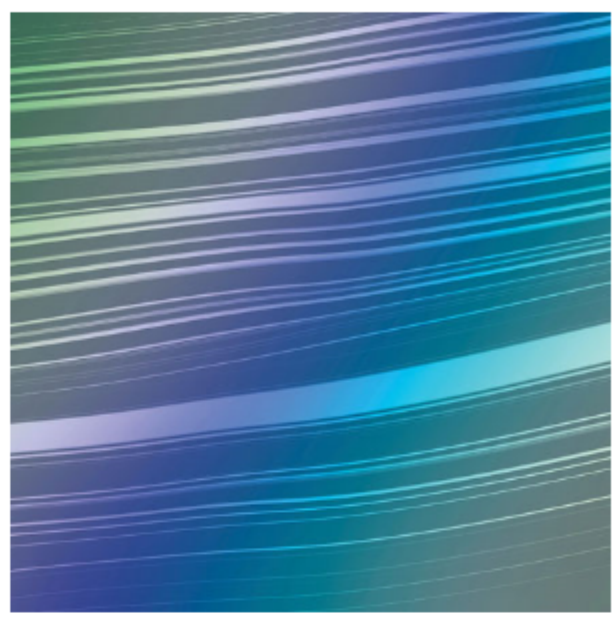

Spectropolarimetry is a powerful technique for remote sensing of the environment. Combining spectroscopy and polarimetry allows researchers to probe particle shape and size distributions that traditional spectroscopy cannot. However, measuring all these dimensions at once is challenging. For example, using the traditional technique of rotating a polarizing filter creates a time delay between measurements, and thus the technique cannot be used on moving targets. SPEX solves this problem by encoding polarization into the spectrum through spectral modulation, meaning the instrument measures spectral radiance and polarization at once. This ability enables snapshot hyperspectral measurements with high precision and accuracy.

Successful SPEX instruments have included groundSPEX and SPEX airborne, which both measure aerosol optical thickness with high precision. The iSPEX smartphone add-on allows citizen scientists to measure aerosols and water reflectance. The NASA PACE mission, due for launch in 2024, will carry SPEXone, which is set to revolutionize aerosol and ocean science. Olivier Burggraaff discusses the physics and instrumentation behind the SPEX technique and existing instruments, as well as their current and future scientific applications.

Who should attend:

Engineers, designers, and R&D scientists who utilize spectroscopy and polarimetry. Those who work in manufacturing, test and measurement, and consulting in fields such as aerospace, astronomy, agriculture, environmental research, technological development, and defense. Anyone who is interested in remote sensing applications.

About the presenter:

Olivier Burggraaff is a researcher developing techniques for hyperspectral and polarimetric remote sensing of water. His work has included the development of a smartphone-based spectropolarimeter for citizen science (iSPEX 2), the SPECTACLE method for camera calibration, spectropolarimetry of marine plastics, and improvements to uncertainty analysis in remote sensing of water. Burggraaff has recently submitted his doctoral thesis at Leiden University in the Netherlands after working in the astronomical instrumentation and environmental science departments.

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