

Electron-Beam Fabricated Diffractive Optics for Earth and Space Applications

Dr. Daniel Wilson, Jet Propulsion Laboratory

**October 19, 2017 (Thursday), 5:30 pm
Moore Laboratory of Engineering, Room B270
California Institute of Technology, Pasadena, CA 91109**



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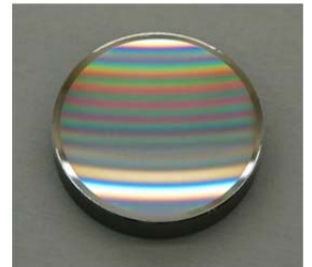
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AGENDA

5:30 pm – Refreshments/Pizza
6:00 pm – Announcements
6:10 pm – Lecture, Dr. Dan Wilson
7:00 pm – Discussions
7:30 pm – Adjournment

IEEE Metro-LA Photonics Chapter special lecture event

Electron-beam fabricated diffractive optical elements have proven to be enabling for a variety of NASA instruments. By combining the precision of the electron-beam tool with carefully calibrated fabrication techniques, three-dimensional surfaces can be created with accuracies down to tens of nanometers. This allows us to fabricate high-performance diffractive optics such as precisely blazed gratings and computer-generated holograms that are designed using optical wavefront engineering algorithms. Further, we have developed techniques for e-beam writing on curved surfaces, allowing us to fabricate convex or concave gratings for compact imaging spectrometers, many of which have flown on airborne and spaceborne missions (e.g. Compact Reconnaissance Imaging Spectrometer for Mars, Moon Mineralogy Mapper, and Portable Remote Imaging Spectrometer). We have also developed techniques for e-beam fabricating grayscale phase-profiled occulting spots for exoplanet imaging coronagraphs, and spot array generators for the Mars 2020 rover. This presentation will give an overview of our diffractive optics fabrication techniques and the instrument applications.



Daniel Wilson is a Principal Engineer in the JPL's Instrument Electronics and Sensors Section. He leads JPL's efforts in developing high-performance imaging spectrometer gratings and has research interests in the design and electron-beam fabrication of diffractive optical elements and instruments. He joined JPL in 1994 and has a PhD in Electrical Engineering from Georgia Institute of Technology. He was awarded JPL's Lew Allen Award for Excellence and the NASA Exceptional Technology Achievement Medal for his work on e-beam fabricated gratings.

Directions and Parking: Parking on the Caltech campus is accessible from Michigan Avenue, south of Del Mar Avenue. Parking is free after 5 pm. Moore Lab location: <http://www.caltech.edu/map/the-gordon-and-betty-moore-laboratory-of-engineering>

Reservation: Please RSVP with your IEEE membership # to dzt_ieee@outlook.com. You are welcome to bring your spouse as a guest. Non-members can go to www.ieee.org/join, then send your membership number.