

# Spring 2019 Colloquium

Department of Physics & Astronomy, TAMU-Commerce

**Apr 11, Thursday, 4-5 PM in Science Building 127**

(coffee and cookies will be served at 3:50 PM)

**Nanophotonics**

## Scanning Diffracted-Light (SDL) Imaging

**Dr. Luis Grave De Peralta**

**Texas Tech University**



Dr. Luis Grave de Peralta earned his MS degree (1982) in Physics at the Oriente University in Cuba, and his Ph.D. degree (2000) in Electrical Engineering at Texas Tech University (TTU) in Lubbock, TX. His Ph.D. research topic was on X-ray reflectivity. From 2000 to 2006, he worked as a post-doc at the Nano Technology Center at TTU doing research in integrated optics and ultrafast optics. In 2007, Dr. Luis began his appointment as an assistant professor at TTU, where he is currently a Professor doing research in nanophotonics, Fourier optics, and quantum optics. More information about Dr. Luis and his research can be found at

[https://www.depts.ttu.edu/phas/People/Faculty/bio\\_grave\\_de\\_peralta/bio\\_grave\\_de\\_peralta.php](https://www.depts.ttu.edu/phas/People/Faculty/bio_grave_de_peralta/bio_grave_de_peralta.php)

### Abstract

Common cameras permit to obtain intensity images of objects; thus, are only sensible to the amplitude of the electric field. However, the phase of the electric field also carries information about the world around us. Intensity images of transparent objects reveal less about the structure of the objects than phase images. For instance, a large variety of living cells are clear; therefore, several phase-recovery imaging techniques have been developed for imaging the phase of light that passes through transparent tissues. The multitude of bright objects visible in the firmament are separated by a transparent and immense medium. The intensity images collected by telescopes give us amazing images of the bright objects filling our Universe. However, intensity images may not tell the complete history because intensity images carry few information about the transparent immensity that separates visible stars, galaxies, and mega structures. I will talk about a novel phase-recovery imaging technique that may allow developing a telescope for obtaining phase images of the Cosmos. I will also discuss how SDL imaging may also allow developing the first phase-recovery optical nanoscope.