

# SEMINARIO

Viernes 3 de Febrero

a las 12.00 horas

## Biophysical Parameter Retrieval of Tree Crowns using Ground-Based Laser Scanning

**Inian Moorthy**

Since the introduction of ground-based laser scanning instruments, traditionally used for mining, urban planning and surveying applications, there now exists a means of rapidly digitizing structural details of vegetation canopies. These Light Detection and Ranging (LiDAR) systems use the time-of-flight principle to measure the distances of objects based on the time interval between laser pulse exitance and return, upon back-scattering from an object. The resultant 3D point cloud data, offers highly detailed spatially descriptive information of vegetation canopy architecture at millimeter-scale resolutions.



In this presentation examples of 3D data, from multiple LiDAR instruments, acquired in olive (*Olea europaea* L.) plantations in Córdoba, Spain will be shown. From the 3D field measurements, quantitative methods to characterize diagnostic architectural parameters such as tree height, crown width, crown height, crown volume, and Plant Area Index (PAI) were developed. With the development of such LiDAR-based methodologies to describe vegetation architecture, the forestry, agriculture, and remote sensing communities are now faced with the possibility of replacing current labour-intensive inventory practices with, modern LiDAR systems. This research demonstrates that ground-LiDAR instruments can potentially be the new observational tool and benchmark for precise characterization of vegetation architecture for improved agricultural monitoring and management.



Inian Moorthy received his M.Sc. and Ph.D. degrees in Earth & Space Science, from York University, Toronto (Canada). His Ph.D. dissertation was titled Tree Crown Structural Characterization: A Study Using Terrestrial Laser Scanning and 3D Radiative Transfer Modeling. His research interests include ground-based laser scanning, high resolution hyper/multispectral remote sensing, radiative transfer modeling and retrieval of vegetation biophysical properties. He is currently a Post-doctoral Fellow at the IAS-CSIC working with Dr. Pablo Zarco-Tejada.

