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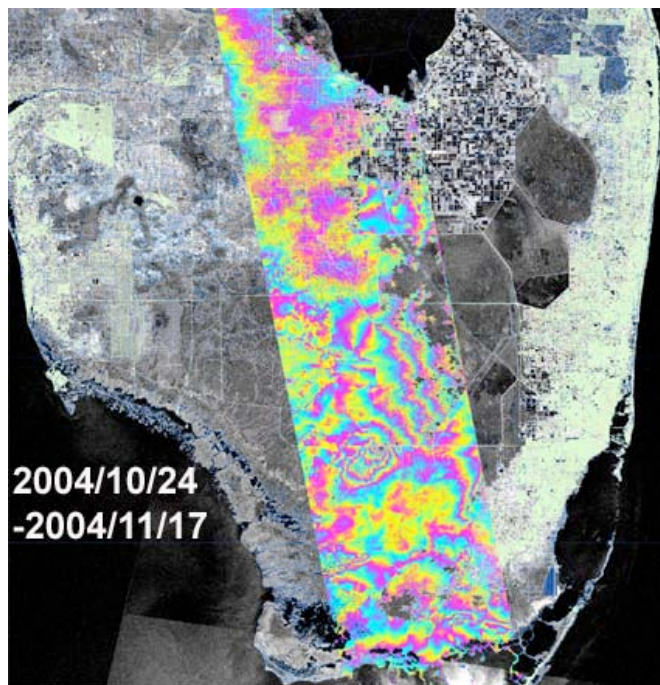
Center for **IMAGING** SCIENCE

**Seminar Series**

# Wetland InSAR: Observations and Implications

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RADARSAT-1 interferogram of central south Florida, showing water level changes in the Everglades wetlands during a 24 day period at the end of 2004.

**4pm, Wed, May 9, 2007**  
**Auditorium of the Center for Imaging Science**

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## **Abstract**

Space-based Synthetic Aperture Radar (SAR) is a very reliable technique for monitoring changes of both the solid and aquatic surfaces of the Earth. SAR measures two independent observables, backscatter amplitude and phase, over a wide swath (50-400 km) with pixel resolution of 10-100 m depending on the satellite acquisition parameters. Here we use interferometric calculations (InSAR) of the phase data for detecting cm-level displacements of the surface. The method compares pixel-by-pixel SAR phase observations of the same area acquired at different times from roughly the same location in space to produce high spatial-resolution displacement maps. Such maps, termed interferograms, are widely used in studies of earthquake induced crustal deformation, magmatic activity, water-table fluctuations, and glacier movements.

Wetland InSAR is a relatively new application of the InSAR technique that detects water level changes in aquatic environments with emergent vegetation. It provides the needed high spatial resolution hydrological observations, complementing the high temporal resolution terrestrial observations. In this study we explore the usage of InSAR for detecting water level changes in various wetland environments. Our main study area is the Everglades wetland (south Florida), but we also expand our study to other areas including the Louisiana Coast (southern US), Okavango Delta (Botswana) and other wetlands. High resolution wetland interferograms provide direct observations of flow patterns and flow discontinuities and serve as excellent constraints for high resolution flow models.

## **Speaker Bio**

Dr. Shimon Wdowinski is a research associate professor at the Rosenstiel School of Marine and Atmospheric Sciences, University of Miami, where he teaches and researches geology and geophysics. His work has focused on the development and usage of space geodetic techniques that can detect very precisely small movements of the Earth's surface. He successfully applied these technologies to study natural hazards and environmental phenomena, such as earthquakes, landslides, and wetland surface flow.

He received a B.Sc in Earth Sciences (1983) and M.Sc. in Geology (1985) from the Hebrew University (Jerusalem, Israel) and an M.S. in Engineering Sciences (1987) and Ph.D. in Geophysics (1990) from Harvard University. Before resuming a faculty position at Tel Aviv University in 1994, he conducted a post-doctorate research at Scripps Institute of Oceanography, UCSD (1990-1993). He joined the University of Miami in 2001.