NSF Grant Number: OPP-0122520

PI: Prasad Gogineni **Institution: University of Kansas**

Title: A Mobile Sensor Web for Polar Ice Sheet Measurements

Research Objectives:

Develop and demonstrate innovative sensors to measure key glaciological parameters for studying the contribution of polar ice sheets to sea level rise. Research involves development of sensors— imaging and sounding radars—, wireless communications, intelligent systems, robotics and ice sheet modeling.

Approach:

Develop radar sensors for imaging ice-bed interface, measuring ice thickness, and mapping internal layers. Integrate and operate sensors from an autonomous rover and a tracked vehicle equipped with communication and navigation systems. Use an intelligent system to determine an optimum sensor configuration for imaging the ice-bed interface and to operate the rover. Conduct field experiments on the Greenland and Antarctic ice sheets to demonstrate the scientific utility of the intelligent sensor package.

Broader Impact:

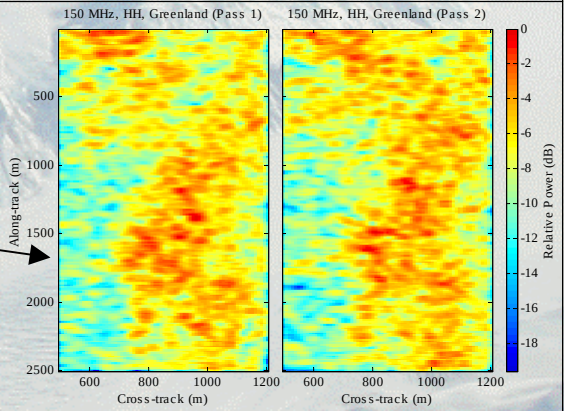
Established a strong outreach program that targets the general public and K-12, involves students and faculty from a minority institution, and provides internships for journalism students. Modernized the GIS laboratory at Haskell Indian Nations University, and has conducted GIS workshops for members of tribal communities.

Significant Results:

First and only successful demonstration of Synthetic Aperture Radar (SAR) imaging of the ice bed through 3-km-thick ice. Integration of the rover with the radar, communication, and intelligent systems. Verification of the Bayesian decision-making engine, agent-to-agent messaging and communication of the intelligent system. Demonstration of multi modem Iridium link.

Project's Web site: http://www.ku-prism.org/

Pass-1 and Pass-2 images are collected with 10-m offset to apply InSAR techniques to determine topography.



Multi-modem Iridium link