

## Using Wireless Sensor Networks to Detect Rainfall Induced Landslides

Wireless sensor networks are one of the fastest emerging fields which have gained immense attention for its application to critical and emergency situations. Amrita University, through the WINSOC project, is applying wireless sensor networks to real-life landslide monitoring and detection scenarios. This implementation is bringing together scientists from diverse fields such as geology and geophysics, and mechanical, computer, electrical, electronics, and communication engineering to save human lives, preserve the environment, and mitigate property damage.

Amrita is the leader of the Indian side of WINSOC, a unique Indo-European Consortium funded by the European Commission. WINSOC, *Wireless Sensor Networks with Self-Organization Capabilities for Critical and Emergency Applications*, focuses on developing a novel new method of wireless sensor networking that mimics biological systems. Other participants include organizations such as Italy's Selex Communication, DUNE, and the University of Rome, Spain's Sapienza, and the University Polytechnic of Catalonia, Switzerland's EPFL (Ecole Polytechnic – Lausanne), the Czech Republic's Center for Science and Society, Greece's INTRACOM, France's CEAL-LETI (Commission for Atomic Energy), and India's Antrix.

The wireless sensor networks developed through WINSOC will enable new paradigms of broad scale environmental and hazardous situation monitoring in which relatively large amounts of inexpensive sensor nodes will collect data and automatically couple together to aggregate data in reliable local decision making processes. This complex and heterogeneous wide area network will be put in place in the Idukki Rainforest area of the southern state of Kerala, India. This region experiences numerous rainfall induced landslides during every monsoon season.

The network architecture as specific to landslide scenarios is constructed with a lower level of wireless network nodes which are connected to a column of geological sensor. These nodes are then connected to a hierarchy of upper level wireless nodes that forward the data on to a central data collection point. From there the data is then sent wirelessly to a local analysis computer, from which it is then forwarded over the Indian Space Research Organization's (ISRO) Edusat Satellite and Village Resource Center satellite network to a more sophisticated landslide data processing and modeling center located at Amrita University.

With its inter-disciplinary initiatives and international partnerships, Amrita is fast emerging as an international presence with a reputation for attracting top quality faculty and providing them with a rich and satisfying environment in which to carry out research into scientific and engineering problems of societal impact.