IT Indore to carry forward NASA project

The Indian Institute of Technology Indore (IIT-I) is going to build a prototype instrument that would be installed in Ladakh, according to institute Director Pradeep Mathur's report released on Saturday.

Dr Siddhansh Sivasankha Mala, a faculty of IIT Indore, in collaboration with senior astrophysicists at the University of Wisconsin-Madison (Prof Peter Tumlin) and the University of Manchester (Prof Lucio Pecchia) would build the prototype.

As part of a long-term NASA project to design, construction and commission of the next-generation Satellite to probe the origins of the cosmos, the above-mentioned three-member team had designed a prototype instrument in 2007.

"Now, the IIT Indore is leading the construction of the next prototype to be installed in Ladakh," he said in the institute's report.

"Dr Mathur is also part of the astrophysics satellite project of the institute. The IIT Indore has a plan to construct a satellite with the help of ISRO and to position it at 1.5 million kilometers away from the Earth. Apart from this, the institute has a series of international joint projects."

Dr Naveen Mishra and Dr Frittie Sharma of IIT Indore are part of the Ganga Health Project, an international consortium being spearheaded by IIT Kanpur to come up with strategies to environmentally handle waste from the river Ganga, which happens to be more than a third of India's population.

The consortium plans to develop infrastructure in order to provide ecological services to the river and to transfer technologies for ecological protection to different localities in the river basin.

Dr Sudeshna Chattopadhyay has received a fellowship from the Deutsche Akademischer Auslands Dienst (DAAD) for collaborative work with Prof Uwe Klamradt of the RWTH Aachen University on collaboration between the two institutes.

Following are some major research initiatives by the institute.

MOU with CERN for construction of detector

The institute signed an MOU with ALICE Collaboration, a CERN experiment, in May. The purpose of the MOU is to design and fabricate materials that can efficiently store and deliver energy. Dr Ravi Kumar is working on novel methods to trap and store heat energy. Besides, Dr Shrikant Motina investigates single crystals to single crystal reversible/irreversible transformations involving processes such as vapor, diffusion, photochemical processes. These find applications in testing for alcohol, for instance. Also, Dr M Anbarasu investigates phase change materials that may be utilized for memory applications. Applications of phase-change materials are not limited to flash memories, though. Fast-switching modulators with a wide variety of applications are being explored.

Medical diagnosis

New methodologies for analysis and classification of bio-signals like electroencephalogram (EEG), electromyogram (EMG), center of pressure (COP) and ECG for medical diagnosis are being aimed at the IIT Indore Epileptic seizures, human emotions, cardiac disorders etc are being examined and analyzed using signal processing. Lab of Dr Bilal Muslim is working on signal analysis.

Astrophysics

The results of two galaxy clusters, mission of light years across, at 10 million degrees, clipping each other at 5000 km/s and resulting in the biggest bang in the universe that dwarf supernova. Such clashes attract the attention of the institute that has planned to build a satellite with the help of ISRO. Dr Siddhansh Sivasankha Mala is working on the project. The IIT Indore’s first radio telescope, which is part of the project, will see the first light in August, the use of embedded systems at 5, 10, 14 GHz is a novel feature. In five years, the institute will have an array of 35 dishes.

Optimal Drug Delivery

Cancerous and numerous growths need to be treated with drugs as well as radiotherapy. The effectiveness of drug delivery in surgery as well as chemotheraphy depends on the model of drug delivery used. Dr Chethan Veekatesh optimizes these drug delivery methodologies. Meanwhile, members of biociences and biologists are constructing interdisciplinary research groups at IIT Indore conducting research on a variety of topics that have urgent and immediate applications in the biomedical field.