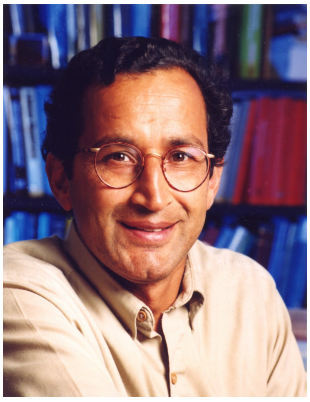
IIT Bombay is organising an Institute Colloquium on Wednesday, December 8, 2010. The details are as follows:

	Speaker :	**Professor Sirish L. Shah** Department of Chemical and Materials Engineering University of Alberta Canada

Title : **Data, data everywhere… How to shelter from the digital tsunami?**
Sensor-fusion and signal processing for plant health management

Day & Date : Wednesday, December 8, 2010

Time : 5.10 p.m.

Venue : P.C. Saxena Auditorium

All are invited.

Abstract:

Most of the major plant, factory, process, equipment and tool disruptions are avoidable, and yet preventable fault detection and diagnosis strategies are not the norm in most industries. It is not uncommon to see simple and preventable faults disrupt the operation of an entire integrated manufacturing facility. For example, faults such as malfunctioning sensors or actuators, inoperative alarm systems, poor controller tuning or configuration can render the most sophisticated control systems useless. Such disruptions can cost in the excess of $1 million per day and on the average they rob the plant of 7% of its annual capacity.

Over the last decade the fields of multivariate statistics, controller performance monitoring

techniques and Bayesian inference methods have merged to develop powerful sensing (*e.g.* Particle Filter based tools) and condition-based monitoring systems for predictive fault detection and diagnosis. These methods rely on the notion of sensor fusion whereby data from many sensors or units are combined with process information, such as physical connectivity of process units, to give a holistic picture of health of an integrated plant. Such methods are at a stage where these strategies are being implemented for off-line and on-line deployment.

This presentation will outline the field of sensor fusion - the application of signal processing methods, in the temporal as well as spectral domains, on a multitude and NOT singular sensor signals to detect incipient process abnormality before a catastrophic breakdown is likely to occur. This talk will be complemented with industrial case studies to demonstrate the success of these methods. The fusion of process data with alarm data, typically in binary mode, and process connectivity information using signed-digraphs will also be illustrated via industrial case studies.

About the Speaker:

Sirish L. Shah has been with the University of Alberta since 1978, where he currently holds the NSERC-Matrikon-Suncor-iCORE Senior Industrial Research Chair in Computer Process Control. He was the recipient of the Albright & Wilson Americas Award of the Canadian Society for Chemical Engineering (CSChE) in recognition of distinguished contributions to chemical engineering in 1989, the Killam Professor in 2003 and the D.G. Fisher Award of the CSChE for significant contributions in the field of systems and control. He has held visiting appointments at Oxford University and Balliol College as a SERC fellow , Kumamoto University (Japan) as a senior research fellow of the Japan Society for the Promotion of Science (JSPS) , the University of Newcastle, Australia, IIT-Madras India and the National University of Singapore. The main area of his current research is process and performance monitoring, system identification and design and implementation of softsensors. He has co-authored two books, the first titled, Performance Assessment of Control Loops: Theory and Applications, and a more recent book titled ‘Diagnosis of Process Nonlinearities and Valve Stiction: Data Driven Approaches”.