

A lot of activity happened in the Physics Lab in the year 2009. This included visits from Faculty and students on Lab open-house sessions. Visitors from COMSATS, GCU, Punjab University and UET visited the lab and saw the experiments. This culminated in a contract agreement with the Institute of Space Technology, SUPARCO under which the Physics Department will set up a freshmen physics lab at the IST. This is an unprecedented initiative in the landscape of higher education in Pakistan, in which one University is charged with providing homemade equipment, experimental ideas, software, lab manuals and training to a sister Institute. Sabieh Anwar was invited at the Physics Department, Quaid-e-Azam University, Islamabad in November 2009 for a presentation on undergraduate experiments set up by his team at LUMS.

The Lab successfully ran an internship programme in which SSE students as well as students from other institutes such as Bahria College, Karachi and Physics Department, Punjab University completed their diverse research projects. These reports are available on the website. Hafsa Hassan from the batch of 2012 was declared the best intern for her contributions to rotational damping and Poisson statistics of background radiation.

Aysha Aftab from Punjab University completed and successfully defended her M.Phil. thesis, "Phase sensitive Faraday detection in diamagnetic liquids" under the supervision of Sabieh Anwar. A former B.S. student from Punjab University, Rafiullah also completed his research thesis with Sabieh Anwar. His research findings were published as "Undesired gradients in low field magnetic resonance imaging", Rafiullah, **M.S. Anwar, Concepts in Magnetic Resonance Part A**, 34A, 173-190 (2009).

Umer Siddiqui from the Physics Lab was selected on an NSF fellowship for participating in the *GEM School Cellular and Molecular Mechanics with a focus on Enabling Technologies* that took place in the University of Illinois at Urbana-Campaign in the summers. A report was published in the July 2009 issue of the HEC Newsletter *News and Views*. Abdul Mannan obtained training in 3D drafting course organized by the National Institute of Design Analysis (NIDA), Lahore. In October 2009, selected people from the Physics Lab (Sohaib Shamim, Umer Siddiqui and Wasif Zia) helped in conducting the 3 days IEEE LUMS Matlab Workshop.

The Physics Lab continued its progress in designing new experiments for the undergraduate students. Exciting progress has been made in a brief span of 12-18 months. This included the addition of a new experiment on electromagnetic induction and determining the latent heat of vaporization of liquid nitrogen. Experiments for the advanced labs are also underway. Considerable effort has been spent in the experimental areas of optics, superconductivity, materials, magnetism, low-temperature physics, radiation physics, vibrations and measurements. Some of these pedagogical experiments designed in the 2009 have now been published in leading journals such as: "Simple circuit for investigating noise in the undergraduate laboratory", U. Hassan, S. Shamim, **M.S. Anwar, European Journal of Physics**,

30, 1143-51 (2009; "Reducing Noise by Repetition: Introduction to Signal Averaging", Umer Hassan and **Muhammad Sabieh Anwar**, Eur. J. Phys. 31, 453-465, 2010; and "Investigating viscous damping using a webcam ", S. Shamim, W. Zia, **M.S. Anwar**, **American Journal of Physics**, 78, 433-436(2010).

Some progress in research was also made in the year 2009. This included the addition of a new post-doctoral researcher, and some research fellows to Sabieh Anwar's research group. Initial results on magnetic thin films were published as "Effect of temperature on structural and magnetic properties of laser ablated iron oxide deposited on Si(100) ", by S.M. Ramay, S.A. Siddiqi, **M.S. Anwar**, S-C. Shin, **Chinese Physics Letters**, 26, 117504 (2009). Some new facilities have also been added to the lab including high temperature furnaces, a low-temperature close cycle helium cryostat, sophisticated test and measurement equipment. However, the main focus has remained the development of indigenous resources using homegrown facilities and equipment. This has resulted in significant cost savings.

Detailed features on the Physics Lab were published in *LUMS Newsnet* (Spring 2009 issue). The Lab also developed its website which is now publicly accessible: <http://physlab.lums.edu.pk> which provides a detailed snapshot of the diverse activities of the Lab.

Sabieh Anwar was also the coordinator of the Khwarizmi Science Society for the celebration of the International Year of Astronomy in 2009. The activities were heralded as a resounding success. The KSS Team, which included several members from the Physics Department, visited remote villages and town schools in Punjab and Khyber with live astronomical viewing of the solar system and galaxies. Reports of these activities have been published in the national and international press.