PHYSICS CHANNELS

Department of Physics, CIIT Lahore

SPRING 2015

Editorial

Creativity is a process which takes courage to be apparent. It requires you to open the windows of your soul to multiple visions out of the same view. While it took a bit longer than usual to bring this issue forward, the thinking and reflection initiated long ago. As the semester activities were trending, it was decided to define a ***theme*** *to trigger influence and inspiration for the younger lot as* ***to shape*** *is our primary aim.*

This issue's primary theme is medical physics. At the same time, we talk about the handful of the activities on board to generate the sense of technology, innovation and synergy, and which truly contribute to emerge of the glory. This includes the efforts to buildup advanced research infrastructure, the shared momentum of increased research interactions across borders and the activities where we took a productive break and invigorated a way of learning flavored with entertainment en route our primary goal to positively influence career and personal development. Thanks to Ms. Samia Aslam, Ms. Faiza Mustafa and Dr. Ayesha Anjum for their suggestions and to the people who contributed with stories supporting the idea.

We wish you research and publications in the coming semester :).

Sincerely yours,

Dr. Ayesha Jamil

This Issue;

WELCOMES Prof. Dr. Qaisar Abbas as DIRECTOR, CIIT, Lahore Campus.

&

CONGRATULATES Prof. Dr. Saleem F. Shaukat on taking charge as the new CHAIR (Phy) and Head of Academics & Research.

COVERS

* **Radiation therapy, a primary means towards disease management.**
* **Opportunities to instigate scientific dialogues and debates as a primary way to instigate student interest.**
* **Buildup of research infrastructure as a way to perk up innovation.**
* **Where the CIIT makes a mark.**

Message From the Chair(Phy) & HoAR

At CIIT, Lahore, we are proud to nexus the tomorrows challenges by innovative approaches of today. We work on the problems that lie at the intersection of science, engineering, business and IT as a part of our vital strategy through intense learning and research. We are strongly tied to live to the Salam's viewpoint, "It's just impossible to talk only of technology transfer. One should talk of science transfer first and technology transfer later…. Unless you are very good at science you will never be good at technology." Physics being one of the universal scientific avenue therefore desires for a continuous spectrum of exploration from the edge of our understanding to applications for everyday uses. We intend to promote research collaboration and discuss new avenues for the inter-disciplinary research and to educate students about the current and future scientific trends.

As a Chairman (Physics) and Head of Academics and Research, I welcome you to join us to create a singular environment of achievement, collaboration, knowledge and many more positive exciting challenges. The mixture of academic strengths within the department as well as in COMSATS, in general, is exhibited through an affable environment for students and faculty, excellent teaching facilities, highly qualified faculty, opportunities for student participation in research and outreach activities, which are considered as key factors for success in the present demanding world.

Prof. Dr. Saleem Farooq Shaukat

Chairman (Dept. of Physics), CIIT

Head of Academics & Research, CIIT, Lahore

Includes;

CONGRATULATIONS TO

Prof. Dr. QAISAR ABBAS

*On becoming the **Director, CIIT, Lahore***

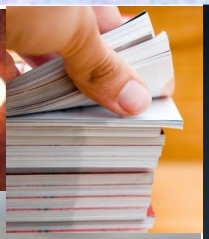
Prof. Dr. Qaisar Abbas holds PhD degree in Human Resource Development from Nankai University Tianjin China and has a Post-Doctoral Research experience at Cardiff Business School, Cardiff University, UK. Over the years, he has also assumed various additional responsibilities at CIIT including, Dean Faculty of Business Administration, Provost, Chief Proctor, Project Director of Infrastructure Development Project CIIT, Member of Campus Selection Committee, Convener Campus Inspection Committee, Convener Board of Studies of Management Sciences, and Member Board of Faculties of Business Administration and Information Sciences. His efforts towards the establishment of a world class business school at CIIT are worth a mention. We hope that the Lahore Campus will touch new heights under his kind guidance.

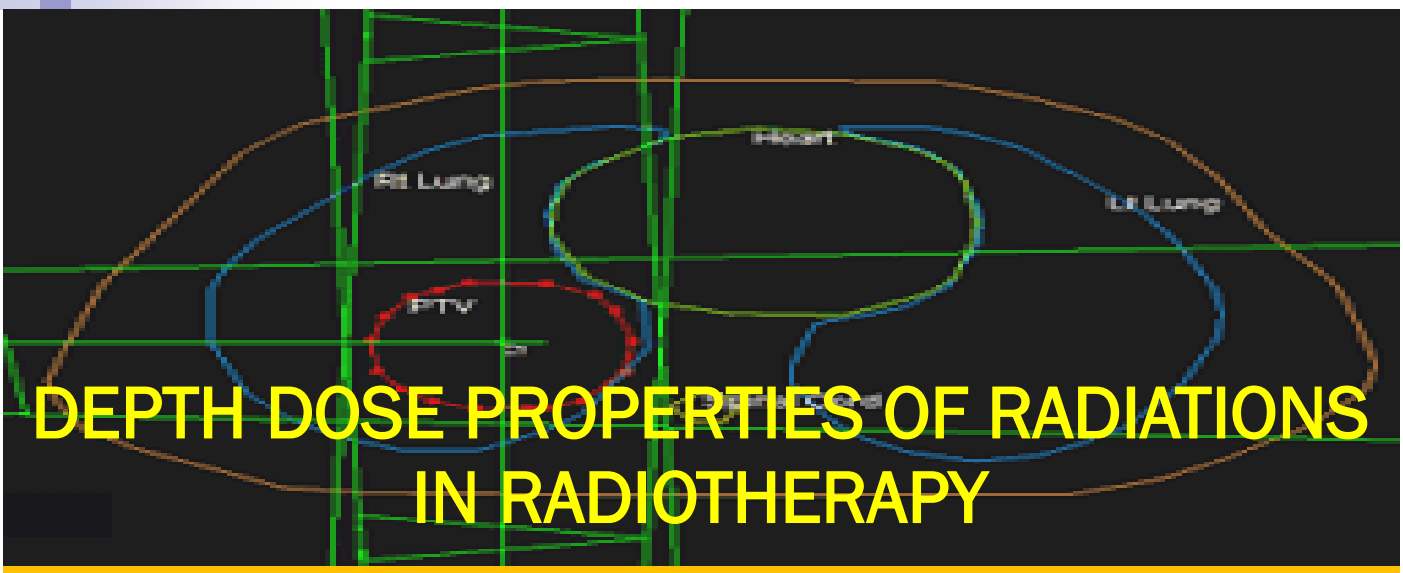
Prof. Dr. SALEEM FAROOQ SHAUKAT

*On becoming the **Chairman, Department of Physics, CIIT***

*& **Head of Academics and Research, CIIT, Lahore***

Dr. Saleem Farooq Shaukat has a long and outstanding career in the academic research and teaching, spanning more than 28 years. He has been awarded the Productive Research Scientist Award by the Ministry of Science and Technology, Islamabad many times in his career. He joined COMSATS IIT in October 2004 and has been actively involved in teaching, research and administrative assignments. He has always stressed upon quality teaching and research as the key elements in signifying the glory of any academic department. His kind guidance and support has enabled the Department to make its mark in producing maximum research output. We sincerely wish him great success in his thoughtful endeavors.





DEPTH DOSE PROPERTIES OF RADIATIONS IN RADIOTHERAPY

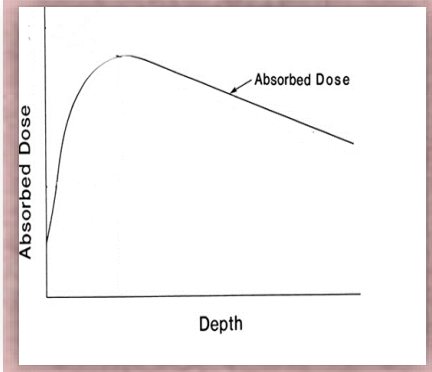
Dr. Naima Amin *(Department of Physics, CIIT Lahore)*

Radiotherapy procedures fall into two main categories: external beam radiotherapy and brachytherapy. In external beam radiotherapy the radiation source is at a certain distance from the patient and the target within the patient is irradiated with an external radiation beam. Photon external beams are all characterized by the same physical parameters, but fall into various categories depending on their origin, means of production and energy.

Radiation dosimetry deals with two distinctly different entities: one describes the photon radiation beam itself in terms of the number and energies of photons constituting the photon beam and the other describes the amount of energy the photon beam may deposit in a given medium such as air, water or biological material.

Dosimetry is a very significant aspect of radiotherapy treatment Optimization of treatment plan and calculation of dose for certain plan is carried out when radiation physicist have measured dosimetry data. This data is actually representing distinctive characteristics of the machine, beam and its energies in the form of dosimetric quantities. Physicists are always concerned to obtain these parameters, first to use in radiotherapy treatment and second to evaluate and examine the physics of radiation beams.

Interaction of x-rays with matter is always remaining an important issue in medical physics especially in radiotherapy physics. Medical physicists are always interested in the dose absorbed by a medium.



Depth –Dose Distribution of Photons

Absorbed dose is a quantity which is scientifically defined and used to calculate the exposure of biological objects, including humans, to ionizing radiation. Absorbed dose in the body is dependent on depth, field size, photon energy and Source to surface distance (SSD).

Measurement of absorbed dose is made using water or any other equivalent media phantom, which is kept perpendicular on the path of beam.

This measurement is expressed as Percent of dose which gives an exclusive value for a

Linear Accelerator for External beam Radiation Therapy

certain set of parameters like beam energy, depth, SSD and field size. Variation in this value can be noted by variation in any of these parameters.

DIALOGUES & DEBATES

COLLOQUIUMS, WORKSHOPS & SEMINARS

INSPIRE & CONNECT

Motivated by scientific diversity, curiosity and an interactive exchange of ideas, the Department of Physics, CIIT Lahore has made it a history to arrange scientific dialogues every semester in the form of conferences, workshops, colloquiums, workshops and seminars. Generally speaking, the events are structured to showcase ideas from various basic as well as applied research perspectives. To participate in the open scientific debate, colleagues from various fellow universities are invited. The aim behind such activities is to instigate student motivation to **think out of the box** to come up with innovative scientific ideas to put theory to practice. Taking a look back over the memories from last academic year here are few notable ones.

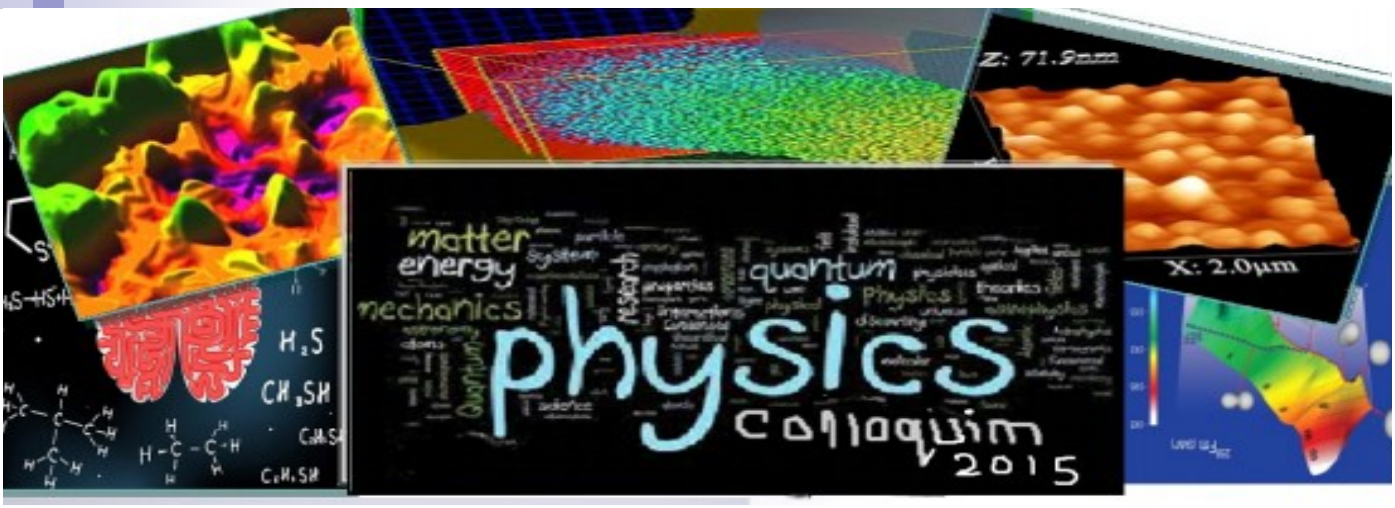
TALK by STEVEN PANG

Agilent technologies offer a full range of atomic and molecular spectroscopy instruments. It also provides the products for life sciences and chemical analysis which mainly includes spectroscopy and chromatography apparatus. It introduced an Ultraviolet-Visible-Near IR Spectroscopy (UV-Vis-NIR) molecular spectroscope which uses the latest technology to provide the researchers with the accuracy and fineness in their results. These analyzers are user friendly with very interacting GUI and are easy to handle. Overall performance of these analyzers is very much enhanced as compared to the former versions of the spectrometers. Universal Measurement Spectrophotometer (UMS) increases signal-to-noise improving accuracy, reproducibility and productivity. Agilent technologies are innovating ways to move towards the precision and accuracy in the measurements and results. Cost effectiveness of the analysis and the user friendliness is devising new horizons for the researchers to excel in their fields.

TALK by Prof. QAIM

The Department of Physics was honored to arrange a guest seminar by Dr. Qaim who has the proud honor to serve as senior scientific officer in Atomic Energy Center, Lahore Pakistan and the Nuclear Research Center, Julich. Currently he serves as professor of nuclear chemistry at University of Cologne, Germany. He is also serving as advisor at Institute of Nuclear Chemistry, Julich. His research interests include various aspects of fundamental and applied chemistry. He has recieved several awards, notably Sitara-e-Imtiaz in 1999 and medals of honor by Egypt and Bangladesh in 2005 and 2013 respectively.

While his talk mainly dealt with the energy related applications of nuclear research, however during his talk, Prof. Qaim stressed upon the interdisciplinary nature of nuclear data research for applications ranging from energy to medicine. Besides he also highlighted how such data is generated and modeled for various fission and fusion based energy systems. He presented a very comprehensive briefing of not only how various efficient nuclear reactors are built, their performance parameters but also the technological caveats along with the possible solutions. He stressed that extensive efforts are needed for developing databases for new generation Fission and Fusion Technology as well as Accelerator Driven System based energy amplifiers.



The idea behind Physics Colloquium held every semester by the department of physics, CIIT Lahore is born out of an attempt to promote Physics as a central solution to the realms of various real world problems related to science, engineering, industry as well as those linked with the inherent curiosity towards the understanding of the origin and existence of universe. To maintain its commitment, the Department of Physics organized its 5th and 6th colloquial meetings on November 12, 2014 and March 25, 2015 respectively where colleagues from various universities across Pakistan were invited.

The meetings emphasized upon the dignified role of physics in revolutionizing the human survival and how the knowledge of the field widens up the frontiers of our understanding of natural existence. The dialogues stressed upon the ground facts that this exchange of scientific ideas to be tested on practical grounds thus to make the spell of such debates more effective and long term.

The canvas covered a wide variety of flavors ranging from efficient energy harvestion to theory behind space plasmas and from neuro imaging diagnostics to the miracles made by graphene electronics. Among the many distinguished guest speakers include Prof. Dr. Shahid Rafique (UET, Lahore), Dr. Fareeha Hameed (Forman Christian College University), Dr. Babar Ahmad Qureshi (Lahore University of Management Sciences, Lahore), Dr. Sadia Manzoor (CIIT, Islamabad), Dr. Waqas Masood (CIIT, Islamabad), Engr. Ahmad Khalid (National Instruments, Islamabad), Dr. Rashid Jalil (University of Engineering Technology, Lahore) and Dr. Fakhr-ul-Inam (Lahore University of Management Sciences, Lahore). The ceremony was also graced by the talks of departmental faculty. A vast majority of the attendees belonged to Physics Department with technological focus in the major areas of sciences including Nanomaterials, Biology, Cosmology and Electronics.

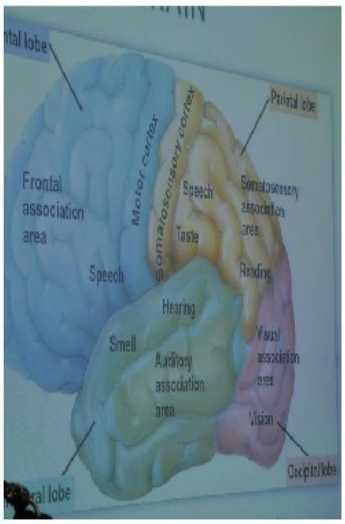
The participants discussed the possibilities of;

- Hydrogen fuel generation by inducing artificial photosynthesis in laboratory-designed Silicon based photovoltaics.
- Exploitation of nuclear radiation for various applications including material imaging, structural detection, charge densities, and detection of in material homogeneities as well as medical benefits like tissue engineering.
- Waves and instabilities related to the explanation and mechanism of solar wind impact on our earth
- Cerebral anatomy and different neuro-imaging modalities for early medical diagnostics.
- Combinatorial approaches based on the design of composites of magnetostrictive and piezoelectric materials as a technique to achieve strong magnetoelectric coupling. Such a strategy would be a leap towards achieving the highest storage capacities .
- Using various distribution function for a complete understanding of wave dynamics spanning our universal atmosphere and the observation of various wave modes as a product of complex plasma reaction phases.
- To address various technological caveats as a result of joint sci-tech collaborations.
- Graphene as a miracle material for nanoscale electronics.
- Of using a stratum of concepts, hypothesis, models and mathematical theories for explaining atomic structures of amorphous semiconductors, disordered alloys, glassy state and many other interesting systems.
- Laser assisted thin film deposition technique.
- Laser assisted pattern writing.
- And many more….

The shared momentum over the diverse scientific perspectives is believed to perk up innovative ideas and nationwide research partnerships .


Executive Lounge


QUANTUM GRAVITY


Frontal association area
Motor cortex
Somatosensory cortex
Parietal lobe
Speech
Taste
Speech
Reading
Hearing
Smell
Auditory association area
Visual association area
Vision
Occipital lobe

RESEARCH FOCI

Quality research and team workb are the prime parameters to excel in academia. Living with similar motives, the department has set several research arenas to facilitate research and idea building. The existing research groups have been reshaped as new colleagues have joined where the major objective of research groups is to have frequent interactions on Productive Research. The purpose behind the exercise is to collect ideas and experience on the joint platform towards the solution of a shared scientific query. The idea has always been to foster a sense of direction and quality research within the group and towards a broader audience.

RF, Microwave & Optoelectronics

Prof. Dr. Saleem F. Shaukat
Dr. Salman Naeem Khan
Dr. M Junaid Amjad
Dr. Naima Amin
Dr. Ayesha Anjum
Dr. Amna Mir
Ms. Mahrukh Bukhari

Plasma Physics

Dr. Muhammad Asif
Dr. Zahida Ehsan
Dr. Muhammad Jamil
Dr. Fraz Bashir

Quantum Optic and Photonic Device

Dr. M. Ashfaq Ahmad
Dr. Farah Alvi
Dr. Ayesha Jamil
Dr. Muhammad Saleem
Ms. Samia Aslam
Ms. Faiza Mustafa

Clean Energy Technologies

Dr. Rizwan Raza
Dr. Saif Rehman
Dr. Nusrat Sajid
Dr. Nadeem Akram
Dr. M Ajmal
Mr. M Kaleem ul Allah

Nanomaterials

Dr. Aamir Razaq
Dr. Asif Hassan
Dr. M Idrees
Dr. Abdul Sttar
Dr. Ishrat Sultana
Dr. M Usman Arslan

High Energy Physics

Dr. Shabana Nisar
Dr. Naveed Aslam
Dr. Nosheen Akbar
Dr. Hassan Mehmood (on leave)
Mr. Noman Ahmad Khan

Magnetic Nanomaterials

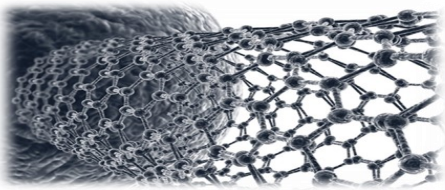
Dr. Majid Niaz Akhtar
Dr. Mukhtar Ahmad
Dr. Yasir Rafiq
Dr. Muhammad Imran
Dr. Akbar Ali

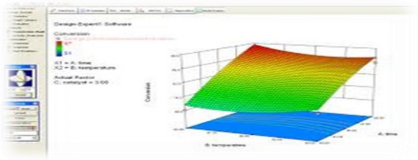
Installation of Atomic Force Microscope

To do state of art science, we need state of art facilities. The Department of Physics is pleased to announce the successful installation of an Atomic Force Microscope to do nano-scale science. The AFM uses a2-dimentional flexure stage to scan the sample in the XY direction, and a stacked piezoelectric actuator to scan the probe cantilever in the Z direction only. This decoupled motion of z-scanner demonstrates high orthogonality and an excellent out-of-plane motion profile. The AFM not only includes all the basic imaging modes e.g. contact, non-contact and tapping mode but also gives the advantage to magnetic domain

analysis, nano-indentation and electronic property analysis. The equipment is up and running in all basic modes including contact, non-contact as well as intermittent contact mode. The equipment will enable to do the topographical studies as well as manipulation by scanning the surface with a sharp tip whose motion is controlled by a set-point driven feedback loop. The equipment is believed to enable further advancements in the nano-scale science and open up research avenues to take part in revolutionizing the field.

Nano-Composites Laboratory





Department of Physics has established a nanocomposite lab for the graduate students, where students will conduct their final year research. In this lab we have few instruments for the characterization of nanomaterials. Lab is equipped with the following instruments:

•**Simulator (Expert Design Software**)-- We can not only screen for vital factors, but also locate ideal process settings for top performance and discover optimal product formulations.

•**Potentiostat/Galvanostat**:-- The Autolab PGSTAT provides the scientist with all the electrochemical methods of interest for surface science. Potentiostatic and gvanostatic control allow the researchers to accurately control the reactions taking place at the electrochemical interface as well as the rate of these reaction and the quantity of material involved. Using these methods, the composition, roughness, and structure and growth mode of deposited materials can be controlled.

•**Four probe IV measurement system**:--The most common way of measuring the resistivity of a conducting material is by using a four-point collinear probe. This technique involves bringing four equally spaced probes in contact with a material of unknown resistance. The two outer probes are used for sourcing current and the two inner probes are used for measuring the resulting voltage drop across the surface of the sample.

•**Sputter coater**:--The EMS 7620 is a compact, low cost SEM sputter coater that comes complete with a glow discharge option as a standard.

Fuel Cell Laboratory

The department has also seen the development of a fuel cell research laboratory equipped with the following facilities.

·**Electrochemical Impedance Analyzer (EIS) -PARSTAT 4000:** The EIS is a unique facility for testing and development of electrochemical analysis system for energy devices and materials.

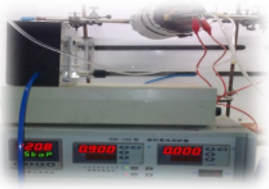
·**Corrosion Cell with Pt and Ag/AgI electrodes**

·**DC 4-Probe conductivity Setup:** This instrument can be used for the conductivity measurements by the 4/probe DC method, which is very common for the materials. (Model 2450 SourceMeter® SMU Instrument and a Four-Point Collinear Probe)

·**Hydrogen Generator:** For fuel cell gas supply

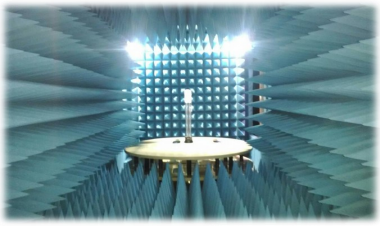
·**Fume Hood**

·**Fuel Cell testing unit (IV measurements)**



·**Planetary Ball Mill (RETSCH)**

Microwave Spectroscopy Laboratory



The last century has been the century of communication revolution. The majestic increase in the number of communication devices and standards has carried itself into the current century.

To pace up with this global revolution and connectivity requirements, the Department of Physics has establishes its Microwave Spectroscopy Laboratory. The facility is equipped with an Anechoic chamber (3.5m L x 1.7m W x 2.1m H) for radiation characterization of microwave devices over a frequency band of 2 to 50 GHz in conjunction with R&S ZVA 50 vector network analyzer for transmission as well as reflection measurements.

Many small tools like power meter, DC-Blocks, wave guides, antennas etc. up to 50 GHz are also available for various application specific measurements.

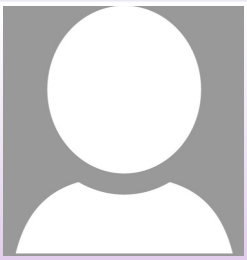
Dr. Arsalan USMAN has recently joined the department as an Assistant Professor. Dr. USMAN completed his PhD studies from University of Engineering and Technology Lahore (UET) in the field of nanotechnology. He has research expertise in the field of thin films, laser matter interactions and nonmaterial synthesis where his work revolved around the fabrication and control of physical properties for the development of smart materials. He also has the honor to complete part of his project at National Institute of Material Science (NIMS), Tsukuba, Japan. Dr. USMAN is also a member of Pakistan Institute of Physics (PIP).

The department is also honored to have Dr. **Muhammad Fraz BASHIR** as a competitive addition to its existing faculty. Dr. BASHIR completed his PhD from Govt. College University Lahore with a research focus in the field of Drift effects on Plasma Waves. He has expertise in different type of Kinetic Theories, Numerical Simulation, temperature anisotropy in Solar wind and Magneotsphere, Geodesic Acoustic Modes (GAMs) in Tokamak Plasmas etc. He was awarded with Commonwealth Scholarship-2012 by the Canadian Government. He has also been ranked as Productive Scientist of Pakistan 2013. He is member of American Physical Society (APS), American Geophysical Union (AGU) and Pakistan Physical Society (PPS). Besides research and teaching, Dr. BASHIR is a footballer and has played for national junior side,, Punjab Games, Inter-university championships and various private all pakistan and all punjab football tournaments.

Dr. Muhammad IMRAN, who also joined the department as an Assistant Professor completed his PhD from Universiti Teknologi Malaysia, Malaysia. Dr. IMRAN's work is majorly focused around the laser assisted pattern formation onto various polymer and glass films. He is a highly motivated professional who wants to contribute towards developing indigenous research labs and quality teaching.

The department is also honored with the joining of **Dr. Yasir RAFIQUE** who completed his PhD from University of Science and Technology Beijing, China. Dr. RAFIQUE is interested in investigating the various aspects of nanomagnetism for optimal performance of various devices. Dr. RAFIQUE has been the author and co-author of a number of research articles published in high impact factor ISI index peer reviewed journals with a cumulative impact factor of more than 46.

Dr Amna MIR, graduated from Beijing university of Posts and Telecommunications with a Doctorate degree in 2015. Her area of research revolves around Terahertz detection schemes, focal plane arrays for terahertz imaging for medical purpose and RF antenna and circuit designing. Prior to doctoral degree, Dr. MIR earned her Masters (M.Sc) and M.Phil degree from Department of Physics, University of Punjab, Lahore. Her current research is focused on designing and optimization of Antennas for satellite navigation system.



The rejoining of **Dr. Nusrat SAJID** is another positive addition to Physics family who graduated from the University of Sheffield, UK with a PhD degree where she developed a maskless far-field photolithography setup capable of diffraction limited resolution in two dimension on different substrates including positive resist, negative resist and self-assembled monolayers (SAMs). The technology has very broad promise in device fabrication as well as the fabricate a 2D and 3D arbitrary patterns for potential biological applications. She also got expertise in biological methods which are essential for cell culture. She obtained topography information on three different cell types using Atomic Force Microscopy (AFM). Moreover, she also measured micro and nano -mechanical properties of different cells with AFM under physiological conditions

TOUCHING NEW HORIZONS

The present day technological demands call for productive pursuance of variety of research expertise, trainings, problem definitions and their possible solution. Hence to create this revolutionary roadmap towards the dawn of modern era, people from Department of Physics, CIIT Lahore have initiated various efforts in the form of research projects, collaborations, arrangement and participation of scientific dialogues etc. Here is a brief of the contributions from our outstanding faculty.

Dr. Muhammad ASIF

In an attempt to explain the MHD equilibria in Fusion Plasmas, one of the CIIT Physics senior researchers **Dr. Muhammad ASIF** successfully managed to secure the research grant under the Higher Education Commission's initiative of "National Research Program for Universities". He is currently supervising four students including Mr. Arroj Ahmad Khan, Mr. Muhammad Bilal, Mr. Zahid Mir and Miss Ayesha Rehman to investigate various technical as well as theoretical aspects of the said project.

Besides contributing to the process of maturing the indigenous research, Dr. ASIF is also committed to self learning and successfully manage to pursue and complete his post-doctorate working as a Research Associate at School of Mathematics and Statistics, University of Sheffield, United Kingdom from Sep. 2014 to Feb. 2015. He also participated in the "Midwest Magnetic Fields Workshop 2015" arranged by University of Wisconsin-Madison, USA from May 21-22, 2015. While he was there, he also had a chance to visit Plasma Physics Laboratory in Canada. It is expected that the visit will be mutually beneficial through scientific exchange of information. Dr. ASIF also had the honor to participate in some experiments on STOR-M tokamak during his stay at Department of Physics and Engineering Physics at University of Saskatchewan, Saskatoon, Canada.

Dr. Zahida EHSAN

Moving further on the roadmap to achieve scientific excellence, Dr. Zahida Ehsan has the honor to be invited to present her research work regarding "Plasma crystals and PK-4 mission" at International Scientific Spring (ISS)-2015 held at NCP from March 16-20, 2015 where she shared how study of plasma physics can help us understand the basic physics of condensed matter alongwith some fundamental phenomenon. She also shed light on zero-gravity flights and why the first scientific experiment launched on International Space Station (ISS) is on so called "dusty plasma".

Seven of her research students also participated in the Workshop on Plasma Physics held on May 4-5, 2015, whose expenses were born by NCP. At Boulder, Colorado she spoke about the robustness of convective dynamo models, the use of stellar observations to shed light on the Sun, and the challenges and promise of data assimilation.

She also participated in the meeting with experts at Laboratory for Atmospheric and Space Physics (LASP). LASP has advanced technical capabilities specializing in designing, building, and operating spacecraft and spacecraft instruments and has contributed significantly in NASA's various missions to space. She also had chance to visit Dust Accelerator Laboratory based in the University of Colorado, Boulder.

Dr. Majid Niaz AKHTAR

Another member of the Physics family Dr. Majid Niaz Akhtar managed to successfully chase his research endeavors by completing his post-doctoral research contract Universiti Kebangsaan Malaysia (UKM), Malaysia from July 2014 to July 2015. Dr. AKHTAR has the proud honor to produce a good number of publications in the year 2014 which was widely appreciated.

Dr. Asif HASSAN

Dr. Asif HASSAN also managed to successfully complete his postdoctoral research work at the department of Science and Technology, Campus Norrköping, Linköping University, Bredgatan, Sweden and brought laurels to himself and the department.

Dr. Hassan MAHMOOD

To explore new avenues in experimental physics, Dr. Hassan MAHMOOD is also currently of to United States on a postdoctoral position.

AWARDS & HONORS

CIIT Talent @BRAZIL

The department is proud to announce that our students are ready to compete the world at large. Here, the efforts made by Dr. Raja Junaid Amjad are worth a mention. Dr. AMJAD not only believes in learning for himself but also working hard to transfer the skills to the forthcoming generations. Recently, two of his students named Faizan Ahmad and Muhammad Abu Bakar were selected to take part "International Glass and Glass Ceramic School" organized by **Universidade Federal de São Carlos, Brazil**. The students also competed for funding their trip to Brazil and successfully managed to secure it.

One of the student is fully funded whereas other one received a partial cover. In this international school candidates are selected from all over the world including Germany, USA, UK, Canada France etc. The selected students were the only Pakistani presenters in the event.

Best Poster Award

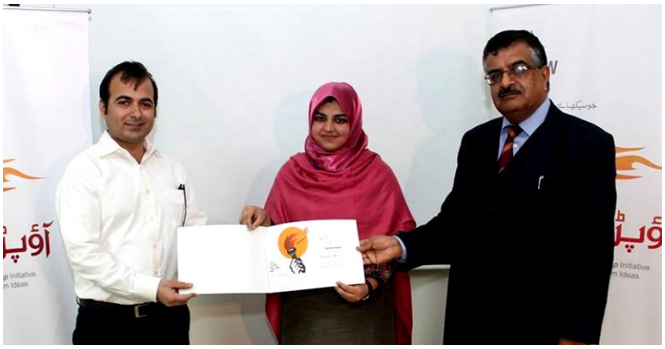
We are pleased to tell that one of our MS students, Asad Feroze, managed to win the Best Poster Presentation Award on presenting his research on a project titled, "Synthesis of Single Phase BiFeO3 by a Modified Precipitation Method" at Workshop on Contemporary Topics in Nano-Magnetism" help at National Center of Physics, Islamabad.

Most Cited Paper

Faculty at Department of Physics, CIIT Lahore wins the honor to produce most cited paper of the year 2014. Dr. Fraz Bashir's article titled, **"On the ordinary mode instability for low beta plasmas"** published in June-2014 has been announced one of the top cited paper of year 2014 in field of plasma physics *published in Physics of Plasmas in June 2014. It is the paper in which he* succeeded *to explain, for the first time,* the left lower corner of Bale-diagram data of solar wind interaction with earth's magnetic field. This paper can be accessed at the link http://scitation.aip.org/content/aip/journal/pop/21/5/10.1063/1.4879823

Teaching Excellence Award

The department has always focused on quality teaching and the faculty has always worked hard to live up the moto. In recognition to her teaching excellence, Dr. Ayesha JAMIL were nominated for the best teacher award by the Express Media Group's initiative to encourage and support the teaching faculty at various institutions.

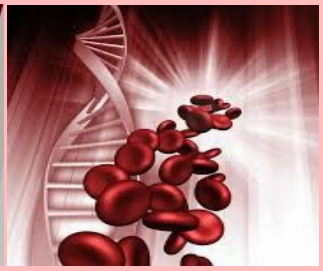


TELECONFERENCE

The department has always stressed upon defining new pathways towards success by creating such an atmosphere. To support the cause, the efforts made by Dr. Zahida Ehsan are worth a mention. She had been involved in arranging a Teleconference for Physics and Engineering students from CIIT, Lahore with Dr. Raoul Trines from Rutherford Appleton Lab, Oxfordshire, UK, on "Laser-Plasma Interactions: from New Way to Energy to Particle Accelerators and Laboratory Astrophysics" on 16th December 2014. Notably Dr. Trines has published research articles in journals like Nature Physics, Physical Review Letters, and Nature Photonics etc. and holds a good repute as a scientist among the international community. He's also supervising students from Oxford, Cambridge, and Lancaster etc.

COMMUNITY SERVICE

Amidst classes and research, the department has also been involved in creating health awareness among faculty and students. A seminar on Awareness about Thalassemia (Blood Disorder) was arranged dated May 26, 2015 when a team of doctors from Allama Iqbal Medical College (AIMC) visited the campus. Various aspects about the symptoms, diagnosis and control of this blood disorder were discussed. Talking on the occasion he introduced that thalassemia as a form of recessive blood disorder caused by the abnormal formation of hemoglobin. The abnormal hemoglobin formed results in improper oxygen transport and destruction of red blood cells. People with thalassemia make less hemoglobin and have fewer circulating red blood cells than normal thus resulting in complications like iron overload, bone deformities, cardiovascular illness etc. the person suffering from this major disease would require regular blood transfusions while the current medical advances hope to improve the life expectancy as well as the quality of life for those suffering from this blood disorder. The speakers further stressed about the need to increase awareness amongst our surrounding community about the symptoms and cure of this disorder. Thanks to Dr. Ishrat Sultana for her help to make this activity possible.



3D CULTURE & FASHION SHOTS

Under the premises of Student Week Fall-14, Dr. Zahida Ehsan organized an event named "3D fashion & culture shots" on October 22, 2014 at COMSATS IIT Lahore. "3D Shots" was a way of getting engineers & scientists' minds to converge in a pleasant setting so that their stereotype image of being nerds could be diminished. Moreover following the lines of president Napoleon Bonaparte, "Give me an educated mother, I shall give you an educated nation", the special message was delivered at the sky lantern ceremony. ”**3D Night"** was organized to bridge the gap between physicists and engineers and to promote the idea of women empowerment. It was a musical evening with some bands performances, cultural and dance performances followed by DJ Music.

Reason for choosing this kind of event was to communicate serious massage is: Students are so much into music and so on that they overlook intellectual debates.

Later on, to encourage and acknowledge the 3D team on organizing two most successful event of the Student Week in FALL14 and SP15, two function were organized where certificates/shields were distributed among the team members. Cakes ceremonies were followed by the live performance by a well-known musical band of COMSATS students and fireworks.

LEARNING WITH FUN

Trip to ICI Soda Ash Factory

A report submitted by ***Sumaira Yasmeen (BPH, 8th Semester)***

Students of BPH-FA11 arranged an excursion trip to ICI Soda Ash Khewra.We visited ICI Soda Ash and learned how ICI produces Soda. We were 25 students with three respected faculty members. Dr. Abdul Sattar, Dr. Ayesha Jamil and Dr. Ayesha Anjum. We are highly obliged to them. We really have great fun them. First of all a brief introduction to ICI is given.

In 1929, a young ICI engineer, R.A. Banks, was sent to Khewra to investigate the feasibility of manufacturing soda ash in the north of India to replace imports from England. 1944 was a momentous year which saw the start of a new epoch in the history of ICI in the sub -continent. With the construction of the new soda ash works and its commissioning completed in July, the first 20 tons of the product was manufactured in the August of the year. The Alkali and Chemical Corporation of India incorporate in 1943. The Khewra soda company limited incorporated as a private company on 13 May, 1952 and subsequently converted into a public company on June 10, 1953.

Over a period of time, the ICI group in Pakistan diversified its Business activities and also undertook necessary corporate reconstruction. As a result, the Khewra Soda Company limited became ICI Pakistan manufacturers limited on December 20, 1986. Later on, April 01, 1987, the ICI group of companies in Pakistan merged to form a single entity, ICI Pakistan limited and soda ash is today one of its premier businesses.

ICI is the largest soda ash producer in the country. The plant started production in the year 1944, exactly 5 decades ago with the capacity of 18000 tons per annum. Today production has grown manifold to 145000 tons per annum thus enabling ICI Pakistan to meet more than the national demands. This facility was sited next to the salt range as rock salt and lime stone to key raw materials for manufacturing soda ash were available here in abundance. Today ICI Pakistan 5 businesses, Polyester soda ash, paints, chemicals and life-science manufacturer and sell a range of industrial and consumer products.

ICI has current annual capacity of 350,000 tons per annum. After visiting ICI, we had lunch at Nawab Bagh Resturaunt Pind Dadan Khan. It was quite delicious.

ICI Soda Ash Khewra Products include;

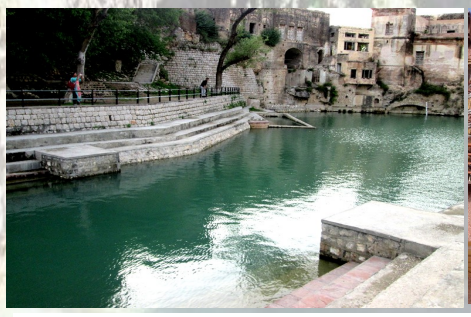
Light Ash: Used as a raw material in the detergents, silicate, paper, chemicals and textile industries.

Dense Ash: Used as a raw material in the glass industry

Sodium Bicarbonate: Used as baking soda and also in poultry/cattle feed, leather tannery and textile industry

After visiting ICI, we had lunch at Nawab Bagh Resturaunt Pind Dadan Khan. It was quite delicious. Then after lunch, we headed towards Neelawahn. We enjoyed the whole ride on the bumpy zigzag roads and hilly pathway on the way to Neelawahn. While we were oriented towards our journey, we stopped for a few minutes at Katas Raj Temples. It was such a beautiful and historical place. Its beauty is captured by our camera. Then finally we reached Neelawahn. It was a beautiful, tourist eye-catching place.

I would like to request HOD that there must be a get-together or a tour to any nice place for the last semester students. These are the memories which they took with them. And these are necessary apart from studies.



IMPACT RESEARCH

Research Publications

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- M. Asif "Study of Energy Confinement Time by the Analytical Solution of Grad–Shafranov Equation with Lithium Limiter for Circular Cross-Section Tokamak" *Journal of Fusion Energy,* Volume 33(4)2014, 449-452
- S. Q. Hussain, W-K. Oh, S. Kim, S. Ahn, A. H. Tuan Le *et al.,* "Study of Low "Resistivity and High Work Function ITO Films Prepared by Oxygen Flow Rates and N2O Plasma Treatment for Amorphous/Crystalline Silicon Heterojunction Solar Cells" *Journal of Nanoscience and Nanotechnology*, Volume 14 (2014), 1-5
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- M. Asif and HT-7 Team "Theoretical Calculation of Effective Ionic Charge with Lithium Limiter on HT-7 Tokamak" *Journal of Fusion Energy,* Volume 33(4) 2014,444-448
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The Department warmly congratulates its family for producing the maximum publications i.e. 65 for the year 2014 and being ranked highest in CIIT.

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Research Publications

- M. R. Dousti and R. J. Amjad "Spectroscopic properties of Tb3+-doped lead zinc phosphate glass for green solid state laser" Journal of Non-Crystalline Solids, Volume 420(2015), 21-25
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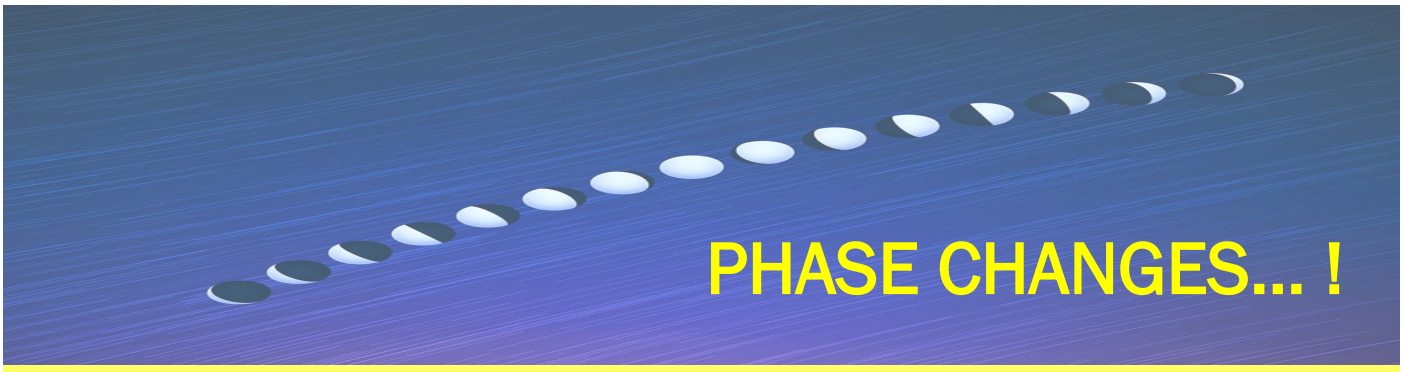
- S. Nisar (BESS Collaboration) "Measurement of the proton form factor by studying e+ e-→ pp^- "Physics Review D, Volume 91(2015), 11, 112004

The Department warmly congratulates its family for producing the maximum publications i.e. 65 for the year 2014 and being ranked highest in CIIT.

- **Dr. Zahida Ehsan** at **"NASA LWS Workshop on Solar Dynamo Frontiers",** June 9- 12, 2015, Boulder, Colorado
- **Dr. Ayesha Jamil** at **"1st International Conference on Energy Systems for Sustainable Development (ESSD 2014)",** May 20-22, 2015 at Lahore, Pakistan.
- **Dr. Muhammad Asif** at "**Midwest Magnetic Fields Workshop 2015"**, May 21-22, 2015 at University of Wisconsin-Madison, USA
- **Dr. Rizwan Raza** at **"International Conference on Energy Systems for Sustainable Development (ESSD-2014)",** May 20-22, 2015 at CIIT, Lahore
- **Samia Aslam** at **"1st International Conference on "Energy Systems for Sustainable Development (ESSD 2014)",** May 20-22, 2015 , CIIT, Lahore, Pakistan
- **Dr. Zahida Ehsan** at **"Workshop on Plasma Physics",** May 4-5, 2015, National Centre for Physics, Islamabad
- **Dr. Nosheen Akbar** at **"7th International Meeting on Particles and Fields",** April 1-4, 2015 at Centre for High Energy Physics, University of the Punjab, Lahore, Pakistan
- **Dr. Zahida Ehsan** at **"International Scientific Spring (ISS)-2015",** March 16-20, 2015, National Centre for Physics, Islamabad, Pakistan
- **Dr. Ayesha Anjum** at "**4 th International Symposium on Biomedical Materials: Translational Research and Commercialization"**, Dec 15-17, 2014, Lahore, Pakistan
- **Dr. Ayesha Jamil** at "**International Conference on Physics and Contemporary Needs",** Nov 19 – 21, 2014, Government College University, Lahore, Pakistan
- **Samia Aslam** at **"International Conference on Physics and Contemporary Needs ",** Nov 19 – 21, 2014**,** Government College University, Lahore, Pakistan
- **Dr. Rizwan Raza** at **"3rd International Conference on Energy, Environment & Sustainable Development (EESD'14)"** at Mehran University of Engineering & Technology, Jamshoro, Sindh, Pakistan
- **Dr. Rizwan Raza** at **"International Conference on Advances in functional Materials",** June 29 to July 3, 2014, Stony Brook University, Stony Brook, New York State USA.



Among the many positive professional transitions, the department has seen many others as well. The most significant ones to be;

- Warm wishes to Dr. Ishrat Sultana on the birth of her baby daughter. The department also would like to congratulate Mr. Nauman Ahmad on the birth of his baby daughter. The wishes are also extended to Dr. Junaid Amjad on the birth of his baby son.
- The department would also like to congratulate Dr. Yasir Rafique for his wedding which took place during last year thus starting a new phase of life.
- Dr. Nusrat Sajid for successfully completing her PhD and rejoining COMSATS as a faculty.
- We also would like to congratulate our departmental co-ordinator, Mr. Rizwan Shah for recently getting married.
- Also warm wishes to Mr. Muhammad Saqlain for getting promoted in his salary grade. The department can never thank enough for his services making every single activity possible in every spread.

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Thank You!

We will be able to make this a successful platform through your support only. We welcome any suggestions from your side which can make the effort a fruitful success. Please feel free to contact us through any of the following means.
Looking forward to your comments/suggestions.

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