



PINSTECH Newsletter

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EDITORS CORNER

All possible efforts are made to make this newsletter informative and fruitful for its readers. That is why a lot of variety has been created ranging from conference/workshop summaries, awards holders, National and International projects, visitors to PINSTECH facilities, books added in SID library, Muslim scientists, Nobel prize winners and so on. The feedback shows that the readers find ample attraction in its contents yet the room for improvement is always there. It has, therefore, been decided to reserve a column for "Letters to Editors" in which the opinions, suggestions as well as healthy criticism is highly appreciated. Colleagues are encouraged to post their views at newsletter@pinstech.org.pk. After the successful implementation of "PINSTECH Scientific Calendar 2010" as per schedule, the next calendar for 2011 has been launched and placed at SID website. The organizers are requested to start the process of inviting nominations well before time for maximum participation.

2nd National Workshop on "Advanced Software for Analysis and Interpretation of Air Quality Data" PIEAS, 25-26 October, 2010

Chemistry Division, Directorate of Science, PINSTECH organized a two days national workshop on "Advanced Software for Analysis and Interpretation of Air Quality Data" from 25-26 October, 2010 at PIEAS to disseminate the knowledge gained from participation in the RCA/IAEA Regional Project RAS/7/015; entitled "Characterization and Source Identification of Particulate Air Pollution in the Asian Region". Dr Muhammad Aslam, Rector PIEAS inaugurated the workshop. He highlighted the importance of obtaining good data for reliable inferences and interpretations for better management of the environment w.r.t. air quality. The workshop registered 39 scientists, engineers, Teachers and students from 18 PAEC establishments, PNRA, KRL, and Universities. The workshop program was divided into 5 Technical Sessions consisting of 5 lectures and 6 practical demonstrations given by Dr. Shahida Waheed, Dr Naila Siddique and Dr Muhammad Wasim. The workshop was concluded by Dr. Jamshed Hussain Zaidi, Director General, PINSTECH who also distributed the certificates amongst the participants.



Participants of Workshop on Air Quality Data Analysis & Interpretation

6th Executive Management Seminar on "Environmental Pollution Scenario of Pakistan: Findings and Remediation"

Chemistry Division, Directorate of Science, PINSTECH organized a three days Executive Management Seminar on "Environmental Pollution Scenario of Pakistan: Findings and Remediation" from 27-29 October, 2010 at PINSTECH Auditorium to bring together scholars, scientists, students, health workers, lawyers and environmental activists from all over Pakistan to focus on the severity of the environmental pollution issues in the country and discuss the remedial steps. Around 100 professionals and executive managers attended the Seminar. These include representatives from various government departments, NGOs, scientific and research organizations, universities/ academic institutions from different parts of the country. The seminar was inaugurated by Dr. Ansar Parvez, Chairman Pakistan Atomic Energy Commission. In his inaugural address, he remarked that environmental pollution is a key issue in Pakistan and emphasized on development of strategies for environmental monitoring and control to address the environmental pollution. He threw light on the importance of public awareness to secure our natural reserves and to control pollution. Dr. Jamshad Hussain Zaidi Director General PINSTECH extended a warm welcome to the



Chairman PAEC Addressing the Gathering at Inaugural Session of the Seminar

Chairman PAEC, and Dr. Shoaib Ahmad, Member (Physical Sciences) as well as participants and resource persons of the Executive Management Seminar. The seminar was closed by Mr. Waqar Murtaz Butt, Member Engineering PAEC.

Two Weeks Training Course on Advanced Analytical Techniques for Sustainable Development

The Central Analytical Facility Division (CAFD) organized a two weeks training course from Sept. 20 - Oct. 1, 2010 on "Advanced analytical techniques for sustainable development" as part of PINSTECH scientific calendar. An overwhelming response was received and 34 scientists from DESTO, NDC, PMO, Universities, Private Sector Organizations such as Hagler Bailly Pakistan Pvt. Ltd., as well as PAEC establishments namely, NMC-II, Qabul Khel, Chemical Processing Complex, DG Khan, C-I, DTD (R-block), UML, CMT, ACL and PINSTECH attended the course.

Director General, PINSTECH was the Chief Guest of the inaugural session. He welcomed the participants of the training course. The expert scientists of CAFD shared their knowledge with the course participants through lectures, experimental demonstrations and group discussions. All aspects of spectroscopic and chromatographic techniques required for professional development in analytical chemistry were dealt with. Useful discussions were held with end-users. Participants showed keen interest in academic collaborations. Dr. Muhammad Aslam, Rector PIEAS, presided over the concluding ceremony and appreciated participants belonging to wide range of scientific disciplines. The close collaboration existing between CAFD and PIEAS was commended. At the end the Chief Guest distributed the certificates among the course participants.



Participants of Training Course on Advance Analytical Techniques

Two Days International Workshop on Current Trends in Radiopharmaceuticals

The Isotope Production Division of the Directorate of Technology organized a two days International Workshop on Current Trends in Radiopharmaceuticals from September 28-29, 2010 at PINSTECH. The workshop was inaugurated by Dr. Mustanser Jehangir (Ex Director General of PINSTECH). Forty five (45) participants from Pakistan Nuclear Regulatory Authority, PAEC (Directorate of Safety, and Nuclear Medical Centers) as well as Government and private hospitals engaged in nuclear medicine related applications attended the workshop. Eleven lectures were delivered in this workshop. In his comprehensive lecture on "Isotopes in Medicine", Dr Gerd Beyer (German Scientist) gave description of the past, present and future of nuclear medicine. Other key lectures covered topics such as: Evolution and scope of ^{99m}Tc -

radiopharmaceuticals in diagnostic imaging, Global Molybdenum-99 Crisis: Basic Facts and Possible Alternatives, ^{99m}Tc -labeled Analogs of Neuropeptide Y (NPY) for Tumor Targeting, Production of Lutetium-177 using PARR-1, and Therapeutic Radiopharmaceuticals: Clinical and Commercial Needs of Pakistan. In his concluding remarks, Dr. M. Riffat Qureshi, Director Coordination PINSTECH appraised the hard work of Dr.



Participants of International Workshop

One Week National Workshop on "Application of Isotope Techniques in Hydrology and Water Resources Management"

Isotope Applications Division, PINSTECH organized a four-day National Workshop on Application of Isotope Techniques in Water Resources Research and Management at PINSTECH from October 04-07, 2010. Isotopic techniques have great potential for a broad spectrum of applications in hydrology. The interest in this new field is continuously growing due to its cost economics, less time consumption and ability to provide information, which sometimes cannot be obtained with other techniques.

The objectives of the workshop were to provide general background information about the nuclear techniques. A total of thirty one (31) scientists / engineers / managers from nineteen (19) institutions attended the workshop. The workshop was inaugurated by Mr. Arif Mahmood, Director General, Pakistan Meteorological Department (PMD). In his inaugural address, he highlighted the importance of proper management of water resources of the country in the wake of looming water crisis. Dr. Jamshed Hussain Zaidi, Director General,



Participants with Director General, PINSTECH and Director General, PMD

PINSTECH, in his welcome address, described the consistent efforts of PINSTECH for promotion of peaceful applications of nuclear techniques particularly in hydrology. In the vote of thanks, Engr. Nisar Ahmad, Director Technology, PINSTECH thanked the chief guest for gracing the occasion. The deliberations of the workshop consisted of 9 technical sessions in which 20 lectures including 7 key-note addresses were delivered.

Dr. Jamshed Hussain Zaidi, Director General, PINSTECH was chief guest in the concluding session on

7th October 2010. In his concluding speech, Dr. Zaidi urged the scientific community to play its role for development and prosperity of the nation. He anticipated that the workshop will help to promote collaboration between PINSTECH and the end-user departments for joint projects. In the end, he distributed certificates among the participants.

Scientific Moot

Scientific Information Division (SID) arranged a discussion session on the improvement of services rendered by SID. Two researchers, one senior (DCS/DCE) and one junior (JS/JE) who are potential users of the Library from each Division of PINSTECH were invited. The Heads of all the sections in SID were present. Mr. Waqar A. Butt, Head SID presented an overview of the services and facilities available at SID. In general discussion, very useful suggestions were given. A few of them are listed below:

- More journals on recent research trends be subscribed
- Facilitate E-Books
- More Computers be provided for researchers
- Software like Chem.gra and Chem. Office be provided for literature search

National Project

Qualification of LEU Fuel Plates / HEU target plates

Non-Destructive Testing (NDT) Section of PINSTECH is actively involved in qualification of LEU Fuel Plates / HEU target plates in addition to nuclear fuel examination related services to PAEC and other public/private organizations as per their requirement. Excellent resolution and high sensitivity computer controlled Automated Ultrasonic Immersion Testing System has been established in NDT lab and standardized to optimize manufacturing processes regarding fabrication of LEU Fuel Plates and Mo target HEU plates. The system works well for the



Automated Ultrasonic Immersion Testing System

investigative studies of de-bonded areas and other internal defects/flaws produced during fabrication processes in nuclear fuel as well as other industrial materials. The technique is now standardized and able to detect internal flaws / de-bonded areas not only in homogeneous materials but also composite/ceramic multilayer materials with precision and accuracy.

(Principal Investigator : Muhammad Farooq, DCS, Head NDT)

International Project

Characterization and Source Identification of Particulate Air Pollution in the Asian Region

Environmental pollution is a major issue as it affects all aspects of our lives from the air we breathe to our way of life. The development of vaccines and antibiotics has enabled man to live longer and has reduced infant mortality resulting in rapid population growth. Transport is a sector which has grown tremendously with the world becoming a global village. Exhausts from all forms of transport are emitting green house gases and particulate matter such as soot into the atmosphere. In most developing nations, which include majority of the countries in the Asia and Pacific Region, cities are unplanned and industries un-regulated. The need for reliable and uniform data on particulate matter and its transport was the driving force behind the implementation of this project. In order to obtain uniform data the IAEA distributed GENT samplers with polycarbonate filters to the participating states: Australia, Bangladesh, China, India, Indonesia, Korea, Malaysia, Myanmar, New Zealand, Pakistan, Philippine, Sri Lanka, Thailand and Vietnam. Neutron Activation Analysis Group at PARR-II has been participating in this project since its beginning in 1998. In this regard, over 800 pairs of coarse and fine filter samples have been collected from 5 different locations in the Islamabad/ Rawalpindi. INAA and PIXE (proton induced x-ray emission) analysis of collected particulate matter shows that biomass was the major component of the fine fraction, followed by road dust, soil and automobile. However, the coarse fraction soil was the major component followed by road dust and biomass/combustion.

2010 Nobel Prize Winners in Chemistry



Richard F. Heck



Ei-ichi Negishi



Akira Suzuki

The Nobel Prize in 2010 Chemistry was awarded jointly to Richard F. Heck, Ei-ichi Negishi and Akira Suzuki "for palladium-catalyzed cross couplings in organic synthesis".

Richard Fred Heck born August 15, 1931 is an American chemist noted for the discovery and development of the [Heck reaction](#), which uses the metal [palladium](#) to [catalyze organic chemical reactions](#) that couple [aryl halides](#) with [alkenes](#).

Ei-ichi Negishi born July 14, 1935 is a Japanese [chemist](#) who has spent most of his career at [Purdue University](#), United States. He is best known for his discovery of the [Negishi coupling](#). Negishi was born in [Changchun](#), at that time the capital of Japanese-controlled [Manchukuo](#), now the capital of [Jilin](#), China. He graduated from the [University of Tokyo](#), and went to United States. He obtained his PhD from [University of Pennsylvania](#). In 1966, he became a postdoc researcher at [Purdue University](#), working with Nobel Laureate [Herbert C. Brown](#). In 1972, he went to [Syracuse University](#) and promoted to professor. In the same year, he went back to Purdue University.

Akira Suzuki born September 12, 1930 is a Japanese chemist who first published the [Suzuki reaction](#), the [organic reaction](#) of an [aryl-](#) or [vinyl-boronic acid](#) with an

aryl- or vinyl-halide catalyzed by a [palladium\(0\) complex](#), in 1979. Suzuki was born in [Mukawa, Hokkaidō](#) and studied at [Hokkaido University](#). From 1963 until 1965, Suzuki worked as a postdoc with [Herbert Charles Brown](#) at [Purdue University](#) and after returning to the University of Hokkaidō he became a full professor.

Great Muslim Scientists

Ibn al Haytham Known in the West as Alhazen, Alhacen, or Alhazeni, an astronomer, mathematician, physicist and physician. was the first person to test hypotheses with verifiable experiments, developing the scientific method more than 200 years before European scholars learned of.



Born in Basra in 965, Ibn al-Haitham studied the work of the ancient Greek philosophers and mathematicians, including Euclid and Archimedes. He was the first person to apply algebra to geometry, and founded the branch of mathematics known as analytic geometry. To discover the truth about nature, Ibn a-Haitham reasoned, one had to eliminate human opinion and allow the universe to speak for itself through physical experiments. In his massive study of light and vision, Kitâb al-Manâzir (Book of Optics), he submitted every hypothesis to a physical test or mathematical proof. To test his hypothesis that "lights and colors do not blend in the air, he devised the world's first camera and observed what happened when light rays intersected at its aperture. Translated copies of this book were circulated throughout Europe in late 13th century. So far among his works, 44 treatises on philosophy, geometry, astronomy and mechanics have been identified. His optical thesaurus formed the basis of the optical works of Roger Bacon. His pioneer work on optics influenced Leonardo da Vinci, Johann Kepler and Sir Isaac Newton.

Visit of Talented Students

A training camp of forty two undergraduate students from different parts of the country for 15th National Physics Talent contest (NPTC) was held at PIEAS. As a regular feature of this programme, their visit was arranged at PINSTECH on 3rd October, 2010. Mr. Waqar A. Butt, Head SID gave a briefing about the history, objectives, activities, projects and achievements of PINSTECH. The students visited the Main Library, Isotope Hydrology, Electron Microscopic, X-Ray Diffraction and Isotope Production labs.



Group Photo of Talented Students visiting PINSTECH

Forthcoming Scientific Events at PINSTECH

1. Two weeks short training course on Theoretical and Practical Aspects of Chromatography: Application of HPLC and GC in Environmental and Nuclear Fields
Organizer: Chemistry Division
22 November - 03 December
2. One day workshop on Ion Sources: Current and Future Applications
Organizer: Physics Division. 07 December
3. Two days conference on Recent Trends in Chemistry
Organizer: Chemistry Division
28 - 29 December
4. Three days workshop on Linacs and their Applications
Organizer: PINSTECH Phase-II

From Scientific Information Division

- Catalogue of 37,000 books in PINSTECH Library is now available at the Homepage of the website www.sidnlps.org.pk as OPEC (Online Public Access Catalogue). Any person can search the contents from any where via internet.
- After introducing the barcode system for issues/returns of books, such a system has been implemented for Library Members with the curtesy of HRD and MIS. The barcodes have been printed on Personal Attendance cards issued to all PINSTECH employees.
- Annual stock taking of the PINSTECH Library has been planned during 2nd & 3rd week of November 2010. Library members are requested to return issued books for bar coding during the last week of November.
- A wadget of International Nuclear Information System (INIS) has been pasted at he Homepage of SID website www.sidnlps.org.pk that gives direct access to complete INIS database.

Books Added in PINSTECH Library

1. Salt Range (geological maps) by Survey of Pakistan, 1980.
2. Nanochemisrty: a chemical approach to nanomaterials by Geoffrey A. Ozin, 2009
3. Pleistocene and Paleolithic Investigation in the Soan Valley Northern Pakistan by H. M. Rendall, 1989
4. The Physical Principles of Thermonuclear Explosive Devices by Friedwardt
5. Winterberg, 1981
6. Separation of Hydrogen Isotopes by Howard L. Rae (Ed), 1978
7. A Computational Study of Catalysis by Gold in Applications of Co Oxidation by Akhtar Hussain, 2010
8. Study of Ni-Cr-Fe- Austenites, Ferrites and Fe-B Melt-Spun Alloys Using the Mossbauer Effect by Muhammad Arshad, 1996
9. Safety Radiation Generator and sealed Radioactive Sources by IAEA, 2006
10. Commissioning of Research Reactors by IAEA, 2006
11. Maintaince, periodic testing and Inspection of research Reactors IAEA 2006
12. Geological Disposal of Radioactive Waste by IAEA, 2006
13. Storage of Radioactive Waste by IAEA, 2006