



### From the Chairman



*On behalf of Pakistan Science Foundation I extend my heartiest greetings of New Year to all the readers. Allah Almighty may bring peace, prosperity and development for the country this year; but to materialize this dream we have to work hard with devotion and sincerity. Beginning of New Year is not only the occasion to celebrate but also to review previous year's*

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## Popular Science Lecture Forensic Science Revamping Criminal Justice System: DG PFSA

Pakistan Science Foundation (PSF) organized a lecture on "Forensic Science and Crime Investigation" by Dr. Muhammad Ashraf Tahir, Director General, Punjab Forensic Science Agency (PFSA), at Pakistan Science Foundation (PSF), Islamabad on January 24, 2017.

Mr. Fazal Abbas Maken, Federal Secretary, Ministry of Science and Technology, was the Chief Guest on this occasion. The lecture was part of PSF's Popular Science Lecture Series. Scientists, security personnel, crime reporters from electronic and print media and people from different walks of life attended the lecture.

Speaking on the occasion the



Mr. Fazal Abbas Maken, Federal Secretary, Ministry of Science and Technology presides over the Popular Science lecture on "Forensic Science and Crime Investigation" at PSF.

Federal Secretary said that the art of investigation and evidence collection has

become a discipline of science that improved the criminal justice system.

He said that the quality of justice depends upon quality of evidence and quality of evidence depends upon quality of investigation. PFSA is doing a very good job in crime investigation, he said, adding that it is a big challenge to sustain this quality work. Mr. Maken congratulated PSF for regularly organizing popular science lectures on very



Dr. Muhammad Ashraf Tahir delivers lecture on "Forensic Science and Crime Investigation" at PSF.

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From the Chairman

*performance, achievements, high lows and hurdles as well as make plans for the whole next year keeping in view the past experiences.*

*It is the occasion of self-accountability whether as the responsible citizens we played our due role in national development. It is also the occasion to devise new strategies for implementing the new plans and overcome the hurdles. Hard work, devotion and commitment to any cause are imperative for success in any field of life, particularly in the field of science and technology to produce some tangible results. I wish and hope that all the scientists, teachers and students on this occasion will make determination to achieve something big at the end of this year that will be the not only make Pakistan proud and distinguished but also the entire humanity.*



Mr. Fazal Abbas Maken, Federal Secretary, Ministry of Science and Technology, speaks at PSF's Popular Science Lecture on "Forensic Science and Crime Investigation" at PSF.

important topics of science.

Dr. Tahir in lecture said that PFSA was established in 2011 under Digital Punjab Vision and it is world's 2<sup>nd</sup> largest forensic facility operating at

international standards. He said that study and application of all sciences for crime investigation and justice is called forensic science. PFSA has no technicians and all

people working on investigations are trained scientists having minimum MPhil qualification and competency.

He said that the PFSA labs included Audio/Visual Analysis, Crime Scene, Firearms, Trace Chemistry, Finger Prints, Narcotics, Forensic Toxicology, Forensic Pathology, DNA Serology and Questioned Documents. He spoke on working of these labs and their success stories.

PSF Chairman Prof. Dr. Muhammad Ashraf spoke on the Foundation's 12 science popularization programmes and the Popular Science Lecture Series. He also talked on the importance of Forensic Science in criminal justice system.

### Gas from Municipal Solid Waste

## Private Sector to Contribute 30% Cost of Technology

Pakistan Science Foundation through its funded project entitled, "Eco-Friendly Alternative Energy Source from Municipal Solid Waste (MSW)" to PCSIR Labs. Complex, Lahore has been successful in developing Refused Derived Fuel (RDF) pellets from the municipal solid waste. Although, its energy outputs have been found sufficient, its waste is yet hard to discard.

So, the next phase of this technology is to obtain gas from municipal waste. In this case, despite incinerating the RDF pellets, gas will be obtained from MSW to be used for heating purposes in different industries. The private sector party M/s Waste Busters Ltd. has consented to contribute 30 percent of the total cost of the project and will be the end-user of the technology after its successful



development. Presently, M/s Waste Buster is also producing RDF pellets which are burnt like coal.

### Quote of the Month

"We must not forget that when radium was discovered no one knew that it would prove useful in hospitals. The work was one of pure science. And this is a proof that scientific work must not be considered from the point of view of the direct usefulness of it. It must be done for itself, for the beauty of science, and then there is always the chance that a scientific discovery may become like the radium a benefit or humanity."

- Marie Curie



Biomass Grinder



Plastic Cutter



Waste Mixer



### “Pilot Scale Demonstration & Popularization of Bio-Geysers”

## PSF Funded Research Project Monitored

Pakistan Science Foundation has funded a joint project with TIKA (Turkish International Cooperation Agency). Title of the project is “Pilot Scale Demonstration and Popularization of Dual Technology of Bio-Geysers with Agro Waste Compositing.” The said project has been funded to Dr. Amir Raza, SSO, NIFA, Peshawar. During the project execution, 34 Bio-Geysers are to be installed in five districts of Khyber Pakhtunkhwa (KPK) province.

This project aimed at:

1. Fabricating the dual technology Bio-Geysers with agro-waste compositing
2. Demonstrating and popularizing the technology of Bio-Geysers and agro-waste compositing at community level in five districts of KPK, Pakistan
3. Training the local fabricators of the Bio-Geysers through participatory approach in the five districts of KPK, Pakistan.

Monitoring of the technical progress to evaluate the field performance of Bio-Geysers installed in Haripur, Abbottabad and Battagram areas was conducted on January 25-26, 2017 by Mr. Nasir M Khokhar, SSO-NSLP/coordinator PSF Monitoring and Evaluation Wing along with Dr. Aurangzeb, Director, Dr.



Muhammad Wisal, Head Soil Science Division, and Dr. Amir Raza, (PI), Senior Scientist NIFA, Peshawar.

During this monitoring visit seven Bio-Geysers units installed in different areas were examined. Most of the Geysers were found working well, at 01°C of atmospheric temperature, the Geysers had heated water up to 39°C.

Overall project progress was found satisfactory and community members expressed their contentment on its performance for water heating and compost making. There was more demand for Bio-Geysers units from community members.

### Science Popularization

## Over 25,000 Students of 137 Schools Visit Science Exhibitions in Jan. 2017

Over 25,000 students and teachers from 137 schools visited science exhibitions arranged by PSF Science Caravan Units across the country in January 2017. The science exhibitions are a regular feature of the Foundation under its Science Popularization Programme. The detail of the exhibitions is as under:

**Federal:** The Science Caravan Federal Unit organized science exhibition at Al Farabi School System, Dina District Jehlum on January 9-13. The exhibition was visited by 1500 students from five schools. A Science Caravan exhibition was also arranged during Lahore Science Mela at Lahore on January 27-30. During the fair, PSF's Mobile Science Lab attracted a huge number of visitors. The exhibition was visited by over 6,500 students from 25 schools.



Glimpses of Science Caravan Exhibition during Science Mela at Lahore



Students being briefed about exhibits inside STFS Mobile Lab and planetarium show at Dina

**Peshawar:** The Science Caravan Khyber Pakhtunkhwa Unit arranged science exhibitions at GHSS-Billitang Kohat and GHS-1 Nowshera on January 23-28 and January 30-31 respectively. Two Popular Science Lectures were also arranged at Govt.



Popular Science Lecture arranged by KP Unit Peshawar on Common Diseases of Eye Hasnain Shaheed HSS Peshawar and GHSS Togh Bala, Kohat on January 4 and 25 respectively. The first lecture was delivered by Associate Prof. Dr. Muhammad Ismail, Science Superior of Peshawar College on the topic “The Ozone Layer” while other lecture was delivered by Prof. Dr. Lal Muhammad from Kohat Medical College, MTI Kohat & KMU Peshawar on “Common Diseases of Eye”. Over 3,661 students and teachers from 12 schools attended these exhibitions and lectures.

**Jaffarabad:** The Science Caravan Jaffarabad Unit arranged exhibitions at the schools of District Hub and Gadani on January 8-22, 2017, which were visited by 830 students and teachers from 27 schools and colleges. Hub Press Club President Mr. Ilyas Kamboh inaugurated the Science Exhibition at Govt. Boys School Akram Colony Hub. The unit also arranged a Walk for Science. The students and president of the Hub Press Club participated in the walk.





Glimpses of science exhibition and walk for science in District Hub

**Tandojam:** The Jaffarabad Unit arranged science exhibition at Govt. High School Sann, Taluka Manjhand, District Jamshoro, on January 10-17. Some 1201 students and 43 teachers from nine schools visited the exhibition. Another science exhibition was arranged at Govt. Girls Higher Secondary School Taluka and District Mirpur Khas on January 23-28. As many as 2,462 students and 120 teachers from nine schools visited these exhibitions.



Glimpses of Science Caravan exhibition arranged by Tandojam Unit

**Faisalabad:** The Science Caravan Faisalabad Unit arranged an exhibition at ILM Group of Colleges, Tehsil Sambrial, District Sialkot, on January 03-13. Assistant Commissioner Tehsil Sambrial inaugurated the exhibition on January 03.

Another two exhibitions were organized at Govt. Boys High



Science exhibition and planetarium show arranged by Punjab Unit Faisalabad

School Wapda Colony Mandi Bahuddian on January 23-28 and at Govt. Girls High School Wapda Colony Mandi Bahuddian on January 28 to February 02. Chief Executive Education District Mandi Bahauddian inaugurated the Science Exhibition on January 24. In these exhibitions 8,000 students from 47 schools participated.

**Multan:** The Science Caravan Multan Unit organized an exhibition at GGHSS Tatay Pur, Multan on January 02-06 which was visited by 1,020 students and 25 teachers of three schools.



Students being briefed during science exhibition arranged at Multan

## 25 Teachers of Dina Schools Participate in Training Session on IBSE

PSF arranged a teachers training session on Inquiry Based Science Education (IBSE) at Al- Farabi School System, Dina, District Jehlum on January 13, 2017, which was attended by 25 teachers from the said school and surroundings areas. Ms. Zaiban Farooq, Assistant

Director Science Caravan introduced the participants about IBSE. Some hands on activities related to physical chemistry and biology were performed. Mr. Asadullah also guided the teachers and students while performing these activities under IBSE programme.



IBSE Training Session at Dina

# Pakistan Museum of Natural History (PMNH)

*Editor: Dr. Muhammad Ismail Bhatti*

## Lal Suhanra National Park explored by PMNH mycologist

Dr. Muhammad Ismail Bhatti, Associate Curator, Botanical Sciences Division (BSD), PMNH and Mr. Adnan Hameed, Collection Incharge

BSD, visited the Lal Suhanra National Park (LSNP) in January 2017 to extensively explore and collect macro fungi of the area. DFO Mr. Jawad and

Mr. Naveed Incharge LSNP gave a detailed briefing to the research team and facilitated in field research work. The PMNH team collected

over 210 samples of different macro fungi during the visit. Some of fungi species were first time reported from the target area. All samples have been



PMNH Research team with fungi specimens collected from the area



preserved in the repository of mycological herbarium of PMNH for further research and reference.

LSNP with 65790.36 hectares area is situated between 29° 12' and 29° 28' northern latitudes and 71° 48' and 72° 08' eastern longitudes with an altitude ranging from 125 to 140 meters on southeastern part of the Punjab Province, 32 kilometers away from the Bahawalpur city towards East at the main Bahawalpur-Bahawalnagar highway. Because of high diversity of wildlife, microhabitats and landscapes, the area was designated as a Protected Area in 1972. LSNP

is of immense value due to forest plantation, wildlife enclosures, picnic spots and fishing in the pond areas. The variability of habitat plays an important role in preserving biodiversity of the area. Natural vegetation inside the plantation is of weedy nature while the desert area supports the vegetation of xeric and semi-xeric type. Lake area has the aquatic or semi-aquatic vegetation that is of submerged, floating or marshy type.

**Visit to Islamia University Bahawalpur:** Dr. Muhammad Ismail Bhatti visited Islamia University Bahawalpur during



the field study tour to LSNP Bahawalpur and adjacent areas. He held a meeting with Dr. Zafar Malik, Lecturer Chemistry and Naveed Malghani, Lecturer Plant

Pathology. Dr. Bhatti briefed them in detail about role of PMNH in the country. Both the scientists of the university offered full cooperation in future collaborative research.

## Wax Moth - A Pest of Combs and Honey Bee Products

Wax moth larvae or greater wax moth, technically called *Galleria mellonella* are very destructive and can speedily destroy stored beeswax combs. They tunnel and chew from side to side combs,

particularly combs that have contained brood and pollen. Healthy, populous honey bee colonies do not tolerate wax moth larvae in the hive. Wax moths are never the initial cause of colony destruction

but in weak colonies their larvae can damage combs not covered and protected by bees. Wax moth larvae are very active in warm weather, but become inactive in the extreme cold of winter. At the

optimum temperature of about 32°C they reach full development about 19 days after hatching. At cooler temperatures, and when food is scarce, the larval period may extend to 5 months.



A hive with wax moth collected during the field study tour to Lal Suhanra National Park, Bahawalpur

## PMNH Renovation, Beautification Expedited

PSF Chairman Prof. Dr. Muhammad Ashraf paid several visits to Pakistan Museum of Natural History in January 2017 and chaired meetings with DG and Directors for improvements in displays and expediting the renovation/beautification of the Museum as well as add new displays to galleries.





## Over 8,900 Persons Visit PMNH in January 2017

A total of 8,901 persons including 3,050 students, 2,630 general public, 16 foreigners and 3,205 children under-five-year age visited the PMNH display galleries in January 2017. The student groups experienced the learning of science through 3-D dioramas, animated exhibits, life-size models of natural history specimens and movies etc. The main student groups from the educational institutions included:

Bahira College Islamabad, Bait-ul-Hamd Girls School Chenab, University of Management Science & Information Technology AJK, SLS Montessori & High School, Islamabad, P.P.S Kunjah Gujrat, Quba International School, Islamabad, Al-Muqaddas Public Welfare High School Gujrat, ABF High School Balochistan, Dawah Centre for Women Islamabad Abdul Wali



A group photo of SLS Montessori and High School Islamabad teachers during PMNH visit with the students.

Khan University Mardan, Sultana Foundation, Islamabad, ICMG Margalla College Islamabad, Beacon-house School System Kharian and The City School Rawalpindi.



Glimpses of student groups visit to PMNH

## Emerald: A Precious and Beautiful Stone

The word "emerald" is derived (via Old French: *esmeraude* and Middle English: *emeraude*), from Vulgar Latin: *esmaralda/esmaraldus*, a variant of Latin *smaragdus*, which originated in Ancient Greek: *σμάραγδος* (*smaragdos*; "green gem"). Emeralds in antiquity have been mined in Egypt since 1500 BCE and India, and Austria since at least the 14th century CE.

Pakistan has large reserves of

mineral ores and gemstones. Pakistani gemstones include a variety of minerals such as Peridot, Aquamarine, Topaz, Ruby and Emerald, making the country significant in the mineral world.

Among these natural treasures, Emerald of Pakistan is acknowledged as precious and well-intentioned all around the globe.

Emerald is a gemstone and a variety of the mineral beryl

( $\text{Be}_3\text{Al}_2(\text{SiO}_3)_6$ ) colored green by trace amounts of chromium and sometimes vanadium. Beryl has a hardness of 7.5-8 on the Mohs scale. Most emeralds are highly included, so their toughness (resistance to breakage) is classified as generally poor. Emerald is a cyclosilicate.

Colombia is by far the world's largest producer of emeralds, constituting 50–95% of the world production, with the

n u m b e r depending on the year, source and grade. Zambia is the world's second biggest producer, with its Kafubu River area deposits (Kagem Mines) about 45 km (28 mi) southwest of

Kitwe responsible for 20% of the world's production of gem quality stones in 2004. Emeralds are found all over the world in countries such as Afghanistan, Brazil, Bulgaria, Cambodia, Canada, China, Egypt, Ethiopia, France, Germany, India, Italy, Kazakhstan, Madagascar, Mozambique, Namibia, Nigeria, Norway, Pakistan, Russia, Somalia, South Africa, Spain, Switzerland, Tanzania, U.S.A. Zambia and Zimbabwe. Emerald deposits are found from DandaoKandao, Buch, NaweDand, Gandao (Mohmand Agency), Kot (Malakand Agency), Bajaur Agency, Mingora, Swat and Northern Areas. Specimens of Emerald can be seen at Pakistan Museum of Natural History, Islamabad.





# Pakistan Scientific & Technological Information Centre (PASTIC)

Editor: Saima Siddique Tariq

## Chairman Reviews PASTIC Activities

A review meeting of PASTIC was convened by the Chairman PSF, Prof. Dr. Muhammad Ashraf on January 12, 2017 which was attended by DG PASTIC Prof. Dr. Muhammad Akram Shaikh and all officers of PASTIC. The main points discussed and advised by the chairman included development of PASTIC Search Engine, continuation of the training programmes, collaboration development with

HEC for NDL, development of Libraries Consortium, revitalization of PASTIC Sub-Centers, strengthening of PASTIC Reprographic Unit and strengthening of International Liaison activities. It was also decided that an IT fair may be organized by PASTIC within a few months. Chairman also advised that EX-DG's of PASTIC may be invited for suggestions to revamp the organization.



A glimpse of Review Meeting presided by Chairman PSF Prof. Dr. Muhammad Ashraf

## Consultative Meeting Held to Revamp PASTIC

PASTIC organized a consultative meeting on January 18, 2017 at PASTIC for deliberation on ways and means for revamping of PASTIC keeping in view the requirements of present digital age. The Chairman, PSF presided over the meeting, which was attended by Ex D.Gs of PASTIC, Director General PASTIC, Director, PASTIC, Senior Officers of PSF and Sectional Heads of PASTIC.

The current activities of PASTIC National Center and all its sub centers were reviewed and discussed. Recommendations and suggestions made during the

meeting included revitalization of technology information section by strengthening of industrial liaison, collection of Libraries data of Union OPAC of Libraries, collection of data about books written by Pakistani authors, revitalization of the Center's activities, focus on web development, web management, etc. As the information services, future development and projection of the organization are based on Information Technology (IT) facilities, therefore IT Section should be strengthened and its manpower should be enhanced. Reprographic Unit of PASTIC

should be made self-sustainable and profitable. The Former Director Generals also gave suggestions like collaboration with ECO and availing the opportunities available with them, development of mobile applications for projection and promotion of services, outsourcing the activities for which skilled manpower is not

available in PASTIC. They suggested to develop indigenous information databases on the important issues i.e. climate change, energy crises, etc. Information professionals/experts from ECO region or China may be invited for studying the internal system of PASTIC and seeking guidelines for paradigm shift according to changing arena.

## Workshop on Research Tools: EndnoteX8

PASTIC Islamabad organized a training workshop on "Citation Management Tool: EndNoteX8 on January 4-5, 2017 at PASTIC National

Centre, Quaid-e-Azam University Campus Islamabad. The objective of this workshop was capacity-building of young researchers and



A glimpse of consultative meeting on revamping of PASTIC



Group Photo of the Participants along with resource Person



enhancing their skills in literature search, citation and PDF management through EndNote citation tool. PASTIC regularly organizes such

training workshops to train the researchers on modern research tools and techniques. Dr Maryum Ibrar Shinwari, Senior Scientific Information

Officer (PASTIC) was the resource person of the workshop attended by 30 Participants including research scholars of M. Phil/ Ph.D of

Quaid-e-Azam University. The certificates were also distributed among the participants at the end of the workshop.

## Training Workshop on Making Your Research Life Easier With Mendeley Tool

PASTIC Sub-Centre, Faisalabad in collaboration with ORIC organized a one-day training workshop on "Making Your Research Life Easier with Mendeley Tool" on January 26, 2017 at Govt.

College Women University Faisalabad (GCWUF). The objectives of the programme were to enable the participants with fundamentals of citation management and to introduce Mendeley -a cross-platform

application (Windows, Mac, Linux, iPhone) that helps researchers manage and annotate their scientific paper collections.

and faculty members participated in the workshop. At the end of the workshop certificates and shields were awarded to the participants.



A glimpse of workshop during the session

Prof. Dr. Noreen Aziz Qureshi, Vice Chancellor GCWUF was the chief guest of the occasion. While addressing the audience she said that a university is recognized by its researchers and teachers because teachers can revolutionize the society. The propagation of education and research is the need of the hour. Dr. Maryaum Ibrar Shinwari, SSIO, PASTIC Islamabad was the resource person. As many as 45 students



Prof. Dr. Noreen Aziz Qureshi, Vice Chancellor GCWUF, presenting shield to the resource person Dr. Maryaum Ibrar Shinwari, SSIO, PASTIC

## PASTIC Training/workshop on SPSS

PASTIC regularly organizes training workshops on Research Methodology. The objective of this programme for students and MSc, MS/M.Phil and Ph.D research scholars is to provide basic understanding about qualitative and quantitative research concept, methods and to build capacity in collecting, managing and analyzing data for qualitative and quantitative research.

In continuation of this regular activity, PASTIC National Centre, Islamabad organized a

three-day training workshop on "Research Tools and Techniques" on January 30 to February 1, 2017. Mr. Muhammad Usman, Web Manager, PASTIC was the resource Person of this workshop.

The organizer of the workshop Syed Habib Akhtar Jafri anticipated that participants of training workshop will utilize their learning skills while conducting their research for getting better analysis output with ease. The participants



A glimpse of certificate awarding ceremony at the end of SPSS training

expressed their appreciation for organizing such need based training. Later on, the certificates were also distributed among the participants.

## PASTIC Arranges Awareness Seminar on PASTIC S&T Services for Researchers

PASTIC arranges its Services Awareness Seminars regularly. The objectives of this regular activity are to raise researcher's awareness of information services offered by PASTIC. These seminars were attended by the students, Researchers and faculty members. Following seminars were organized in January 2017.

1. One-day Awareness Seminar at School of Biological Sciences, University of the Punjab, Lahore on January 3
  2. One-day Awareness Seminar at Institute of Bio-Chemistry and Bio-Technology, University of the Punjab, Lahore on January 10
  3. One-day Awareness Seminar at Department of Solid State Physics, University of the Punjab Lahore on January 17
- One-day Awareness Seminar at Institute of Clinical Psychology, University of Karachi on January 26

## PASTIC Services Stalls

PASTIC organized 7 services stalls in Lahore and Faisalabad in January 2017 including on January 3, 2017 at School of Biological Sciences, University of the Punjab, Lahore, on January 10 at the Institute of Bio-Chemistry and Bio-Technology, University of the Punjab, Lahore, on January 17 at the Department of Solid State Physics University of the Punjab, Lahore and on January 27 at the College of Statistics and Actuarial Sciences, University of the Punjab, Lahore. Three stalls were organized in Faisalabad educational institutions.

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