NEWS AT A GLANCE

FORTHCOMING EVENTS:

1) First International Conference on the Material Point Method for Modelling Large Deformation and Soil-Water-Structure Interaction

   10 Jan 2017 - 13 Jan 2017; Delft, Netherlands
   http://www.mpm2017.eu

2) EAGE Workshop on Naturally Fractured Reservoirs

   05 Feb 2017 - 08 Feb 2017;
   Dubai, United Arab Emirates
   Seismic attributes, 3D fracture statistics, rock matrix, well logs, Petrochemistry
   http://www.eage.org/event/index.php?eventid=1266

3) Third AAPG/EAGE/MGS Myanmar Oil and Gas Conference Exciting Evolution : Myanmar's petroleum systems, plays and field developments

   22 Feb 2017 - 24 Feb 2017; Yangon, Myanmar
   http://www.eage.org/event/index.php?eventid=1497&Opendivs=s3

AWARDS AND RECOGNITION

1) ISRO Young Scientist award has been received by Ms.Jenita Mary

2) Dr. Abhey Ram Bansal, Principal Scientist working at CSIR – NGRI, Hyderabad has been elected as a Fellow of the National Academy of Sciences, India (FNASc)

3) Prof G. Parthasarathy, Chief Scientist of CSIR-NGRI has been honoured with "Best Reviewer Award" for the year 2015 by the Journal "Geoscience Frontiers".

4) The prestigious 'India Gaurav Award' has been conferred on Dr. T.K. Chand, CMD, NALCO, for his significant contributions and achievements in the field of Industry, on 18th Sep.2016.

IGU Awards for the year 2016

1) Dr.Hari Narain LifeTime Achievement Award- Prof.O.P. Varma

2) Decennial Award- Dr.Kalachand Sain

3) Krishnan Medal- Dr.Uma Shankar

4) Anni Talwani Memorial Prize- Dr.Prakash Kumar

Memorial/Endowment Lectures:

1) Prof.K.R.Rannathan Memorial Lecture- Prof.Harsh K Gupta

2) Sri LN Kailasam Memorial Lecture – Sri Sudhakar Mahapatra

3) Prince Mukarram Jah Endowment Lecture- Prof.D.C.Panigrahi

4) Dr.H.N.Siddique Memorial Lecture- Sri.G.C.Katiyar

5) Electrotek & Geometric Endowment Lecture- Prof.Mrinal Sen

Prof.D.Lal Best Paper Award

1) M.S.Chaudhari, M.Majumdar, V.Bagade and S.Ranga

2) Uma Vadapalli and N.Vedanti

SCIENCE NEWS

*Historical records may underestimate global sea level rise

New research published in *Geophysical Research Letters* shows that the longest and highest-quality records of historical ocean water levels may underestimate the amount of global average sea level rise that occurred during the 20th century. Dr. Philip Thompson, associate director of the University of Hawai'i Sea Level Centre in the School of Ocean and Earth Science and Technology (SOEST), led the study.

The investigation concludes that it is highly unlikely that global average sea level rose less than 14 cm during the 20th century, while the most likely amount was closer to 17 cm.

Source: P. R. Thompson, B. D. Hamlington, F. W. Landerer, S. Adhikari. Are long tide gauge records in the wrong place to measure global mean sea level rise? Geophysical Research Letters, 2016; DOI: 10.1002/2016GL070552

* Magma movements foretell future eruptions

Geologists have traced magma movement beneath Mt. Cameroon volcano, which will help monitoring for future volcanic eruptions. The researchers revealed a complex magma plumbing system beneath Mt. Cameroon volcano by analyzing crystals from the two most recent eruptions in 1999 and 2000. The results further suggest that between eruptions magma batches migrate to shallower depths where they evolve and increase their explosive potential. Hence a longer time between eruptions increases the likelihood of the next eruption being more explosive in style, similar to the Eyjafjallajökull eruption on Iceland in 2010.

Source: Harri Geiger, Abigail K. Barker, Valentin R. Troll. Locating the depth of magma supply for volcanic eruptions, insights from Mt. Cameroon. Scientific Reports, 2016; 6: 33629 DOI: 10.1038/srep33629

* Exhaling Earth: Scientists closer to forecasting volcanic eruptions

On average, 40 volcanoes on land erupt into the atmosphere each month, while scores of others on the seafloor erupt into the ocean. A new time-lapse animation uniting volcanoes, earthquakes, and gaseous emissions reveals unforgettably the large, rigid plates that make the outermost shell of Earth and suggests the immense heat and energy beneath them seeking to escape.

Recent discoveries by Deep Carbon Observatory (DCO) scientists in the Deep Earth Carbon Degassing (DECADE) initiative are laying the foundation for improved volcanic eruption forecasts. These hard-won advances required expensive, dangerous expeditions to sniff gas emissions for clues. By 2019, DECADE scientists hope to have gas monitoring stations on 15 of the world's 150 most active volcanoes. This will add to the eight stations currently operated by other entities such as the USGS and the University of Palermo (Italy). Data collected at these monitoring stations are feeding a new database of volcanic carbon emissions, making potentially life-saving information available to many more scientists around the world.

DCO volcanologists are also advancing basic knowledge about how different volcanoes work, which is further advancing eruption forecasting.

Source: J. Maarten de Moor, A. Aiuppa, G. Avard, H. Wehrmann, N. Dunbar, C. Muller, G. Tamburello, G. Giudice, M. Liuzzo, R. Moretti, V. Conde, B. Galle. Turmoil at Turrialba Volcano (Costa Rica): Degassing and eruptive processes inferred from high-frequency gas monitoring. Journal of Geophysical Research: Solid Earth, 2016; 121 (8): 5761 DOI: 10.1002/2016JB013150

TECHNICAL NEWS

** Ocean Bottom Seismometer: Compiled by **Raja Acharya,** IMD, Regional Meteorological Centre, Kolkata

An ocean-bottom seismometer (OBS) is a seismometer designed to record natural and manmade vibrations under oceans and lakes. Data analysis yields information about structure and composition of the sea floor and the deeper crust. In a typical seismic survey, the instruments should be operational for several days (deployments can exceed 12 months), which requires a data storage capacity of more than 500 Mbyte.

The OBS consists of an aluminium sphere which contains sensors, electronics, enough alkaline batteries to last 10 days on the ocean bottom, and an acoustic release. The two sphere halves are put together with an O-ring and a metal clamp to hold the halves together. A slight vacuum is placed on the sphere to better ensure a seal. The sphere by itself floats, so an anchor is needed to sink the instrument to the bottom. The instrument is designed to deploy and recover by any vessel. All that is needed (for deployment and recovery) is enough deck space to hold the instruments and their anchors and a boom capable of lifting an OBS off the deck and swing it over to lower it into the water. The OBS is bolted to the anchor and then dropped (gently) over the side.

Seismometers work using the principle of inertia. The seismometer body rests securely on the sea floor. Inside, a heavy mass hangs on a spring between two magnets. When the earth moves, so does the seismometer and its magnets, but the mass briefly stays where it is. As the mass oscillates through the magnetic field it produces an electrical current, which the instrument measures. The seismometer itself is a small metal cylinder; the rest of the footlocker-sized OBS consists of equipment to run the seismometer (a data logger and batteries), weight to sink it to the sea floor, a remote-controlled acoustic release and flotation to bring the instrument back to the surface.

Prior to deployment, the data logger is programmed with the number of sensors to record the sample rate for data acquisition and the start time. At the designated time, information from the selected sensors is recorded on the data logger's 810 Megabyte hard disk. This information is recorded contiguously for all selected sensors until either the hard disk is filled or the OBS is recovered and the data collection stopped.

The OBS is recovered with an acoustic release. Once the OBS's location is confirmed, a coded transmitted pulse is sent from the surface to initiate the release. Once the OBS has reached the surface, the instrument is retrieved and stored until a later time when the data can be downloaded. Turning the instrument around for the next deployment requires downloading the data onto another computer, replacing the batteries, testing the system, and programming in new parameters.

The sensors used in the OBS consists one vertical 4.5 Hertz seismometer, two horizontal 4.5 Hertz seismometers, and one hydrophone. The horizontal seismometers are mounted 90 degrees to the vertical and 90 degrees to each other. The hydrophone provides information that is similar to the vertical seismometer, and under certain conditions can have a better signal/noise ratio. To keep the design of the USGS OBS simple and compact, the seismometers are indirectly coupled to the earth via the sphere, release hardware, the anchor, and the spring used to hold the OBS to its anchor (the spring is needed to pull the attachment bolt away from the OBS during release).

The ground motion caused by earthquakes can be extremely small (less than a millimetre) or large (several meters). Small motions have high frequencies, so monitoring them requires measuring movement many times per second and produces huge amounts of data. Large motions are much rarer, so instruments need to record data less frequently, to save memory space and battery power for longer deployments. Because of this variability, engineers have designed two basic kinds of seismometers: 1) Short-period OBSs and 2)Long-period OBSs.



Source: 1) https://en.wikipedia.org/wiki/Ocean-bottom_seismometer

2) http://woodshole.er.usgs.gov/operations/obs/whatobs.html

Outstanding Contribution to Atomic Energy and India's Nuclear Weapons Program

Rajagopala Chidambaram

Dr. Chidambaram was born on 12 November 1936 in Madras, India. Chidambaram completed his early education in Meerut and Chennai, completing his B.Sc. with honours in physics, having stood first rank at the departmental and the University level of the Madras University in 1956. After enrolling in master's program, Chidambaram taught introductory physics laboratory courses and obtained M.Sc. in physics, writing a fundamental thesis on analog computers from the same institution, in 1958. He was accepted for the doctoral programme of the Indian Institute of Science (IISc), and was awarded the PhD in 1962. His thesis contained the research work on the development of Nuclear Magnetic Resonance, and was conferred with the Martin Forster Medal for the best doctoral thesis submitted to the Indian Institute of Science. His contribution to the enhancement of condensed matter physics and material science led him to be conferred with a D.Sc., in physics by the IISc after submitting his doctoral thesis on experiments which he conducted at IISc. He has been conferred doctoral degrees in physics by eight Indian universities.

After receiving his doctorate in physics, Chidambaram joined the Bhabha Atomic Research Centre (BARC). He served as the director of the physics group initiating research on physical aspects of nuclear weapons. At BARC, he rose to become one of the senior nuclear scientists involved in various classified projects, and was one of the central figures building the nuclear programme. In 1967, Chidambaram joined the nuclear weapon designing effort along with his fellow scientists in constructing and building the metallurgical and physical aspects of the nuclear weapons. He and his colleagues worked out the equation of state of plutonium, which is still classified by all nuclear weapon states. He chose the implosion method and initiated research at BARC in very close interaction with the Terminal Ballistics Research Laboratory (TBRL) of the Defence Research and Development Organisation (DRDO). Chidambaram also assisted the Indian Army to construct a nuclear test site at long-constructed Indian Army base, Pokhran Test Range in Rajasthan.

He served as the principal scientific adviser to the federal Government of India. Some of his initiatives as Principal Scientific Adviser, including the setting up of the Core Advisory Group for R&D in the Automotive Sector (CAR) to increase academia-industry interaction, the creation of RuTAGs

(Rural Technology Action Groups) for effective need based technology delivery in rural areas and the establishment of SETS (Society for Electronic Transactions and Security).All of them are making significant impact. During the last few years, he helped conceptualise and supervised, along with National Informatic Center, the setting up of the high-speed 'National Knowledge Network' to connect about 1,500 educational and research institutions in India. He has emphasised the need for 'Coherent Synergy' (a phrase he has coined) in India's Science & Technology (S&T) efforts to take India on a sustained fast-growth path. He has also focused on the importance of 'Directed Basic Research' as an addition to (not a substitute for) self-directed basic research.

Chidambaram is the recipient of number of awards and honours. The Indian Government acknowledged his contribution to the successful nuclear tests by awarding the Padma Shri, the fourth highest Civilian honour of the nation, in 1975 and the Padma Vibushan, the second highest civilian honour, in 1999. His other prominent awards are the Distinguished Alumnus Award of the Indian Institute of Science (1991), the C.V. Raman Birth Centenary Award of the Indian Science Congress Association (1995), the Distinguished Materials Scientist of the Year Award of the Materials Research Society of India (1996), the R.D. Birla Award of the Indian Physics Association (1996), the H. K. Forodia Award for Excellence in S & T (1998), the Hari Om Prerit Senior Scientist Award (2000), the Meghnad Saha Medal of the Indian National Science Academy (2002), the INS Homi Bhabha Lifetime Achievement Award of the Indian Nuclear Society (2006), the Life Time Contribution Award in Engineering (2009) from Indian National Academy of Engineering, the C.V. Raman Medal of the Indian National Science Academy. He has been awarded D.Sc. degrees (Honoris Causa) by more than twenty universities in India and abroad. Chidambaram is a Fellow of all the science Academies in India and the Third World Academy of Science (TWAS), Trieste (Italy). He has also served as a member, chairman and president of a number of organizations which, among others, include IIT-Madras, IIT-Bombay, the Materials Research Society of India, the Council of Scientific and Industrial Research (CSIR), and the International Union of Crystallography. In early 2008, the IAEA invited Chidambaram to be a member of the "Commission of Eminent Persons", for making recommendations to the Board of Governors, regarding long-term priorities and funding.

P.R.Reddy