UNESCO Award

UNESCO has announced its Kalinga Award for Popularization of Science for the year 2009. The award winners are Vietnamese American Professor of Astronomy Trinh Xuan Thuan and Indian Professor Yash Pal.

The Kalinga Prize for the Popularization of Science is an award given by UNESCO for exceptional skills in presenting scientific ideas to lay people. It was created in 1952, following a donation from Biju Patnaik, the founding president of the Kalinga Foundation Trust in India. The recipient of this annual award must have demonstrated a brilliant career as writer, editor, lecturer, film producer, radio/television programme director or presenter and have talent in interpreting science and technology for the public.

The recipient should promote the international importance of science and technology and its contribution to improving public welfare, enriching the cultural heritage of nations, and solving problems faced by humanity.

Trinh Xuan Thuan was born in 1948 in Hanoi and completed his B S at the California Institute of Technology, and his Ph D at Princeton University. He also taught astronomy at the University of Virginia since 1976, and is a Research Associate at the Institut d'Astrophysique de Paris. He was a founding member of the International Society for Science and Religion.

Thuan specializes in extragalactic astronomy and galaxy formation with his research focusing on the evolution of galaxies and the chemical composition of the universe. He is considered one of the leading astrophysicists in the world and has written many popular books including *The Birth of Universe*, *The Secret Melody*, *Chaos and Harmony*. A number of his books have been translated into Vietnamese. In 2007, he received the Grand Prix Moron Award from the French Academy for his book *Roads of Light*. His latest book is *Dictionary for Fans of Sky and Stars* in 2009.

Yash Pal was born in 1926. He joined TIFR in 1949 and worked until 1983. He is an institution builder; he created Space Applications Centre (SAC) and Information and Library Network (INFLIBNET) at Ahmedabad, Inter-University Centre for Nuclear Science at New Delhi and Inter-University Centre for Astronomy and Astrophysics (IUCAA) at Pune.

Yash Pal has remained DST Secretary and UGC Chairman. He is the most sought after speaker amongst the science communicators in our country today.

The award was presented on 5 November 2009 at the World Scientific Forum in Budapest, Hungary.

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MEETING REPORT

Lunar and planetary science conference*

Lunar and Planetary Science Conference (LPSC) completed 40 years of its existence this year; continuing a tradition that started on 5 January 1970 with the first lunar science conference coinciding with the Apollo 11 mission results. This conference was special for India as well, since there were two special sessions dedicated to lunar missions which included 11 presentations on results from Chandrayaan-1, India's first mission to Moon. Attended by 1521 participants from 23 countries, the five-day event consisted of 48 technical sessions with 525 oral and 936 poster presentations.

The conference started with Peter Smith, Principal Investigator's talk on Phoenix Lander mission to Mars. The mission has the distinction of landing at the highest latitude (68.22°N) and youngest terrain (<0.5 b.y.) with the capability to do wet chemistry for the first time on Mars. Smith presented an overview of the mission and important results from Phoenix. Detection of water ice by visual means, scanning calorimetry and mass spectrometry, discovery of perchlorate and detection of calcium carbonate by thermal and evolved gas analysis, and solution chemistry measurements were the major highlights.

Mike Mellon (University of Colorado) talked about formation of polygons at the landing site reporting polygon diameters ~3–5 m that has been validated by spacecraft observations. There exists a link between polygon diameter and ice-table depth. Modelling results for the current climatic conditions suggest formation of ~5 m size polygons when the ice table occurs at 5 cm below the soil. Ice has been seen at 1.6–16 cm depth, indicating the role of other factors as well. The existence of larger diameter pattern and variable trough depths indicate change in climatic conditions through time which might have led to variation in ice table and therefore the polygon size. A synonym of simplicity, Telltale (Figure 1 *a* and *b*), was presented by Holstein-Rathlou (Aarhus University). It is a mechanical wind anemometer comprising a light cylinder connected through fibres. The motion of the cylinder with respect to a reference is captured from its image in a mirror and this gives local wind speed and direction. One of the important findings was that particle movement was much faster at the landing site than is required for the formation of aeolian features like dunes, explaining the absence of dunes at the Phoenix landing site.

The next highlight was presentations on Chandrayaan-1 and SELENE missions. J. N. Goswami, Principal Scientist, Indian mission presented an overview and

*A report on '40th Lunar and Planetary Science Conference – Fortieth Edition' that was held at the Woodlands Waterway Marriott Hotel and Convention Center, Texas (USA) during 23–27 March 2009.

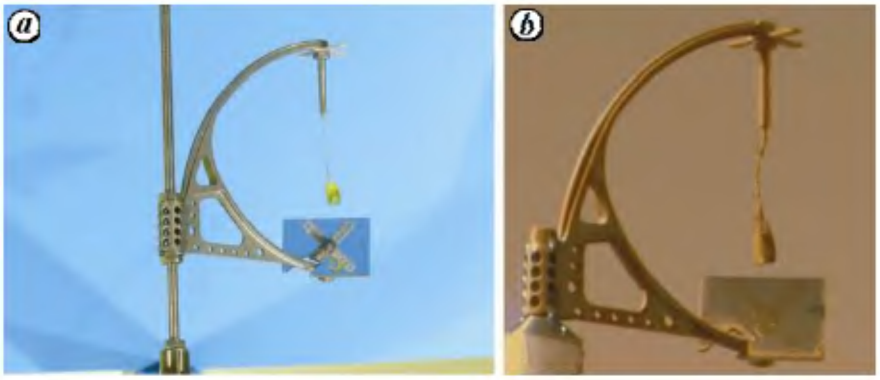

Figure 1. ***a***, The Telltale instrument as imaged on Earth[1]; ***b***, Image of Telltale from Mars[2] taken on sol 70, about halfway through the Phoenix mission.

coverage statistics from instruments on the spacecraft. Polar coverage by Mini-SAR and Lunar Laser Ranging Instrument (LLRI) for the permanently dark regions, hyperspectral coverage by Moon Mineralogy Mapper amounting to over a billion spectra, highest spatial resolution data by Terrain Mapping Camera and continuous radiation flux measurements by RADOM were some of the key datasets emphasized in the talk.

Paul Spudis (LPI) presented preliminary results from Mini-SAR that aims to ascertain occurrence of water ice on lunar poles. It employs a new technique wherein circular polarized beam illuminates the target surface and return signal is measured in linear horizontal and vertical polarization allowing understanding of finer details about the target. He showed certain craters with high circular polarization ratio (CPR) for both crater interior and exterior indicative of a relatively young crater with blocky material. However, for another crater, high-CPR was restricted to the interior, indicating that something other than blocky ejecta was contributing to the signal. One possibility is water ice. Incidentally, the crater is also in permanent darkness.

Carle Pieters (Brown University) discussed topographic structure of the Orientale basin, its connection to lunar stratigraphic units and its interpretation based upon 86 spectral bands of Moon Mineralogy Mapper. She reported detection of pervasive crystalline anorthosite within masses of shocked plagioclase in the Inner Rook Mountains identified by the 1.3 micron absorption band of plagioclase. It is an important finding for it confirms occurrence of anorthositic rocks as a stratigraphic layer which formed during the crystallization of the magma ocean. Global presence of crystalline, pure anorthosite on the Moon was also confirmed by the team led by Makiko Ohtake (JAXA) based on the study of multispectral datasets from SELENE mission. Kamalakar (ISRO) made a presentation on LLRI on Chandrayaan-1. He informed that LLRI has so far obtained 2,900,000 data points on the lunar surface, way beyond the ULCN 2005 dataset (272,000) based on earlier missions. It would lead to a better control network on the Moon. He also showed high-resolution DEMs of large craters like 231 km diameter crater Clavius.

Till recently, the prevalent notion of Moon and Mercury being depleted in volatiles led to evolutionary models incorporating only anhydrous phases. McCubin *et al.* presented results from Ion Probe studies on lunar apatites derived from Apollo sample collection and lunar meteorites. Assuming that only F, Cl and OH^- were the volatile species available during apatite formation, they presented the possibility of magmatic water content of 1 wt% in certain cases. Additionally, large difference between volatile concentrations in apatites belonging to mare basalts and magnesian suite rocks indicate their heterogeneous distribution in respective parent bodies.

Blewett *et al.* presented modelling results discussing abundance of magmatic gases driving an eruption. They concluded that volatile abundance required to launch reasonably sized pyroclasts to a distance of 24 km (spread of studied deposit) would need ~2400 ppm of CO on Moon and ~5500 ppm of CO on Mercury. It far exceeds the earlier expectations.

Mark Wieczorek talked about reorientation of our Moon by large impacts. The authors studied the clustering of different age basins around the western and eastern edge of present day Moon. The leading edge of the Moon (Antapex) should receive relatively lesser number of impactors as compared to the trailing edge (Apex). Their analysis showed a cluster of older basins around the present-day leading edge, suggesting that it was actually the trailing edge in the past. It implies that the far side of the Moon faced us back in time.

1. Gunnlaugsson, H. P. *et al.*, *J. Geophys. Res.*, 2008, **L113**, E00A04.
2. Holstein-Rathlou *et al.*, *J. Geophys. Res.*, 2009 (submitted).

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