

Editorial

The Physical Research Laboratory (PRL), Ahmedabad celebrated its Diamond Jubilee during 2006–07. An international conference on **Challenges for Solar Cycle-24** was organized during 22–25 January 2007 at PRL, as a part of this celebration. The conference was attended by more than 140 participants including 40 delegates from outside India. The conference was conceived with the idea to address key science issues such as: What would the behaviour and magnitude of the next solar cycle be? What are the major questions to be addressed by the international programs, viz., IHY, Space-Weather, CAWSES and Sun–Earth connection?

An International Advisory Committee (IAC) and Scientific Organizing Committee (SOC) consisting of distinguished scientists from all over the globe were formed to plan the conference. The IAC and SOC decided on three thematic topics, viz., **Magnetic fields, Energetics and Instrumentation**. For each thematic topic, several sub-topics were chosen by the SOC. The topic ‘Magnetic fields’ covered many important subjects such as evolution of magnetic fields, dynamo, helioseismology, helicity, magneto-convection, and coronal magnetic fields. The second topic ‘Energetics’ dealt with sub-topics such as solar irradiance, coronal heating, flares, coronal mass ejections, particle acceleration, IP shocks, solar energetic particles (SEPs), space-weather and Sun–Earth connection, and IHY and CAWSES programs. The ‘Instrumentation’ theme covered ground-based high-resolution observations, active and adaptive optics, next generation instrumentation, current space missions, and future space instruments.

The conference was inaugurated on 22 January 2007 by Prof. U. R. Rao, Chairman, Council of Management, PRL. The inaugural program included a keynote address on *Outstanding Problems in Solar Physics* by Prof. Markus J. Aschwanden of Solar & Astrophysics Laboratory, Lockheed Martin Advanced Technology Center, USA, who gave a broad perspective of the current status of solar physics and its challenges.

The scientific program included plenary, invited and contributory talks. The plenary talks comprised of solicited reviews each of duration 40 min followed by in-depth discussions of about 10 min. A total of six plenary talks were organized: three in ‘magnetic fields’ and three in ‘energetics’. A total of 26 invited talks each of duration 25 min including in-depth discussions were organised covering all three focal topics and addressing the international scenario plus very recent work on a sub-topic of the focal theme topic. A total of 26 oral contributory talks each of duration 15 min were organized in order to provide an opportunity for young researchers as well as for those interested in short presentations and these talks generated very interesting and interactive discussions.

In view of the overwhelming response from various Indian institutes and universities to participate in the conference, we encouraged many participants to make poster presentations. In response, 59 posters from India and outside were displayed which resulted in serious discussions and interactions.

The conference was well received in terms of active participation by a large number of solar researchers including many foreign delegates. The keynote address by Prof. Markus Aschwanden, the plenary talks by Prof. Saku Tsuneta on *First results from Hinode Mission* and by Prof. J. M. Davilla on *First Results from STEREO Mission* as also the several interesting presentations on the prediction of “low versus high amplitude of the next solar cycle 24” and their follow-up discussions were interactive among the participants as well as the media.

The Physical Research Laboratory was founded in 1947 by Dr. Vikram A. Sarabhai, initially, at his residence with research on cosmic rays. The laboratory was later, formally established on November 11, 1947, in the M. G. Science College, Ahmedabad, with support from the Karmkshetra Educational Foundation and the Ahmedabad Education Society. The initial focus was research on cosmic rays and the properties of the upper atmosphere. Research in theoretical physics and radio physics were added later with grants from the Atomic Energy Commission. The history of solar research at PRL began with the founding of the Udaipur Solar Observatory in the middle of Fateh Sagar lake in Udaipur in 1975 and the subsequent taking over by the Department of Space in 1981.

A special evening session was organized in the memory of Prof. Arvind Bhatnagar, founder of Udaipur Solar Observatory, Udaipur, which was chaired by his colleague and friend Prof. J. O. Stenflo. A popular evening lecture on ‘The Inconstant Sun’ was delivered by his colleague Prof. S. M. Chitre, which was attended by the conference participants, students, faculty of PRL and invited guests from Ahmedabad.

A special session on INDO-US collaboration in solar physics was organized at USO, Udaipur on 26 January 2007 and new collaborative efforts for ground as well as space programs were initiated.

We are thankful to the **Indian Academy of Sciences, Bangalore** for publishing this special issue of *Journal of Astrophysics and Astronomy* comprising refereed and accepted papers presented in the conference. Our thanks are due to all the referees for reviewing the papers. We thank members of the International Advisory and Scientific Organizing Committees for suggesting magnificent focal topics and contemporary subjects which helped in framing the scientific program.

The conference was made possible by the generous financial support by Prof. J. N. Goswami, Director, PRL, Ahmedabad. Substantial financial assistance was received from Indo US Science & Technology Forum, New Delhi to organise the special session on ‘INDO-US collaboration in solar physics’ at USO, Udaipur. We also received outstanding support and co-operation from all the members of PRL. We sincerely appreciate the help received from members of the LOC in organizing this conference.

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Guest Editors