

## Foreword

The International Linear Collider Workshop in the year 2006 (LCWS06) was held in March 9–13, 2006, in Bangalore, India under the aegis of World Wide Study for Future Linear Colliders. These workshop-style conferences have been the main International fora for developing the physics case and reviewing detector designs and techniques for an electron–positron linear collider. This world-wide series of the LCWS workshops started in 1991 and have travelled all around the world. More information on the previous workshops in the series is available at the url <http://www.tifr.res.in/~lcws06/>. History has taught us that electron and hadron accelerators are complementary in the exploration of new physics frontiers. The high energy physics community in the world has reached an accord that a Linear Collider operating at 0.5–1.0 TeV would provide both unique and essential scientific opportunities; it has endorsed with the highest priority the construction of such a machine. A major milestone towards this goal was the approval, by the International Committee on Future Accelerators (ICFA), of the recommendation of the International Technology Recommendation Panel (ITRP) for the cold technology of the future International Linear Collider (ILC). LCWS06 was the first International Linear Collider Workshop after the choice of this technology was announced.

Together with the Large Hadron Collider (LHC) at CERN, the ILC would allow physicists to explore energy regions beyond the reach of today's accelerators. At these energies, researchers anticipate significant discoveries that will lead to a radically new understanding of what the universe is made of and how it works. The nature of the ILC's electron–positron collisions would give it the capability to answer compelling questions that discoveries at the LHC will raise, from the identity of dark matter to the existence of extra dimensions. The ILC Global Design Effort (GDE) will establish the design of the ILC, focusing the efforts of hundreds of accelerator scientists and particle physicists in America, Europe and Asia. The ILC will be designed, funded, managed and operated as a fully international scientific project. An international effort will define the administrative and financial model for the project.

The meeting of the GDE, held concurrently with the LCWS06 for the first three days was a 'first' at the LCWS06 organised by the Indian Institute of Science, Bangalore and has been repeated since then. A discussion of the effort towards an ILC in India, meetings between the ILC community and the members of the Indian industry, which has contributed to magnet building at the LHC at CERN, Geneva, as well as those who have contributed to the detectors and an Education and Outreach Workshop for Physics Teachers conducted by the QuarkNet team from Fermilab and the Indian Academy of Sciences, were other notable features of this workshop. The report of many of these

## Foreword

has appeared elsewhere (for example *Symmetry* (Fermilab), *Current Science* (Bangalore, India, etc.) and is not included here in these Proceedings.

The GDE pre-workshop meetings began, in fact, one day before the LCWS06, on the 8th itself. The GDE/ILC overview by Barry Barish in the joint plenary session set the tone of the meeting. The joint plenary session also had talks by Roberto Petronzio (FALC) and Ken Peach (Europe Strategic Plan) which were presented remotely. The DCR, i.e. Design Concept Report (for the LCWS) and the RDR i.e. Reference Design Report (for the GDE) documents were discussed at the workshop and have since then been finalised and both efforts have moved on. The GDE has chosen to post all its talks on the agenda at <http://ilcagenda.cern.ch/conferenceOtherViews.py?view=standard&confId=6>. The LCWS had its usual division into 13 parallel sessions. Included in these proceedings are some of the plenary talks such as the overview of the physics and experiments at the ILC, the detector concepts, as well as a large number of talks presented in the parallel sessions. Large number of contributions related to detectors and the machine design interface (MDI) and  $\gamma\gamma, e\gamma$  option are some of the special features of these proceedings.

Our thanks are due to the following agencies in India which sponsored the Workshop: (1) Department of Science and Technology (DST), (2) Board of Research in Nuclear Sciences (BRNS), (3) Harishchandra Research Institute (HRI), (4) Institute for Mathematical Sciences (IMSc), (5) Tata Institute for Fundamental Research (TIFR) and (6) Variable Energy Cyclotron Centre (VECC). Thanks are also due to Deutsches Elektronen Synchrotron (DESY) at Hambury, for support towards participation of young researchers as well as those from the third world in the workshop.

A very special vote of thanks to Dr Anil Kakodkar, Chairman, Atomic Energy Commission for finding time in his highly busy schedule to come and inaugurate the activity. We wish to express our thanks to the members of the WWS, the program advisory committee as well as the national organizing committee. Our most sincere thanks are due to the EHEP group at TIFR which maintained the web page for the conference. Special thanks are due to Mr Desphande, EHEP group, TIFR for his valuable help in many aspects of the organization and communications at the workshop. Help from Mr Ravi from IMSc, Chennai and Mr Kulkarni from TIFR, in setting up and maintaining the network facility at the conference venue and making all the remote presentations possible, deserves a special mention. We would like to thank the staff of the Indian Academy of Sciences for their invaluable help in many aspects of organization as well as the digital library at IISc, for allowing use of their premises for conducting the Education and Outreach Workshop for Physics Teachers, held on March 10 and 11, 2006. Thanks are due to

*Foreword*

Profs S Tonwar, B Acharya and R Verma for their help in conducting the same. A very, very special vote of thanks to Prof. G Rangarajan for helping us out of many a sticky spots. Last but not the least, a big cheer to the team of volunteers from the Centre for Theoretical Studies and the Department of Physics in the Indian Institute of Sciences Bangalore and Raman Research Institute. In addition to them some of our colleagues from different high energy physics institutes, HEP students and post-doctoral fellows provided invaluable help. There are far too many to mention all by names, but Profs S Banerjee, R Basu, S K Rai and S D Rindani deserve special mention. Without the help of the office staff of the Centre of High Energy Physics, Mr Keshava and Mr Janardhana, nothing could have been achieved. We extend our sincere thanks to them. Of course, the workshop was a success only because of the participants, hence we extend most heartfelt thanks to them.

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