

## Preface

The XXI International Symposium on Lepton and Photon Interactions at High Energies marked the return of the Symposium to Fermilab at the start of the Run II collider era of the Tevatron. As of 11-16th August 2003, the Tevatron has delivered an integrated luminosity surpassing that of the previous collider run. Whereas the IX Symposium, held at Fermilab in 1979, marked the start of construction of what was then called the “Energy Saver/Doubler”, this one saw the newest accelerator at Fermilab – the Main Injector – in full operation for both protons and antiprotons. With the Main Injector the instantaneous luminosity of the Tevatron collider is a factor  $\sim 50$  higher than the original design luminosity presented in 1979 for the “Energy Saver/Doubler”. Soon to join the presently running MiniBooNE experiment will be a new neutrino program at Fermilab powered by the intense proton beams provided by the Main Injector. This summer saw the completion of the MINOS far detector and the NUMI neutrino beamline will soon be completed.

At the IX Symposium the first evidence for gluons was shown and QCD emerged as the theory that could describe what was known about hadrons. It was hoped that QCD would soon be near to gaining the stature of QED. At this Symposium a major breakthrough was presented. Lattice QCD has reached a new level of precision, where errors on calculated quantities can at last be reliably quantified at the several % level. Soon, instead of testing Lattice QCD we will be using it to help us determine more precisely the parameters of the Standard Model and to look for New Physics. Other highlights for this Symposium included the vast amount of new data from the  $B$ -factories with the tantalizing possibility of non-Standard Model CP-violation in  $\phi K_S^0$ , and the discovery of a new, as yet unexplained, particle, the  $X(3872)$ . The remarkable progress in neutrino physics was again evident with the last pieces of the solar neutrino problem falling into place and settling on the LMA-1 solution. However we were reminded how much we still need to understand by the talks on Dark Matter and Dark Energy. The talks also showed the synergy between the different areas of particle physics and between particle physics, astroparticle physics and cosmology, especially in the

search for New Physics at the TeV energy scale.

While still following the traditional program of review talks, for this edition of the Symposium a real effort was made to increase active participation throughout the Symposium. This was partly achieved by holding breakout discussion sessions between the formal plenary talks. There, the speakers from several sessions were available for an extended “Question and Answer” session. These new sessions were enormously successful, and the only regret maybe is that we do not have a written record of these discussions. However this probably allowed for a more informal and relaxed atmosphere. Additional participation was also generated by another new introduction to the Symposium, a “Physics Posters” session. There were 66 physics posters presented with obvious enthusiasm by young physicists. These poster presentations were split over two days and included results from 20 different experiments as well as posters on theory, analytical techniques, and detector development. A “Laboratory Posters” day was again held with the participation of 15 laboratories, based in eight different countries. In addition, one evening was devoted to a special session on the Computational Data GRID, comprising an interesting program with both talks and posters.

Another aim for this Symposium was to increase the participation of younger scientists, who are the future of the field. As well as having some excellent young speakers and holding the new “Physics Posters” session, younger scientists were recruited to help throughout the Symposium. Included in this were the local organizing committee, the Scientific Secretaries, and one of the editors can still be considered young!

A major effort at this Symposium was public outreach. Members of the press held special discussion sessions with scientists on various physics topics; there was also a special press conference with the Laboratory Directors. The outreach effort included interaction with the public during several hours in the Field Museum in Chicago, which was covered by the press. There were also excellent “Plain English” articles written on seven different particle physics and cosmology topics made available via the Symposium website. At a public lecture on the last evening

of the Symposium, Fermilab director, Mike With-  
erell, gave an inspiring talk on “New Questions about  
Matter, Space and Time” to a packed auditorium of  
the local public. Capping off these outreach efforts  
was the launch of Interactions.org, a multinational  
website designed as a central resource for communi-  
cators of particle physics.

Following the excellent efforts of LP2001 on  
keeping a good record of the Symposium, we have  
tried to provide as good a record as possible via the  
website and through a DVDROM included with the  
hardcopy of the proceedings. These will provide a

lasting record of the live webcast streaming video for  
each talk, the talk slides, the writeups of each talk,  
the public lecture, and the physics and laboratory  
posters.

The synergy between different areas of particle  
physics and cosmology that was so evident at LP2003  
can be viewed as a broad attack to dispel the veil at  
the TeV energy scale. This effort will continue to  
pull at this veil and foreshadows the bursting forth  
of New Physics that will overwhelm, delight, excite,  
and inspire us. We hope that LP2005 will bring us  
a glimpse of this future era.

Harry W. K. Cheung  
and  
Tracey S. Pratt  
*Proceedings Editors*

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We thank the excellent Local Organizing Committee who worked very hard on all aspects of the Symposium, including the poster sessions, website, public outreach and contributed paper submission. Thanks to the International Advisory Committee for contributing useful suggestions on the program. The Scientific Secretaries are gratefully acknowledged for their many activities, including classifying all the contributed papers, providing technical help to speakers, and for their support during the sessions.

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C. Newman-Holmes

*Chair, Lepton-Photon 2003 Organizing Committee*

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