

Foreword

The international workshop *New Trends in HERA Physics 2011* took place from September 25 to 28, 2011 at Ringberg Castle, which overlooks Lake Tegernsee in the foothills of the Bavarian Alps, one of the most picturesque locations to be found in the whole of Germany.

The castle was built during the first half of the twentieth century by Duke Luitpold in Bavaria (Herzog Luitpold in Bayern), a member of the Wittelsbach family which ruled Bavaria over 800 years, and his friend Friedrich Attenhuber, an all-round artist, architect, and interior decorator. The castle is entirely their creation, from the massive Renaissance-inspired exterior right down to the fittings and furniture, which, in every detail, were designed by Attenhuber himself and executed by native craftsmen. Attenhuber also painted every single picture exhibited in the castle. According to the Duke's last will, the castle passed into the hands of the Max Planck Society after his death, in 1973. The castle was then transformed into a conference venue, where scientists can exchange their latest ideas and discuss problems with their colleagues from all over the world in beautiful surroundings and in a relaxed mountain atmosphere, high above the daily business activities.

This was the seventh event in a series of Ringberg workshops on HERA physics, which was started in 1997 and continued in 1999, 2001, 2003, 2005 and 2008. At the end of these workshops, many participants expressed the opinion that this was a successful endeavour to bring theorists and experimentalists together in order to interpret the latest HERA data, and that it would be useful to organize a follow-up workshop in a similar spirit.

With the 2011 Ringberg workshop this series comes to an end, after the HERA accelerator has been switched off in 2007. The focus of the workshop was therefore on approaching the final experimental results as the heritage of the HERA program, together with the theoretical interpretation. In the three days of the workshop thirty experts in elementary-particle physics, both theorists and experimentalists, from fifteen universities and research institutions in eight countries congregated to present and discuss the latest results on the various aspects of HERA physics. Specifically, there were twenty-one presentations, about one half given by theorists, the other half by experimentalists, the latter representing the H1, HERMES, and ZEUS collaborations at HERA, and furthermore the COMPASS and JLAB collaborations; results from the Tevatron and from the LHC have been presented as well.

A mayor focus was on the measurement of the proton structure functions from deep-inelastic scattering (DIS) (charged and neutral current) and the extraction of parton distribution functions (PDFs); emphasis was given in particular to heavy quark theory approaches and to the implications for Tevatron and LHC physics; furthermore, spin physics and deeply virtual Compton scattering (DVCS) together with generalized parton distributions (GPDs) were covered. Another focus was the precision determination of $\alpha_s(M_Z)$. Other topics included: theory of DIS and Higgs production, low x DIS, diffractive physics, heavy flavour and J/ψ production, particle

production and Monte Carlo event generators. We hope that the high-energy-physics community will benefit from these proceedings, in which the ongoing efforts in understanding the nature of the strong interactions, with particular emphasis on HERA physics, are documented.

We wish to thank all our friends and colleagues who have contributed to these proceedings. We are indebted to the workshop secretary, Mrs. Rosita Jurgeleit, for her assistance before, during, and after the workshop and to Kirsten Sachs for her technical assistance in the editorial work. We also would like to thank the castle manager for his organisational work and his guided tour through the castle and its history. The local costs at Ringberg Castle and the costs for the publication and dissemination of these proceedings were covered in equal parts by the Deutsches Elektronen-Synchrotron at Hamburg and the Max-Planck-Institut für Physik at Munich, which we gratefully acknowledge.

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