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J. Trampetić J. Wess (Eds.)

Particle Physics in the New Millennium

Proceedings of the 8th Adriatic Meeting



RUDJER BOŠKOVIĆ INSTITUTE

Max-Planck-Gesellschaft
zur Förderung der Wissenschaften e.V.



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Cover Picture: (see Fig.1 contribution by D. Denegri in this volume)

Cataloging-in-Publication Data applied for

A catalog record for this book is available from the Library of Congress.

Bibliographic information published by Die Deutsche Bibliothek

Die Deutsche Bibliothek lists this publication in the Deutsche Nationalbibliografie;
detailed bibliographic data is available in the Internet at <http://dnb.ddb.de>

ISSN 0075-8450

ISBN 3-540-00711-3 Springer-Verlag Berlin Heidelberg New York

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Springer-Verlag Berlin Heidelberg New York
a member of BertelsmannSpringer Science+Business Media GmbH

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Printed in Germany

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Typesetting: Camera-ready by the authors/editor
Camera-data conversion by Steingraeber Satztechnik GmbH Heidelberg
Cover design: *design & production*, Heidelberg

Printed on acid-free paper

54/3141/du - 5 4 3 2 1 0

Preface

The traditional purpose of the Adriatic Meeting is to present most advanced scientific research conducted by the lecturers who take part in the development of their fields and, in addition, to provide a school-like atmosphere for young scientists.

Dubrovnik, as a geographical centre of this region of Europe, provided a most adequate location for this conference. Having very agreeable surroundings, the conference site nevertheless gave a focus for very strong scientific interaction.

The subjects chosen for the 8th meeting, in September 2001, were gauge theories, particle phenomenology, string theories and cosmology.

We were able to bring together a very good cross section of outstanding scientists who gave extraordinarily good presentations. Certainly one reason for this success is that most of us feel obliged to help the scientific life in South East Europe return to its former level. However, there are very exciting new scientific developments as well.

Part of the meeting was dominated by neutrino physics which has just seen exciting progress by establishing neutrino masses experimentally. This was discussed within neutrino masses and grand unified theories (GUTs). General aspects of neutrino physics and CP violation, neutrino mixing and the baryon asymmetry were presented along the same lines.

On the theoretical side the idea of the construction of gauge theories on non-commutative spaces and their phenomenological implications is accepted worldwide within the particle physics community.

Both status of CP violation and heavy meson decay were discussed at a moment when the recent experimental results became available. A remarkable achievement of heavy quark physics in general and CP violation within the framework of heavy quark effective field theory (HQEFT) was made on the basis of nonperturbative QCD.

For an outlook on Large Hadron Collider (LHC) and the physics to be done there, the meeting took place at just the right time. We are especially proud that at this 8th Adriatic Meeting there were a number of representatives from huge experimental collaborations ranging from ATLAS and CMS at CERN to CLEO at Cornell. It is a pleasure to note here the excellent contact that was established with particle physicists from South America, in particular from Brazil.

Cosmology with its new estimate of dark matter was another subject of huge interest.

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Finally, there was a number of extremely interesting presentations concerning the theoretical and experimental problems in: SUSY, magnetic monopoles in QCD, the perturbative QCD approach, hot matter in QCD and physics beyond the standard model at new accelerators.

All of this gave an impressive overview of the present activities and the progress in those areas of physics represented at the meeting. At the same time it created an active atmosphere which drew many of the young scientists into these fields.

We would like to thank young members of Theory Division, Rudjer Bošković Institute for help during the Conference: G. Duplančić, H. Nikolić and H. Štefančić. For a substantial help during the organization of the Conference we would especially like to thank K. Passek-Kumerički. We would like to thank L. Jonke for great help in preparing these Lectures Notes.

Muenchen,
March 2002

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