

## Preface

After the discovery of supersymmetry in the seventies of the 20th century, there was a rapid development of the ideas related to the unification of gauge interactions with gravity within the framework of superstring theory. The application of superstring theory to cosmology began with the most explored example of the pre-big-bang scenario of M. Gasperini and G. Veneziano of 1991 and on. From superstring theory the theoreticians were led into brane theory, or rather to M-theory, which also became an inspiration to cosmologists. The Hořava-Witten and Randall-Sundrum brane scenarios, together with ekpyrotic/cyclic scenario, were the most successful results of these investigations. Since these scenarios are based on theories of the unification of all the *fundamental* interactions in the universe, it was natural to call them cosmology of fundamental theories, fundamental cosmology or, in short, COSMOFUN.

The idea of fundamental cosmology brought together a group of European cosmologists during the last couple of years: the informal COSMOFUN activity was designed to form a more regular group that could effectively collaborate, train young scientists, organize conferences and workshops. One of these pioneering activities was the “Pomeranian Workshop in Fundamental Cosmology” which took place in September 2005 in Pobierowo – a beautiful resort at the Baltic sea in the north-western part of Poland – the region called Pomerania. As an organizer I noticed that the participants enjoyed this area very much.

During the workshop, which was attended by about 30 scientists, ideas in fundamental cosmology were exchanged and vividly discussed. There were invited lectures as well as short talks. The former have been collected in the form of review papers and are presented in the current issue.

I would like to thank all the lecturers for the effort they made in order to prepare these nice contributions and for keeping the deadline for submission. I would like to thank Prof. Dr. Friedrich Hehl for the support of the idea of publishing the proceedings of the workshop in “Annalen der Physik”. The financial support from the Polish Ministry of Education and Science (former Polish Research Committee) and the University of Szczecin is gratefully acknowledged.

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Prof. Dr. Mariusz P. Dąbrowski

### **Pomeranian Workshop in Fundamental Cosmology**

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#### **Organized by:**

Cosmology Group, Institute of Physics, University of Szczecin, Poland

#### **Organizing Committee:**

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