

## Editorial

### Special Topic Issue “Grassmannian Paths to Cosmology”

#### Guest Editors:

**M. P. Dąbrowski (Szczecin), K. A. Meissner (Warsaw), Yu. V. Shtanov (Kiev)**

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The idea of the “Grassmannian Conference in Fundamental Cosmology” emerged for two reasons.

Firstly, it was a continuation of the previous activity of a group of European cosmologists gathered in the informal COSMOFUN (Cosmology and Fundamental Interactions) project. Along with being involved in regular scientific collaboration that resulted in common publications, the group has also organized several conferences. One of them was the “Pomeranian Workshop in Fundamental Cosmology,” which took place in September 2005 in Pobierowo near Szczecin and was reported in *Annalen der Physik* **15**, No. 4–5 (2006).

Secondly, and even more importantly, it was dedicated to the bicentennial of the birth of a mathematical genius, a theologian, and a philologist Hermann Günter Grassmann (1809–1877), who had spent most of his life in Szczecin. His famous algebra, known today as the Grassmannian algebra, is an indispensable element of modern mathematics and one of the basic tools in advanced particle physics. If supersymmetry is discovered experimentally, it will be proved to exist in the real world of fundamental microphysics.

Amazingly, throughout all of his life, Grassmann was just a school-teacher. He first taught at the Marienstifte School (nowadays, this is the building of the High School No 9 in Szczecin on the Mariacki square), and, since 1843, at the Friedrich Wilhelm Grammar School. Living in isolation from the academic life, paradoxically, he was able to benefit from that, working with liberty on the topics of his own choice and pursuing his paths without being disturbed by the diverse opinions of the authorities in the field. This, perhaps, is one of the reasons why his works were so farsighted, and why their full appreciation came much later.

Application of Grassmann’s geometric ideas to physics had a deep impact on contemporary cosmology, and we find numerous links between Grassmann and this glorious science in our volume “Grassmannian Paths to Cosmology.” These more or less direct paths and links, reported at the conference, have been collected from over fifty participants, and now we have a pleasure to present them to the physicist community in this volume of the journal.

The wide range of interests of Hermann Grassmann also gave some interdisciplinary dimension to the conference. It was attended by two winners of the Templeton Prize, Prof. John D. Barrow and Rev. Prof. Michael Heller. The conference sessions were held at a city of Szczecin cultural place “13 Muz” – just 200 meters away from the Marienstifte School. During the same week (16–19.09.2009), a parallel interdisciplinary conference dedicated to the memory of Grassmann was organized by philosophers from the University of Potsdam with the last common session in Szczecin.

In conclusion, we would like to thank the Editor-in-Chief, Prof. Dr. Ulrich Eckern and the Editor of the gravitation and cosmology part of the journal, Prof. Dr. Friedrich Hehl, for welcoming the idea of publishing the contributions of the conference in the “*Annalen der Physik*”. The financial support from the Polish Ministry of Science and Higher Education, the WestPomeranian Government, the City of Szczecin, and the University of Szczecin is also highly appreciated.

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Prof. Dr. Mariusz P. Dąbrowski  
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**“Grassmannian Conference in Fundamental Cosmology”  
14–19 September 2009, Szczecin, Poland**

**Organized by:**

Cosmology Group, Institute of Physics, University of Szczecin

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M. P. Dąbrowski (chair), T. Denkiewicz (secretary), A. Balcerzak, J. Garecki, K. A. Meissner (Warsaw), Yu. V. Shtanov (Kiev), J. Stelmach.

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