

Foreword

The Proceedings presented here collect most of the lectures delivered during the twenty eighth Winter School of Theoretical Physics held in Karpacz, Poland, February 17–February 29, 1992.

It is already more than a quarter of a century since the first Winter School took place in Karpacz in 1964. Every year since then (except 1982) the School has been organized by members of the Institute of Theoretical Physics of Wrocław University. The topics of the School vary, reflecting the recent developments of modern theoretical physics as well as interests of people at our Institute.

The programme of the present XXVIII Winter School focused on the recent developments in differential geometric methods in quantum physics. The main topics covered by the lectures of the School may be divided into the following groups:

- quantum field theoretic models including topological field theory, conformal field theory and quantum gravity models,
- noncommutative differential geometric methods with applications to supersymmetric quantum theory and gauge field theory,
- applications of quantum groups to quantum theory,
- the connection between functional integration and quantum physics on the level of rigorous stochastic analysis.

The articles collected in these Proceedings reproduce quite accurately the program of the School. In each field there were major lectures delivered by experts, which continued for several lecture hours starting at an elementary level and ending with recent advanced developments. In addition there were talks concerning special topics. The material is divided into sections.

It is now a pleasure to thank those institutions and people who made it possible for the School to take place. This School could not have been held without the extensive and efficient help we received.

From the financial point of view we could not have succeeded without the sponsors listed below:

- The Polish Committee for Scientific Research,
- The University of Wrocław,
- Foundation of the Karpacz Winter Schools,
- International Centre for Theoretical Physics in Trieste,
- Ecole Polytechnique Federal de Lausanne.

Last but not least I am grateful to my colleagues from the Institute for their

generous help in the preparation of the School. Among the many colleagues to whom I am indebted let me mention Jerzy Lukierski, Zbigniew Hasiewicz and Zbigniew Jaskólski. Andrzej Borowiec took the responsibility of secretary.

On the behalf of the Organization Committee
Roman Gielerak
Director of the 28th Karpacz Winter School