

Preface

This volume is an outgrowth of a special summer term on “Harmonic analysis, representation theory, and integral geometry”, hosted by the Max Plank Institute for Mathematics (MPIM) and the then newly founded Hausdorff Research Institute for Mathematics (HIM) in Bonn in 2007. It was organized and led by S. Gindikin and B. Krötz with the help of O. Offen and E. Sayag. The purpose of this book is to make an essential part of the activity from the summer term available to a wider audience.

The book contains research contributions on the following themes: connecting periods of Eisenstein series on orthogonal groups and double Dirichlet series (Gautam Chinta and Omer Offen); vanishing at infinity of smooth functions on symmetric spaces (Bernhard Krötz and Henrik Schlichtkrull); a formula involving all the Rankin–Selberg convolutions of holomorphic and non-holomorphic cusp forms (Jay Jorgenson and Jürg Kramer); a scheme of a new proof for the so-called Helgason conjecture on a Riemannian symmetric space $X = G/K$ of the non-compact type (Simon Gindikin); an algorithm for the computation of special unipotent representations attached to certain regular K -orbits on a flag variety of the dual group (Dan Ciubotaru, Kyo Nishiyama, and Peter E. Trapa); applications of symplectic geometry, particularly moment maps, to the study of arithmetic issues in invariant theory (Marcus J. Slupinski and Robert J. Stanton); and restrictions of representations of $SL_2(\mathbb{C})$ to $SL_2(\mathbb{R})$ treated in a geometric way, thus providing a useful introduction to this research area (Birgit Speh and T. N. Venkataramana).

In addition, the volume contains three papers of an expository nature that should be considered a bonus. The first, by Joseph Bernstein, is a course for beginners on the representation theory of Lie algebras; experts can also benefit from this. Although Feigin and Zelevinski published an expanded version of these notes, the original from 1976, which is much more suitable for beginners, had never been published. The second contribution, by Jacques Faraut, introduces the work of Okounkov and Olshanski on the asymptotics of spherical functions on symmetric spaces of a large rank. The third, by Yuri A. Neretin, is an introduction to the Stein–Sahi complementary series.

Acknowledgments

We thank the invited lecturers and participants for creating a stimulating atmosphere of cooperation and communication without which this volume would not have been possible. We thank the referees for their efficient and helpful reports. We also express our gratitude to MPIM and HIM for providing us with a wonderful working environment.

Hannover, Germany
Haifa, Israel
Be'er-Sheva, Israel

Bernhard Krötz
Omer Offen
Eitan Sayag

Representation Theory, Complex Analysis, and Integral
Geometry

Krötz, B.; Offen, O.; Sayag, E. (Eds.)

2012, X, 275 p. 23 illus., Hardcover

ISBN: 978-0-8176-4816-9

A product of Birkhäuser Basel