

Preface

Mathematical developments and breakthroughs have in many of their most shining examples been achieved by researchers who were fluid in the language of more than one field of mathematics and able to translate ideas from one field to another one. An outstanding example, almost a proof, for this claim is Friedrich Götze. Over the past more than 30 years he obtained a series of beautiful results in both probability theory and analytic number theory (among others), and, quite often, a central idea of the proof of these results is to borrow a technique from another field. This volume is dedicated to him. It consists of thirteen papers, the majority of which are based on contributions to a workshop that took place from August 4 to 6, 2011 at Bielefeld University on the occasion of Friedrich's sixtieth birthday. This workshop was supported by CRC 701 "Spectral Structures and Topological Methods in Mathematics".

The scope of the articles in this collection is as broad as Friedrich's interest. He started out as a pure mathematician studying complex geometry and topology for his diploma thesis with Friedrich Hirzebruch in Bonn. After that he changed his field of research to statistics to do his Ph.D. with Johann Pfanzagl in Cologne. His first papers analyze the speed of convergence and asymptotic expansions in central limit theorems for various statistics. He soon became a worldwide acknowledged expert for giving best-known or even optimal rates of convergence in limit theorems. In the 1990s he broadened his spectrum by a series of articles on the geometry of numbers. The choice of this particular subject was not a coincidence. Already Friedrich's analysis of the convergence rates in limit theorems for quadratic forms led to questions in analytic number theory, in particular to the investigation of the number of lattice points in an ellipsoid. These questions were first tackled by Hardy and Littlewood, on the one hand, and Landau, on the other, in the 1920s, but it was not until a series of fundamental papers by Friedrich and his coauthors that these questions were ultimately solved with the help of probabilistic methods.

Apart from the two subjects mentioned above Friedrich has always been open for new trends in probability, statistics, and many other fields. Over the past 2 decades he made major contributions to the theory of random matrices and free probability, the theory of resampling techniques, and log-Sobolev inequalities, among others.

Many of Friedrich's results were derived in collaboration with colleagues and friends, many of whom presented talks on the occasion of his sixtieth birthday and also contributed to this volume. In total, it collects 13 papers (all of which have been peer-reviewed) by researchers in fields in which Friedrich has become famous for his contributions, namely number theory, probability, statistics and combinatorics, and the theory of random matrices. Many of these papers have been stimulated by his work, either by the choice of subject or by his techniques. The articles are prefixed by an interview by Willem van Zwet, which illuminates Friedrich's achievements in the context of his personal experiences.

We thus hope to be able to shed some light on Friedrich's preeminent scientific work.

Münster, Germany

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Limit Theorems in Probability, Statistics and Number
Theory

In Honor of Friedrich Götze

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