Preface Issue 3/4-2013

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The year 2013 is of importance for stochastics in several respects. First of all it is the 250th anniversary of what today is known as Bayes' theorem. "An essay towards solving a problem in the doctrine of chances" by the late Rev. Mr. Bayes appeared in 1763. Thomas Bruss reviews again the context, the contents, the enormous implications and in parts also the historical discussion of this ground breaking essay. His review originates from the recently established collaboration of Zentralblatt für Mathematik and Jahresbericht der DMV.

2013 is also "The International Year of Statistics" to which the Jahresbericht contributes with the help of Winfried Stute and his survey on the statistics of point processes and their relations to risk analysis and survival analysis. After having explained the basic notions and ideas by means of simple examples from everyday experiences, Winfried Stute focuses in particular on the role of point processes in market research, on modelling of purchase patterns and the influence of advertising and how statistics may help to deal with the a priori unknown model parameters.

For about 100 years general relativity has been a strong inspiration both for mathematicians and mathematics. Lorentzian geometry has been established as an active and fast developing field of mathematics which interacts not only with physics but also with other fields of mathematics like e.g. Riemannian geometry. Olaf Müller and Miguel Sánchez give a comprehensible introduction to the key features and an accessible survey on some of the most important and recent developments in Lorentzian geometry. Although there are some common features of Riemannian and Lorentzian geometry, for example the existence and uniqueness of a torsion free covariant derivative, there are however fundamental differences already at a basic level, for example

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when thinking of manifolds as metric spaces, and considering notions and properties of geodesics and completeness. The authors consider, among other topics, causality, global hyperbolicity, the constraint equations for initial values of the Einstein field equations, constant mean curvature space-like hypersurfaces, singularities, definitions of mass, spinors and holonomy. Their article ends with explaining a number of conjectures and open problems. The authors see a large potential for applying Lorentzian techniques in Riemannian geometry. They mention the solution of the Yamabe problem as a prominent example for the fruitful interaction between general relativity and Riemannian geometry and advertise that still much more could be achieved in this direction.

Ulrich Felgner's historical-philosophical article reflects Hilbert's "Grundlagen der Geometrie" and its role in the long discussion, which already started in ancient Greece, on how to formulate a safe foundation of geometry.

Four extensive book reviews can be found in this double issue. Two of them are concerned with completely different aspects of Fourier Analysis. The third of the books under review addresses the interplay of symplectic and complex geometry while the fourth one deals with some recent developments in algebraic topology.

Readers and subscribers of the Jahresbericht may have noticed that this year the first two issues appeared with some delay. The last two issues have to be combined into the present single one. I apologise for all these inconveniences. However, I hope that every reader will be satisfied with the contents of the articles and reviews and will enjoy this issue.