

Preface

In this volume many of the plenary lecturers of the *33rd Conference on Stochastic Processes and Their Applications* present their personal snapshots of recent important developments that they have been involved in within the area of stochastic processes and their applications. This reflects the idea leading us to compose this congress report: to present a collection of survey type articles that offer a glimpse of the state-of-the-art in many of the promising and thriving fields of the area of stochastic processes and their applications at the moment this SPA conference was held.

One of our hopes is that this collection may help young scientists in setting up research goals in the wide scope of fields represented in this volume.

To our knowledge, this is the first time that proceedings of an SPA conference has been published. The idea for this volume grew among the organizers in Spring 2009, and after a meeting with Professor Marta Sanz-Solé from the Bernoulli Society in Berlin and upon approval by both the CCSP¹ and the publishing committee of the Bernoulli Society we decided to go ahead with it. As a particularly welcome effect of this volume we could imagine starting a tradition for forthcoming SPA events.

We wish to thank all contributing plenary speakers, anonymous referees and the EMS publishing house for making this volume possible.

On behalf of the 33rd SPA organizing committee: Enjoy reading!

Berlin and Potsdam, June 2011

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¹'Committee for conferences on stochastic processes' of the Bernoulli Society.

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The 33rd SPA Conference 2009

The 33rd Conference on Stochastic Processes and Their Applications (SPA) was held in Berlin from July 27 through July 31, 2009, with more than 600 participants from 49 countries¹.

The conference continued a successful series of SPA conferences in this prospering field of mathematics, which is both reflected in the growing number and internationality of participants, as well as in the size of the program and the recognition for the field within mathematics.

One indication of this might be seen in the felicitous fact that one of the plenary speakers, Professor Stanislav Smirnov from Geneva, was awarded with a *Fields Medal* in 2010.

The main aim behind the selection of the 20 plenary lectures at this conference was to give an overview of recent developments in the rich current active research fields in Stochastic Processes and Their Applications, in particular aimed at younger participants. They were also chosen to reflect the variety of the current probability community with respect to research topics, scientific age and diversity with respect to geography and gender. We think that this has worked very well, and hence our thanks go to the members of the scientific committee (see below).

We particularly encouraged young researchers and researchers from developing countries to participate. More than 300 talks and 40 poster presentations, many of them by young participants, reflected the vibrancy of the field and provided an international forum for scientific and cultural exchange.

One further major aim of this conference was to *make the stochastic processes community feel at home*. Hence, we put particular emphasis on the social and public program of the conference, a few highlights of which we would like to report about briefly here.

During a reception in the ‘Lichthof’ of TU Berlin on the first evening of the conference, following a welcome address by Staatssekretär Dr. Hans-Gerhard Husung on behalf of the Senate of the State of Berlin, Professor Alice Guionnet from Lyon was announced as winner of the 2009 Loève prize. The elegant musical background throughout the reception was provided by a classical trio with direct links to the probability community, namely Alice Adenot-Meyer² (Mezzo-Soprano), Thérèse Dourdent (Piano) and Professor Sylvie Rœlly (Cello). Professor Ruth Williams from San Diego provided a personal obituary, remembering the recently deceased Professor Kai Lai Chung (1917–2009).

On the second evening, Professor Marc Wouts from Paris was awarded with the Itô-Prize. The sad occasion of the recent passing away of one of the most influential probabilists, Professor Kiyoshi Itô (1915–2008), was remembered by a touching and

¹Detailed conference information can be found at www.math.tu-berlin.de/SPA2009

² Alice Adenot-Meyer is a daughter of Paul-André Meyer

charming presentation of his life and work by Professor Masatoshi Fukushima from Osaka.

A large part of the evening was devoted to the work and tragic life of the Berlin-born mathematician Wolfgang Döblin. Wolfgang Döblin (1915 – 1940) was the second son of the famous Jewish-German novelist Alfred Döblin (‘Berlin Alexanderplatz’), an eminent figure in German intellectual life during the Weimarer Republik. In 1933, his family escaped the Nazis to Paris, where Wolfgang became a French citizen and studied probability at the Institut Henri Poincaré. He wrote a brilliant dissertation under the supervision of Maurice Fréchet in 1938. One year later, Wolfgang Döblin was drafted for French military service. In May 1940, facing imminent capture by the Wehrmacht, he took his own life in Housseras (Vosges, France). Before, however, he was able to mail his last mathematical manuscript “*Sur l’équation de Kolmogoroff*” in a sealed envelope to the Académie des Sciences, which remained unopened for 60 years. It has only recently been discovered and investigated by Bernard Bru and Marc Yor, and it turned out that it contains spectacular results, in particular related to the work of Itô.

The screening of a recent documentary on Wolfgang Döblin’s life and mathematical legacy in the presence of the filmmakers Agnes Handwerk and Harry Willems followed an introduction to his mathematical work and life by Professor Hans Föllmer.



Figure 1. During the Monday reception at TU Lichthof.

The success of this conference would not have been possible without the tireless commitment of many people. First, we wish to thank all plenary, invited session and contributed session speakers and the poster presenters for their scientific contributions. We further wish to thank the scientific committee and the representatives of the Bernoulli

Society, in particular Professors Ruth Williams and Marta Sanz-Solé, for all their effort, dedication and advice. Many students, staff and faculty at TU Berlin, HU Berlin and U Potsdam contributed greatly to the smooth running of this conference. A special heartfelt ‘thank you’ goes to Ms Jean Downes, running the conference secretariat. The TU Berlin and its Mathematical Institute provided support in many ways – we particularly thank the TU President Professor Kurt Kutzler. Finally, thanks go to the ‘TU Servicegesellschaft’ and in particular to Ms Lisa Hertel.

Plenary Lectures

Jinho Baik (Ann Arbor, MI)

“Limit laws of directed last passage site percolation”

Sourav Chatterjee (Berkeley)

“Superconcentration”

Freddy Delbaen (Zürich)

“Monetary utility functions, BSDE and (non-) linear PDE”

Amir Dembo (Stanford) Lévy Lecture

“Statistical mechanics on sparse random graphs”

Saïd Hamadène (Le Mans)

“Switching problems and systems of reflected BSDEs”

Claudia Klüppelberg (Munich) IMS Medallion Lecture

“Lévy driven stochastic volatility models”

James Martin (Oxford)

“Multi-class particle systems, growth models, and queues”

Servet Martinez (Santiago)

“Quasi-stationary distributions in Markov chains and population models”

Pierre Mathieu (Marseille)

“Symmetric diffusions in a random environment: the Einstein relation”

Jonathan Mattingly (Durham, NC)

“What makes infinite dimensional Markov processes different?”

Peter Mörters (Bath)

“The parabolic Anderson model with heavy-tailed potential”

Ed Perkins (Vancouver) Doob Lecture

“Uniqueness and non-uniqueness in parabolic stochastic partial differential equations”

Gesine Reinert (Oxford)

“Gaussian approximation of functionals: Malliavin calculus and Stein’s method”

Laurent Saloff-Coste (Ithaca, NY)

“Merging properties of time inhomogeneous Markov chains”

Alexander Schied (München)

“On the mathematics of illiquid markets”

Gordon Slade (Vancouver) IMS Medallion Lecture

“The self-avoiding walk”

Stanislav Smirnov (Genève)

“Conformal invariance and universality in the 2D Ising model”

Masayoshi Takeda (Tohoku)

“ L^p -independence of growth bounds of Feynman–Kac semigroups”

Anton Wakolbinger (Frankfurt am Main)

“Random genealogies in diffusion processes”

Feng-Yu Wang (Beijing)

“Functional inequalities and applications”

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List of Donors

The Organizing Committee expresses its gratitude to all those who have supported the conference either financially or by providing services and goods. Without this support, the conference would not have been possible.

Public and Academic Bodies

Bernoulli Society
IMS - Institute of Mathematical Statistics
DFG - Deutsche Forschungsgemeinschaft
BMS - Berlin Mathematical School
DMV Fachgruppe Stochastik
Französische Botschaft in Deutschland
Institut für Mathematik, Technische Universität Berlin

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