ESF Exploratory Workshop on
Dissipative Systems: Entropy Methods, Classical and Quantum Probability

Vienna (Austria), November 1-3, 2010

Convened by:
Ansgar Jüngel®, Anton Arnold®, Dominique Bakry®,
and Franco Fagnola®

® Institute for Analysis and Scientific Computing, Vienna University of Technology (AT)
® Laboratoire de Statistique et Probabilité, Université Paul Sabatier, Toulouse (FR)
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**ESF Exploratory Workshops:**

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Main Objectives of the Workshop:

This workshop will bring together people working in research fields related to classical and quantum evolution problems. The meeting aims at identifying mathematical contact points and stimulating joint research between three different communities: classical probability theory, quantum probability theory, and partial differential equations. Novel ideas and techniques for the mathematical description of the large-time behavior of many-particle systems are expected to emerge from combining the tools established in the different fields. Hypercontractivity and entropy methods play a pivotal role in all three disciplines, and they will serve as a focal point for the presented talks and discussions.
Programme

Sunday, October 30, 2010
Afternoon
Arrival

Monday, November 1st, 2010

08.30-09.00
Registration

09.00-09.10
Welcome by Convenor
Ansgar Jüngel (Vienna University of Technology, Vienna, Austria)

09.10-09.30
Presentation of the European Science Foundation (ESF)
Mats Gyllenberg (ESF Standing Committee for Physical and Engineering Sciences (PESC))

09.30-12.30
Morning Session: Classical Probability
09.30-10.15
Keynote Lecture “Quasi-invariance and mixing of Poisson point measures under interacting transformations”
Nicolas Privault (City University of Hong Kong, Hong Kong)

10.20-10.50
“Asymptotic approximations in free probability”
Friedrich Götze (Universität Bielefeld, Germany)

10.55-11.25
Coffee Break

11.25-11.55
“Optimal transportation, gradient flows and geometry”
Karl-Theodor Sturm (Universität Bonn, Germany)

12.00-12.30
“On stochastic completeness of jump processes”
Alexander Grigoryan (Universität Bielefeld, Germany)

12.30-14.30
Lunch Break and Discussions

14.30-18:10
Afternoon Session: Quantum Probability
14.30-15.15
Keynote Lecture “The equilibrium of open system dynamics: an analysis of the Markov chain”
Rolando Rebolledo (Pontificia Universidad de Chile, Chile)

15.20-15.50
“From classical to quantum hypercontractivity for Ornstein-Uhlenbeck semigroups”
Raffaella Carbone (Università di Pavia, Italy)

15.55-16.25
Coffee Break

16.25-16.55
“Non-Markovian quantum dissipation”
Bassano Vacchini (Università di Milano, Italy)

17.00-17.30
“Quasi-invariance and mixing of Poisson point measures under interacting transformations”
Max von Renesse (Technische Universität Berlin, Germany)

17.35-18.05
“Stochastic Schrödinger equations”
Carlos Mora (Universidad de Concepción, Chile)
Tuesday, November 2\textsuperscript{nd}, 2010

**Morning Session: PDE Theory**

09.00-09.45  
Keynote Lecture “Functional inequalities, thick tails and asymptotics for the critical mass Patlak-Keller-Segel model”  
\textbf{Eric Carlen} (Rutgers University, USA)

09.50-10.20  
“Entropy methods for fragmentation-drift equations”  
\textbf{José Alfredo Canizo} (Universitat Autonoma di Barcelona, Spain)

10.25-10.55  
Coffee Break

10.55-11.25  
“Fast diffusion equations: matching large time asymptotics by relative entropy methods”  
\textbf{Jean Dolbeault} (Université Paris Dauphine, France)

11.30-12.00  
“Proving convex Sobolev inequalities by an algebraic entropy method”  
\textbf{Daniel Matthes} (Technische Universität Wien, Austria)

12.05-12.50  
Keynote Lecture “On Wigner and Bohmian measures”  
\textbf{Peter Markowich} (Cambridge University, United Kingdom)

12.55-14.30  
Lunch Break and Discussions

**Afternoon Session: Classical Probability**

14.30-15.15  
Keynote Lecture “Efficient quantum tomography and complementarity”  
\textbf{Denes Petz} (Budapest University of Technology, Hungary)

15.20-15.50  
“How hot can a heat bath get?”  
\textbf{Martin Hairer} (University of Warwick, United Kingdom)

15.55-16.25  
Coffee Break

16.25-16.55  
“On long-time behaviour of some kinetic Vlasov-Fokker-Planck type equation”  
\textbf{Arnaud Guillin} (Université de Provence, France)

17.00-17.30  
“Ergodicity of dissipative dynamics in large interacting systems”  
\textbf{Boguslaw Zegarlinski} (Imperial College, United Kingdom)

17.35-18.05  
“Around Nash inequalities”  
\textbf{Dominique Bakry} (Université Paul Sabatier, France)

19.30-22.00  
Conference Dinner
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<th>Time</th>
<th>Session</th>
<th>Topic</th>
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<tr>
<td>09.00</td>
<td>Morning Session: Quantum Probability</td>
<td>&quot;Equivalence of dynamical detailed balance and local KMS condition for non equililibrium states&quot;</td>
<td>Luigi Accardi</td>
<td>Università di Roma, Italy</td>
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<td>09.05</td>
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<td>&quot;Dilatation of minimal quantum dynamical semigroups&quot;</td>
<td>Martin Lindsay</td>
<td>Lancaster University, United Kingdom</td>
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<td>Coffee Break</td>
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<td>10.55</td>
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<td>&quot;Quantum dissipative dynamics and generalized master equations&quot;</td>
<td>Viacheslav Belavkin</td>
<td>University of Nottingham, United Kingdom</td>
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<td>11.45</td>
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<td>&quot;On the new approach of quantum probability&quot;</td>
<td>Władysław Majewski</td>
<td>Gdansk University, Poland</td>
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<td>12.20</td>
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<td>Lunch Break and Discussions</td>
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<td>14.10</td>
<td>Afternoon Session: PDE Theory</td>
<td>&quot;Measure solutions of sub-linear diffusion equations with drift&quot;</td>
<td>Giuseppe Toscani</td>
<td>Università di Pabia, Italy</td>
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<td>15.00</td>
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<td>&quot;Semiconductor modeling and nonlinear higher-order PDEs&quot;</td>
<td>Josipa-Pina Milisic</td>
<td>University of Zagreb, Croatia</td>
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<td>15.35</td>
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<td>&quot;Quantum Fokker-Planck models: long time properties of solutions&quot;</td>
<td>Lukas Neumann</td>
<td>Universität Innsbruck, Austria</td>
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<td>16.05</td>
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<td>Discussion of follow-up activities</td>
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<td>17.35</td>
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<td>End of Workshop and Departure</td>
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