Bad Honnef Physics School
Supported by the Wilhelm and Else Heraeus-Foundation

Methods of Path Integration in Modern Physics

August 25 - 31, 2019, Physikzentrum Bad Honnef, Germany

Organised by

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Functional integral methods have been playing an increasing role in theoretical physics ever since Richard Feynman recognized that quantum mechanics can be formulated in terms of path integrals. The path integral is not only more intuitive than other approaches, it also gives rise to insights, approximations, and applications that are difficult to obtain by alternative methods. Therefore, it has been successfully employed in such diverse areas as quantum field theory, astrophysics, elementary particle physics, nuclear physics, atomic and molecular physics, quantum chemistry, condensed-matter physics, ultracold quantum gases, complex systems, and econophysics. Despite its importance, neither the unifying approach to quantum and statistical field theory in terms of the Feynman path integral, nor the resulting advanced methods for interacting quantum and statistical field theories are much covered in standard curricula. This advanced summer school on path integration techniques aims at providing students and young independent researchers with a hands-on introduction to the use of path integration techniques in modern physics and at exposing the participants of the school to methods that go beyond the standard tool box of field theory. The school will start with a basic introduction to the Feynman path integral in quantum mechanics which will serve as a basis for the subsequent lectures on more advanced methods of quantum and statistical field theory.

Speakers and Topics

Lawrence Schulman (Potsdam, USA):
Quantum mechanics

Andreas Wipf (Jena, Germany):
Statistical field theory

Carlos Sa de Melo (Atlanta, USA):
Many-body theory, BEC-BCS crossover

Jean Zinn-Justin (Paris, France):
Quantum field theory, large-N technique, instantons

Victor Dotsenko (Paris, France):
Random matrix theory, supersymmetry, replica trick

Steve Simon (Oxford, UK):
Wilson loops spin, topology, holonomy group

Wolfhard Janke (Leipzig, Germany):
Quantum Monte Carlo

Hagen Kleinert (Berlin, Germany):
Vortices and Gravitationally Interacting Massive Particles

Fees:
Covering full board and lodging at the Physikzentrum Bad Honnef
200 € (for DPG members 100 €).

Application & more information: **www.pbh.de**

Deutsche Physikalische Gesellschaft Φ **DPG**

Physikzentrum Bad Honnef

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