Report on the Workshop/Seminar

"Quantum dynamical concepts: From path integrals to semiclassics"

From the 11th of August until the 22nd of August 2008 an introductory seminar followed by an interdisciplinary workshop took place at the Max-Planck-Institut für Physik Komplexer Systeme in Dresden. The seminar week was attended by approximately 30 and the workshop by around 70 scientists from all over the world. Theoretical approaches to solve the time-dependent Schrödinger equation by using Feynman path integral techniques and semiclassical approximations were in the topical focus of the whole event. Applications ranged from quantum chaology to chemical dynamics in condensed phases. A total of 41 theoretical talks, 6 of which were contributed talks by younger scientists, were held during the central workshop. The interdisciplinary nature of the event manifested itself in the presence of physicists, chemists and mathematicians. Lively discussions after the talks and cross references between different talks made the event a very fruitful one. The MPIPKS colloquium by Ulrich Weiss from the University of Stuttgart demonstrated the feasibility of path integral calculations for qubits in a dissipative environment and the final workshop talk by William H. Miller from UC Berkeley was an impressive proof of what so-called semiclassical initial value methods can do in order to improve the quality of molecular dynamics simulations.

Younger participants have used the two poster sessions and especially the preceding seminar week (which was held on a tutorial level) for intense discussions and contacts to the senior participants. Foundations of the theory underlying most of the workshop talks were laid out in great detail e. g. in the presentation by Uzy Smilansky from the Weizmann Institute of Science, who gave four 90 minute lectures on semiclassical theory.