Physik-Kolloquium

Dienstag, den 12.07.2011, 17:00 Uhr

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30 years quantum Hall effects—history, applications, and new developments

Basic research on the most important device in microelectronics, a silicon field effect transistor, led in 1980 to the discovery of the Quantum Hall Effect (QHE). Electrical measurements on such a device demonstrated, that a new type of electrical resistor can be realized, a resistor with a well defined value which depends exclusively on fundamental constants. In 1981, similar measurements by Stormer and Tsui on devices with higher quality showed a new phenomenon called fractional QHE. Today, the word QHE is a synonym for the more general topic of electrons in strong magnetic fields or topological phenomena with connections not only to semiconductor physics but also to other research areas like astrophysics (edge states in gravity and black hole physics), high energy physics (quantum Hall quarks), new fields of solid state physics (topological quantum computation and topological insulator) and metrology (fundamental constants). This broad interest in QHE physics explains the high publication rate in this field of about one publication per day. The talk starts with a historical review and will focus on two topics, the application of the QHE in connection with our international system of units (SI units) and some new developments in quantum Hall physics.

Ort: Hörsaal für Theoretische Physik, Linnéstraße 5
Alle Teilnehmer sind ab 16:30 Uhr zu Kaffee vor dem Hörsaal eingeladen.