

Venue:

Deutsches Museum | Ehrensaal Museumsinsel 1 | 80538 München

How to get to the venue from the central station:

- · Several S-Bahn train lines to "Isartor" station (S1, S2, S3, S4, S6, S7 & S8)
- · Underground lines U1 and U2 to "Fraunhofer Straße"
- · Bus no. 132 to "Boschbrücke"
- · Tram no. 18 to the Deutsches Museum, tram no. 17 to Isartor.

For further information on the venue please visit www.deutsches-museum.de

The German Academy of Sciences Leopoldina is the world's oldest academy involved in natural sciences. It was founded in 1652 in the City of Schweinfurt. The Leopoldina was appointed Germany's National Academy of Sciences in July 2008.

The National Academy of Sciences Leopoldina and its partner academies Deutsche Akademie der Technikwissenschaften – acatech and Berlin-Brandenburgische Akademie der Wissenschaften (representing the Union der deutschen Akademien der Wissenschaften) collaborate together in the Standing Committee to give advice to policy makers and the public.







Registration:

Please register by 5 May 2011: http://interplan.de/reg/2011/Leopoldina11/index.htm There is no registration fee.

Contact and organisation:

www.leopoldina.org

Dr. Christian Anton Leopoldina – Nationale Akademie der Wissenschaften Emil-Abderhalden-Straße 37 · 06108 Halle (Saale) Tel. 0049 345 - 472 39 861 E-Mail: christian.anton@leopoldina.org

Quantum Technologies



Deutsche Akademie der Naturforscher Leopoldina
– Nationale Akademie der Wissenschaften –

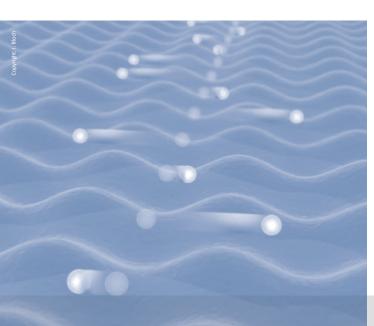
acatech - Deutsche Akademie der Technikwissenschaften

Berlin-Brandenburgische Akademie der Wissenschaften (für die Union der deutschen Akademien der Wissenschaften)

Quantum technologies in the 21st century

The technological progress of the 20th century was driven by electronics and photonics. At the beginning of the 21st century there is already substantial evidence that the use of coherence and entanglement of composite quantum mechanical systems will propel technological applications. Indeed, today quantum mechanics is no longer restricted to physics but plays an important role in many other disciplines such as chemistry, electrical engineering, and mathematics. Quantum Science has emerged as a common denominator that encompasses all key elements of these previously separate disciplines.

The purpose of this conference is to assemble a number of leading scientists from various fields to present a wide range of quantum physics and technological fields which are affected by quantum technology, from fundamental research (e.g. superconducting devices and biology) to real-world applications (e.g. communications, metrology and semiconductor technology). Additionally, there will be a panel discussion on the economic perspectives of quantum technologies.



Programme

Monday 9 May 2011

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9:15 a.m.	I	Opening Wolfgang Heckl (Munich)
		Welcome Gunner Berg (Halle)
9:30 a.m.	I	Emergent Quantum Technologies: the Exploitation of Quantum Coherence Peter Knight (London)
10:00 a.m.	I	Quantum metrology with cold atoms Mark Kasevich (Stanford)
10:30 a.m.	I	Probing Strongly Interacting Quantum Matter using Ultracold Quantum Gases Immanuel Bloch (Munich)
11:00 a.m.		Coffee break
11:30 a.m.	I	Futures of Quantum Communication: Quantum Memories for Quantum Networks and Device-Independent QKD Nicolas Gisin (Geneva)
12:00 noon	I	Nonlinear quantum optics in superconducting circuit quantum electrodynamic systems Barry Sanders (Calgary)
12:30 p.m.	I	Quantum Science and Technology with Superconducting Electronic Circuits Andreas Wallraff (Zurich)
1:00 p.m.	1	Lunch at Deutsches Museum
2:00 p.m.	I	Exploring quantum magnetism with ultracold atoms Markus Greiner (Harvard)
2:30 p.m.	I	Semiconductors – a potential platform for quantum technologies? Manfred Bayer (Dortmund)
3:00 p.m.	I	Coherent control of dense Rydberg gases Tilmann Pfau (Stuttgart)
3:30 p.m.	1	Coffee break
4:00 p.m.	T	Quantum Coherence, Decoherence, and Phase Transition Dynamics Wojciech Zurek (Los Alamos, Ulm)
4:30 p.m.	I	Beyond Stokes, a Tale of Two Vector Spaces Joseph Eberly (Rochester)

5:00 p.m.		Quantum Networks with Atoms and Photons Christopher Monroe (Maryland)
5:30 p.m.	1	Integrated quantum photonics Jeremy O'Brien (Bristol)
Tuesday	10	May 2011
9:15 a.m.		Quantum cryptography, twenty year later Artur Ekert (Oxford, Singapore)
9:45 a.m.	1	Optical Quantum Technology for Communication and Sensing Gerd Leuchs (Erlangen)
10:15 a.m.	I	Coherent Atomtronic Devices Nicholas Bigelow (Rochester)
10:45 a.m.		Coffee break
11:15 a.m.	1	Quantum Technology taken to its (speed) limit Tommaso Calarco (Ulm)
11:45 a.m.	1	What Quantum technology can learn from quantum biology of light harvesting, light reception, and magnetifield reception Klaus Schulten (Urbana)
12:15 p.m.	1	Quantum effects in biology: A new playground for Quantum Information Scientists Martin Plenio (Ulm)
12:45 p.m.		Lunch
2:00 p.m.	1	Panel discussion: Economic potential of quantum technologies Doris Schmitt-Landsiedel (Munich) Peter Russer (Munich) Nicolas Gisin (Geneva) Moderator: Patrick Regan (Munich)
3:30 p.m.	1	Coffee break
4:00 p.m.		Interference - the mother lode of quantum technology Gunnar Bjoerk (Stockholm)
4:30 p.m.	1	Optical multimode entanglement – from ideas to practical devices Hans Bachor (Canberra)
5:00 p.m.	1	Engineering in the noise: when technology meets the quantum of light Howard Carmichael (Auckland)
5:30 p.m.		Quantum control on a nanoscale Myungshik Kim (London)
		Scientific coordination: Wolfgang Schleich (Ulm)