

ASC Sonderkolloquium

*(besonders empfohlen für Studierende mit Interesse an Quanten-
Computing und die Rolle des Quanten-Messprozess)*

Dienstag, den 17. Mai 2005

17:15 Uhr

Hörsaal E52, Theresienstr. 37

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In Praise of Measurement

A quantum computer provides a toy universe in which to re-examine many aspects of quantum mechanics and quantum metaphysics. In particular measurement, against which John Bell unleashed one of his most eloquent polemics, plays a transparent role. Since all measurements can be constructed out of identical 1-Qbit measurement gates, such obscurity as there is in the notion of measurement reduces to the obscurity of the elementary 1-Qbit gate. The 1-Qbit measurement gate is insufficiently celebrated in the quantum-computational literature. Without it the quantum computer has, in Abner Shimony's admirable words, "no foreign policy." Without it no computation has been done. Without it there can be no error correction. Without it no computation can begin. Measurement takes coherence away but measurement, somewhat unexpectedly, also gives coherence.

The talk reflects the speaker's efforts over the past five years to teach computationally relevant quantum mechanics to computer scientists. It will include an opening tutorial for physicists on the relevant nomenclature and terminology of quantum computation.