

## EINLADUNG

zum Vortrag von

**Ao.Univ.Prof. Dr. Caslav Brukner**

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### **Correlations: classical, quantum and beyond quantum?**

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**Dienstag, 9. März 2010, um 17.00 Uhr**

Ort: Lise-Meitner-Hörsaal, Fakultät für Physik, Universität Wien,  
1090 Wien, Strudlhofgasse 4 / Boltzmannngasse 5, 1. Stock

*Barrierefreier Zugang: Boltzmannngasse 5, Lift, 1. Stock rechts über den Gang zum Hintereingang des Hörsaals*

#### **Abstract:**

Classical correlations could arise from a situation in which someone writes the same number on two pieces of paper and sends them kilometres apart. When received, both papers have the same number, but this correlation is due to pre-existing properties of the pieces of paper. Quantum correlations are strikingly different; they cannot be explained on the basis of local systems possessing pre-existing properties - a feature referred to as "quantum non-locality" and characterized by violation of the celebrated Bell inequalities. Even though quantum non-locality does not allow us to send information faster than the speed of light (i.e. it is non-signalling), it surprisingly can produce effects as if information had been transferred leading to powerful techniques in computing and cryptography. Despite the advances in quantum research, physicists still do not fully understand the fundamental nature of non-locality. Recently it was realized that correlations can be "more non-local" than quantum correlations, in the sense of violating Bell's inequalities even stronger than quantum mechanically, without contradicting the requirement of non-signalling. Is there a good physical reason why such correlations do not seem to exist, or do we simply not know where to look for them?

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#### **CHEMISCH-PHYSIKALISCHE GESELLSCHAFT**

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