



**Sonderforschungsbereich 631**  
Festkörperbasierte Quanteninformationsverarbeitung



## Seminar Announcement

---

Fakultät für Physik der Universität Regensburg  
Universitätsstr. 31, 93040 Regensburg

**Sprecher:** Prof. Dr. Markus Büttiker  
Universität Genf

**Ort:** Hörsaal, H 34

**Zeit:** Montag, 16. April 2007, 16.15 Uhr

**Thema:** Shot noise: From Schottky to Bell

**Abstract:**

The theoretical and experimental investigation of current fluctuations is one of the most active fields of mesoscopic physics. We present a discussion of current cross correlators in mesoscopic conductors. Making an analogy to the optical Hanbury Brown Twiss experiment we discuss how quantum statistical effects and two-particle interference effects can be investigated with current cross correlations. In particular we propose a geometry where first order interference effects (in conductance) are absent but shot noise correlations due to two particle physics exhibits an Aharonov-Bohm effect. In this geometry the two particle Aharonov-Bohm effect is a direct indicator of orbital electron-electron entanglement. The visibility of the two particle Aharonov-Bohm effect determines the degree to which a Bell inequality can be violated. We discuss quantum state tomography as means to evaluate arbitrary entanglement measures. We illustrate the theory with related experimental work.

---

**Hausadresse:**  
Universitätsstraße 31  
93053 Regensburg

**Postadresse:**  
Universität  
93040 Regensburg

**Telefon:** (0941) 943-3199  
**Telefax:** (0941) 943-3196

**e-mail:**  
Christoph.Strunk@  
physik.uni-regensburg.de