

## WEEKLY CALENDAR

March 21, 2011

### Departmental Colloquium

Thursday, 3:40 PM, March 24, 2011  
109 Nicholson Hall

#### **"Spin-foams: Path integral and canonical quantum gravity in one"**

**Jonathan Engle**  
Florida Atlantic University

*Host: Kristina Giesel, Jorge Pullin and Parampreet Singh*

*• Refreshments served at 3:15 PM in 232 (Library) Nicholson Hall •*

Path integral and canonical quantizations are sometimes presented as different equivalent formulations of quantum mechanics. But, though Path integrals have the strength of allowing space-time covariant expressions for quantum dynamics, if one is careful, one sees that they implicitly use information from the canonical theory. Loop quantum gravity is in many ways a highly successful canonical quantization of general relativity, but there is no broad consensus regarding the definition of its dynamics. Spin-foams offer a definition of the dynamics of LQG via path integral. In this approach, the successes of LQG are retained -- predictions of discrete geometric spectra and black hole entropy calculations, for example -- while allowing dynamics to be defined in a space-time covariant way. In this talk, I will present the general arguments motivating the spin-foam approach, the conceptual non-trivialities involved, and give a summary of progress that has been and is being made.

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#### **Publications:**

1. "Photon counting spectral CT versus conventional CT: comparative evaluation for breast imaging application", **Shikhaliev P. M.** and Fritz S. G., *Physics in Medicine and Biology* **56**, pp.1905-1930 (2011).
2. "ZITTERBEWEGUNG IS NOT AN OBSERVABLE", **R. F. O'Connell**, *Modern Physics Letters A*, Vol. 26, No. 7 (2011) 469-471.
3. "Spin-selective scatterers as a probe of pairing in a one-dimensional interacting fermion gas," **Daniel E. Sheehy**, *New Journal of Physics* **13** (2011) 035015 (9pp).