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## WEEKLY CALENDAR

March 19-23, 2012

### DEPARTMENTAL COLLOQUIUM

#### "Loop Quantum Gravity, Spin Foams, and Gravitons"

3:40 PM, March 22, 2012  
109 Nicholson Hall

**Eugenio Bianchi**  
Perimeter Institute

Host: Jorge Pullin

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

Loop Quantum Gravity provides a candidate description for the quantum degrees of freedom of gravity at the Planck scale. In this talk, I review recent progress in formulating its covariant dynamics in terms of Spin Foams. In particular, I discuss the main assumptions behind this approach, its relation with classical General Relativity, and its low-energy description in terms of an effective quantum field theory of gravitons.

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### SPECIAL SEMINAR

#### "Bone Removal from X-ray CT Angiography Data for 3D Diagnosis"

3:30 – 4:30 PM, Monday, MARCH 26, 2012  
109 Nicholson Hall

**Abdalmajeid Alyassin**  
University Texas Health Science Center

Host: Wayne Newhauser

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

A fast and novel technique was developed to exclude obstacle data from a single Computed Tomography Angiography (CTA) data set. The data was minimally processed to preserve the majority of the CTA data in its original form, especially the vascular information. The technique was based on a newly developed adaptive composite mask which used multi-step image processing techniques. Excluding a structure like-bone from CTA data can improve several three dimensional (3-D) visualization techniques such as volume rendering, shaded surface display, or maximum intensity projection to better render the vascular data unveiling any aneurysms or calcifications in a clear manner. This enhancement in angiogram visualization is expected to increase the sensitivity of clinical diagnoses. The proposed technique demonstrated obstacle free 3-D vessel visualization in ten different CTA data sets.

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### PUBLICATIONS:

1. "A gravitational wave observatory operating beyond the quantum shot-noise limit," R.S. Amin, **S. Caudill**, C.A. Costa, **R. DeRosa**, **A. Effler**, T.T. Fricke, **J.A. Giaime**, **G. Gonzalez**, **W.W. Johnson**, J. Slutsky and **M. Sunu** *Nature Physics* 7: 962-965 (2011)