



College of
Science
Department of Physics
& Astronomy

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Weekly Calendar

April 13, 2015

Departmental Colloquium

"Quantum Gravity Comes of Age"

3:30 PM Thursday, April 16, 2015

119 Nicholson Hall

Richard Woodard

University of Florida

HOST: Ivan Agullo

• Refreshments served at 3:10 PM in 232 (Library) Nicholson Hall •

"I argue that cosmological data from the epoch of primordial inflation is catalysing the maturation of quantum gravity from speculation into a hard science. I explain why quantum gravitational effects from primordial inflation are observable. I then review what has been done, both theoretically and observationally, and what the future holds. I also discuss what this tells us about quantum gravity. This talk is based on arXiv:1407.4748.

Special Seminar:

Louisiana Consortium for Neutron Scattering "Self-assembly in complex fluids"

Monday, April 13, 2015, 3:00 pm

1008B Digital Media Center, LSU

Arun Yethiraj

University of Wisconsin-Madison



Spring Seminar

Adrian Roitberg

University of Florida, Gainesville

"Computational studies of energy transfer in dendrimers"

3:30pm, Wednesday, April 15, 2015

1008B Digital Media Center, Louisiana State University

Saturday Science:

Saturday, April 18, 2015

Saturday Science at LSU

Nicholson Hall Room 130
10:00 AM

Dr. Karen Maruska, Department of Biological Sciences, LSU

"The nervous system"

Special Announcement:

"What I did with my Physics Degree"

Thursday, April 16, 2015 – 5:30 p.m.

Nicholson Hall – Room 119

Publications:

1. "Quantum spacetime of a charged black hole", Rodolfo Gambini, Esteban Mato Capurro and **Jorge Pullin**, Physical Review D 91, 084006 (2015).



**SEMINAR
SERIES
2015**

NEW DATE!

Rescheduled from Feb 23

Monday, April 13 - 3:00pm
1008B Digital Media Center
Louisiana State University

Self-assembly in complex fluids

The self-assembly of molecules into nano-structured materials is a fascinating process because small changes in intermolecular interactions can have a large impact on the final mesoscopic structures. An interesting goal is the directed self-assembly of molecules where the chemical nature of the molecules drives the assembly into specific nanostructures. In this talk I will discuss two classes of molecules: lipid/peptide mixtures and Gemini surfactants. In the former specific interactions between the peptides and lipids causes lipid segregation and the formation of curved interfaces. Gemini surfactants form lyotropic liquid crystalline phases. Using computer simulation we show that both non-electrostatic and electrostatic interactions play an important role in the self-assembly of these systems, and both are promising candidates for chemistry directed self-assembly.



Guest Speaker

**ARUN
YETHIRAJ**

**Professor of Chemistry
University of
Wisconsin-Madison**

Dr. Yethiraj's research focuses on theoretical studies of soft condensed matter, particularly the development of methods and the application of these methods to understand the structure and dynamics of condensed phases.

Free and open to the public



www.physics.lsu.edu/lacns



Computational studies of energy transfer in dendrimers

– Adrian E. Roitberg, University of Florida, Gainesville



SEMINAR
WEDNESDAY
APRIL 15
1008B DMC
LSU
3:30 PM

Excited state non-adiabatic molecular dynamics simulations are used to study the nature of the energy transfer in different model dendritic molecules built from linear poly-phenylene ethynylene (PPE) in different architectures. Dendrimers built from these building blocks have been experimentally shown to undergo highly efficient and ultrafast unidirectional energy transfer. We have recently introduced a highly efficient method to compute non-adiabatic excited-state dynamics, including analytically computed gradients and non-adiabatic couplings. The simulations start by an initial vertical excitation selected according to the experimental conditions. By running many simulations, we observe ultrafast and mostly one-directional electronic energy transfer, concomitant with an also ultrafast vibrational energy transfer. The energy gaps and non-adiabatic couplings are strongly influenced by the different nuclear motions in the different potential energy surfaces. This behavior guarantees the successful unidirectional energy transfer associated to the efficient energy funneling in light-harvesting dendrimers.

Prof. Roitberg attended the University of Buenos Aires in Argentina, where he received his Bachelor degree. He attended the University of Illinois at Chicago from 1989 to 1992, where he received his PhD in computational physical chemistry under the direction of Prof. Ron Elber. He was a postdoctoral fellow at Northwestern University from 1992 to 1995, when he moved to the National Institute of Standards and Technology to serve as a staff member. In 2001 he joined the faculty at the university of Florida, in their chemistry and physics departments. He was promoted to Full professor in 2011. Dr. Roitberg is a Fellow of Both ACS and APS and serves now as Chair of the Computers in Chemistry division of ACS.
<http://users.clas.ufl.edu/roitberg/home.html>

All seminars are available via HD videoconferencing at the following venues:
LA Tech - 122 Nethken Hall, LSU - 1008B DMC, SUBR - 211 J.B. Moore Hall,
Tulane - 600 Lindy Boggs, UNO - 234 Liberal Arts Building, Xavier - 226 Qatar Pavilion.

<http://lasigma.loni.org>

2015

What I did with my Physics Degree

Thursday, April 16 - 5:30 p.m.

Nicholson Hall - Room 119

Physics Alumni share career experience

Q & A

Benjamin Anger, Senior Associate Researcher/ Innovation, Research & Dev.

"Basic & Applied Magnetic Resonance Research in a Research Lab"

Ben will discuss his experience working in Shell's NMR and MRI research labs, and how he uses magnetic resonance to understand both the fundamental physics of fluids and gases in porous rocks as well as the application of this knowledge to problems of commercial interest.

Madhu Kohli, Geophysics Discipline Lead/ Upstream Americas Deepwater

"Physics: Key to a 'Solid State' Career"

Madhu joined Shell in 1981 as a Geophysicist supporting lease sale assessments. In her journey at Shell, she has had several assignments in Exploration, Development and Technology teams addressing geophysical challenges that impact reservoirs for development. She will share how she has utilized her degree and journey in physics to have a sustaining career in the oil industry.

Elizabeth Tanis, Petrophysicist, Shell Deepwater Operations

Alec Yang, Petrophysicist, Shell Deepwater Operations

Alec and Liz joined Shell's Deepwater Operational Petrophysicist group within the last few years after completing their doctorates. Petrophysics is the study of the properties (physical, electrical and mechanical) and the rock/fluid interactions of petroleum systems. They will share how they progressed in the oil and gas industry and explain how their background in physics provided an easy transition into their new roles.

Pizza and refreshments will be served.

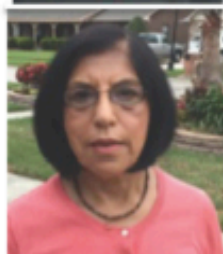
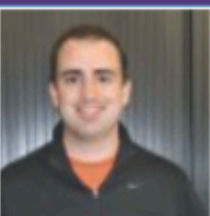
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LSU

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5:30 p.m.

Thursday, **April 16**

**Nicholson Hall
Room 119**