

Weekly Calendar & News

March 16-23, 2018

Special Colloquium

[Light for Quantum communication: Narrowband, entangled photon pairs](#)

[Gurpreet kaur Gulati](#)

NASA Jet Propulsion Laboratory

Host: Mark Wilde

- 3:30 PM **Tuesday, March 20**, in 119 Nicholson Hall
• Refreshments served at 3:10 PM in 232 (Library) Nicholson Hall •

Many proposed quantum-photon networks are based on single photons carrying information between atomic nodes. An efficient information transfer requires strong interaction between the atoms and the photons for which the photons should have an appropriate frequency bandwidth and a temporal shape. In this talk I will present a source of narrowband heralded single photons based on four wave mixing process in a cold atomic ensemble, and shaping them for interaction with a single atom.

I will also talk about a research proposal to build a miniaturized, portable, cost effective photon pair source which is prerequisite for quantum repeaters protocol and discuss ways to generate multipartite entangled states using atoms.

New Publications

- "On-orbit Operations and Offline Data Processing of CALET Onboard the ISS", Y. Asaoka, N. Cannady, M. Cherry, T.G. Guzik, J. Wefel et al., *Astroparticle Phys.* 100, 29 (2018); <https://www.sciencedirect.com/science/article/pii/S0927650517303213>.

Departmental Colloquium

[Helical molecules in flatland: chiral recognition, spin-filtering and molecular machines](#)

[Karl-Heinz Ernst](#)

Department of Chemistry University in Zürich, Switzerland

Host: Jiandi Zhang

3:30 PM **Thursday March 22**, in 119 Nicholson Hall

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

Molecular recognition among chiral molecules on surfaces is of paramount importance in biomineralization, enantioselective heterogeneous catalysis, and for the separation of chiral molecules into their two mirror-image isomers (enantiomers) via crystallization or chromatography. Understanding the principles of molecular recognition in general, however, is a difficult task and calls for investigation of appropriate model systems. We are currently studying intermolecular interactions on well-defined solid surfaces, which allows in particular the use of scanning tunneling microscopy (STM). Examples of chiral amplification via the so-called 'sergeant-and soldiers' effect as well as manipulation of chiral adsorbates via inelastic electron tunneling will be presented. In a Pasteur-type experiment at the nanoscale, molecules that constitute a dimer are spatially separated with a molecular STM tip and their absolute handedness is determined with submolecular resolution STM. Moreover, we report spin-dependent filtering of electrons by monolayers of these helical molecules. Finally the first successful electrical current-driven, unidirectional motion of a synthetic molecule will be presented.

LSU Physics & Astronomy in the News

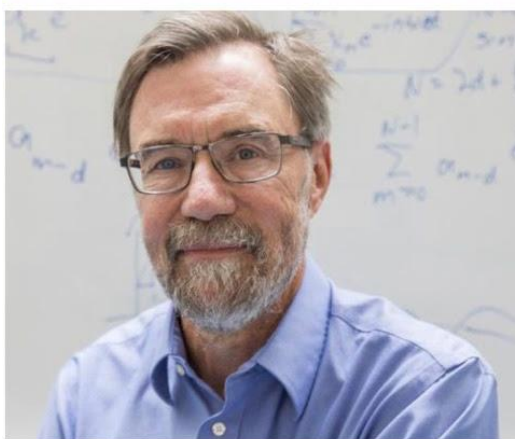
- [Khang Pham Awarded LSU Discover Scholar](#)
- [Científicos argentinos destacan la "voluntad de vida" de Hawking](#)
- [Argentine scientists highlight Hawking's "will to life"](#)
- [PhD Alumnus Chad Hanna Talks 'How Fast can Gravitational Wave Detection get?'](#)

Events

- **Hearne Eminent Lecture:** "What the #\$*! Do We (K)now!? about Quantum Mechanics" by Carlton Caves (Flyer is attached)
 - When: Friday, March 16, 2018 2:30 PM
 - Where: Student Union - Royal Cotillion Ballroom - Room 250
- **Saturday Science:** "Using technology to understand mental illness" by Alex Cohen from Psychology Department of LSU (Flyer is attached)
 - When: Saturday, March 17, 2018 10:00 AM - 11:15 AM
 - Where: Nicholson (James W.) Hall - Room 130
- **LaCNS Seminar:** "Understanding Disordered Materials via Unbiased Simulations" by Dr. Tom Berlijn from Oak Ridge National Laboratory (Flyer is attached)
 - When: Monday, March 19, 2018 3:00 PM
 - Where: 1008B Digital Media Center



HEARNE EMINENT LECTURE SERIES



WHAT THE #*\$! DO WE (K)NOW!? ABOUT QUANTUM MECHANICS

A PUBLIC LECTURE BY
DR. CARLTON M. CAVES,

CENTER FOR QUANTUM INFORMATION
AND CONTROL

Dr. Carlton M. Caves
Ph.D., California Institute of Technology, 1979

Distinguished Professor
Department of Physics & Astronomy

Director
Center for Quantum Information and Control
University of New Mexico

Fellow, American Physical Society
Fellow, American Association for the
Advancement of Science

Friday, March 16
2:30 p.m.
Royal Cotillion Ballroom
LSU Union

There is a world of consummate strangeness at our fingertips, provided our fingers are so exquisitely fine as to be able to feel and manipulate individual atoms and molecules. Ever since the realization that the behavior of atoms and molecules is governed by the laws of quantum mechanics, it has been understood that the world of the very small is nothing like the familiar world of everyday experience. Yet only recently has it been fully appreciated just how different the world of quantum systems is---and how that difference might be exploited to do things that can't be done in our mundane everyday world.

Dr. Caves will illustrate how weird the atomic-scale world really is and indicate how we might take advantage of that weirdness using new technologies for manipulating atomic-scale systems.

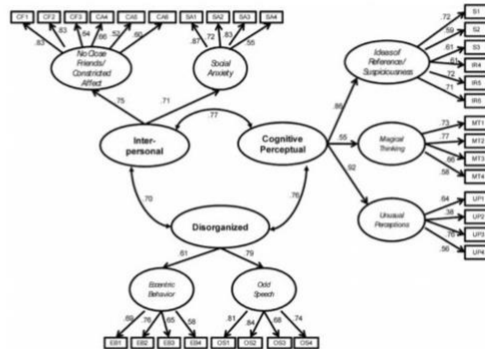
You will have to pay close attention, but the reward will be a glimpse of the truly astonishing nature of the world we all inhabit.

LSU | College of
Science
Department of Physics
& Astronomy

SATURDAY SCIENCE

All hands on deck: The importance of multidisciplinary 'big data' approaches for solving serious mental illness

A free public lecture by
Dr. Alex S. Cohen



About the Lecture

Dr. Alex S. Cohen is an Associate Professor in the Department of Psychology at LSU, as well as Director of LSU's Affective Science and Psychopathology Laboratory and adjunct at the Pennington Biomedical Research Center in Baton Rouge.

Serious mental illness (e.g., schizophrenia, bipolar disorder, depression) reflect some of the most costly and devastating illnesses in the world. In the last century, virtually every academic discipline has separately attempted to understand the causes of mental illness. This has yielded very little substantive advances, as we still have a very poor understanding of these illnesses, very rudimentary treatments and no cures. With recent breakthroughs in computational power, informatics, inexpensive and sophisticated technologies, and behavioral and neuro-sciences more generally, this may change in the coming decades. Solving serious illness will likely require multidisciplinary teams of scientists savvy with big data analytics.

17 March 2018, 10-11:00 a.m.

Room 130 Nicholson Hall, LSU

LSU

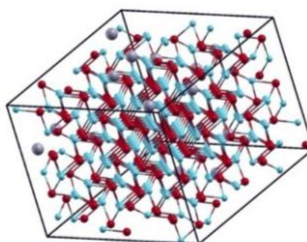
College of
Science
Department of Physics
& Astronomy



Monday, March 19
3:00 pm
1008B Digital Media Center
Louisiana State University

Understanding Disordered Materials via Unbiased Simulations

Inserting disordered impurity atoms is one of the most powerful ways to tune the functionality of advanced materials. In this talk I will demonstrate how disorder controls and reveals the underlying physics of heat conduction in thermoelectrics, electron pairing in superconductors and Anderson localization in intermediate band semiconductors. In particular I will illustrate how unbiased and materials-specific simulations shed light on complex experiments on disordered materials and allow for a fundamental understanding of their properties.



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2018



Guest Speaker
**Dr. Tom
Berlijn**

Research Staff
Member

Oak Ridge National
Laboratory

Free and open to the public



www.lsu.edu/physics/lacns

