

## **World of Physics Open Night, Friday, November 4, 2016**

ESS 001; 7:30 P.M.

For more information: <http://www.physics.sunysb.edu/Physics/WorldsOfPhysics/20162017/>

**Dominik Schneble**

### **“Ultracold atoms and Bose-Einstein condensates”**

Experimental methods to cool neutral atoms to nanokelvins make it possible to observe quantum-mechanical effects with (almost) the naked eye. One of the most spectacular achievements of the past two decades has been the direct observation of Bose-Einstein condensation in trapped atomic gases. Bose-Einstein condensates, in which all atoms occupy the same quantum state and form a giant matter wave, have allowed for a plethora of investigations such as atom lasers, vortices, superfluidity, and superradiance. Bosonic and fermionic quantum gases, and advanced techniques for their manipulation, now allow researchers to address questions throughout modern physics, ranging from correlated behavior of electrons in solids to the physics of neutron stars. This talk will give an introduction to this thriving field, and highlight some of research done in our own laboratory.

Dominik Schneble is an Associate Professor and leader of the Ultracold Atomic Physics Group at Stony Brook University. He obtained his PhD from the University of Konstanz in 2002 and worked as a Postdoctoral Associate at MIT, before joining Stony Brook in 2005.

## **Living World Open Night, Friday, November 11, 2016**

ESS 001; 7:30 P.M.

For more information: <http://life.bio.sunysb.edu/marinebio/livingworld/>

**Lesley Thorne**

### **"Climate Impacts on North Pacific Albatrosses"**

Animal movement plays a central role in the ability of species to respond to climate-driven environmental change and is a major driver of biological processes from individuals to ecosystems. In the context of climate change, animal movement can be influenced both by changes to the distribution of resources, and by direct effects of environmental factors on movement and energetic expenditure. Albatrosses are ideal study species for examining the impacts of both of these climate impacts due to their foraging strategy of exploiting ephemeral, widely separated prey patches using energetically efficient gliding flight. Telemetry and colonybased studies in the North Pacific Ocean have shown that El Nino-Southern Oscillation (ENSO) conditions affect both foraging habitat and wind fields available to albatrosses, and that these factors combine to influence albatross movement and life history.

Lesley Thorne is an Assistant Professor in the School of Marine and Atmospheric Sciences at Stony Brook University. Lesley received a BSc at the University of Guelph in Canada and a PhD from Duke University. Lesley's work is broadly focused on ecological questions in pelagic

systems, and much of her research focuses on understanding the biophysical and trophic interactions driving the habitat use and foraging behavior of different marine predators (primary marine mammals and seabirds). She has worked in a wide range of marine systems, including the Bay of Fundy, the South Atlantic Bight, the Caribbean and Sargasso Seas, the western Antarctic Peninsula, and the Main and Northwestern Hawaiian Islands.

## **Geology Open Night, Friday, November 18, 2016**

ESS 001; 7:30 P.M.

For more information: <http://www.geo.sunysb.edu/openight/index.html>

**Brian Phillips**

### **“Using nuclear magnetic resonance (NMR) to locate impurities in minerals that can tell us something about their history”**

Calcium carbonate minerals such as calcite are ubiquitous in nature, being the main component of limestones and similar rocks that are exposed over about 20% of Earth's land surface. Precipitation of carbonate minerals removes CO<sub>2</sub> from the atmosphere, while creating a repository of valuable chemical information about the environment in which they formed. During crystal growth various impurities are incorporated into the mineral, some of which geoscientists are exploiting to infer environmental conditions at the time and place the mineral precipitated, called “paleo-environmental proxies”. With micro-analytical methods now available geoscientists can read such chemical and isotopic signatures at sub-millimeter resolution to determine chemical variability at geologically short time scales. In this presentation I will discuss the factors that determine how an impurity becomes trapped in a mineral, whether its abundance is suitable for use as an environmental proxy, and the results of some of our research that show where impurities are located in calcium carbonate minerals. For this research we use nuclear magnetic resonance (NMR) spectroscopy, which is based on the same phenomenon as MRI and measures the pitch of atomic nuclei “singing” in a strong magnetic field. This allows us to locate impurity atoms from their chemical environment and identify some of their neighbors.

Brian Phillips is a Professor in the Department of Geosciences at Stony Brook University. He has been on the faculty at Stony Brook University since 2002, where he investigates the atomic arrangement of minerals and related materials using primarily Nuclear Magnetic Resonance (NMR) spectroscopy. His research focuses particularly on bonding of atoms adsorbed to mineral surfaces and how impurities are incorporated in minerals. He is a Fellow of the Mineralogical Society of America.

### *Directions to SUNY Stony Brook and ESS Building*

- ⇒ From exit 62 of the Long Island Expressway (LIE, I-495) follow Nicolls Road (Route 97) north for nine miles. Pass the South and Main entrances to the University.
- ⇒ Enter the North entrance which will be on your left.
- ⇒ At the top of the small hill, turn right on Circle Road.
- ⇒ Proceed about 1 mile.
- ⇒ Turn left onto Campus Drive and then immediately turn left again onto John S. Toll Drive.
- ⇒ Proceed about 50 yards then turn right into the large paved parking lot.
- ⇒ The Earth and Space Sciences building is the large concrete building at the northeast end of the parking lot.

Map of campus is on the web at: <http://www.stonybrook.edu/sb/map/>

### **TEACHER IN SERVICE CREDITS**

If your school requires you to have a sequence of educational opportunities in order to receive in-service credit, please advise them that during the Fall 2016 semester we will provide attendance certification for each of the lectures attended.

Please contact the respective department for more information.