Astronomy Open Night, September 7, 2018

ESS 001; 7:30PM

For more information: http://www.astro.sunysb.edu/openight/opennite.html

Frederick Walter

"The SMARTS way to observe: What recent observations tell us about galactic novae Discoveries"

In 2003 NOAO, the US national observatory divested itself of their small (i.e., meter-class) telescopes. The SMARTS consortium has operated these telescopes at Cerro Tololo Interamerican Observatory since then. Unlike the classical observing mode of a few full nights at the telescope at infrequent intervals, SMARTS queue-scheduled observations afford the opportunity to obtain frequent observations of interesting targets.
Over the past 15 years I have invested a great deal of effort in observing and studying the galactic novae, which are thermonuclear runaways (hydrogen bombs) on the surfaces of white dwarf stars accreting gas from close companion stars. Novae are interesting not only because they explode, but because they are a common end state of low mass stars, because they form dust, and because they may be the source of the bulk of the Lithium found in the Galaxy.
Following introductions to SMARTS and to the novae, I shall use examples of recent bright novae to illustrate how high-cadence observations have changed our view of the nova explosions. This is publically-accessible science: I shall highlight how contributions made by amateur astronomers contribute to the field.

Prof. Walter, a resident of East Setauket, studies star birth, stellar weather (including stellar coronae), and star death using the *Chandra* and XMM-*Newton* X-ray observatories, the Hubble Space Telescope, and telescopes in Arizona, Hawaii and Chile. He has been a professor of Astronomy at Stony Brook since 1989.

Living World Open Night, Friday, September 14, 2018

ESS 001; 7:30PM

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

Cancelled

Geology Open Night, September 21, 2018

ESS 001; 7:30PM

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

Weisen Shen

"Decipher the Support of the Transantarctic Mountains - A Comprehensive Geophysical Investigation"

The Transantarctic Mountains (TAM), extending from the Northern Victoria Land (Pacific side) to the Pensacola Mountains near the Weddell Sea (Atlantic side), is a 3000-km long mountain range with a peak elevation of ~ 4,000 meters, representing one of the largest intracontinental mountain range in the world. Traditionally, they are viewed as a rift-shoulder Mountains related to the West Antarctic Rift system, similar to the San Juan Mountains of the southern Rockies. In this presentation, I will show how the geophysicists use the state-of-art techniques to collect, process, and present the seismic data in Antarctica to decipher the mechanisms that support the TAM, and show that the TAM is much more complex than a simple rift-shoulder mountain.

Weisen Shen is an observational seismologist, with research interest on the seismic and thermal structures of the Earth's continental lithosphere. Dr. Shen received his Ph.D. from the Department of Physics at the University of Colorado Boulder. He was a postdoctoral scholar at the Department of Earth and Planetary Sciences at Washington University in St Louis between 2015–2018 working with Dr. Douglas Wiens. In Spring 2018, he joined the faculty of the Department of Geosciences at Stony Brook University where he is an assistant professor. Dr. Shen has completed two Antarctica fields seasons (2015-16, 2017-18) to install, service, and collect seismic sensors, visiting both the remote field sites in Siple Dome, West Antarctica and near the South Pole station. Dr. Shen is also the recipient of the Antarctica Service medal from the National Science Foundation. His current research focus is on the uplift of the Southern Transantarctic Mountains.

World of Physics Open Night, Friday, September 28, 2018

ESS 001; 7:30PM

For more information: http://www.physics.sunysb.edu/Physics/WorldsOfPhysics/2017-18/

Will Farr

"The New Field of Gravitational Wave Astronomy"

Forty years in the making, the field of gravitational wave astronomy opened with a bang in September 2015 with the first-ever detection of the gravitational waves from a merging pair of black holes. These extreme objects contain 30 to 40 times as much mass as the sun, but are about the size of Manhattan; they slammed into each other at about half the speed of light! The energy generated by the collision outshone, for a moment, all the stars in the universe; here on earth, the signal was sufficiently strong to move person-sized mirrors in the LIGO instruments a distance that is a tiny

fraction of an atomic nucleus. Thanks to work by thousands of scientists around the world, the LIGO instruments were able to detect such a tiny displacement, and record the gravitational wave. Subsequently, LIGO (and its European partner, Virgo) has announced five more black hole mergers and, last August, the merger of two neutron stars. This latter event involved city-sized atomic nuclei, again slamming into each other at a large fraction of the speed of light; the result of the explosion was apparent in both gravitational waves *and* by a flash of gamma rays, followed by a glow that faded over hundreds of days that was observed by thousands of astronomers using traditional telescopes around the world. Thanks to these observations, we now know that events like this one are responsible for producing a sizable fraction of the elements heavier than iron---gold, for example---in the universe. This talk will describe the how the LIGO detectors make such phenomenally sensitive measurements, go over some of the highlights from the past two years' observations and talk about the very bright future of this new field.

Will Farr is a new Associate Professor of Physics at Stony Brook; he also leads the gravitational wave astronomy group at the Flatiron Institute's Center for Computational Astronomy in Manhattan. Until this fall, he was a Senior Lecturer at the University of Birmingham, working in that institution's Institute for Gravitational Wave Astronomy.

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

NYS teachers who wish to receive CTLE credit for any of these lectures must register here: https://goo.gl/forms/pfdNLevMTO8VfbJ02. You must register for each lecture you attend and sign-in at the lecture. The Graduate School will send a CTLE certificate about six weeks after each lecture.