Astronomy Education Workshop

JOINT WITH BIANNUAL MEETING OF THE NEBRASKA CHAPTER OF THE AMERICAN ASSOCIATION OF PHYSICS TEACHERS

FOR HIGH SCHOOL TEACHERS AND COLLEGE INSTRUCTORS

8:30a.m. - 4:30p.m.

Saturday, October 6, 2018

Jorgensen Hall
UNL City Campus

For attendees:

- Choose four out of 16 breakout sessions (30 minutes)
- Choose one of three 90-minute hands-on sessions
- Enjoy a continental breakfast, lunch, parking, and a door-prize raffle
- Bring a laptop (preferred) or tablet/smartphone

RSVP at: **go.unl.edu/astro2018**

Organized by UNL Department of Physics and Astronomy and the Center for Science, Mathematics and Computer Education.
Questions? Contact Dr. Kevin Lee: **klee@unl.edu**

PRESENTATION 1

Dr. Laura Trouille

Vice President of Citizen Science, Adler Planetarium
Northwestern University

Bringing Citizen Science Zooniverse-based Research Experiences into Introductory Science Courses

Working with a national collaboration of astronomy educators and researchers at a range of institution types (R1, SLAC, Community College), we have developed a suite of active learning materials incorporating a citizen science based research experience into introductory astronomy courses for non-STEM majors. The in-class activities and group research experience engage the students in citizen science through Zooniverse and employ custom extensions to Google sheets to provide a student-friendly interface for data analysis and interpretation, all while addressing core Astro 101 topics. In this talk, I will provide an overview of the curricular materials and approach as well as highlight key results to-date in terms of usability and impact on students' attitudes and learning. I will also discuss our upcoming effort to adapt the framework, infrastructure, and tools for other disciplines and for K-2. This work is supported by the NSF-IUSE award #1524189.

PRESENTATION 2

Dr. Greg Snow

Professor, Department of Physics and Astronomy,
University of Nebraska-Lincoln

The Detection of Gravitational Waves from the Merging of Very Massive Astrophysical Objects Extremely Far Away

In his theory of General Relativity, Albert Einstein described gravity as a curvature of 4-dimensional space-time surrounding a massive object like our sun. He also predicted that "gravitational waves" would be created when two stars collide. Gravitational waves are rippled distortions of space-time, like the waves that spread out when a rock is dropped in a pool of still water. Over the last 3 years, an experiment called LIGO – the Laser Interferometer Gravitational-wave Observatory – has detected gravitational wave ripples that were emitted by pairs of very massive black holes or neutron stars which merged together as long as 1.3 billion years ago at distances as far as 1.3 billion light years from Earth. I will describe gravitational waves in simple terms, as well as the impressively accurate LIGO experiment and its amazing, first-ever discoveries of gravitational waves. I also will describe the new age of gravitational wave astronomy, which will rely on multiple LIGO-like experiments to be operated at many locations on Earth. Once again, Einstein was right!