

## **Astronomy Open Night, October 5, 2018**

ESS 001; 7:30PM

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

Alan Calder

### **“Searching for Life in the Universe”**

Mankind has long speculated about the existence and nature of life elsewhere in the Universe. While there is no accepted evidence of life anywhere other than Earth, contemporary studies apply the scientific method to answer these questions. The study of life in the Universe encompasses many traditional disciplines including Astronomy, Biology, Chemistry, and Geology, and has been dubbed the field of "Astrobiology."

In the next Astronomy Open Night, Prof. Alan Calder will discuss the scientific search for life in the Universe. He will describe how our understanding of life on Earth guides the search for life elsewhere and some of the tools utilized in the search. He will present recent results in the search for life in the Universe.

Alan Calder joined the Stony Brook Physics and Astronomy department in 2007 after research appointments at the University of Illinois and the University of Chicago. His research is in numerically modeling astrophysical phenomena, and he has studied a variety of problems including core collapse and thermonuclear supernovae, merging neutron stars, and classical novae.

## **Living World Open Night, Friday, October 12, 2018**

ESS 001; 7:30PM

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

Jeremy B. C. Jackson

### **“Breakpoint: Reckoning With America’s Environmental Crisis”**

Jeremy Jackson is Professor of Oceanography Emeritus at the Scripps Institution of Oceanography and Senior Scientist Emeritus at the Smithsonian Institution. He studies threats and solutions of human impacts on the environment and the ecology and evolution of tropical seas. Jackson is the author of more than 160 scientific publications and eleven books. He is a Fellow of the American Academy of Arts and Sciences and has received numerous prizes and awards including the BBVA International Prize in Ecology and Conservation, The Paleontological Medal, and the Darwin Medal of the International Society for Reef Studies. Jackson’s work on the collapse of coastal ecosystems was chosen by Discover

magazine as the outstanding scientific achievement of 2001. His new book Breakpoint: Reckoning with America's Environmental Crises appeared in April 2018.

Dr. Jackson will discuss highlights from his new book with journalist Steve Chapple about major environmental challenges in America today due to climate change, mismanagement, and corruption and the highly encouraging practical solutions that are beginning to catch on. He will focus on American agriculture, drowning coasts, and the ways that climate change and extreme weather are exacerbating decades of chronic mismanagement of natural resources. The story begins in the vast Iowa GMO cornfields that produce mostly ethanol no one needs at the expense of massive soil erosion, nutrient runoff, dead zones in the Gulf of Mexico and Great Lakes, and poisoned drinking water. Then down to the Mississippi Delta and Louisiana coast that is disappearing underwater at the rate of a football field an hour so that New Orleans will be an island with terra firma far to the north. Chronic drought in the southwest, increasingly extreme flood rain storms moving east, and stronger hurricanes threaten agricultural systems nationwide and coastal cities all along the East and Gulf Coasts. We know what to do to alleviate or adapt to most of these challenges and have the resources to do so. I will conclude with examples of local, state, and private sector initiatives that are beginning to turn things around in spite of the current political administration

Co-sponsored: Office of the Provost, Ecology and Evolution

Department, Science Open Nights Consortium, School of Marine and Atmospheric Sciences

## **Geology Open Night, October 19, 2018**

ESS 001; 7:30PM

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

Hanna Nekvasil

### **“Magmatic gas and the Martian surface: What comes out of this gassy mix?”**

Soil makes up the major part of the Martian surface. We would expect this soil to reflect the major igneous rock units as well as the secondary re-worked rock units observed on the surface. Yet the fine-grained material from this soil is quite different than expected. I will discuss here what role the youngest Martian lavas may have played in producing the unique compositional characteristics of the soil, by coupling experimental results and remote observations.

Hanna Nekvasil received her B.A from Cornell University in 1979 and her Ph.D. from Penn State in 1985. She has been a professor in the Department of Geosciences at Stony Brook since 1988. She is an experimental petrologist studying the role that volatiles in magmas have played in planetary evolution. Her work has ranged from experimental simulations of hot spot magmas in order to understand the development of the diversity seen among such magmas, to the volatile load of the Moon and how it affected the formation of the lunar crust, and most recently to the contributions of vapor-deposited phases to planetary surfaces.

# World of Physics Open Night, Friday October 26, 2018

ESS 001; 7:30PM

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

George Sterman

## “Imaging Fundamental Processes”

The contemporary theory of fundamental forces can be pictured as just a handful of particle species, acting among themselves according to a few simple rules. This theory can in principle account for the richness of the visible universe. It results from a centuries-long process of speculation and investigation, culminating in the language of quantum field theory. Yet every successful theoretical framework defines its own limitations, and suggests new questions and criteria. Looking back and ahead, I will give a perspective on our current theories, and on how future developments may be influenced by evolving ideas in theoretical physics, by high energy experiments at accelerators, and by exquisite observations of the faintest cosmic signals.

George Franklin Sterman is a theoretical physicist and the Director of the C. N. Yang Institute for Theoretical Physics at Stony Brook University where he holds the rank Distinguished Professor. George Sterman's research focuses on quantum field theory and its applications in quantum chromodynamics. He authored a textbook entitled *An Introduction to Quantum Field Theory* in 1993.<sup>1</sup>

George Sterman was awarded the 2003 J.J. Sakurai Prize for Theoretical Particle Physics "For developing concepts and techniques in QCD, such as infrared safety and factorization in hard processes, which permitted precise quantitative predictions and experimental tests, and thereby helped to establish QCD as the theory of the strong interactions."<sup>[5]</sup> He received a Guggenheim Fellowship in 1985, is a Fellow of the American Physical Society and has served as an Associate Editor for *Physical Review Letters*.

## 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.