Astronomy Open Night, Friday, February 5, 2016

ESS 001; 7:30 P.M.

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

Max Katz

"Seasons in the Sun"

Our local star plays a key role in supporting life on Earth through a warm (but not *too* warm) climate, but there are multiple factors that determine the nature of Earth's climate. Our atmosphere plays a key role in mediating the interaction between the Sun's energy and the Earth's surface, reflecting some of the light and trapping some of it too. The distance from the Sun plays a big role too, as well as the orientation of the Earth's rotation axis and the wobbling about that axis over time. In this talk Katz will discuss the various factors that control Earth's climate and contrast Earth's habitability to the stark inhospitable nature of planets like Venus. We will look at what we know about the relationship between climatic shifts in the past, and events like mass extinctions. And we will discuss what is now happening with global warming, and try to understand how such trace amounts of greenhouse gases can have such a serious effect on our climate, as well as put the current warming into historical context.

Max Katz is a fourth-year Ph.D. student in the Department of Physics and Astronomy at Stony Brook University. He holds an M.S. in Physics from Rensselaer Polytechnic Institute. Here at Stony Brook, his research interests are mainly in computational fluid dynamics, specifically simulations of stars, especially the kinds of stars that explode.

Living World Open Night, Friday, February 12, 2016

DARWIN DAY DISTINGUISHED LECTURE

ESS 001; 7:30 P.M.

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

David Jablonski

"Mass Extinctions in the Fossil Record and Their Meaning for Today's World"

The fossil record is punctuated by extinction events at all scales, from the loss of one or two fish species with the drying of a lake, to the wholesale disappearance of dinosaurs (birds aside) 65 million years ago. The handful of events that are global in scale and bring down a wide spectrum of species are termed mass extinctions, which account for less than 10% of all the extinction over life's long history, but have been pivotal in shaping the world's biota. Because most research has centered on the causes of mass extinctions, we are just beginning to understand their evolutionary roles. Growing evidence points to a change in the rules of survival during mass extinctions, so that evolution is re-channeled during these rare but intense episodes.

The evolutionary bursts that follow the extinctions may be just as important as the extinctions themselves, as new or previously obscure lineages take advantage of the opportunities opened up by the demise of dominant groups. However, a closer look at recovery intervals shows that survival alone does not guarantee evolutionary success: not all survivors are winners. The implications of this new understanding of extinction for present-day biodiversity are complex but wide-ranging.

David Jablonski combines data on living and fossil marine organisms to ask large--- scale evolutionary questions about origins, extinctions, and geographic distributions. He grew up in New York City a few blocks be a paleontologist by the age of five. He got a BA from Columbia University and a PhD from Yale. He was a postdoc at the University of California, Santa Barbara, and a Miller Fellow at Berkeley before joining the Ecology and Evolutionary Biology faculty at the University of Arizona. He moved to the University of Chicago in 1985, where he is now the William R. Kenan, Jr., Distinguished Service Professor in the Dept of Geophysical Sciences and the Committee on Evolutionary Biology (a multi-institutional PhD program). He chaired CEB for 6 years, and was elected to the American Academy of Arts and Sciences in 2000 and the National Academy of Sciences in 2010. He has published more than 140 scientific papers and book chapters on topics ranging from mass extinctions to the origin and maintenance of the diversity gradient from poles to tropics, and the role of multilevel processes in evolution.

Geology Open Night, Friday, February 19, 2016

ESS 001; 7:30 P.M.

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

Joel Hurowitz

"A Rover's Eye View of the Ancient Surface and Climate of Mars"

For nearly a decade, the international program of Mars exploration has been guided by a remarkably useful framework that describes how Mars' environmental conditions have evolved in the context of time-dependent changes in the composition of rock and soil deposits at the Martian surface. Built on the basis of observations by the instruments onboard the European Space Agency's Mars Express Orbiter, this framework describes an early era of Earth-like surface environments that gave way to a far more arid environment in which surface water was acidic and salt-rich.

Ongoing observations by Mars Express and the higher-resolution instruments onboard NASA's Mars Reconnaissance Orbiter have continued to refine and extend this paradigm, but as is the case on Earth, the greatest insight into the evolution of surface environments comes from close-up examination of the sedimentary rock record. *In-situ* observations of sedimentary rocks by NASA's *Opportunity* and *Curiosity* rovers enable evaluation of hypotheses developed from orbit, and reveal that interactions between iron-rich waters and the atmosphere have played a critical role in the evolution of the Martian surface.

Prof. Hurowitz will discuss observations of the sedimentary rock record by NASA surface missions to Mars, drawing parallels between ancient Mars and processes inferred from ancient sedimentary rocks on Earth. He will also discuss the upcoming Mars 2020 rover mission and the role that the Planetary Instrument X-ray Lithochemistry (PIXL), part of the scientific payload for this mission, will play in further deciphering the geochemical history of the surface of Mars.

Joel Hurowitz, an assistant Professor in the Department of Geosciences, is a geochemist and planetary scientist working at the forefront of the exploration of Mars and the Solar System. Specializing in understanding the processes of sedimentary rock formation and evolution, Prof. Hurowitz has worked extensively on the ongoing Mars Exploration Rover mission, launched in 2003, and the more recent Mars Science Laboratory (MSL) rover mission, which was launched in 2012. He has played a variety of roles on these missions from scientist, to rover instrument design and operations specialist, to science and engineering operations team leader.

Prof. Hurowitz is the Deputy Principal Investigator of one of the 7 instruments recently selected for the science payload of the Mars 2020 Rover mission, which is expected to operate on Mars at least through the year 2023. This instrument, called "PIXL", for "Planetary Instrument for X-ray Lithochemistry", is a micro-focus X-ray fluorescence instrument that will produce high-fidelity maps of the distribution and abundance of chemical elements within rocks and soils at the Mars 2020 rover landing site. He has previously held positions at the NASA Jet Propulsion Laboratory (JPL, 2007-2013),and the California Institute of Technology (Caltech, 2006-2007).

World of Physics Open Night, Friday, February 26, 2016

ESS 001; 7:30 P.M.

For more information: http://www.physics.sunysb.edu/Physics/WorldsOfPhysics/2015/

Alexander Orlov

"How Nanotechnology Can Save Us and Environment: Making It Happen In a Safe Way"

Nanotechnology is offering wonderful opportunities to make most of materials around us much better. Nanoparticles can help us to produce energy in a more efficient and less harmful way. They can also transform the environment around us and help us to clean it. Nanotechnology is opening new and exciting world for our civilization and we are still only at the beginning of this fantastic journey. However, there are questions about how safe those small particles are, and whether there are ways to make them safer. This lecture will discuss examples of emerging frontiers in this area while attempting to outline challenges in nanotechnology field.

Alexander Orlov is an associate professor of materials science and engineering at State University of New York, Stony Brook. He is also a faculty member of the Consortium for Interdisciplinary Environmental Research, an affiliate faculty of the Chemistry Department and the Institute for Advanced Computational Science at Stony Brook University. He is also a visiting professor at

Cambridge University, U.K. Dr. Orlov's principle research activities are in the development of novel materials for energy generation, structural applications and environmental protection. He was awarded the U.S. National Science Foundation CAREER Award and the U.K. National Endowment for Science Technology and Arts CRUCIBLE award. He was also selected to the Fellowship of the U.K. Royal Society of Chemistry, the U.S. National Academy of Engineering (NAE) Frontiers of Engineering (U.S.), the NAE Frontiers of Engineering Education and was made Kavli Fellow in 2014 by the Kavli Foundation and the U.S. National Academy of Sciences.

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 Spring 2015 semester we will provide attendance certification for each of the lectures attended.

Please contact the respective department for more information.