October 10
*When the Dust Settles: Ice Records Through Time*
Sarah Aciego, Professor of Earth and Environmental Sciences (U-M)
Although dust seems like a small component of the Earth’s ecosystem, it provides essential nutrients to ocean and terrestrial environments. Dust source activity, dust transport, and deposition are highly variable on timescales ranging from minutes to centuries to millennia depending on climate, landscape evolution and human activity. Dr. Aciego will present three case studies examining the modern, ice core, and geologic record of dust sources and deposition through the use of physical and chemical characterization of the dust.

October 17
*Lighting Up Dark Matter*
Eric Bell, Professor of Astronomy (U-M)
One crucial component of our current understanding of galaxies and cosmology is that most of the matter in the Universe is in the form of dark matter—an as-yet-unidentified form of matter that appears to neither give off nor interact with light. In this talk, Professor Bell will describe what we have learned about the distribution of dark matter around galaxies by studying stars in the sparsely-populated distant outskirts of galaxies, well outside where one would expect to find stars.

October 24
*Measuring Time from the Ultrafast to the Ultraprecise*
Steven Cundiff, Harrison M. Randall Collegiate Professor of Physics (U-M)
Ultrashort light pulses produced by lasers are the shortest man made events, reaching durations measured in femtoseconds to attoseconds. They can be used to measure processes that occur on similar timescales. Surprisingly, perhaps, they are also useful in constructing the most precise atomic clocks. Dr. Cundiff will discuss both of these uses of ultrashort light pulses and the connection between them.

October 31
*The Physics of Halloween*
Introduced by Timothy Chupp, Professor of Physics (U-M)
Devilish demos delight and deceive.

(Continued)
November 7

*Ice Fishing for Cosmic Neutrinos*

Francis Halzen, Hilldale and Gregory Breit Professor of Physics (University of Wisconsin - Madison)

*The James Robert Walker Memorial Lecture*

Eighty-six holes over 1.5 miles deep were melted in the Antarctic icecap to create *IceCube*, a novel astronomical observatory. Into each hole was lowered a string knotted with basketball-sized light detectors that are sensitive to the shimmering blue light emitted in the surrounding clear ice when ghostly particles called neutrinos pass through the Earth. These neutrinos are cosmic messengers from the most violent processes in the universe—for example, giant black holes gobbling up stars in the heart of quasars and gamma-ray bursts, which are the biggest explosions since the Big Bang. This talk covers *IceCube’s* early results and its discovery of cosmic neutrinos.

November 14

*Mighty Cyanobacteria: From Oxygenation of Planet Earth to Pollution of Lake Erie*

Gregory Dick, Professor of Earth and Environmental Sciences (U-M)

Tiny organisms called cyanobacteria have a huge impact on our planet, both throughout its history and today. Deep in Earth's history, they oxygenated the atmosphere, enabling the evolution of life as we know it. In the modern world they provide crucial ecosystem services but can also make toxins that threaten ecosystems and drinking water supplies. This talk will introduce these mighty microorganisms and discuss how we are studying them to better understand the history and future of life on Earth.

November 21

*Mechanobiology at the Cellular Length Scale*

Allen Liu, Professor of Mechanical Engineering (U-M)

If someone punches me, I will feel pain. How do cells in your body sense and respond to mechanical cues? This talk will discuss an emerging area of cellular mechanobiology.

December 5

*Coloring the Universe*

Travis A. Rector, Professor of Physics and Astronomy (University of Alaska)

Everyone loves pictures of space. But have you ever wondered if that’s what it really looks like? Or if the colors are real? For over twenty years astronomer Dr. Rector has been making color astronomical images with some of the world’s largest telescopes. In this talk, Dr. Rector will give a behind-the-scenes look at what professional astronomers do, and what they don’t do, when making these beautiful images.

To learn more about the program and to donate online: [www.saturdaymorningphysics.org](http://www.saturdaymorningphysics.org)

To view previous talks: [www.youtube.com/michiganchannel](http://www.youtube.com/michiganchannel) then scroll to *Saturday Morning Physics*