### WHAT PHYSICISTS DO

_“We are a way for the cosmos to know itself.”_- Carl Sagan

**Mondays at 4:00pm**

<table>
<thead>
<tr>
<th>Date</th>
<th>About</th>
</tr>
</thead>
</table>
| **Sept 9** | **ASTRONOMY CAREERS: FROM EDUCATION TO GIANT TELESCOPES**  
Santa Rosa Junior College astronomy instructor Laura Sparks will discuss her career path in science education, as well as off-the-beaten-path opportunities in astronomy research and outreach. She will share insights from her recent expedition to visit major observatories in the southern hemisphere as an ACEAP (Astronomy in Chile Educational Ambassadors Program) ambassador. |
| **Sept 16** | **THE DARK SIDE OF EXTREME GALAXIES**  
Galaxy formation and evolution is closely tied to the effects of dark matter and supermassive black holes. Aaron Romanowsky will present observations and dynamical modeling of two extreme and mysterious classes of galaxies -- the ultracompact dwarfs and the ultra-diffuse galaxies -- to provide novel constraints on their underlying dark components and their evolutionary histories. |
| **Sept 23** | **EXPLORING PLANETS ORBITING NEARBY STARS**  
The NASA Transiting Exoplanet Survey Satellite (TESS) mission launched last year and is finding hundreds of planets orbiting nearby stars. The TESS mission will probe the compositional diversity of small planets, investigate the formation of planetary systems, and set the stage for the next phase of exoplanet exploration: the quest for biosignatures in the atmospheres of strange new worlds. Presented by Dr. Courtney Dressing. |
| **Sept 30** | **FROM ASTROPHYSICS TO ANGEL INVESTOR - HOW SCIENCE HELPED ME SUCCEED**  
Entrepreneur and lapsed astronomer Lance Cottrell will discuss how a background in physics has informed and supported his circuitous path from privacy advocate to intelligence community vendor to startup mentor. |
| **Oct 7** | **ADVENTURES IN NANOMAGNETISM**  
The foundations of our modern society rest on storing and moving electron charges. Imagine what more we could discover and do if we could also manipulate electron spins, or the intrinsic magnetic moment of electrons. James Lee will describe his research to date along these lines in magnetic thin films and nanostructures. |
| **Oct 14** | **THE SEARCH FOR RARE EARTHQUAKE-LIKE PRECURSORS: MAXENT MOON-SPIN RESONANCE MgO STUDY**  
According to Prof. Dr Freund (NASA Ames) currents of positive holes in the earth's crust are precursors of earthquakes; Menlo Park seismologists are not so sure. MaxEnt Muon-Spin research yields indirect evidence, these itinerant positives holes are indeed present in MgO; earthquake warnings of weeks (not seconds) ahead are well plausible! Presented by Dr. Carolus Boekema. |
| **Oct 21** | **SHINING X-RAYS ON TOPOLOGICAL TEXTURE: INSIGHT INTO MAGNETIC SKYMIIONS**  
Recently discovered skyrmions is an example of a topological phase that manifest in magnetic systems as a hexagonal lattice of spin vortices. Due to topological protection, skyrmions can be moved coherently over macroscopic distances with low currents compared to domain wall motion, and is therefore a potential candidate for low power storage and logic applications. Presented by Sojuy Roy. |
| **Oct 28** | **A BRIEF OVERVIEW OF THE SENSORS AND SPECTROCOPY GROUP AT VIAVI SOLUTIONS**  
The sensors and spectroscopy group of Viavi Solutions produces the MicroNIR-NIR spectrometer as well as binary multispectral (BMS) filters. The variety of scientific fields used in both instrument development and applications will be discussed. Presented by Valton Smith. |
| **Nov 4** | **ON SYMMETRY: FROM NOETHER TO THE HIGGS: AKA WHAT (THEORETICAL) PHYSICISTS DO**  
In this talk, Alex Miller will discuss how discoveries of the early 1900's completely revolutionized the way that theoretical physicists see the world around them. We will explore how theorists today put symmetry at the forefront, defining our theoretical systems primarily by the symmetries that govern them. |
| **Nov 11** | **VETERAN’S DAY—NO TALK** |
| **Nov 18** | **A BRIEF OVERVIEW OF THE SENSORS AND SPECTROCOPY GROUP AT VIAVI SOLUTIONS**  
The sensors and spectroscopy group of Viavi Solutions produces the MicroNIR NIR spectrometer as well as binary multispectral (BMS) filters. The variety of scientific fields used in both instrument development and applications will be discussed. Presented by Valton Smith. |

This series is supported by private donations and Instructionally Related Activities funds.