Monday, December 4, Special ICMT Seminar: “Modern semiclassical theory of magnetic oscillations and breakdown” Aris Alexandradinata; 12:00 pm in 190 ESB

Monday, December 4, ME/HE Seminar: “Discovery and Investigation of CEvNS: coherent elastic neutrino nucleus scattering” Rex Tayloe; 1:00 pm in 276 Loomis

Tuesday, December 5, Astronomy Colloquium: “The Nature and Demographics of Small Exoplanets” Diana Dragomir; 3:45 pm in 134 Astronomy

Wednesday, December 6, Physics Colloquium: “The Dawn of Graviational-Wave Astrophysics” Vicky Kalogera; 4:00 pm in 141 Loomis

Visitors:

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Materials Genome center at USC, MAGICS, will hold its 2nd workshop for materials software on March 2-4, 2018, just before the APS March Meeting (March 5-9) in Los Angeles. Graduate students, postdocs and early career faculty are invited to participate. For selected participants, expenses for lodging and food, for March 2-4, will be covered. MAGICS Center is supported by the Department of Energy, Basic Energy Sciences.

Kindly forward this information to materials physics and computational physics graduate students, postdocs and early career faculty that may be attending the APS March meeting in Los Angeles. Please see the attached Workshop Poster.

MAGICS Website to Apply for the Workshop: https://magics.usc.edu
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Visitors:

The Highly Frustrated Magnetism (HFM) conference for 2018 will be held in Davis, CA from July 9, 2018 through July 14, 2018.

It is time now for abstract submissions. We request all interested individuals to submit abstracts in duplicate:

(1) By filling out the Google Form
https://goo.gl/forms/eVl7AWXmnKswfJgn1

(2) By completing the attached template for oral/contributed presentations and emailing it to:
hfmabstracts@physics.ucdavis.edu

The Google Form will make it easy for us to sort the abstracts while the latex submission would help us put together a program booklet. Please submit both. Also note that we are limiting two contributions per presenter (with a maximum of one oral presentation). The Program committee will select the accepted oral presentations. The remaining oral contributions will be automatically considered for a poster. To ensure consideration, abstracts must be submitted before the deadline date of Jan 31, 2018.

Some more information on the conference (invited speakers, registration dates and fees, hotel rates etc.) can be found in the attached flyer and on our website:

We look forward to seeing many of you in Davis.
Special ICMT Seminar

Title: "Modern Semiclassical theory of magnetic oscillations and breakdown"

Speaker: Aris Alexandradinata, Yale

Date: Monday, December 4  Time/Location: 12:00 pm / 190 ESB

Abstract: The modern semiclassical theory of a Bloch electron in a magnetic field now encompasses the orbital magnetic moment and the geometric phase. These two notions are encoded in the Bohr-Sommerfeld quantization condition as a phase ($\lambda$) that is subleading in powers of the field; $\lambda$ is measurable in the phase offset of the de-Haas-van-Alphen oscillation, as well as of fixed-bias oscillations of the differential conductance in tunneling spectroscopy. In some solids and for certain field orientations, $\lambda/\pi$ are robustly integer-valued owing to the symmetry of the extremal orbit, i.e., they are the topological invariants of magnetotransport. Our comprehensive symmetry analysis identifies solids in any (magnetic) space group for which $\lambda$ is a topological invariant, as well as identifies the symmetry-enforced degeneracy of Landau levels. The analysis is simplified by our formulation of ten (and only ten) symmetry classes for closed, Fermi-surface orbits. Case studies are discussed for graphene, transition metal dichalcogenides, 3D Weyl and Dirac metals, and crystalline and $\mathbb{Z}_2$ topological insulators. Finally, I will discuss extensions of the quantization condition to incorporate quantum tunneling between orbits, known as magnetic breakdown.
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### ME/HE Seminar

**Title:** “Discovery and Investigation of CEvNS: coherent elastic neutrino nucleus scattering”

**Speaker:** Rex Tayloe (Indiana University)

**Date:** Monday, December 4

**Time/Location:** 1:00 pm / 276 Loomis

**Abstract:** The coherent elastic neutrino-nucleus scattering (CEvNS) process was predicted to exist over 40 years ago as a natural consequence of the newly-discovered neutral weak current. It has the largest cross section for reactor and pion-decay neutrino sources (~1-50MeV) yet remained undiscovered due to the challenges of the low-energy event signature. The recent 6.7sigma discovery at the ORNL SNS using a 15~kg CsI detector will be presented along with discussion of the future opportunities for precision studies of neutrino properties and interactions.
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Astronomy Colloquium

Title: “The Nature and Demographics of Small Exoplanets”

Speaker: Diana Dragomir (MIT)

Date: Tuesday, December 5

Time/Location: 3:45 pm / 134 Astronomy

Abstract: Please see here
https://physics.illinois.edu/calendar/event/12/5/2017/33270625

Visitors:
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**Visitors:**

**Physics Colloquium**

**Title:** “The Dawn of Gravitational Wave Astrophysics“

**Speaker:** Vicky Kalogera (Northwestern University)

**Date:** Wednesday, December 6

**Time/Location:** 4:00 pm / 141 Loomis

**Abstract:** In the past two years the gravitational-wave detections enabled by the LIGO detectors have launched a new field in observational astronomy allowing us to study compact object mergers involving pairs of black holes and neutron stars. I will discuss what current results reveal about compact object astrophysics, from binary black hole formation and core-collapse of massive stars to short gamma-ray bursts and nuclear matter physics. I will also highlight what we can expect in the near future as detectors sensitivity improves and multi-messenger astronomy further advances.