APS Division of Astrophysics

Electronic Newsletter 2011-2012, Part 2

March 10, 2012

In this issue

APS DAP Officers 2011-2012:

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Past Chair: Dan McCammon
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Member-at-Large: Lynn Cominsky
Member-at-Large: Rachel Bean
Member-at-Large: Amber Miller
Councilor: Neil Cornish

Questions? Comments?

Newsletter Editor:
Corbin Covault
corbin.covault@cwru.edu

April 2012 APS Meeting

Finalize your plans now to attend the April 2012 meeting held this year in Atlanta, Georgia. This year's theme is **100 Years of Cosmic Ray Physics**, a theme that resonates in several exciting areas of particular interest to the membership of the Division of Astrophysics. A number of plenary and invited sessions will feature presentations by DAP members. Here are the key details:

What: April 2012 APS Meeting

When: March 31 through April 3, 2012

Where: Hyatt Regency Hotel, Atlanta, Georgia

More: Information on Registration, Lodging, Program, etc: go to http://www.aps.org/meetings/april

Division of Astrophysics Executive Committee Elections:

Each year the Division of Astrophysics (DAP) of the APS elects new members for the open positions on the DAP executive committee. A nominating committee has been appointed by the current executive committee.The Division of Astrophysics (DAP) will be holding elections to fill vacancies for three open positions in DAP that will be selected this year. The candidates for the positions are:

- Vice-Chair (chair line):
  - John Beacom (The Ohio State University)
  - Chung-Pei Ma (University of California at Berkeley)
- Members-At-Large (two positions):
  - Thomas J Weiler (Vanderbilt University)
  - Michael L. Cherry (Louisiana State University)
  - Cole Miller (University of Maryland)
  - Julie McEnery (NASA Goddard)

As in years past, elections will be conducted *online*. Members may request a paper ballot. Every DAP member has been notified of the elections and has online access to the job descriptions and statements for each candidate. Note that the deadline for elections is **Friday, April 6, 2012**. Questions? Contact Corbin Covault by email: corbin.covault@cwru.edu.

The APS DAP Executive Committee strongly encourages Division members to participate in the 2012 election. Your vote counts. Vote today!

Annual DAP Business Meeting at April 2012 APS Meeting:

The Division of Astrophysics will hold its annual **Business Meeting** at the April APS meeting in Atlanta on **Monday, April 2 at 5:45 PM** in room Embassy D. ***All members of DAP are warmly encouraged to attend the annual business meeting.*** Please join us for discussion of issues relevant to the membership of the DAP. Newly elected APS Fellows from the DAP will be honored. Xavier Siemens will talk to us briefly about Einstein@Home. Lavish refreshments will be served. See you there.

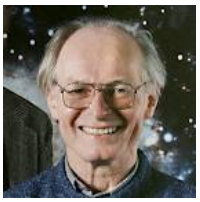
Plenary Sessions for April 2012 Meeting

The April 2012 APS meeting will feature two exciting plenary presentations on topics that are of central interest to the membership of the Division of Astrophysics. Here we highlight plenary sessions for Saturday and Monday:

100 years of Cosmic Ray Physics: Morning Plenary Session, Saturday March 31, 2012

8:30 to 10:18 AM

Sponsored by Kavli Foundation



- Alan Watson (Leeds): History of Cosmic Ray Physics
- Ellen Zweibel (Wisconsin): Plasma Physics of Cosmic Rays
- Sam Ting (MIT): AMS and Cosmic Rays

2011 Nobel Prize Plenary Session for Monday, April 2, 2012

8:30 to 10:18 AM



- Saul Perlmutter (Lawrence Berkeley National Laboratory)
- Adam Riess (Johns Hopkins University)
- Frank Wilczek (Massachusetts Institute of Technology)

April 2012 Meeting: Lunch with the Experts:

Attention DAP Graduate students: Once again, the April 2012 will feature the very popular Lunch with the Experts, scheduled for **Sunday, April 1, at 12:30 PM.** Graduate students are encouraged to **sign up for a lunch at the registration desk**. Spots will be given on a first-come first-served basis. Students will enjoy complimentary box lunch while participating in an informal discussion with an expert on a topic of interest to them. This year there are three featured experts from the DAP:

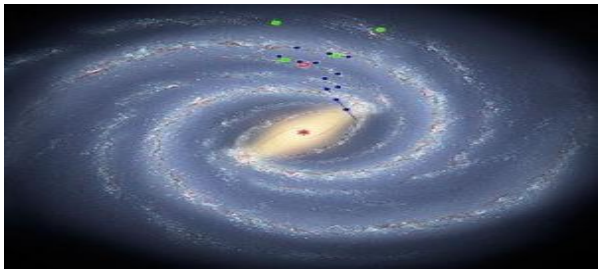
Topic:	Who:
Pulsar Timing & Gravitational Waves	Andrea Lommen (Franklin & Marshall College)
Communicating Science to the Public	Lynn Cominsky (Sonoma State University)
Is the Black Hole in our Galactic Center Really a Black Hole?	Clifford Will (Washington University)

DAP Sessions for April 2012 Meeting

The current schedule of plenary, invited, and contributed sessions sponsored or co-sponsored by DAP is tabulated in time-order below. On the following pages find the highlight descriptions of selected sections. This year's April meeting promises to be particularly exciting for members of the astrophysics and astroparticle physics and cosmology communities.

Session ID	Day Date	Start Time	Room	Title
A1	Sat Mar 31	8:30 AM	Regency Ballrm	Plenary I: Kavli Keynote Session
B3	Sat Mar 31	10:45 AM	Hanover CDE	**Invited Session: Homing in on the Galactic Center Black Hole**
B7	Sat Mar 31	10:45 AM	Embassy D	Dark Matter: Direct Searches and Theory
C3	Sat Mar 31	1:30 PM	Hanover CDE	**Invited Session: Intermediate Mass Black Holes: In Search of...**
C7	Sat Mar 31	1:30 PM	Embassy D	Neutrino Astronomy
D3	Sat Mar 31	3:30 PM	Hanover CDE	**Invited Session: Research in Cosmology Education**
D7	Sat Mar 31	3:30 PM	Embassy D	Inflation and Cosmology
D8	Sat Mar 31	3:30 PM	Embassy B	Gravitational Waves: Data Analysis
G3	Sun Apr 01	8:30 AM	Hanover CDE	**Invited Session: Toward Origins of Galactic Cosmic Rays**
G4	Sun Apr 01	8:30 AM	Intl. Ballrm North	**Invited Session: Pulsar Timing Arrays and Gravitational Radiation**
G7	Sun Apr 01	8:30 AM	Embassy D	Dark Matter: Indirect Searches
H3	Sun Apr 01	10:45 AM	Hanover CDE	**Invited Session: Toward Origins of Extra-Galactic Cosmic Rays**
H7	Sun Apr 01	10:45 AM	Embassy D	Extragalactic Astronomy and Gamma Ray Bursts
J3	Sun Apr 01	1:30 PM	Hanover CDE	**Invited Session: Cosmic Rays and Hadron Physics**
J7	Sun Apr 01	1:30 PM	Embassy D	Gamma Rays and Neutrinos in the Galaxy
L7	Sun Apr 01	3:30 PM	Embassy D	Cosmic Ray Abundances and Electron/Positron Measurements
P1	Mon Apr 02	8:30 AM	Regency Ballrm	Plenary II: Nobel Prize Session
Q3	Mon Apr 02	10:45 AM	Hanover CDE	**Invited Session: Dark Matter: Indirect Detection**
R3	Mon Apr 02	1:30 PM	Hanover CDE	**Invited Session: Testing Gravity on Cosmic Scales**
T2	Mon Apr 02	3:30 PM	Regency Ballrm V	**Invited Session: Dark Matter: Direct Detection**
T3	Mon Apr 02	3:30 PM	Hanover CDE	**Invited Session: New Stars in Astrophysics**
T7	Mon Apr 02	3:30 PM	Embassy D	Cosmic Ray Composition and Air Shower Studies
U7	Mon Apr 02	5:45 PM	Embassy D	***DAP Business Meeting and Reception***
W3	Tue Apr 03	10:45 AM	Hanover CDE	**Invited Session: Cosml. Constraints from Small-Scale CMB Anistpy.**
W7	Tue Apr 03	10:45 AM	Embassy D	Cosmic Ray Spectrum and Distribution
W9	Tue Apr 03	10:45 AM	Embassy E	Direct Dark Matter Detection
X3	Tue Apr 03	1:30 PM	Hanover CDE	**Invited Session: Hot Topics in Astrophysics**
X7	Tue Apr 03	1:30 PM	Embassy D	Neutron Stars and General Astrophysics

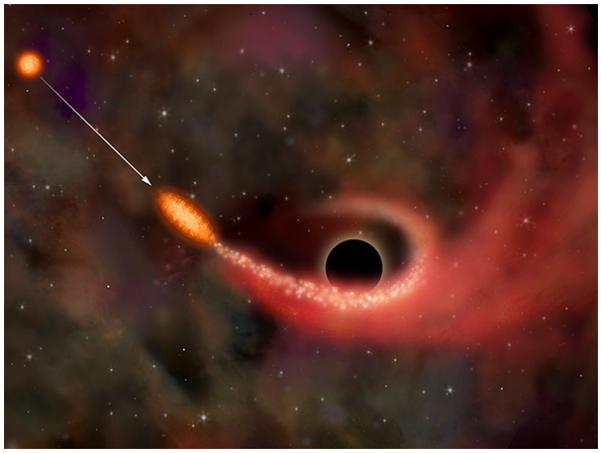
April 2012 Meeting DAP Invited Sessions Highlights: Part 1 of 4



Homing in on the Galactic Center Black Hole

Saturday, March 31, 10:45 AM

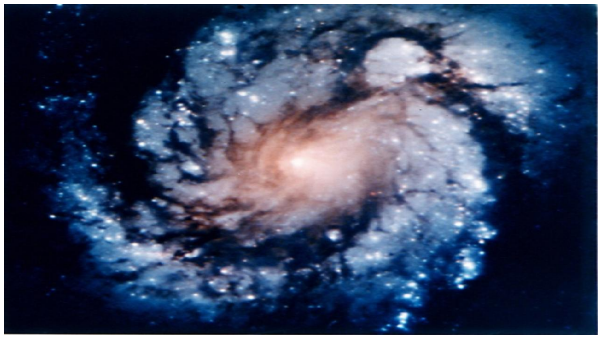
This session will take a fresh look at the observational and theoretical advancements in our understanding of the Milky Way's supermassive black hole. We will reconsider: How do we know there is a Super-Massive Black Hole at the galactic center? How does matter accrete on it? And what new techniques can be developed to image a black hole? Speakers: Mark Reid: "Evidence for a supermassive black hole at the center of the Milky Way?" Ramesh Narayan: "Accretion Mechanisms," and Avery Broderick: "Imaging Black Holes." (Image Credit: Robert Hurt, IPAC; Mark Reid, CfA, NRAO/AUI/NSF)



Intermediate Mass Black Holes: In search of the Missing Link

Saturday, March 31, 1:30 PM

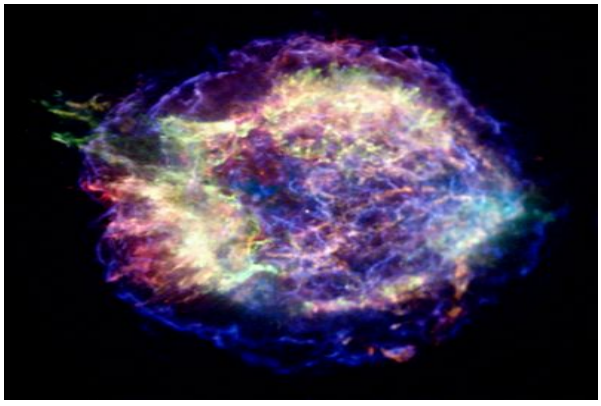
There is compelling observational evidence for the existence of stellar mass and super-massive black holes, but much less is known about systems with masses intermediate between these extremes. This session will describe the latest results in the hunt for these elusive objects, and explore the theoretical implications for galaxy formation and black hole - galaxy coevolution. Speakers: Jenny Greene: "The smallest supermassive black holes," Natalie Webb: "Evidence for IMBHs from tidal disruption events and ultra luminous X-ray sources," and Ilya Mandel: "Intermediate-mass black holes: A theoretical perspective."



Research in Cosmology Education

Saturday, March 31, 3:30 PM

Is dark energy "dying"? Is there a black hole at the center of our Universe? Or maybe our Solar System? What preconceptions do college students bring with them when they try to understand the modern cosmological paradigm? This invited session explores current educational research into student understandings of the origin, structure, composition and evolution of the Universe. Invited speakers Janelle Bailey (University of Nevada Las Vegas), Kim Coble (Chicago State University), and Ed Prather (University of Arizona) will also address strategies for improving educational effectiveness through interactive activities using real data, lecture tutorials and other active learning strategies.

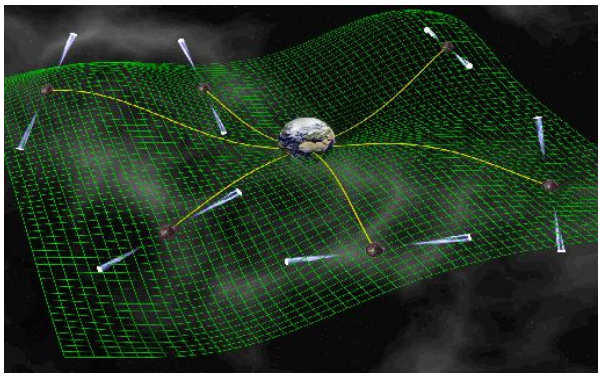


Toward an Understanding the Origins of Galactic Cosmic Rays

Sunday, April 1, 8:30 AM

This session will feature the latest results that address our understanding of the nature and sources of cosmic rays that likely originate from within our galaxy. To what extent are we moving toward finding a "smoking gun" for hadronic particle acceleration? Speakers: Mirko Boezio: "Precision Measurements of the Cosmic-Ray Composition," Stefan Funk: Gamma-ray observations of Cosmic ray accelerators," and Elena Amato, "The Origin of Galactic Cosmic Rays: Theory Confronts Observations."

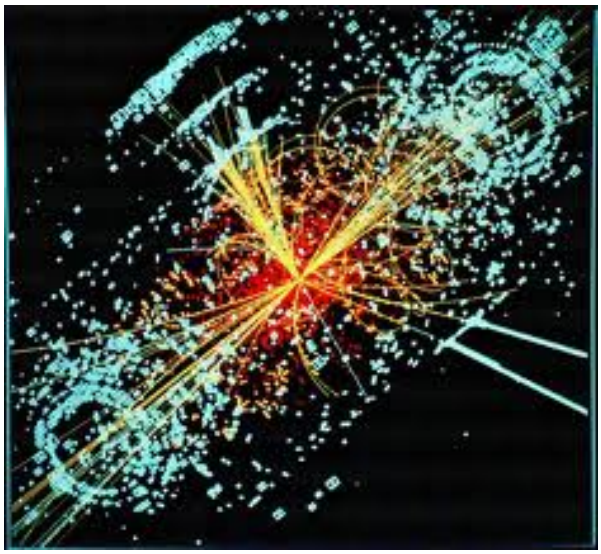
April 2012 Meeting DAP Invited Sessions Highlights: Part 2 of 4



Pulsar Timing Arrays and Gravitational Radiation

Sunday, April 1, 8:30 AM

Pulsar Timing Arrays (PTAs), which use networks of radio telescopes to monitor pulsars distributed across the sky are a promising new approach to the detection of gravitational waves in the nanohertz frequency range. This session will provide an update on the development of these arrays and their possible uses for testing gravitational theory and astrophysical models. Speakers: Andrea Lommen: "Pulsar Timing Arrays: No longer a Blunt Instrument for Gravitational Wave Detection," Zoltan Haiman: "Electromagnetic Emission from Supermassive Black Hole Binaries Resolved by Pulsar Timing Arrays," and Massimo Tinto: "Testing Alternative Theories of Gravity using Pulsar Timing Arrays."



Cosmic Rays and Hadron Physics

Sunday, April 1, 1:30 PM

Cosmic-ray experiments have amassed a vast amount of data at energies extending well above those accessible at particle accelerators. This data can provide information about hadron physics, particularly in the forward direction. Cosmic Ray studies also require input from hadron physics for many analyses, particularly those concerning the cosmic-ray composition. The purpose of this session is to bring together experts from both areas, put forth areas of common interest, and encourage future collaboration in these areas. Speakers: Lisa Gerhardt: "Cosmic Ray Muons in QCD," Klaus Werner: "Collision modelling in air showers and accelerators," and Ralph Engel: "Hadronic Physics and Air Shower Detectors."

April 2012 Meeting DAP Invited Sessions Highlights: Part 3 of 4

Toward an Understanding the Origins of Extragalactic Cosmic Rays

Sunday, April 1, 10:45 AM

This session will feature the latest results that address our understanding of the nature and sources of cosmic rays that likely originate from outside our galaxy. Results described will include a cosmic ray measurements in the intermediate energy region (from "knee to ankle") which may correspond to a transition from galactic to extra-galactic sources. We also discuss recent results from observations of the highest energy cosmic rays. Additional discussion on theoretical considerations, synthesis and interpretation, and reflections on current and future efforts using novel techniques, such as radio detection of cosmic rays

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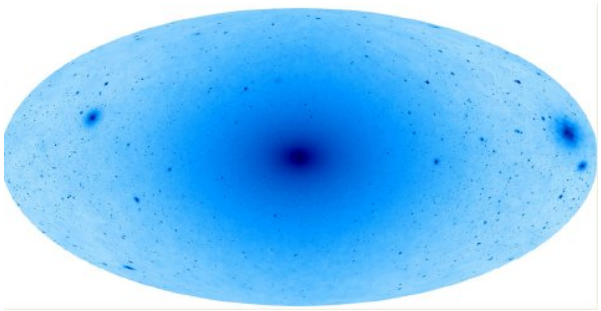


Dark Matter: Indirect Detection

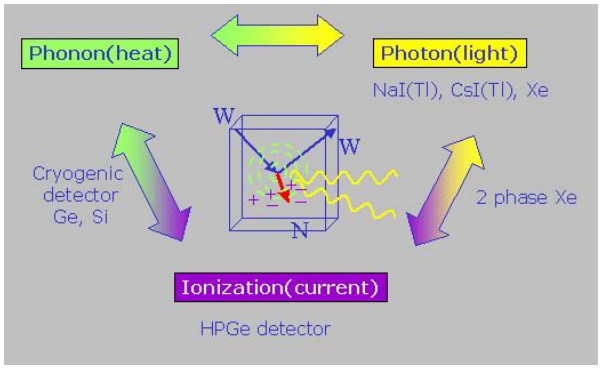
Monday, April 2, 10:45 AM

Indirect detection of dark matter relies on the concept that in some compelling scenarios, dark matter particles are weakly interactive, relatively "cold" and massive, with masses in the range of a GeV to TeV. Such particles might annihilate to produce a pair of photons with energies corresponding to those masses. Indirect searches rely on detection of such photons from astrophysical sources dominated by dark matter: most promising are clusters of galaxies, dwarf "satellite" galaxies present in the vicinity of the Milky way, and the Galactic Center itself. This session will highlight the on-going searches using observations from satellite- (Fermi Observatory) and ground-based (Cerenkov telescope) facilities covering respectively GeV and TeV ranges, and will feature a summary of theoretical implications as well as an outlook for the future searches.

Testing Gravity on Cosmic Scales

Monday, April 02, 1:30 PM

Putting general relativity to test on cosmological and astrophysical scales has become an emerging theme in astrophysics and gravity. This session will feature talks on the latest theoretical and observational developments in this field. Speakers: Bhuvnesh Jain: "Astrophysical tests of gravity," Claudia deRham: "Theoretical developments in bounding gravity in extra dimensions," and Fabian Schmidt: "N-body simulations of modified gravity models."



Dark Matter: Direct Detection

Monday, April 2, 3:30 PM

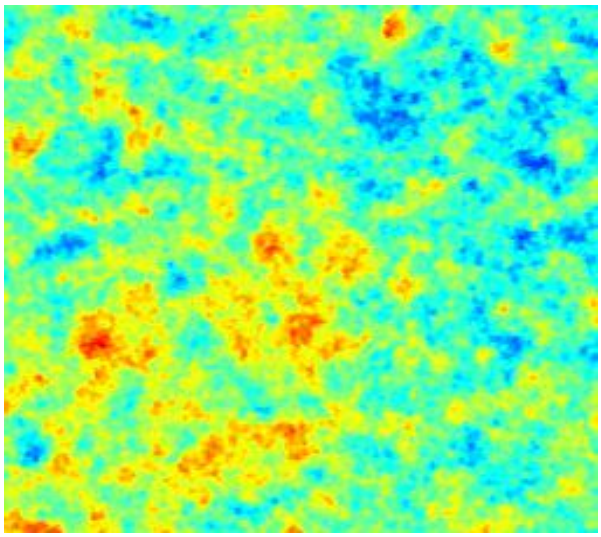
This session will feature the latest results from experiments working on direct detection of dark matter, including results from XENON100 that have suggested evidence for dark matter, as well as results from other other experiments. We will also include a talk on theoretical interpretation and synthesis and on trends and prospects for the field in the future. Speakers: Elena Aprile, Jocelyn Monroe, and Neal Weiner.

April 2012 Meeting DAP Invited Sessions Highlights: Part 4 of 4

New Stars in Astrophysics: 2012 DAP Early Career Recognition Lectures

Monday, April 2, 3:30 PM

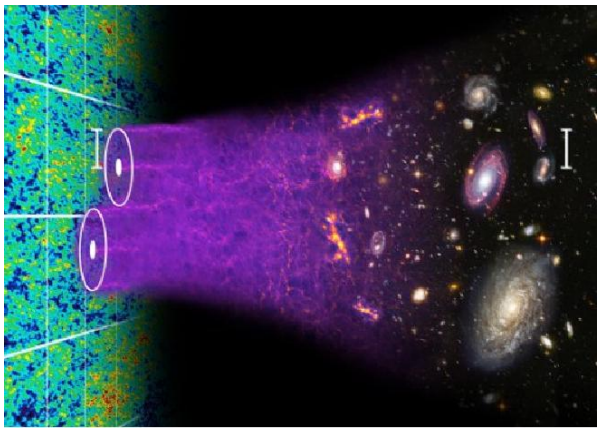
This will be a session devoted to prize-winners in Astrophysics, including the co-winners of the Bethe Prize, and winners of newly established DAP awards for young researchers. Manuel Peimbert will give the Hans A. Bethe Prize Lecture: "The Primordial Helium Abundance." Kumiko Kotera: "A quest for sources of ultrahigh energy cosmic rays," and Laura Lopez: "Uncovering the Explosions of Supernova Remnants."



Cosmological Constraints from Small-Scale CMB Anisotropy

Tuesday, April 3, 10:45 AM

Talks in this session will describe both theoretical predictions and observational results addressing questions related to cluster physics, gravitational lensing, non-Gaussianity in the CMB, and large-scale structure. With both the ACT and the SPT now rapidly producing new results, this session is timely and important. Tobias Marriage: "Latest results from the Atacama Cosmology Telescope," Bradford Benson: "Cosmological Constraints from the South Pole Telescope," and Kendrick Smith: "Non-Gaussianity in the CMB."



Hot Topics in Astrophysics

Tuesday, April 3, 1:30 PM

Hot topics provides a sampling of some of the exciting recent developments in astrophysics. This year Nikhil Padmanabhan will announce the first results from the Baryon Oscillation Spectroscopic Survey, showing a clear imprint of primordial sound waves in the distribution of galaxies. He will discuss what these measurements tell us about the properties of dark matter. Lloyd Knox will talk about the hunt for additional neutrino species, and how ongoing microwave background measurements are closing in on this elusive quarry. Michael Boylan-Kolchin will discuss some troubling discrepancies between the predictions of cold dark matter models and the observed properties of dwarf galaxies orbiting the Milky Way.