ASTROPHYSICS newsletter

The Division of Astrophysics
•
The American Physical Society
•
March 2000

DAP Business Meeting

The Annual Business Meeting of the DAP will be held on Sunday afternoon, April 30, 2000 at 5.30 PM in Room 104A of the Long Beach Convention Center. This will follow on directly after the invited paper session on recent results from CHANDRA. In addition to other business, an induction ceremony will be held for the new DAP APS Fellows (see below). In keeping with recent tradition the DAP will sponsor a Wine and Cheese reception at the business meeting.

March/April 2000 Physics in Canada: *'A Century of Canadian Physics'*

This special issue of Physics in Canada will include the following articles:

A Century of Canadian Physics: Much to Celebrate, E. Vogt

The Canadian Association of Physicists since 1945, D.D. Betts

Rutherford and His Legacy to Canada, J.M. Robson

The Life of Sir John Cunningham McLennan, C. Brown

Rasetti à Laval, J. LeTourneux

The National Research Council's Impact on Canadian Physics, P.A. Redhead

Atomic Energy in Canada: Personal Recollections of the Wartime Years, P.R. Wallace

Neutron and Other Stories from Chalk River, W.J.L. Buyers

Nuclear Physics Activities at Chalk River, J.S. Geiger and T.K. Alexander

Emergence of Physics Graduate Work in Canadian Universities: 1945-1960, M. Preston

Plus Vignettes on: Robert Bell, Lloyd Elliott, Gerhard Herzberg, Walter Kohn, George Laurence, Bennett Lewis, D.K.C. Macdonald, Bruno Pontecorvo, Arthur Schawlow, Gordon Shrum, Frederick Soddy, Richard Taylor, Harry Welsh, and Tuzo Wilson.

Abstracts for each of these articles can be found on the PiC online section of the CAP's website -

Fellowship Nominations Sought

Members of the Division of Astrophysics are invited to submit nominations for Fellowship in the APS. The number of new Fellows is limited to one-half percent of the current membership. Every year, our division nominates 6 or 7 APS members for Fellowship. If you would like to recommend a member for Fellowship, you may do so by filling out the nomination form which may be found, along with related information, at http://www.aps.org/fellowship/

Please submit nominations by May 1 to:

Executive Officer
American Physical Society
One Physics Ellipse
College Park, MD 20740-3844
ATTN: Fellowship Program

Unsuccessful nominations submitted for the first time last year will be reconsidered this year by the Fellowship Committee (though additional supporting letters would be still welcome). Beyond one year, nominations must be resubmitted.

In This Issue

New APS Fellows

The following distinguished scientists are our Division's new Fellows of the American Physical Society.

Charles L. Bennett – *"For leading the team that discovered the primordial anisotropy of the cosmic microwave background radiation with COBE data and for being the Principal Investigator for its successor, the Microwave Anisotropy Probe."*

Thomas James Bernatowicz – *"For measurements of the double beta decay of 128Te and 130Te consequent limits of <1.5 ev on the Majorana mass of the neutrino, and for key contributions to the discovery and laboratory study of ancient stardust providing new insights into grain growth in stellar outflows."*

Charles Dennison Dermer – *"For original contributions to gamma-ray astronomy and the theory of astrophysical radiation processes, and for the development of models of radiation from gamma-ray bursts, blazars, black holes, neutron stars, and the Sun."*

Marcelo Gleiser – *"In recognition of his contributions to early universe cosmology."*

Chryssa Kouveliotou – *"For outstanding discoveries and significant advances in observational high-energy astrophysics, especially in the fields of gamma-ray bursts and magnetars."*

Summer Grosby Starrfield – *"For fundamental contributions to our understanding of the cause and evolution of the nova outburst involving forefront observational and theoretical studies of these explosions."*

Christopher Stubbs – *"For the detection of gravitational microlensing in the galactic halo and for his searches for new long-range forces."*

Arthur B.C. Walker – *"For pioneering contributions to x-ray spectroscopy and imaging of the solar corona including the analysis of atomic processed in high temperature plasmas and analysis of energy balance in the transition region and corona."*

WOLF PRIZES 2000 IN PHYSICS AND MATHEMATICS, ANNOUNCED

Two Pioneers of Neutrino Astronomy, from the USA and Japan, to Share the Wolf Prize in Physics for 2000

Jerusalem - The 2000 Wolf Prize in Physics will be shared by Professor Raymond Davis Jr. of the University of Pennsylvania and the Brookhaven National Laboratory, USA, and Professor Masatoshi Koshiba, of the University of Tokyo, Japan, "for their pioneering observations of astronomical phenomena by detection of neutrinos, which created the emerging field of neutrino astronomy."

The Israel-based Wolf Foundation announced last week that the two world-renown scientists will share the $100,000 Prize. "Their observations of the elusive neutrinos of astrophysical origin have opened a new window of opportunity for the study of astronomical objects, such as the Sun and exploding stars, and the study of fundamental properties of matter," stated the Jury. Davis and Koshiba developed complementary methods that have yielded important scientific results and have inspired the development of new neutrino detection experiments.

Also, announced was that Raoul Bott, of Harvard University, Cambridge, USA, and Jean-Pierre Serre, of the College de France, Paris, will share the $100,000 Wolf Prize in Mathematics for 2000. Professor Bott, is cited for his "deep discoveries in topology and differential geometry and their applications to Lie groups, differential operators, and mathematical physics." Professor Serre, is recognized for his "many fundamental contributions to topology, algebraic geometry, algebra and number theory, and for his inspirational lectures and writing."

The 2000 Wolf Prizes will be conferred by the President of the State of Israel, Mr. Ezer Weizman, at a special ceremony, at the Knesset (parliament) in Jerusalem, on Sunday, May 21, 2000.

DAP Election 2000

It is time again to elect new officers and members-at-large for the Executive Committee. The candidates for member-at-large of the executive committee and for vice chair have provided their statements below. Please review them, and vote on the enclosed ballot! DEADLINE: April 12, 2000 ballots must be received.

For Vice Chair

Susan A. Lamb

BIOGRAPHICAL INFORMATION:
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
Susan Lamb earned her D.Phil. in Astrophysics from Oxford University in 1973 for research in solar physics. From 1973-77, she worked on the evolution of massive stars with Icko Iben as a postdoctoral fellow in the Astronomy Department at the University of Illinois at Urbana-Champaign and at the Institute of Astronomy in Cambridge. She continued this work as a faculty member in the Department of Astronomy at UCLA and then moved to the Department of Physics at the University of Missouri at St. Louis in 1978. In 1977 she initiated a program of optical and UV observations of massive stars, to collect data with which to compare large-scale supercomputer calculations of the evolution of massive stars, and in 1978 she became a Visiting Staff Member at Los Alamos National Laboratory. Since 1980, Lamb has been a faculty member in the Physics and the Astronomy Departments at the University of Illinois at Urbana-Champaign. In 1985, she was awarded a National Research Council Senior Fellowship to carry out research at NASA-Ames Research Center and in 1993 she was a Visiting Scientist at NORDITA and the Neils Bohr Institute in Copenhagen. Her research interests now include not only massive stars and their environments, but also disk and irregular galaxies, large-scale star formation (particularly in colliding galaxies), the fueling of AGN, and the role of galaxy interactions and mergers in structure formation and the evolution of galaxies. Her work involves both numerical studies using supercomputers and collaborations with others to obtain and interpret multi-wavelength observations. Lamb has co-organized international conferences and workshops on the fueling of AGN, global star formation, and collisions of galaxies, and has served on review panels for both NASA and NSF. She is currently one of the two managing editors of the journal Astrophysics and Space Science (Kluwer). Her home page is at http://www.astro.uiuc.edu/collide/

CANDIDATE STATEMENT:
The Division of Astrophysics can be a vital contributor to the health of the physics community by helping to publicize the very exciting results currently being obtained using both ground- and space-based astronomical observatories, and the theoretical and computational breakthroughs that are being achieved. The media are eager to place this new information before an interested public, and the DAP, in cooperation with other organizations such as the AAS and NASA, can help by supplying accurate information, supporting the generation of attractive graphics and animations, and providing suitable explanations. I consider the recruitment of well-qualified undergraduate students into physics and astrophysics to be of the highest importance. I support outreach efforts designed to kindle interest in astrophysics among high school students and science and engineering undergraduates, and to encourage capable students from diverse, currently underrepresented backgrounds to pursue graduate work and careers in astrophysics. This encouragement must be accompanied by a continuing effort to improve the health of both astrophysics and the larger physics community by providing jobs opportunities and adequate funding. This will involve us in lobbying and in planning and executing programs of the highest quality at our meetings. As in the past, sessions of invited speakers should be designed to provide overviews of exciting areas of astrophysics that will be of interest to physicists in other sub-disciplines (e.g., gravitational, computational, nuclear, and particle physicists). Invited speakers, who are attending the meeting, thereby attract a broader segment of the physics community to become involved in work on the exciting questions of our field.

Robert Rosner

BIOGRAPHICAL INFORMATION:
Chair, NRC/NAS Committee on Solar Physics (1987-89); NAS Committee on Plasma Science (1989-1991); Chair, NAS/Astronomy Survey Committee Solar Physics Panel (1989-1991); AAS/SPD Executive Committee (1989-1992); UCAR/NCAR Scientific Programs Evaluation Committee [SPEC] (1990-91); APS/Astrophysics Division Executive Committee (1990-1992); Member, Visiting Committee, Harvard-Smithsonian CfA (1993-1998); Chair, Visiting Committee, Harvard-Smithsonian CfA (1995); Trustee, Adler Planetarium, Chicago, IL (1990-1998); Member-at-large, AURA Board (1994-97); Member, AURA Board of Directors (1997-9); Member, NAS/ BPA/Committee on Astronomy & Astrophysics "McCray" Panel (1994); Chair, Nominating Committee, Astrophysics Division, APS (1994-5); Member, NAS Committee on Astronomy & Astrophysics (1996-8); Member, NASA Information Systems and Science Operations Working Group (1996-1998); Member, NAS "Solar Physics from Ground" ("Parker") Committee (1997-8); Chairman, Theory Panel of NAS/NRC Fusion Science Assessment Committee (1999-present); Member, NAS/NRC Committee on Plasma Sciences (1999-present); Member, HAO/NCAR Scientific Advisory Committee (1999-present).

CANDIDATE STATEMENT:
Astrophysics is one of the most vibrant areas of physics today. As such, it is essential that our field have a strong presence within the APS. Among other things, this means that our Division should represent all of astrophysics, and not specialized subdisciplines within it. This has been long recognized; and over the past two decades, substantial efforts have been made to bring a more representative cross-section of astrophysics into our Division. However, much remains to be done since the centrifugal attractions, principally from

the AAS and other professional societies, are large; it is essential to continue active recruitment to our Division. One of the most successful methods for highlighting our Division's activities, both within and outside the APS, is its sponsorship of major topical sessions, focussing on the most exciting areas in astrophysics. This is an activity that I would be particularly interested in further developing. I would also be especially interested in collaboration with the AAS in joint sponsorship of topical meetings.

For Member-at-Large

John Blondin

BIOGRAPHICAL INFORMATION:
John Blondin received his Ph.D. from the University of Chicago in 1987. He subsequently held postdoctoral positions at NASA / GSFC, University of Virginia, and University of North Carolina. In 1993 he joined the Department of Physics at North Carolina State University, where he currently holds the position of Associate Professor. His research in computational astrophysics spans many areas of astronomy, including supernova remnants, core-collapse supernovae, interacting binary stars, star formation and stellar jets, stellar winds and planetary nebulae.

CANDIDATE STATEMENT:
The DAP serves a unique role in the astrophysics community by providing a direct link with the larger community of physicists. There are numerous exciting examples of interdisciplinary connections between astrophysics and other sub-fields of physics, including neutrino observatories, the highest-energy cosmic rays, high-powered laser experiments, and the acceleration of the Universe. Additionally, astrophysics serves the larger scientific community through the public's affinity for astronomy. The exciting discoveries in astronomy serve to garner the attention of the general public and politicians, creating broad support for science. The DAP should continue to foster these roles in the physics community through high-quality, interdisciplinary sessions at meetings, broad outreach to the public and schools, rapid communication with legislative offices, and by maintaining a strong voice within the APS.

Richard Mewaldt

BIOGRAPHICAL INFORMATION:
Richard Mewaldt received a Ph.D. in Physics from Washington University in St. Louis in 1971. Since that time he has been with the Space Radiation Laboratory at Caltech, where he is presently a Senior Research Associate in Physics. His research interests include cosmic ray astrophysics, and solar, heliospheric, and magnetospheric physics, focussing on studies of the elemental and isotopic composition of energetic particles in space. He has been an investigator on the NASA missions IMP-7&8, ISEE-3, SAMPEX, ACE, and STEREO, as well as several balloon-borne instruments.

CANDIDATE STATEMENT:
In my opinion the most important role of the DAP is to further communication - communication among our members, with the broader physics community, and with the public. Our primary means of encouraging this is through the planning of meetings that highlight exciting new discoveries and developments in astrophysics. In order to reach a broader audience and attract greater participation, I would strive to develop special sessions that focus on interdisciplinary topics such as the recent enthusiasm for studying fundamental physics in space.

Joel Primack

BIOGRAPHICAL INFORMATION:
AB Princeton '66, PhD Stanford '70, Junior Fellow Harvard 1970-73, UCSC 1973-present. After earlier research in particle theory, I have been working mainly in cosmology and astrophysics since about 1980. I am one of the main originators and developers of the theory of cold dark matter and its many variants, and more recently I have worked on many aspects of galaxy formation and structure, and on the extragalactic background light and high energy gamma ray absorption. I was director of the 1986 Theoretical Advanced Study Institute on Elementary Particle Physics and Cosmology (TASI-86) at UCSC, and co-director of the 1995 Enrico Fermi school on Cosmology in Varenna. I served on the Program Advisory Committee of the Center for Particle Astrophysics 1990-94, I helped to organize the 1994 Snowmass meeting on Particle and Nuclear Astrophysics and Cosmology, and I currently serve on the DOE-NSF SAGENAP advisory committee. I have been active in outreach activities; for example, I was a scientific advisor on the IMAX movie "Cosmic Voyage", which was made by the Smithsonian National Air and Space Museum, and I was co-organizer of the 1999 public conference "Cosmic Questions" at the Smithsonian National Museum of Natural History. I also helped to start the APS-AAAS Congressional Science Fellow Program and other programs to expand the use of science in policymaking throughout government, and I directed the Federation of American Scientists project on Protecting the Space Environment. I am a Fellow of APS and AAAS.

CANDIDATE STATEMENT:
The tremendous vitality of astrophysics today is leading to increased interest by the larger physics community and increased support from DOE. But the NASA Space Science budget had a serious shortfall last year, and the NSF Astronomy and Physics budgets are chronically underfunded, leading to such a low fraction of supported proposals that many active researchers have to spend an inordinate amount of time seeking funding. I think it is extremely important for the Division of Astrophysics to promote increased public understanding of our exciting field — especially since a large part of the public is eager to understand more about the universe. We also need to work to improve the quality of education about astronomy and cosmology in primary and secondary school. In particular, we need to combat the effort, for example by the Kansas School Board, to remove cosmology — as well as geology and evolutionary biology — from the school curriculum. Like the experimental sciences, these "historical sciences" develop theories that are tested by the success of their predictions concerning new knowledge. It is important for people to appreciate that the science is now allowing us to obtain reliable knowledge about the past, including the history of stars, galaxies, and the entire universe.

Program for DAP April 2000

Virginia Trimble, Chair-Elect

Saturday, 29 April. 11 AM - 2PM

Origin of Cosmic Magnetic Fields

Organizer: Amitava Bhattacharjee (for TGPAP), Virginia Trimble (for DAP)

Speakers:

Angela Olinto (University of Chicago) Cosmological Magnetic Fields

Philipp Kronberg (University of Toronto) Galactic and Intergalactic Fields SinceRecombination: Their Origins and Recent Results FromProbing Them

Carl Heiles (University of California, Berkeley) The Magnetic Field in the Milky Way Galaxy

Amitava Bhattacharjee (University of Iowa) Magnetic Reconnection and the Dynamo Effect

Russell Kulsrud (Princeton University) Where Do We Stand on the Origin of Cosmic Magnetic Fields?

Saturday, 29 April. 2:30 - 5:30 PM

Engine of Gamma Ray Bursters

Organizers: Clifford Will (for TGGR), Charles Dermer & Peter Meszaros (for DAP)

Speakers:

Chryssa Kouveliotou (USRA at NASA/MSFC) Recent Developments in Gamma-Ray Burst Research

Stan Woosley (UCSC) Collapsars, Gamma-Ray Bursts, and Supernovae

Maximilian Ruffert (University of Edingburgh) Merging Netron Star - Black Hole Binaries

Wai-Mo Suen (Washington University) Numerical Relativity and Neutron Star Mergers

Lee Samuel Finn (Penn State) Detecting Gravitational Radiation from Gamma-Ray Burst Sources

Sunday, 30 April. 11 AM - 2 PM

Cosmic Rays: Probing the Extremes

Organizers: Michael Cherry, Gaurang Yodh

Speakers:

Brenda Dingus (University of Wisconsin) Gamma Ray Bursts at TeV Energies

James Buckley (Washington University) Supernova Remnant Origins of Cosmic Rays at 10s of TeV and Above

James Matthews (Louisiana State) Maximum Rigidity and the Composition of Cosmic Rays above 1 PeV

Charles Jui – (University of Utah) Extremely High Energy Cosmic Rays

Jonathan Ormes (NASA / GSFC) What can Antimatter, Gamma Rays and X-rays say about the Origin of Cosmic Rays?

Sunday, 30 April. 2:30 PM - 5:30PM

First Results from the Chandra X-ray Telescope

Organizer: Harvey Tananbaum

Speakers:

Martin Weisskopf (NASA / MSFC) The Chandra X-ray Observatory,

Leon van Speybroeck (Harvard-Smithsonian Center for Astrophysics) Chandra Observatory Mirror Performance and Sample Galaxy Cluster Results

Steve Murray (Harvard-Smithsonian Center for Astrophysics) Chandra High Resolution Camera - On-orbit Performance and Early GTO Results

Gordon Garmire (Penn State) Early Results from the Chandra-Xray Observatory obtained with the Advanced CCD Imaging Spectrometer

A. C. Brinkman (Space Research Organization of The Netherlands (SRON)) Early Results of the Low Energy Transmission Grating

---

Member-at-Large Canidates continued

Mel Ulmer

BIOGRAPHICAL INFORMATION:

Short biographical sketch of Mel Ulmer, Professor of Physics and Astronomy at Northwestern University: I began work in X-ray astronomy in 1966 at the University of Wisconsin. After receiving a Ph.D. in Physics from the Univ. of Wisconsin in 1970, I spent 4 years at the Univ. of California, San Diego, and then 2 years at the Harvard-Smithsonian Center for Astrophysics before coming to Northwestern University in 1976. Since coming to Northwestern Univ. I have analyzed data from various satellite missions including HEAO's 1 through 3, SAS-3, SMM, ROSAT, CGRO, and ASCA. I am currently the Principal Investigator of the X-ray Mirror Program at Northwestern, which includes being a member of the Hard X-ray Telescope on Con X. I am a Co-Investigator of NASA's Compton Gamma Ray Observatory Oriented Scintillation Spectrometer Experiment. I have been director of the Astrophysics program at Northwestern since 1982. I am a Fellow of the APS and have published over 200 articles in journals or conference proceedings.

CANDIDATE STATEMENT:

The DAP has a dual obligation to continue to convey the excitement of astrophysics to the physics community at large as well as to the public. As member of the DAP executive committee, I will help organize programs for the APS meeting and will help encourage public talks related to these meeting. At least one way this can be done is to encourage members who are attending the APS meeting to volunteer to give talks on astronomy to alumni groups who are associated with their parent educational institution. This depends on the relevant alumni association having a good and active group that is close to the meeting site. Attempts to give such talks will not meet with uniform success. Nevertheless, if all DAP attendees try, we should be able to marshal a few public talks per meeting in locations that have significant population densities.

Spectrometer on Board Chandra

Claud Canizares(Massachusetts Institute of Technology Center for Space Research) - First Results from the Chandra High Energy Transmission Grating Spectrometer

Monday, 1 May. 11 AM - 2 PM

Triumphs of 20th Century Astrophysics

Speakers:

Charley Lineweaver (Univ. New South Wales, Australia): How We Know there was a Big Bang?

Judith Lean (Naval Research Laboratory, Washington DC): What We Know (and Don't Know) about the Sun's Influence on the Earth

Roger Ulrich (UCLA): How We Know the Stars Run on Nuclear Energy

Michael Turner (Univ. of Chicago): How We Know What the Universe Is Made Of.

Sterl Phinney (CALTECH): How We Know there are Black Holes in Quasars

Tuesday, 2 May. 8 - 11 AM

The Women of Stellar Astrophysics

Organizers: Beverly Berger for CSWP, Virginia Trimble for DAP

Speakers:

C. Megan Urry (STScI): Stellar Astronomy Today

Dorrit Hoffleit (Yale): Fleming, Cannon, and the Classification of Stars

Katherine Gaposchkin Haramundanis (Compaq Computer Corporation): Cecilia Payne Gaposchkin and the Composition of the Stars

Martha Hazen (Center for Astrophysics, Harvard): The Unsung Heroines, 1935-1965

Barbara Anthony-Twarog (Univ. of Kansas): Beatrice Tinsley and the Assembling of Stars into Galaxies

Contributed talks and posters on these and other topics in Astrophysics are much desired. Graduate students reporting for the first time on their thesis work will be given a double time slot (roughly 20 minutes rather than 10).

DAP Executive Committee and Officers 1999

Chair ..... Trevor Weekes
Chair-Elect ..... Virginia Trimble
Vice Chair ..... Charles Dermer
Past Chair ..... Jonathan Grindlay
Secretary/Treasurer ..... Neil Gehrels
Division Councilor ..... Stephen Holt

Executive Committee Members (1999) . Patricia Boyd
Executive Committee Members (1999) . Gerald Fishman

Executive Committee Members (2000) . Michael Cherry
Executive Committee Members (2000) . C. Megan Urry

NAME	EMAIL	PHONE	FAX
Patricia Boyd	padi@dragons.gsfc.nasa.gov	(301) 286-2550	(301) 286-1684
Mike Cherry	cherry@phunds.phys.lsu.edu	(225) 388-8591	(301) 388-1222
Chuck Dermer	dermer@osse.nrl.navy.mil	(202) 767-2965	(301) 767-6473
Jerry Fishman	fishman@ssl.msfc.nasa.gov	(205) 544-7691	(205) 544-5800
Neil Gehrels	gehrels@gsfc.nasa.gov	(301) 286-6546	(301) 286-0677
Josh Grindlay	jgrindlay@cfa.harvard.edu	(617) 495-7204	(617) 495-7356
Stephen S. Holt	holt@lheavx.gsfc.nasa.gov	(301) 286-6066	(301) 286-1772
Virginia Trimble	vtrimble@uci.edu	(714) 824-6948	(714) 824-2174
Meg Urry	cmu@stsci.edu	(410) 338-4593	(410) 338-4767
Trevor Weekes	tweekes@cfa.harvard.edu	(602) 670-5726	(602) 670-5713