

Solar Physics Division of the American Astronomical Society

Annual Report: 2014-2015

Dana Longcope, SPD Chair

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The Solar Physics Division of the American Astronomical Society works to advance the study of the Sun and to promote the coordination of solar research with other branches of science.

Sunspot Cycle 24 appears to have passed its maximum. This cycle, like several before, has shown two distinct peaks in activity indices, such as sunspot number. This first occurred in 2012 when the Sun's northern hemisphere reached its peak activity. The southern hemisphere, however, appears to be lagging by about two years, and reached its peak some time in the middle of 2014. Between February 2011 and February 2015 there were at least 559 M-flares and 43 X-flares.

A number of highlights are worthy of note from the past year:

- The Solar Dynamic Observatory (SDO) is continuing to provide unprecedented high quality, high resolution data, and is celebrating five years in orbit. SDO provides near real time alerts of flares and initiations of coronal mass ejections (CMEs), as well as tracking of coronal holes and projections of their associated high-speed solar wind streams.
- NASA's STEREO mission consists of two spacecraft, launched in 2006 into solar orbits, one ahead of and the other behind the Earth's, in order to provide a 360° view of the Sun, its wind, and eruptions. Their orbits have taken them inexorably to the opposite side of the sun (superior solar conjunction). From there they cannot communicate with Earth and so were switched to "safe mode" as of March 2015. An anomaly experienced by one craft just before entering safe mode raises some doubt about its current status. They will both emerge from conjunction and at least one, but hopefully both, will re-establish communication in July 2015.
- Solar Physicists are becoming more adept at bringing an ever broadening range of observational data to bear on answering basic questions. This becomes more challenging and more important with the increasing number of spacecraft and ground-based observatories. This trend was exemplified when a very large flare on March 29, 2014 became the latest record holder for "the best-observed flare of all time." According to the NASA press release of May 7, 2014, the flare was observed by four NASA spacecraft and one ground-based telescope. It is already on pace to become the most well-analyzed flare, with at least five papers devoted to it in its first year.
- The Advanced Technology Solar Telescope was renamed in honor of Hawaii Senator Daniel K. Inouye. The official name of the facility is now the Daniel K. Inouye Solar Telescope (DKIST). Construction of the DKIST continues apace atop Haleakelaa on Maui, HI. To date the telescope structure has been

completed up to the base of the enclosure ring. DKIST staff has continued moving to its new headquarters in Boulder, CO.

- The new Heliophysics Division Director at NASA HQ is Mr. Steven Clarke,
- HAO announced Dr. Scott McIntosh its new director

As of April 2015, the SPD membership is now 452 active members, of which 45 are Division Affiliates from other scientific organizations. This represents an 8% drop from membership reported in 2014, whose cause is still unclear. It could be an artifact of earlier reporting necessitated by a committee meeting held earlier than usual. Or it could represent genuine attrition from the field. We will revisit the question next year when the reporting date will have returned to normal (late May).

The 2015 meeting of the SPD was held in conjunction with the Space Physics and Aeronomy (SPA) section of the AGU. This was the first of a series of joint meetings intended to be held every third year and named the Triennial Earth-Sun Summit (TESS). The meeting was held in Indianapolis, IN, April 26-30. 320 abstracts were submitted, of which 56% were in traditionally Solar Physics areas and 22% were in areas of common interest with the SPA. 174 abstracts (54%) requested an oral presentation. By using 3 parallel streams virtually every request was granted a 15-minute slot. Obvious overlap between session topics was avoided as much as possible. This was largely achieved, at least based on informal discussions with attendees. The meeting attendance was about 300.

The 2016 SPD meeting will be a stand-alone meeting held in Boulder Colorado, May 31 – June 4, and hosted by the National Solar Observatory (NSO) at its new headquarters location in the campus of the University of Colorado. For its 2017 meeting the SPD has committed to a back-to-back meeting with the High Energy Astrophysics Division in Jackson Hole, Wyoming around the total solar eclipse Aug. 21, 2017. The 2018 meeting will be the second TESS meeting, held jointly with AGU/SPA.

The SPD bestows annual prize lectures. The 2015 Hale prize, for outstanding contributions to the field of solar astronomy, was awarded to George Doschek “for his pioneering work in solar spectroscopy, in particular for his important insights into the interpretation and analysis of solar spectral observations, and his leadership as US principal investigator of the Yohkoh Bragg Crystal Spectrometer and Hinode Extreme Ultraviolet Imaging Spectrometer instruments.” George delivered a 50-minute talk entitled “An X-ray-EUV Spectroscopic View of the Solar Atmosphere” on April 28, 2015 at the TESS meeting. The 2015 Karen Harvey prize, which recognizes a significant contribution to the study of the Sun early in a person’s professional career, was awarded to Jonathan Cirtain "For his major contributions to the development of the next generation of solar instrumentation and his studies of the role of magnetic reconnection in the heating of the solar corona." Jonathan delivered a 50-minute talk entitled “Advances in the understanding of coronal energy release mechanisms” to the on April 30, 2015 at the TESS meeting.

During their 2015 meeting the SPD committee voted to double the cash award for each prize to \$2,000.

The SPD was led during the 2014-2015 interval by Leon Golub, chair, and vice-chair Dana Longcope. The other officers are Yuhong Fan, secretary, and David McKenzie, treasurer. The SPD committee members are David Alexander (past-chair), Brian Welsch, Stephen White, Mark Cheung and Gordon Emslie. The committee met in person at the TESS meeting in Indianapolis on April 25, 2015, and conducted business via email throughout the year. Most of the work of the SPD is accomplished by committees. The SPD is grateful for their efforts. More detailed information about committees, activities, and history of the division can be found at the SPD's website: <http://spd.aas.org>. In April 2015 elections were held for Secretary and SPD Committee, with Aimee Norton (Stanford) elected as Secretary, and Stephen Bradshaw (Rice University) and Sabrina Savage (NASA/MSFC) elected to the Committee.

The Nominating Committee submits nominations to the SPD Secretary for vacancies in the positions of Officers and Committee-persons. The Nominating Committee ascertains the willingness of its nominees to serve if elected. It is currently chaired by Amy Weinbarger and includes Kathy Reeves and Steven Cranmer.

The Prize committee selects the recipients of the Hale and Harvey Prizes. Members of the committee were led by Toni Galvin (Chair), and included Doug Braun, K. D. Leka, Mark Linton and Bart DePontieu. Beginning 2015 Mark Linton will assume the role of chair and Toni Galvin and Bart DePontieu will be replaced by Sarah Gibson and Haimin Wang.

Popular writing awards are presented to authors of popular or semi-popular articles on the Sun or the effects of the Sun on the Earth's environment. One award is typically made to a scientist author and the other is made to a science writer/journalist. This year an award was made only in the first category. The award was given to J. Kelly Smith and David L. Smith for their article "Discovering the Radio Sun" in the October 2014 issue of *Sky & Telescope* Magazine.

The SPD Student Committee serves as an advocate for student-related issues and provides advice to the SPD community with the goal of fostering a healthy growth in student participation in Solar Physics and the development of these students into solar scientists. The SPD Student Committee members are Gordon Emslie (Chair), Kathy Reeves and Matthias Rempel. Since the late 1970s, the SPD has presented a number of awards annually to outstanding undergraduate and graduate students who are interested in pursuing a career in solar physics. During their 2015 meeting the SPD committee voted to increase to the total amount allocated to these awards to \$10,000.

Adopting a suggestion from the 2014 AAS leadership meeting, the SPD committee created an award to offset costs (up to \$400) of family care for members attending the annual SPD meeting. In its inaugural year there was one applicant. The award was created and announced late in the year (December 2014), which could have led to low visibility. It is hoped that the applications will increase as the award becomes more widely known. The SPD committee voted to open the opportunity to travel to the 2015 Meeting on Inclusive Astronomy in Nashville, TN.

During its meeting in Indianapolis, the SPD committee discussed the need for increased diversity in Solar Physics. Toward this end they voted to a number of minority graduate student fellowships of \$2,500 per year.

The Thomas Metcalf SPD Travel Fund was established in 2007 to help support travel costs of recent PhDs and advanced graduate students in order to enable them to participate in a meeting relevant to solar physics. Awardees are selected based on their potential for future contributions to the field of solar physics. Recipients are expected to present results relevant to their thesis or current work in solar physics. Over the past year awards were made to three recent PhDs, for two different conferences: one award for the LWS/SDO/Hinode/IRIS/VAP Workshop in Portland, OR, and two for the IAU Symposium 305 on Astrophysical Polarimetry in Costa Rica. Four meetings in the upcoming year have already been selected to which the Metcalf fund will make awards. The Metcalf Travel Fund committee is chaired by Todd Hoeksema with members Marc DeRosa, Mark Miesch and Kathy Reeves.

The Public Policy committee is current chaired by A. Gordon Emslie. The committee made a visit to Capitol Hill in April 2015. This was more focused than past years, 6 offices of congressmen on committees with direct influence over Solar and Space Physics funding.

The SPD press officer is Craig DeForest, and the committee responsible for the SPD website is chaired by Joe Gurman with assistance from Rick Bogart, Steven Cranmer, David McKenzie and Angelos Vourlidas.

The SPD's electronic newsletter, SolarNews, is distributed semimonthly to the worldwide solar physics community. It provides the disciplines' premier global means for communicating news and information. Archives are available at <http://solarnews.nso.edu>. Since 2009, SolarNews has a direct news exchange with the UK Solar Physics newsletter. SolarNews is prepared and edited by the SPD secretary, Yuhong Fan, who finished her final term in 2015. The new secretary will be Aimee Norton.