

## **AIA and HMI E/PO Report**

*Deborah Scherrer*

*For period 1-30 April 2004*

### **1. Collaboration with the Challenger Centers (SAO)**

*Background:* The High Energy Astrophysics Division (HEAD) and the Science Education Department (SED) at the Smithsonian Astrophysical Observatory (SAO) have designed and will direct the development and implementation of an innovative E/PO program that is national in scope, aligned with all pertinent space science education standards, and embedded in the existing partnership between the SED and more than 50 Challenger Learning Centers (CLCs) across the country. They are partnering with the Christa McAuliffe CLC (MCLC) at Framingham (MA) State College to design a Sun-Earth mission scenario for use as the centerpiece in each of the CLCs simulators. The simulation experience, and the science embedded within, will be accessible to both students and general audiences. Collectively CLCs annually host more than 500,000 upper elementary and middle school students and more than 20,000 classroom teachers. They will work closely with the Challenger Center for Space Science Education in Alexandria, VA (CCSSE) during the design, development, and dissemination of the scenario, with special emphasis on creating a simulation specifically for the CCSSE's new mission platform for each work station. The Astronauts Memorial Foundation (AMF) at the Kennedy Space Center (KSC) strongly supports this E/PO project and will make information about it available to its constituents.

Bruce Ward and Ed DeLuca of SAO, who designed the program, have sent the resulting plan and draft budget to Drs. Thompson and St. Cyr. At the LWS workshop copies were also distributed to Ms. Drobnes and the SDO EPO instrument leads. Bruce is also working on converting the proposal to a form consistent with the guidelines distributed by Dr. Morrow after the SDO workshop.

The proposed effort is only possible with the addition of funds in excess of that which has been distributed to the instrument teams. Alternate funding options are being explored.

*April Report:* Bruce Ward has converted the proposal into a form consistent with the new NASA guidelines and has had numerous discussions with the staff at the Christa McAuliffe CLC about the proposed effort.

During the coming months we would like to meet with Emilie and other SDO and LWS EPO personnel to review the proposed effort and address any concerns that may arise. We can arrange for the NASA people to visit the Arlington CLC and view a simulation.

### **2. Science Fellow Service Learning Program ( Partnership with Stanford's Haas Center and with Montana State)**

The Stanford Science Fellows continue their weekly science sessions at 3 sites of the Boys and Girls Club of the Peninsula. Under Kelly Beck's leadership and guidance, each session is jointly planned by the team, based upon activities and experiments known to be effective and with resources provided through the contract. The outreach arm of the program has only 2 more weeks before completion. The Science Fellows are planning a final event – a trip to Stanford for all 70-80 of the B&G Club members who participated in the science program. Included will be a tour of the Wilcox Solar Observatory, where they will see how the telescope works and also experiment with an assortment of sun-related activities.

Our Science Fellow e-zine/blog coordinator, Liz Phillips, has interviewed her first target -- Laurent Gizon, a solar physicist in the Solar Observatories Group at Stanford. The article she has written based on this interview will form the core for the first "issue" of the *Astronomy Edge*, Liz's title for the ezine. Initial publication is scheduled for May. John Beck continues to offer excellent mentoring for Liz.

The Science Fellow program at Montana continues, with web-based facilities available to allow community sites to request visits from the Fellows. In addition, Dave McKenzie continues to work with Eric Brunzell, of Space Education Initiatives, to develop an effective assessment/evaluation plan for the project.

3. **Solar Planetarium Program** (*Stanford, jointly funded by NASA's LWS program & in collaboration with NSF's CISM Project*)

The NASA funds for this joint activity between HMI, AIA, NASA's Living with a Star program, the Lawrence Hall of Science, and with collaboration from Rice University and NSF's CISM Project, have finally been secured. We can now move forward with development of a solar planetarium program for small, interactive planetaria. Given the availability of new technology, this program will include imagery for full-dome projection. We are also expecting the program to include imagery from the Solar Max IMAX movie, currently being negotiated by Rice University. A teleconference is scheduled for April 24 to work on development of a storyboard.

4. **Solar Sudden Ionospheric Disturbance Monitor (SID) Project** (*jointly funded by NSF's CISM program*)

A beta SID monitor has been arranged for, and is being installed at, Castro Valley High School, a nearby school in the Bay Area. Ray Mitchell, our primary SID Teacher Intern, is supervising the installation. Ray also continues to work with the Cal State Hayward graduate students to develop data acquisition software and to explore options for mass-producing the monitors.

The research-quality monitor, AWESOME, is nearing completion and our students have researched companies available to manufacture the box and circuits. We've made arrangements with Umran Inan, of Stanford's EE Department, to have the EE grad students continue, at lower levels, working with AWESOME through the

summer and some of next school year, to help with installation at beta sites, develop documentation, and to be available to trouble-shoot during the beta period.

Shannon Lee, our student from Chabot College, has collected the existing SID data, organized it, and done an initial analysis. The monitors show consistent ability to capture flares of C-2 strength and higher, and their data have an excellent correlation with flares detected by the GOES satellite. What is of interest are a few “flares” caught by our SID monitors that are not detected by GOES. Shannon will be investigated what may be causing these.

## 5. Partnerships with Local Science Museums

- *The Tech Museum, San Jose, CA*  
Stanford staff met with representatives from The Tech Museum in San Jose and Chabot College science personnel to explore a potential 3-way partnership. An arrangement looks promising. We agreed to explore working solar science, and especially the SID project, into The Tech’s “Design Challenge” technology model, helping students and the public understand the function and role of technology in our modern society. Our plan is to start by having both Chabot College and The Tech become beta sites for our new research-quality AWESOME ionospheric disturbance monitors this summer.

John Beck and Paul Mortfield, of Stanford, were invited to give a day-long presentation at The Tech’s Earth Day Celebration on April 24. They provided visitors opportunities to view the Sun in h-alpha, play with a SunSpotter, take home some posters, and experiment with UV beads.

- *Chabot Space and Science Center, Oakland, CA*  
Stanford arranged for the 4H Astronomy Project members to set up a display at Chabot on Astronomy Day, April 24. Members distributed about 300 posters to the public, demonstrated their constellation models, and directed experiments with UV beads. Best of all, the Astronomy Project kids went away with a very positive experience of being the “experts” in communicate astronomy to the public. We are indebted to Ben Burress at Chabot for providing these kids with this wonderful opportunity.

We are also exploring with Chabot some joint work on archaeoastronomy, in line with NASA’s E/PO theme for 2005. Chabot is planning archaeoastronomy summer teacher workshops and activity guides. Linda Block, a 5<sup>th</sup> grade teacher at Independent (public) School in Castro Valley is working closely, on a volunteer basis, with Ben Burress of Chabot to design, develop, present and assess the workshops. Stanford is looking into providing support on the solar science aspects, and other resources, to enhance the workshops.

## 6. Brief Updates:

- **NASA’s Theme for 2005 -- Ancient Observatories Timeless Knowledge**

Deborah Scherrer participated in various meetings and teleconferences to start organizing for NASA's Ancient Observatories emphasis in 2005. Isabel Hawkins, of NASA's SECEF, has developed a set of general goals and guidelines, as well as specific plans for highlighting Chaco Canyon and Chichen Itza. Her hopes are that the missions can focus on complimentary topics. We have chosen to highlight the Medicine Wheels, particularly the Big Horn Medicine Wheel initially studied by Jack Eddy. The intent is to develop a resource collection of information and activities to support NASA initiatives, including a website to support these activities. We will be collaborating with Chabot SSC on this target and hope to expand the project's reach into the Science Fellows, 4H Astronomy, and solar planetarium program efforts.

- **4H Astronomy Project**

The 4H Astronomy members again delivered their planetarium program to a local 4H club. This time the program included a 25-minute presentation on the Sun, developed by member Zac Butko from the work done by Paul Mortfield on the SPA slide set collection.

The 4H members also presented a day-long display at Chabot SSC on Astronomy Day (details above).

- **Chabot Community College Collaboration**

We continue to support, with resources and information, the Integrated English, Math, and Science (IEMS) project at Chabot Community College, a minority-serving institution. On April 27, we hosted a trip to Stanford for the students in that program. The students were given a tour both of the Stanford campus and of the Wilcox Solar Observatory and provided with a collection of materials on solar science. Deborah Scherrer has been appointed to formally serve on the Advisory Board for the IEMS program. An initial teleconference is scheduled for May.

As part of Chabot's Science on Saturday program, Phil Scherrer is scheduled to give a talk on Understanding the Inside of the Sun to students and the public.

- **Summer EXITE Camp for Underserved Middle-School Women**

Stanford is readying to host its first EXITE camp in June 2004. Detailed schedules have been set and we are currently soliciting in East Palo Alto, CA for students. The Solar Center will host the students for one afternoon, working with them to build and use spectroscopes.

The concept of a continuing e-mentoring program was explored, although similar existing products are much too extensive for our resources to support. We will explore possibilities of working with the Haas Center to continue outreach to our EXITE camp girls throughout the coming school year.

- **Outreach to Schools**

John Beck gave a solar presentation to the German-American International School.

Paul Mortfield represented science as a career to Milpitas High School students on Career Day (actually March).

- **E/PO Professional Training**

Kelly Beck, of the Haas Center, attended Space Science Institute's K-12 Education Workshop for Scientists, Engineers, and EPO Professionals. This is the premier workshop training for professionals developing and/or managing EPO programs. Deborah Scherrer joined the workshop on the last day for a Symposium on Excellence in Science Education.