

# HMI Education & Public Outreach Report

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*For period from 15 Nov 2003 – 15 Jan 2004*

## **1. Partnership with Stanford's Haas Center – Science Service Learning Program**

During November our Science in Service class completed its training in service concepts and science educational techniques and moved on to a 3-week introduction to solar science. This coincided nicely with a period of intense flare activity, so the students were treated to a “real time” demonstration of solar phenomena! Cheri Morrow, Professor Philip Scherrer, and John Beck all gave presentations on solar science and its importance to the space-Earth environment.

At the final class, we undertook both an aural and written evaluation of the initial part of the program from the students. Response was extremely positive. All students who started the course completed it, and all students indicated a desire to become a Student Science Fellow for quarters 2 and 3.

Quarter 2 for the Science Service Learning Program will begin 20 January. This quarter and next, our Science Fellows will receive training in science education techniques and activities, then take these activities out into the community. Opportunities for evaluation and discussion of issues will be included.

Kelly Beck, our Haas course designed, spent the last month negotiating with community outreach programs on how our students might be involved. Arrangements were made with 3 specific programs in which to place our Science Fellows. These include a ThinkQuest program (<http://www.thinkquest.org/>) in Belle Haven K-8 school in East Palo Alto (made up primarily of underserved students), a conglomeration of the Boys' and Girls' clubs in the local economically-deprived areas, and EPASA (<http://www.yers.org/epasa.html>), a Stanford-based college-prep program for students at risk. Ms. Beck has individually interviewed all the students in our program to determine their interests, and is currently matching up students with community programs.

We gave a poster presentation on our Haas program at the AGU fall meeting in San Francisco.

## **2. Solar Sudden Ionospheric Disturbance Monitor<sup>1</sup> (SID)**

San Leandro High School (a government-recognized inner-city population school) has completed their beta evaluation of our SID monitor. An instructor of general science, Rick Styner, designed a curriculum and labs to incorporate the SID monitor into his sophomore program. Professor Philip Scherrer and I attended the students' final presentation of reports on their research projects, in which they compared their

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<sup>1</sup> Cofunded with NSF through the CISM Project.

solar SID data with various events in the community. While their data was not extensive enough to show definite correlations, the students had put quite a bit of effort into gathering and preparing their data, analyzing it along with the SID data, and preparing their reports. We were pleased and impressed. We hope to have Mr. Styner give a presentation at the AGU next year on this project.

Our two EE graduate students have designed and are developing a research-quality SID monitor in the \$1000 range. They have nicknamed the project AWESOME (Atmospheric Weather Education System for Observation and Modeling of Effects). This week they demonstrated an almost-complete prototype, which included a GPS chip that was able to pick up time stamps. They expect to have a full-completed improved receiver finished by the end of the quarter (March).

We are exploring the possibilities of including a magnetometer with the SID project, to allow the students to monitor all primary aspects of solar activity effects on Earth. While soda-bottle monitors are available, they are difficult to work with. The THEMIS project is developing \$10,000 monitors to be placed in high schools, but these are beyond our scope. UCLA has evidently developed magnetometers for placing in schools. We will check these out as well.

### **3. Presentation Bank<sup>2</sup>**

We are working with the AGU Space Physics and Aeronomy Education Committee to develop an updated version of their publically available “slideset” to introduce the general public to SPA-related fields. Paul Mortfield, contractor on this project, detailed his new draft slideset at an AGU poster session at the Fall SF meeting. The complete draft will be delivered to the SPA Edu committee hopefully early next week for their feedback. Target is to have the slideset available to AGU by mid-March.

### **4. Solar Planetarium Program for Small Domes<sup>3</sup>**

The Lawrence Hall of Science is still awaiting delivery of their grant funds to begin this project. In the meantime, we have been collaborating with Rice University in their quest to obtain a full-dome projection device for small planetariums. Pat Reiff was able to demonstrate a newly developed system at the Fall AGU in San Francisco. What Pat has is a complete system, including dome, computers, projector, and star projection capabilities, with a price tag of roughly \$60K. We are looking into other options to provide low-cost opportunities for those who already have a dome and the standard Starlab-type projector.

### **5. Brief updates on other programs:**

- **Sundagger website**, joint collaboration with Anna Sofaer’s Solstice Project.

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<sup>2</sup> Project jointly undertaken with the AGU Space Physics and Aeronomy Education Committee and the MDI mission on SOHO.

<sup>3</sup> Jointly funded with NASA’s LWS, NSF’s CISM project, and done in collaboration with the Lawrence Hall of Science

We are considering the possibility of developing a website to support the educational opportunities offered by the Sundagger event in Chaco Canyon, to coincide with NASA's theme of "Ancient Observatories" for 2005. We have initially discussed the concept with Anna Sofaer, discoverer of the solstice marker and director of the Sundagger Solstice project. She is interested in the website project and has already agreed to allow us the use of some of her imagery, etc. We are looking into the possibility of having one or two of our undergraduate students become involved with this.

- **4H Astronomy Project, Alameda County**

Students in our 4H Astronomy Project are being trained in the use of the portable Starlab and are developing their own portions of a planetarium program to be given to other 4H and regional groups. The students have a public presentation, to be judged and evaluated, on 14 February.

- **Chabot Community College Partnership**

We continue to collaborate with Chabot Community College in their Integrated Science, English, and Math program. Stanford will be providing support through resources and participation in their Saturday Science program, to be beginning this quarter. We also are planning a trip to Stanford as incentive for the students to complete the program.

- **Astronomy for the Blind**

As noted before, one of our Student Science Fellows is blind and we have been exploring resources both to improve her ability to serve in our program and ways for her to work with other groups in making astronomy accessible to the blind. We've arranged with MathWorks to provide a beta version of their MatLab software for the sight-impaired to Stanford. We are also looking into other resources that would improve accessibility to solar science for the blind.

- **Local outreach activities**

The group continues to provide presentations and resources to teachers, classrooms, and science museums through the Bay Area. Next month we have scheduled an in-service day with Fremont Elementary Science teachers to tour our Wilcox Solar Observatory and be introduced to the resources available through the Solar Center.