

## From the Director's Office

*Steve Keil*

The National Solar Observatory and its community were very pleased to learn that the National Science Board (NSB) approved the following resolution at its August 6-8 meeting: "RESOLVED, that the National Science Board authorizes the [NSF] Director at his discretion to include the construction of the Advanced Technology Solar Telescope in a future budget."

This action moves the ATST out of the "readiness" stage and makes it a potential new start in the Major Research Equipment and Facility Construction (MREFC) account. While NSB approval is not a commitment of funds, it is a necessary step toward a possible future appropriation for a construction start.

Project manager Jeremy Wagner, project scientist Thomas Rimmele, and the rest of the project team deserve our congratulations for their superb efforts that enabled us to cross this major threshold. The NSO also extends special thanks to NOAO staff members Jeff Barr and Chuck Gessner for their contributions to the project.

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AURA's management oversight committee for the NSO, the Solar Observatory Council (SOC), has undergone a few changes recently. Steven Kawaler (Iowa State University) and Pere Pallé (Instituto de Astrofísica de Canarias) have rotated off the council. We would like to thank Steve and Pere for their useful and helpful advice these last few years. Peter Gilman (High Altitude Observatory), who has been an SOC member since its inception, has also rotated off, but we hope to continue to work with him and benefit from his invaluable insight and help as he remains active on the AURA Board. We welcome two newly elected SOC members, Sarah Gibson (High

Altitude Observatory) and Rene Walterbos (New Mexico State University). Their term began July 1, and we look forward to working with them over the next several years.

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The NSO Users Committee met in April in conjunction with the NSF "Town Hall" meeting in Tucson. A subset of the committee also met during the AAS Solar Physics Division meeting in Honolulu. The 2007 report of the committee is available at [www.nso.edu/general/committees/](http://www.nso.edu/general/committees/).

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The NSO had a sizable presence at the May 27-31 AAS Solar Physics Division (AAS/SPD) meeting in Honolulu. Twenty-six papers by NSO scientists were presented, including three posters by Research Experiences for Undergraduates (REU) students and one by a graduate student who just completed his PhD thesis with NSO.

A few weeks later, the second annual University of Arizona and NSO Summer School in Solar Physics was held at NSO/Sacramento Peak (see separate article with details in this *Newsletter*). Both the AAS/SPD meeting and the Solar Physics Summer School provided opportunities for announcing the new graduate program in solar physics at the University of Arizona Lunar and Planetary Laboratory (LPL). The new program provides opportunities for collaborations with NSO scientific staff. Former NSO/REU student Thomas Schad has been admitted to the graduate program at LPL and will be the first student in this program beginning with the semester that has just started. Tom presented very exciting results at the AAS/SPD meeting in Honolulu on a definitive measurement of

Alfven waves in the solar corona. In addition to the usual graduate course load at LPL, Tom will be working closely with Matt Penn at NSO this academic year.

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In addition to Tom Schad, we are pleased to welcome Kim Streater to NSO as our new Kitt Peak Projects Manager. Kim's primary responsibility will be serving as project manager for the SOLIS facility, which is in an extended commissioning phase at the Kitt Peak SOLIS Tower (formerly known as the KPVT). Kim comes to us from the High Altitude Observatory (HAO) in Boulder, Colorado, where he served as Manager of the HAO Instrumentation Group since 1993. His accomplishments at HAO include management of projects and operations for both ground- and space-based instrumentation in solar physics. With a degree in physics from the University of Arizona, Kim is neither a stranger to Tucson nor to the NSO, where he started his career serving as an observer at Sacramento Peak from 1979-1983. His significant experience in the development and commissioning of new solar instrumentation will be a tremendous asset to the NSO.

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K. S. (Bala) Balasubramaniam left NSO this summer to join the Air Force Research Laboratory scientific staff in residence at Sacramento Peak. While we miss Bala as part of the NSO staff, we extend our very best wishes to him for success in his new career with the Air Force. Since he is still at Sac Peak, we will continue to receive the benefits of his participation in our programs, such as the REU and graduate student programs.

# ATST

## The ATST Team

The Advanced Technology Solar Telescope (ATST) project took a significant step forward in August with the approval of a resolution by the National Science Board (NSB) authorizing “the [NSF] Director at his discretion to include the construction of the Advanced Technology Solar Telescope in a future budget,” thus advancing the ATST from “readiness” under the NSF’s Major Research Equipment and Facilities Construction process to candidacy for a new start in a future budget cycle. This is not a commitment to fund, and does not imply that the construction funds request will be in the next budget cycle. Nevertheless, the project is pleased with this major action by the NSB.

Meanwhile, ATST design refinements continue, and steady progress is being made toward completion of the Final Environmental Impact Statement (EIS) for the Haleakalā site, following an internal review of the process by the NSF, the Lead Agency for the proposed project. Interactions with other interested state and federal agencies are the current focus. Communications are ongoing with Haleakalā National Park, the Federal Aviation Administration, the Advisory Counsel for Historic Preservation, the Office of Hawaiian Affairs and other agencies regarding issues raised by review of the Draft EIS, released in September 2006. The Final EIS is expected to be completed by the end of 2007, with a Lead Agency Record of Decision to follow by mid 2008.

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Optical systems for the ATST underwent a series of three systems design reviews (SDRs) July 24-26. The purpose of these reviews was to determine readiness for freezing designs and preparing subsystem Request for Proposal (RFP) packages, and to identify risk areas requiring further analysis or design effort. The SDRs covered the overall optical prescription, the Top-End Optical Assembly (TEOA), and the Wavefront Correction System (WCS).

The first SDR covered ATST’s overall optical prescription, which now is frozen and under change control. Optical Systems Manager Eric Hansen led the review. Since the optical design is a basic element determining the configuration of many subsystems, freezing it is a critical step in meeting the overall project schedule. The ATST Optical Prescription (SPEC-0029, rev. B) comprises 13 mirrors, from the 4-meter M1 to a 400-millimeter steering mirror that delivers the image beam to user instruments on the coude platform.

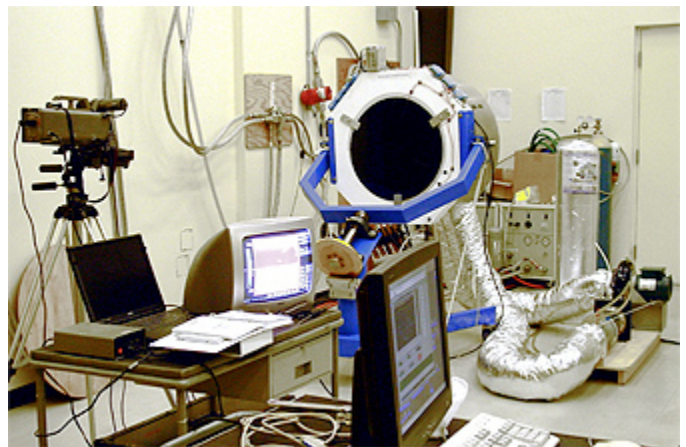
The Optical Systems SDR included the requirements overview and development, error budget development, design development and performance, instrument development, stray light modeling, quasi-static alignment modeling results, and the alignment plan. The committee assessed the status of the optical design and analyses efforts, and commented on readiness to freeze the design. This will allow preparation of subsystem RFP packages to complete the design and fabrication of optical and non-optical subsystems starting in FY 2009. The SDR also identified risk areas that require further analysis or design effort.

The review of the TEOA, a relatively new designation encompassing the M2 module, Heat Stop, Lyot Stop, M2 Support Frame, and their associated control system, was also led by Hansen. The review committee was asked whether the ATST team has done enough of the correct engineering work to proceed with preparations for procurement. The procurement strategy plan is one of competitive bidding, leading to a fixed-price contract for a final design and fabrication package consisting of both secondary and heat stop assemblies. In addition to the standard RFP package, the project intends to provide a “reference design” that may be used to guide a vendor’s proposal. Within the project, reference designs have been used to demonstrate feasibility, assess performance, and allocate error budgets, as well as define interfaces between various subsystems.

The last review, led by Adaptive Optics Project Manager Steve Hegwer, covered the Wavefront Correction System (WCS). The committee was asked to review the status of the WCS design and analyses efforts and comment on the readiness of the design, readiness of subsystems/components, readiness to let contracts to complete the design and fabrication of subsystems, and to assess risk areas that require further analysis or design effort. Four distinct areas comprise the WCS: quasi-static telescope alignment of the overall optical system, the active optics, a fast tip/tilt mirror system (M5), and the high-order adaptive optics (HOAO), including the M9 deformable mirror that will compensate for atmospheric distortion of the image. The HOAO system has been the focus of development efforts at NSO for the past several years.

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Design concepts for cooling the ATST M1 mirror blank (made from Ultra Low Expansion glass, 4.4-meters in diameter and 75 millimeters thick) have proposed to utilize closed-cycle, chilled-air jets on the



The ATST mirror-cooling test-rig within the NOAO Flex-Rig facility at the beginning of Phase I testing.

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*ATST continued*

back surface. After thermal modeling of the mirror and the initial control system were reviewed, it was recommended that the risk associated with this process could be reduced if a prototype of the mirror and cooling system were tested. The ATST project proceeded with this recommendation, designing a scaled test-rig of the M1 mirror cooling system.

Following design, review, and construction, the ATST Mirror Cooling Test-Rig has begun Phase I testing in the NOAO Flex-Rig facility. Phase I testing is providing step response of the test-rig mirror for tuning the air-flow rate and temperature control. Thermal imaging of the mirror's front surface as well as monitoring of critical air and surface temperatures during the cooling process have provided interesting and exciting results. These results will be analyzed with respect to the initial modeling and the models refined. Once the models have been pinned and optimal parameters determined, the project anticipates moving the ATST Mirror Cooling Test-Rig to the NSO Global Oscillating Network Group farm facility for Phase II testing. This testing will introduce the closed-loop control of the jet air temperature while tracking the Sun throughout the day.

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The ATST Integrated Project Schedule (IPS) has proven to be a useful tool to perform various "what-if" scenarios associated with the construction-related effort of the project. With the foundation for the IPS in place, attention is now focused on updating the design and development schedule and all of the activities required to prepare for construction funding. The majority of the activities are associated with enhancing requirements and specification documents, preparing bid packages, conducting design reviews and completing interface control drawings. Inputs for most of the major components have been updated and each of the Integrated Project Team (IPT) leaders

is in the process of updating their schedule. The schedule status will continue to be monitored on a monthly basis, and will also provide some of the initial data to implement the Project Management Control System (PMCS).

One common pitfall that many large science projects have experienced in the past is waiting until after the construction project is underway before beginning to implement a PMCS. This is a non-trivial task. By the time a PMCS is up and running, problems may have already occurred that are harder to address after the fact. ATST is mitigating this risk by putting the PMCS planning in place during the design and development phase of the project, and has engaged Triad Project Management Services to design and implement the PMCS. The initial infrastructure to support the PMCS is now in place and will be extended as construction nears.

The goal of the ATST PMCS is to integrate a suite of cost, scheduling, and reporting tools/databases that provide the Integrated Project Team and Project Manager with accurate and timely information used to continually manage and report on performance of the project. Fundamentally there are five key components to the PMCS system: 1) a bottom-up cost estimate that is frozen; 2) an Integrated Project Schedule (IPS), which is ultimately baselined; 3) an Earned Value Management System (EVMS), which is integrated with the IPS and contains time-phased budgets, actual costs and earned-value calculations; and 4) a PMCS Change Control to record, communicate and process approved changes to the baseline.

The ATST is using proven off-the-shelf applications such as Primavera for scheduling and Cobra for earned value, combined with leveraging some Triad-proprietary applications that have been developed for other large science projects. 

# SOLIS

Carl Henney & the SOLIS Team

The past three months were highlighted by the return of Kim Streander to NSO in July as the new SOLIS Project Manager. Kim is well known to the NSO, where he was an observer at Sacramento Peak, NM from 1979–1983. Since 1993, Kim has been affiliated with High Altitude Observatory (HAO), where he was the manager of the HAO instrumentation group, and had operational responsibility for the Fourier Tachometer (working for several years in Tucson, where the Fourier Tach was operated) and Advanced Stokes Polarimeter projects. In total, Kim brings to SOLIS more than 25 years of experience involving solar instrumentation and project management oversight.

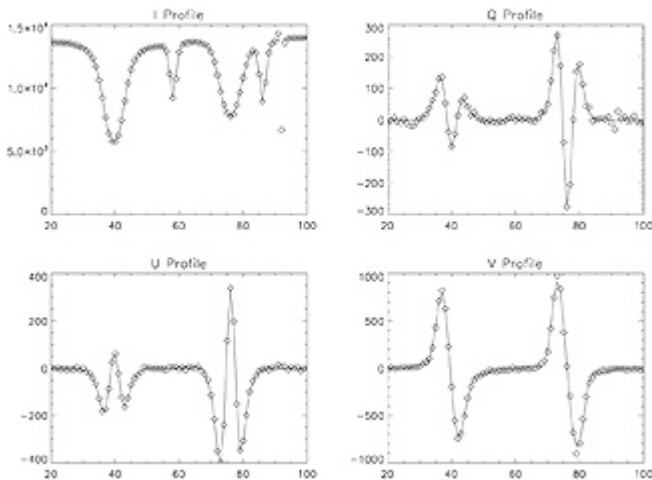


Figure 1. Example fits using the EHF method (solid line) to VSM Stokes data (diamonds) observed 3 November 2006. The fitting algorithm excludes outliers, as illustrated in the sample I-profile spectra shown in the upper left panel.

The VSM Vector Working Group (VSWG) continued to make good progress with the final calibration and pipeline code for processing VSM 630.2 nm vector data. Currently, the primary task is to better parameterize and remove polarization fringes from the VSM Stokes profile data. During this interim period, quick-look vector magnetic FITS-formatted data and JPEG image files are available for recent observations. In addition, the VSWG is investigating the feasibility of preserving all of the VSM Stokes profile data. The original scope of the SOLIS program did not include archiving the observed Stokes profiles; however, preliminary work has begun to store the profiles in a compressed format using the Expansion in Hermite Functions (EHF) method by del Toro Iniesta and Lopez Ariste (*A&A*, 412, p. 875). Example fits to VSM Stokes profiles data (observed 3 November

2006) are shown in figure 1. By utilizing the EHF method for data compression, a storage-space saving of a factor of eight is estimated for VSM vector data.

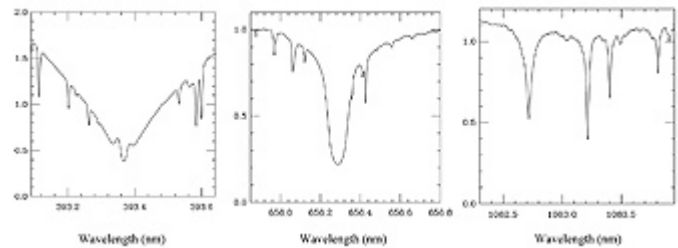


Figure 2. Sample integrated solar spectra measured by the SOLIS Integrated Sunlight Spectrometer (ISS). Shown are spectra of the Ca II K (left), H $\alpha$  (center), and He I 1083.0 nm (right) spectral bands. Ca II H & K and He I 1083.0 nm spectra are now available daily as both FITS-formatted data and JPEG image files. Additional bands, including H $\alpha$ , will be available soon.

Ca II H and K and He I 1083.0 nm spectra recorded by the SOLIS Integrated Sunlight Spectrometer (ISS) are now available daily (see figure 2). The spectra are available as both FITS-formatted data and JPEG image files. In addition, various Ca II K-line parameter time-series data are available as text-formatted data and JPEG image files. Additional spectral lines are expected to be available within the next quarter.

Work on the new SOLIS Data Acquisition System (DAS) and preparation for the replacement VSM cameras is progressing well. The new DAS will replace the no-longer-supported current system. The new DAS hardware configuration supports the new Sarnoff camera link format and reduces the current VxWorks bottleneck when sending data to the Storage Area Network. The DAS operational software has been written and tested using camera simulators, which allows the system to match the Sarnoff 300 HZ frame rate and array size of 1024  $\times$  256. Camera delivery is expected by the end of August, with qualification tests and finalization of the complete DAS expected by the end of this fiscal year.

In addition, the Full-disk Patrol (FDP) and VSM guider development is progressing well. Once completed, one guider will be installed and used to finalize the optical alignment in the FDP, whereas the second guider will be installed in the VSM to automate the spatial focus and pointing during observations. The original SOLIS guider design has been altered in order to reduce noise and meet scientific requirements. Testing of the new circuit, in quad cell mode, has demonstrated that the design functions well when using one linear array.

# Mapping Sodium Absorption in the Mercury Exosphere During the 2006 Transit

*A. E. Potter (NSO), R. M. Killen (University of Maryland), & T. Bida (Lowell Observatory)*

We observed Mercury during the transit of 8 November 2006 at two NSO sites: the McMath-Pierce Solar Telescope on Kitt Peak and the Dunn Solar Telescope at Sacramento Peak. The observations were successful, with good seeing and clear skies at both sites.

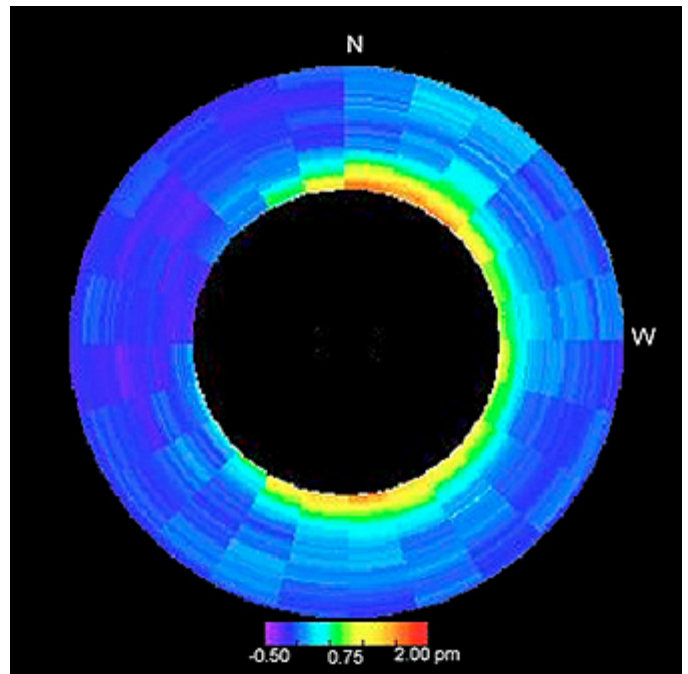
We present here the results from observations at Kitt Peak, where the main spectrograph was used to obtain spectra of the sodium absorption surrounding the disk of the planet silhouetted against the Sun. The observations at Sunspot used the Interferometric Bidirectional Spectrometer (IBIS). Processing of the data from this complex instrument is still in progress.

For the McMath-Pierce observations, the spectrograph slit was oriented first North–South, and later East–West, and a series of slit spectra were measured in each orientation. The planet’s position relative to the spectrograph slit was controlled by an adaptive optics system that yielded an effective seeing of about 0.5 arcsec. The planet was stepped across the slit in 0.5-arcsec increments to obtain a series of slit spectra. The slit extended about 10 arcsecs beyond the silhouette on either side to provide absorption spectra close to the planet, as well as reference solar spectra well away from the planet.

The sodium absorptions near Mercury were determined by subtracting a reference solar spectrum from each of the spectra close to the planet. The figure shows the map of sodium absorption above the planet that was determined from these measurements. The absorption is expressed in terms of equivalent-width units of picometers. There was no measurable sodium absorption at the dusk equator (observer’s east side), while the dawn equator (observer’s west side) showed some sodium absorption.

Sodium absorption above the poles was five or more times larger than over the eastern equator, suggesting high-latitude sources for sodium. Absorption over the north pole was larger than over the

south pole. In both north and south high-latitude observations, the slope of the absorption with altitude above Mercury was less than above the eastern equator, suggesting the presence of high-temperature sodium at high latitudes. The authors were guest observers at the NSO, and the research was supported by the NASA Planetary Astronomy program.



Map of sodium absorption around Mercury during the November 2006 transit of Mercury across the Sun. The absorption is expressed in equivalent-width units of picometers.

# 2007 Summer School in Solar Physics

*Dave Dooling*

The second annual Summer School in Solar Physics, hosted by the University of Arizona and the National Solar Observatory (NSO), was held June 11-15 at NSO/Sacramento Peak. The intensive one-week “short” course on solar physics was aimed at graduate and advanced undergraduate students.

“The purpose of the short-course was to provide a basic introduction to solar physics for students who do not have an opportunity to take such a course at their home institution, or who have an interest in the physics of the Sun and may possibly want to pursue a career in solar physics, space physics, or a related field,” said Joe Giacalone of the University of Arizona. Some 31 students and faculty attended the school.

The featured speaker was Eugene Parker, the S. Chandrasekhar Distinguished Service Professor in Physics, Astronomy & Astrophysics at the University of Chicago. Parker is highly respected in the physics community for his seminal work on the solar wind and on the nature of astrophysical magnetic fields.

Speakers representing NSO included Han Uitenbroek, Frank Hill, Aimee Norton, and Matt Penn. Other speakers included Steve Cranmer (Harvard-Smithsonian Center for Astrophysics), Terry Forbes (University of New Hampshire), Giacalone and Randy Jokipii (University of Arizona), and Tami Rogers (High Altitude Observatory and University of Arizona). In addition, several students gave short talks on their own work.

Topics included solar radiative transfer, helioseismology, solar interior, solar magneto-hydrodynamics, chromospheric and photospheric magnetic fields, corona and solar wind, solar activity and magnetic reconnection, and high-energy charged particles.

The Summer School in Solar Physics is funded by a grant from the National Science Foundation and will be repeated in summer 2008.



A team of problem solvers: (left to right) Angela Curtis (Embry-Riddle Aeronautical University), Erica Morgan and Felipe Colazo (Vanderbilt University), and Michael Crain (University of Texas, San Antonio).



Professor Joe Giacalone (wearing hat) chats with students as they view the Sun with an H-alpha telescope.

# GONG<sup>++</sup>

*Frank Hill & the GONG<sup>++</sup> Team*

The past few months have been occupied mainly by activities leading to the evolution of GONG<sup>++</sup> to include an important Space Weather capability. We have initiated a research project to forecast active region evolution, begun design of an H-alpha observing capability, and made further progress on the calibration between the far-side signal and magnetic fields. While these steps will hopefully lead to operations support from the US Air Force, they are intrinsically valuable scientifically and should lead to improved understanding of the Sun and the evolution of its magnetic field.

### GONG<sup>++</sup> Science Highlights

We co-sponsored the recent SOHO 19/GONG 2007 meeting on "Seismology of Magnetic Activity," held in Melbourne, Australia, from July 9-13. Led by Paul Cally and the group at Monash University, the meeting was a great success. Topics included coronal seismology, flare excitation of acoustic waves, theoretical models of wave propagation in magnetic fields, and local helioseismology with Hinode. Many thanks to Paul Cally, Alina Donea, Diana Besilu-Ionescu, and John Lattanzio for the local arrangements.

Thanks to a grant from the Air Force Office of Scientific Research, we have initiated a project to develop forecasts of active-region evolution. Using data assimilation techniques, we will incorporate the subsurface flow fields we derive from ring diagrams into two numerical simulations of the surface magnetic field. One model will be provided by George Fisher, Bill Abbett, Brian Welsch and David Bercik at the Space Sciences Laboratory, University of California, Berkeley. The other simulation will be produced by S. T. Wu, A. H. Wang, Allen

Gary, and Chakri Deverapalli at the Center for Space Plasma and Aeronomic Research, University of Alabama in Huntsville.

Work has begun on the development of a custom patch interface for the ring-diagram pipeline. With custom ring patches, and a catalog of active regions, the objective is to develop tools for the analysis and prediction of emerging active regions. Helena Freedlund, a teacher from LaRue County Middle School in Hodgenville, Kentucky, and a participant in this year's NSO Research Experiences for Teachers program, has done a terrific job of designing and populating the emerging region data base.

Motivated by the needs of the Air Force, we have begun to develop an enhancement of the GONG<sup>++</sup> instrument incorporating an H-alpha observing capability. An initial exercise indicated that it is quite feasible to add the capability with a non-polarizing beam splitter between the calibration wheel and the main optical components. The new light beam would be routed through a filter and the data recorded by a 2048 x 2048-pixel CCD with its own data acquisition system. All of the components are commercially available, substantially reducing the cost of development and deployment. This increased scientific capability should not compromise the global and local helioseismology capabilities in any way.

The GONG far-side monitor detected active region NOAA10953 in the far hemisphere of the Sun and was able to follow it before it appeared on the front side April 26. There was no active region at

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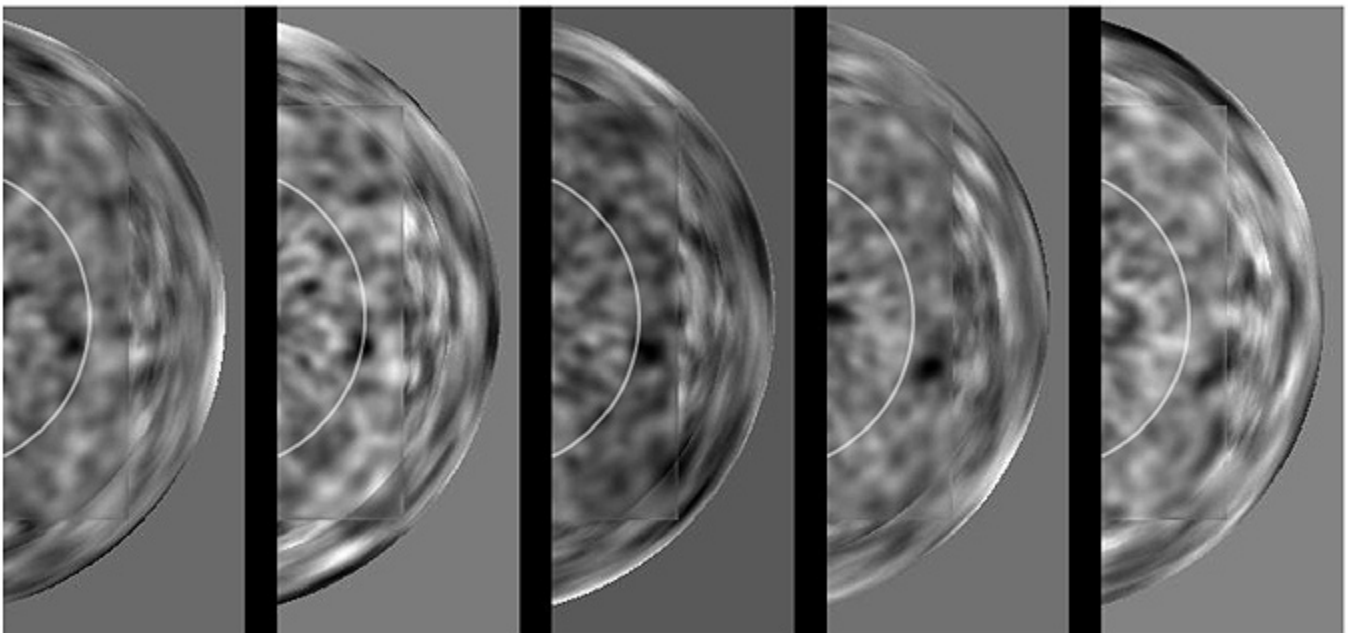


Figure 1. This sequence of images shows a projection of the phase shift of acoustic oscillations on the Sun's surface centered at the far-side antipode of disk center and extended all the way around the limb and onto the front side. The projection covers approximately  $\pm 78$  degrees of the front side, leaving only a small portion of the front side not sampled. The data are for days 7, 7.5, 8, 8.5 and 9 September 2005. The white circle represents the solar east limb. The strong signature corresponds to active region NOAA10808. These data allow a direct comparison of the phase shift and the magnetic field strength without the need for unrealistic assumptions about the variability of the magnetic field.

GONG<sup>++</sup> *continued*

the same position in the previous Carrington rotation, meaning that it was born on the far side. In a period of low solar activity, advance knowledge of the presence of active regions is very important. Hi-node scientists have expressed their interest in using the far-side maps as a tool to plan their observations and have asked us to include them in our activity alert distribution list.

Last issue, we reported the recent achievement of a calibration between the far-side phase shift signal and the magnetic field of the active regions. This is necessary for the use of the far-side signal as a space weather tool. However, the current calibration process requires the unrealistic assumption that the magnetic field of the active region does not change its magnitude between its appearance on the front side, and its passage across the far side. Now, Irene Gonzalez-Hernandez has developed the capability to extend the far-side analysis beyond the solar limb back onto the front side. This allows a direct simultaneous comparison of the far-side signal and the magnetic field strength without any assumptions. Figure 1 shows an example of the analysis.

**Network Operations & Engineering**

A preventive maintenance (PM) trip was made to Learmonth in April to replace the Lyöt filter, which was producing excessive scattered light and degrading image quality. Considerable improvement in image quality was achieved with the new filter. The next PM trip was to El Teide in May, where the CCD was replaced. Preparations for a post-monsoon September trip to Udaipur are underway. This instrument has been stowed since June 25 due to the onset of the rains.

Work has continued on troubleshooting camera problems and improving the performance of the thermoelectric coolers. A mechanical modification to the turret pitch head has been made and initial indications are that friction between the pitch head and the stationary surface is considerably decreased. Work on the hot spare by our instrument shop is drawing to a close.

The migration to the latest version of VxWorks has been put on hold, due in part to issues encountered when trying to compile TCL/TK under the new operating system. Troubleshooting the new CPU and Data Acquisition System (DAS) boards will be done using a slightly older version of the operating system instead. The search for a replacement camera has begun, and a promising candidate has been identified and placed on order for evaluation and testing. One of the benefits of a new camera will be the use of an industry standard camera-data interface. This means that we will be able to retire the current DAS and replace it with off-the-shelf hardware.

**Data Processing, Software Development & Analysis**

Porting of Data Storage and Distribution System (DSDS) applications and Data Management and Analysis System pipelines to Linux continues. New Graphical User Interface applications are being built around the constantly growing suite of magnetogram products. For example, the magnetogram group is continuing research into a new method of generating a series of synoptic maps that focus on a previously observed solar event. This new style of synoptic map sequences could enable the detection of transient solar phenomenon in near-real time. A new custom movie generator is now available on the magnetogram pipeline website. It allows users to export their movies to several standard formats, so that they can be saved and viewed offline.

Processing to date includes month-long (36-day) velocity time series and power spectra for GONG Month 118 (centered at 4 December



Figure 2. Participants in the GONG/IIA 2007 International Research Experience for Students (IRES) program at the Indian Institute of Astrophysics (IIA) in Bangalore, India. Left to right: Annapurni Subramaniam (Secretary, Board of Graduate Studies, IIA), Kiran Jain (IRES/GONG Program Coordinator), Siraj Hasan (Director of IIA), Sarah Sonnett (University of Hawaii, Manoa), Natalie Hinkel (Arizona State University), Russell Stoneback (University of Texas, Dallas), and Nicholas Moskovitz (University of Hawaii, Manoa).

2006), with a fill factor of 0.88. The 108-day Mode Frequency Tables, Merged Velocity images and Ring Diagrams are available through Month 117. Last quarter, the DSDS distributed 406 GB in response to 19 data requests.

**Program**

The NSF-sponsored International Research Experience for Students (IRES) School in Bangalore, India, is going well, and will have concluded by the time you read this *Newsletter*. Four US graduate students— Russell Stoneback (University of Texas Dallas), Natalie Hinkle (Arizona State University), Sarah Sonnett (University of Hawaii, Manoa), and Nicholas Moskovitz (University of Hawaii, Manoa)—arrived in early June and have settled in at the Indian Institute of Astrophysics.

Some significant personnel changes have occurred at our Australian site in Learmonth. John Kennewell has retired after 27 years as the chief physicist at Learmonth for the Ionospheric Prediction Service (IPS). In addition, David Cole has retired as the director of the IPS, based in Sydney, Australia. Both John and David have made major contributions to the success of GONG through their excellent management and scientific enthusiasm for the program. We wish both of them well in their future activities.

Mohamed Aksouh, a graduate student from the Centre de Recherche en Astronomie, Astrophysique et Géophysique (CRAAG) in Algiers, is visiting us in Tucson as part of the NSO 2007 Summer Research Assistantship program. He is working with Rudi Komm and Frank Hill on a project to estimate the profile of turbulence within the solar convection zone. Mohamed is using techniques borrowed from astronomical site testing, developing a theory that links acoustic scintillation to the internal solar turbulence in a manner similar to the relation between scintillation of sunlight and turbulence in Earth's atmosphere. ☼