**Meeting Date:** April 22, 2014

**Attending:**

David Alexander (Chair),

Nick Arge, Air Force Research Lab

Tim Bastian, University of Virginia and National Radio Astronomical Observatory

Terry Forbes, University of New Hampshire

Holly Gilbert, NASA Goddard Space Flight Center

Jerry Harder, University of Colorado LASP

Alex Pevtsov, National Solar Observatory

Chris St.Cyr, NASA Goddard Space Flight Center

Gang Lu, HAO/NCAR, HAO Acting Director

Joan Burkepile, HAO/NCAR, MLSO Manager

**AGENDA ITEMS:**

Status of Current Instrumentation

Data products / Web page

Community Observing Campaigns and Engagement with broader community

User Metrics / Data Requests

Status of MLSO Staff and Facility

MLSO Post-Docs / Young Instrument Scientist

SOLIS

NSO / HAO merger possibilities

LoWL Solar Pointing Platform at MLSO

**NOTES:**

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**NSO – HAO Potential Merger**

Gang recently spoke with the new NCAR director Jim Hurrell, and he assured her that HAO is an integral part of NCAR. HAO staff met last year and there was nearly unanimous agreement that HAO belongs at NCAR. HAO staff feel that NCAR is our home. Gang also met recently with Valentin Pillet, NSO director, and he never mentioned the merger. Valentin’s top priority is to see that the DKIST (ATST) is successfully constructed. He does not want anything to jeopardize that project. Gang spoke with NSF officers in January and in April and there was no mention of it by NSF. Gang also stated that any merger would need to be discussed at the NCAR-NSF and AURA-NSF level.

Terry recently spoke with Stan Solomon and Stan thought that the merger was not going to happen (at least anytime in the foreseeable future). HAO is not pursuing it. HAO/NCAR does not want this to happen. It could be very problematic.

Nick asked how a merger would work since HAO is not just about solar. A large fraction of the staff study the Earth’s upper atmosphere. Would HAO be torn apart in a merger?

Alex reminded us that the talk of a merger began back when there were discussions at NSF about transferring NSO to the AGS (formally GEO) division. If that happened questions were raised as to why NSF would have two solar centers in the same division.

Nick asked what part of HAO is solar?

… To be accurate I used the HAO Organizational chart (available at:

<https://www2.hao.ucar.edu/hao-organizational-chart>

I have not included 3 people listed there as they are no longer at HAO:

Michael Thompson (solar) now NCAR deputy director, Keith MacGregor (solar) now at NASA, Maura Hagan (AIM: Atmosphere, Ionsphere, Magnetosphere) as she has recently stepped down as NCAR deputy director. I have included not included Gang Lu under AIM; I put her in administration. Here is the breakdown:

Solar: 17 2/3 FTE (Don Kolinski is 2/3 MLSO, 1/3 HAO web page manager)

AIM: 13 FTE

Instrumentation Group: 8 FTE; they support solar and AIM instruments and are about 75% on outside funding

Administration: 7 FTE (includes Gang Lu)

Computer Management: 3 1/3 (1/3 is Don Kolinski HAO web page management and support)

Mauna Loa: 2 FTE, 2 casual (1 casual = ~ 1/3 FTE each)

Tim: What is HAO budget?

Gang has provided a more detailed breakdown of the NSF funds that NCAR allots to HAO. The total HAO base budget is $5.4 M.

HAO base funds are roughly divided into 4 pieces: ~1/4 for each of the science section (actually AIM funds are little bit smaller than the two solar sections by 10~15%), and 1/4 for MLSO and IG (which adds up to ~$1M).

Alex: NSO base budget is ~$9 M with ramp-up coming soon.

General consensus is that this does not seem likely while DKIST is under construction as that is a top priority and nothing should interfere with that.

**GONG:**

David wanted us to know that NSF astronomy got a very strong message from the community that the NSO synoptic program (GONG / SOLIS) is very important and needs to continue

Nick: GONG data are used operationally by the Space Weather Prediction Center forecasters. However, the Air Force is discontinuing funding.

David: Hopes Air Force can be convinced otherwise.

Nick: He heard that NOAA may come up with funds.

Alex: He also heard NOAA had expressed interest and may be coming up with the $400 K per year to replace Air Force funding of the same amount. Unfortunately that is in FY16 so FY15 will be a tough year for GONG / SOLIS.

Joan: HAO reduced its costs to GONG. We were charging for 1/3 of an observer; we have cut that in half. We will continue to work with GONG group to further reduce costs wherever possible. We have a great working relationship with GONG group and want to continue having GONG at MLSO.

**PSPT presentation by Jerry Harder**

PSPT is still working well and producing excellent and unique science data. They have observed for a full cycle including a complete solar minimum that had some interesting and unexpected results. The SORCE (Solar Radiation and Climate Experiment) group at CU continues to utilize PSPT observations for their science. PSPT has produced and continues to produce very valuable observations.

University of Colorado students (e.g. grad student Courtney Peck) continue to use PSPT data in collaboration with Mark Rast.

Terry: What is plot in Jerry’s PSPT report?

Jerry: that shows good correction between the SIM irradiance data at 280 nm and the area of plage and facula measured from the PSPT observations.

Jerry: Mark and he would like to have the MLSO observers set up a regular cleaning schedule for PSPT lenses and filters. The red filter is somewhat ‘soft’. Alice (HAO) reports filter may be scratched. Would like HAO to look further into this.

They would also like to have a pointer to PSPT from web page.

Joan: There is already images of PSPT on MLSO home page with direct links to PSPT data download page. I will see if HAO will add this to the HAO homepage as well.

Jerry and Mark also need to work with CU LASP and the ‘Lizard’ data group to get more exposure for PSPT observations.

FUTURE: WHAT COMES AFTER PSPT?

Jerry noted that PSPT has been in operation since late 1990s and there are no spare parts for critical components. Key hardware failures will result in the termination of the PSPT instrument. Joan noted that the software was written at NSO, is on an old computer and no one at HAO is currently available to support the NSO code. Computer failure can also result in the end of mission unless significant resources are found to port the code to new hardware.

Alex: You need to plan a new instrument now.

David: Is there support at LASP for increased PSPT presence?

Jerry: We need to do more to develop that.

Jerry and Mark have tried to propose through NSF MRI program but have not been successfully at CU level. Institutions are only permitted 3 proposals from the entire institute and must provide significant co-funding. They have also submitted a proposal in 2013 to NASA to build a PSPT-like instrument for the space station that could do absolute photometry but that was declined. They have a proposal in now for a balloon flight to test a demonstration instrument.

The next generation SORCE will be on the space station.

David: Many of the NASA manned proposals are unsolicited.

Jerry: Cost of space-based parts significantly increases the cost of the instrument.

He is also interested in proposing a bandpass monitor to support the SORCE space-based platform.

Nick suggested trying the Air Force Defense University Research Instrumentation Program (DURIP) and sent us the URL.

Alex suggested talking with him to work with the IU working group on solar synoptic observations as he is a committee member. Jerry will talk with him about it.

Tim: How unique are the PSPT observations?

Alex: They are unique photometrically. [Joan:They provide the most precise pixel-to-pixel relative photometry of magnetic structures in the photosphere/chromosphere]

David suggested HAO getting NCAR involved since PSPT is an observational bridge between SUN-Earth and is directly relevant to NCAR climate research interests. HAO will follow-up on this.

Jerry noted his appreciation of the support the committee has provided PSPT.

Joan presented MLSO information includeing:

**Status of and data products from CoMP and KCor**

CoMP is fully operational and producing a variety of data products in the 2 FeXIII lines including line center intensity and enhanced contrast intensity images, doppler images, q, u and total linear polarization, and magnetic field azimuth in plane-of-sky.

KCOR is operational and undergoing calibration. The instrument meets the primary requirement of viewing into the first coronal scale height (1.05 solar radii) every 15 seconds. Qualitative images (gifs) in two resolutions are available with fits images and fully calibrated images coming later this year. The spare objective lens will be installed in June for testing along with a complete check of the optical alignment to maximize instrument performance.

**NEW WEB PAGE, COMMUNITY OBSERVATIONAL CAMPAIGNS AND PRODUCTS**

The MLSO web page has undergone major changes and additions. There is an improved news page, updated instrument pages, a special observing campaign page and form for community requests, and a new analysis tools page that includes a new forward modeling IDL GUI interface that includes the ability to compare models with a variety of solar observations including CoMP and SDO AIA. This new GUI is the result of a collaboration between HAO and community scientists.

**ChroMag**

ChroMag (the Chromospheric Magnetometer) is a new versatile instrument that will record full Stokes polarimetery (I,Q,U,V) of a variety of emission lines between 587 and 1083 nm. It will begin by observing: He I 587.6 and 1083.0 nm; Halpha, CaII 854.2 nm, and Fe I 617.3 nm (same as HMI). It will be able to observe all lines in less than 1 minute. It is capable of generating 350 GB per hour. Bandwidth at MLSO will not allow us to run at these rates for more than 2 hours. We solicit community input on observations that can be run throughout the 10 hour observing day at lower rates (e.g. 1 image per minute). For example we could produce Doppler Halpha and He-I images at a few minute cadence over the 10 hour day. Processing of the data is non-trivial. Full inversions to produce vector magnetic field data are the most difficult. Doppler images can be produced with less intensive programming efforts. Terry mentioned that he would want to have Doppler Halpha to study evolution and eruption of filaments and prominences.

The question was raised about the funding source for ChroMag. ChroMag has been funded by HAO money. It was developed using the old HAO PICS halpha instrument objective lens (13 cm) and calcite taken from the PICS halpha filter. HAO purchased one camera and built the 6-stage filter that is the heart of ChroMag. It supports Alfred DeWijn’s time and engineering time to complete the hardware. The instrument is a prototype since one camera does not allow for dual-beam polarimetry needed to account for polarization changes due to seeing. The PICS objective lens is also smaller than the original design. Nevertheless, HAO feels that this prototype can contribute significantly to chromospheric science.

ChroMag will be added to the Special observing campaign MLSO web page once it is operational at MLSO (2015).

The committee suggested we have an after hours meeting at SHINE to solicit community suggestions. Joan will work with the SHINE committee, Alfred DeWijn (HAO) and Don Kolinski (HAO) to make this happen.

**USER METRICS**

Joan provided graphs of Registered Users, Publications and Data Holdings through January 21, 2014.

The committee requested a list of publications by instrument. Joan has compiled a complete list by instrument for 2013 and early 2014 publications and put it on the user\_comm ftp site. If requested she will do the same for 2012 publications. Other committee members mentioned that they also spend a significant effort to compile user statistics for the observations they manage. Publications are time consuming to track down. The committee suggested putting the data use acknowledgement statement in more than one location on the MLSO web page. It is currently listed on the data download page. Some users complete ignore it. Alex mentioned that he has seen papers using NSO data with absolutely no acknowledgement making it nearly impossible to track these publications.

**STATUS of MLSO STAFF AND FACILITY**

MLSO had 3 full time observers. Darryl Koon retired in mid-2012. He was replaced in early 2013 by two casual observers as a cost-cutting measure. The current staff is now 2 full time observers and two casuals. The casual observers work approximately 700 hours per year each. They do not receive health or retirement account benefits. They do get paid for their drive and use GSA cars. Joan would like to see the budget increased to bring back benefits to all the observers. All 4 observers are excellent employees who work incredibly hard to keep the observatory running smoothly and producing the highest quality data.

UCAR has stepped up for the first time (since 1965) and is now providing significant funds to repair and improve the building. They have replaced the outside staircase and doghouse support structure that were collapsing. They have repaired the roof so it no longer leaks onto PSPT equipment and the interior walls. (PSPT had been covered with a tarp). Later this year they will complete a number of repairs including the installation of the large dome (the hardware on the dome is failing making it difficult to rotate) purchased last year by HAO, removal of asbestos floor tiles, replacement of windows, repairing water damaged walls, replacing broken boards in the boardwalk leading up to the building, replacing electrical conduit and other items. If the committee wants more information, Joan can provide a complete report of all repairs. HAO administration is also working with UCAR to have them cover internet costs (currently $32 K per year + overhead). HAO pays full on-site overhead rates (59.8%) that should include maintenance and internet. HAO is extremely pleased that UCAR is stepping up and taking over these costs. UCAR facility manager Matt McMullen has invested a lot of his time and effort in making this happen and HAO is very grateful to him for all he’s doing.

**MLSO Post-Docs and Young Instrument Scientists**

Joan presented a list of young post-docs and instrument scientists that have been or currently are working on MLSO observations and instrumentation. Alfred DeWijn has been promoted to a Project Scientist II and is the instrument scientist on 3 major HAO instrument efforts: K-Cor, DKIST (ATST) VISP, and Chro-Mag. He is a bright young scientist whose has a strong future at HAO.

**SOLIS**

Alex informed the committee that the operational budget for the NSO synoptic program has been significantly cut and will be at the 50% level in FY15. NSO is doing everything they can to maintain the program. SOLIS has been moved to Tucson where it is being automated and configured to consolidate hardware. NSO will seek Requests for Information (RFI) from the community to house and operate the SOLIS instrument beginning sometime around FY16(?). Three most potential sites at this time are Haleakala, Mauna Loa and Big Bear. SOLIS operating costs at the new site must be kept very low. The Air Force building at Haleakala may provide the low/no cost option SOLIS needs. If NOAA approves the SOLIS installation at Mauna Loa, HAO will make every effort to keep costs extremely low. If NOAA approves, HAO will submit a proposal to the NSO RFI.

**Low-L Platform**

The Low-L helioseismic instrument at MLSO was decommissioned years ago. It sits atop a stable pad and tracks the Sun via a heliostat that feed light into an optics bay and auto-guider. HAO is soliciting community interest in using the hardware to support solar instrumentation of comparable size. We will bring information about the platform to the SHINE session about ChroMag.

HAO is very grateful to the MLSO User committee for their time, thoughtful questions, comments and suggestions. Please contact me (joan) with edits and corrections, you would like me to make to these notes.