The National Solar Observatory (NSO) Users Committee Report

To: Dr. Valentin Pillet, Director National Solar Observatory

The NSO Users Committee (UC) met 17-18 May 2017 at the NSO HQ in Boulder, Colorado.

Committee members participating: Boboltz (ex officio), Braun, Choudhary, DeForest, Henney, Lin, McAteer (chair), Rabin (outgoing chair), Reinard. Casini sent his apologies that he was unable to attend.

NSO participants: Berukoff, Hill, McMullin, Penn, Pillet, Rast (DKIST SWG chair), Rimmele, Uitenbroek,

We are grateful to Jennifer Ditsler for her coordination of the meeting logistics, and to Tom Schad for his lunchtime science presentation.

We thank Alysha Reinard and Doug Rabin for their contributions to the UC during their terms and we wish them good tidings in their future endeavors.

As discussed at the UC, we provide this report as a bulleted list of recommendations and remarks within 1 month of the the meeting and we look forward to hearing back from the director within 3 months in response to the 8 recommendations below. The chair remains available to the director to discuss any items at any time during the year.

Submitted on behalf of the NSO Users Committee this 12th day of June, 2017

on behalf of the NSO User Committee Dr R.T.James McAteer (chair)

UC Recommendations arising from the May 2017 UC meeting

The UC recommends the following 8 potential courses of action for the director to consider at his discretion. We look forward to hearing back from the director within 3 months in regards to which recommendations have been accepted and which actions have been planned.

 Recommendation 1: SOLIS be shipped to BBSO according to the timetable presented, with no delay.

SOLIS data remains a key instrument in the NISP suite. The decision has been made to move it to BBSO. The timeline, as presented, for a successful move entails shutdown in September 2017 and a return to operations 5 months later. There are possibly some external constraints on the return to operations, but we propose that any slip in the date for return to operations should not influence the shutdown date. As SOLIS clearly cannot stay in Tucson, we recommend moving the instrument to BBSO on schedule and mothballing it in place at BBSO if needed.

• Recommendation 2: NSO continue to play a vital oversight role in the DKIST Critical Science Plan workshops.

We are glad to see so much enthusiasm in these workshops and look forward to seeing who participates, including careful encouragement of grad student involvement, and making sure the Science Use Cases all get submitted on time.

Recommendation 3: NISP plan for an end-to-end calibration of GONG and SOLIS.

The expertise to provide an inter calibration of NISP data lies with NSO. Clearly the implementation of any calibration may have to wait for GONG upgrades and SOLIS relocation to be completed, but the existence of this plan may provide an impetus in the community to proceed with the best possible inter calibration of these data.

• Recommendation 4: NSO give high priority to working with the community in order to provide a key, simple, higher level product from DKIST data.

The UC recommends that NSO give high priority to providing a high-level DKIST data product as early as possible after DKIST first light—preferably, Milne-Eddington or (at a minimum) weak-field approximation vector magnetograms. Although we recognize that the decision on actual high level data products is outside our committee, we see a large user demand for some simple products. For example, photospheric Fe I data could be selected and ME-inverted using existing community codes, both in USA and international. Magnetograms from SOHO/MDI, SDO/HMI, and GONG are among the most-used high-level data products in all of solar physics. We expect that vector magnetograms from DKIST, taking advantage of existing codes and pipelines such as Hinode SP, would fill a high-priority community need and jump-start community involvement with DKIST. As such, we expect the provision of some high level product (equivalent to SoHO-MDI magnetograms and Hinode-SP ME-inverted Stokes spectra) would provide strong encouragement towards broad community involvement.

 Recommendation 5 (McAteer was recused from this recommendation): NSO work to assist the Sunspot Solar Observing Consortium in providing for operations of the Dunn Solar Telescope. We encourage NSO to provide some level of partnership, as appropriate under discussions with NSF, to continue to do everything possible for the success of the Dunn Solar Telescope after October 2017. We expect that the use of any resulting observing time or data, as clarified in an MOU with the operating consortium, would be limited to NSO scientist's projects and NSO-led instrument proof-of-concepts.

 Recommendation 6: NISP consider ranking improved liquid crystal modulators above the new cameras, and consider a new H-Alpha filter as the lowest priority for refurbishments for GONG.

We strongly urge NISP to consider making the current GONG set-up as correct and stable as possible to be the driving force behind their decisions. Installing Improved liquid crystal modulators is key to ensuring high quality GONG magnetogram products into the future

 Recommendation 7: The director consider altering the UC membership to promote an inclusive committee.

We serve at the discretion the NSO director, and we encourage the director to consider the possibility of international members (we note the user base of both DST, CSP, and NISP is about 1/3 international), to retain a diversity of sex (we note the only female member is leaving the UC), to retain interested government agencies (we note that both the NOAA and NASA members are leaving the UC), and possibly expand the UC to include representation from the modeling community. At the directors discretion we are happy to provide a list of nominees. We also recommend that the director take this opportunity to set some expectations on membership, including level of attendance at telecons and meetings, duration of service, and expected annual turnover.

• Recommendation 8: The director push forward with his vision for the role of the UC in the future.

The NSO has a responsibility to service the scientific interests of the broad solar physics community. The UC has a responsibility to communicate those interests to the director. As the role of other NSO Committees has changed over the years to have less reflection on science, now may be a good time to redefine the role of the UC so that it remains complimentary with other NSO committees (both existing and potential), with as little overlap as possible. We are eager to receive clarity on our future role as we would like to assist as best we can in providing user feedback and recommendations on the status, enhancements, and future science made possible by NSO data.

- We suggest we remain as one committee, with no split into two UCs, and no splinter sessions at meetings.
- We propose the UC could meet twice a year by phone, in addition to our regular UC meeting. Within 1 month (June) after the in-person meeting (May), the chair will provide a list of recommendations to the director. Three months later (August / September) the director will report back to the UC on which of those recommendations have been accepted and what action is planned. Three months prior (February / March) to the next UC meeting, the UC and director will meet to discuss the agenda for the next meeting. It is expected that specific items will be introduced by both the UC and the NSO director. The in-person meeting (May) would focus on those specific items, with some important

- informational status updates. NSO would lead the facilitation of these two telecons in coordination with the chair of the UC.
- In the short term, we expect that the approach as described above would lead to a natural focus on NISP for the next 2 years.
- We suggest that a focus on some specific items may require 'guest participation' from specific individuals, and NSO should consider inviting these individuals on a one-off basis to attend the full UC meeting. We suggest that such a focus on some specific items may also entail some presentations from members of the UC at the in-person meeting.
- We would like to be more public in our role. We suggest to consider a joint notice to solar news (from chair of UC and director of NSO) at appropriate times during the year. For example, in September we could announce that the list of accepted recommendations have been published online, and in March we could announce the agenda items for the next meeting.
- We suggest making some of the status overviews and informational talks available online 1 week before the UC meeting. The UC would be expected to provide feedback to the NSO on which sections of presentations could be reduced or omitted.

Other UC Remarks arising from the May 2017 UC meeting

The UC realizes the importance of this year to NSO, as they complete their unification to one site in Boulder. We congratulate the NSO on their progress to this end, and look forward to seeing this completed this year.

The UC congratulates the DKIST construction team on its careful handling of all aspects of DKIST oversight. All additional federal mandates have been handled well by the team. All challenges continue to be clearly identified and solved at minimum disruption to the project. We look forward to hearing continued updates in future meetings.

The UC supports NSO on its ongoing coordination with Solar Orbiter and Solar Probe Plus. This activity is a natural follow on from successful coordination with ALMA and helps to make the community aware of the vital role that NSO plays in all aspects of heliophysics. The UC looks forward to hearing more about the SHINE session on coronal science, with an eye on using this to expand the user base for DKIST. Further, it seems clear that NSO personnel have key roles to play with regards to the future of SPRING and we look forward to continuing progress.

The UC is encouraged by the plan to continue to host future Science Working Group workshops at American institutions and we would like to be updated on these as they occur.

The UC was excited to see the progress on the data center. The team have looked at the concerns of the community and are now addressing each concern appropriately. We look forward to seeing continued progress on an API to link into VSO, a minimum services requirement, a data policy on PhD student projects, and a clarity on the availability of raw data.

The UC is encouraged by the excitement resulting from the inversion workshop (SIR) hosted at NSO. We hope to see these community activities become a regular feature as we try to grow the user base in preparation for DKIST data. At future meetings we would be happy to hear about any tools NSO can assist to provide to the community as the community works to create their own high level data.

The UC is glad to see NSO and HAO submit a white paper to address the long term issue of growing the user base in USA. We encourage a decentralized vision, where no single institution 'owns' this effort and we hope to see strong community involvement in this.

The UC is glad to see some future in the McMath Pierce facility and we hope this can come to fruition.