Director's Office

From the AURA President

William Smith

This edition of the *NOAO Newsletter* comes at a propitious time. Over the past year, AURA has embarked on an intensive effort to identify and recruit a new director for NOAO. Given Sidney Wolff's distinguished leadership and impressive record of accomplishments, this search has been a difficult one. I am pleased to say that our efforts have produced an outstanding success in the selection of Jeremy Mould.

Jeremy Mould has been closely associated with AURA and with NOAO for more than a decade. Not only does he bring a world-class scientific reputation, he has a long track record as an observatory director and as an outstanding manager. AURA is extremely fortunate to have Jeremy's services at this critical time in NOAO's future.

The AASC Decadal Survey has articulated a bold—and very different—vision for NOAO and the role of a national observatory. It is clear that NOAO staff have in fact heavily contributed to this vision and thus have already demonstrated their commitment to achieving it. Jeremy Mould's leadership will be a crucial

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Back to the Future

Jeremy Mould

I am rejoining the National Optical Astronomy Observatory very conscious of the honor of being invited to lead the observatory by AURA in its role representing the national astronomical community, and very excited about the years ahead. The excitement comes from a far-sighted decade plan, *Astronomy & Astrophysics in the New Millennium*, which the community has made, and in which NOAO is challenged to play its part.

The Survey Committee sees the astronomy community creating the needed new facilities cooperatively, while retaining the full power of the diversity which has made US astronomy so successful. NOAO is asked to make this its agenda, not from a position of strength, but from a peer position. This is an attractive vision to many of us, but it is not an easy one to realize, and we can't afford the luxury of a lot of redundancy in the system. The requirements placed on NOAO are many, but a core responsibility is some access to unique facilities by proposers on the basis of simple merit.

Since the release of the decade plan, NOAO has been a hive of activity examining initiatives which it might facilitate in partnerships (such as LSST and GSMT) and ways of enhancing what it is already doing (such as archiving). This will continue through the first half of this year, culminating in the submission of AURA's proposal to the National Science Foundation to continue managing NOAO. I am coming on board at a critical time, and a key role for me is to help find the balance between resourcing the existing facilities, whose research output is impressively productive, and the strategic development of NOAO's part in the system which we need to have in ten years' time. I'm looking forward to working with you all.

Jeremy Mould has been selected as the new NOAO Director

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element in making this vision a true success. Beginning in February, Jeremy will undertake an aggressive effort to examine every facet of NOAO and every possible way in which NOAO can lead in implementing the Decadal Survey. This transition effort will be made all the more difficult by the prospect of the recompetition that will be held for AURA's managing role for NOAO over the next year.

This effort will be difficult but will yield long-lasting benefits for NOAO and for the astronomy community. It will put in place the necessary structure we so much need for the coming decade. I urge all NOAO staff to cooperate fully with Jeremy in this undertaking and to lend him your strong support. I look forward to a dynamic and prosperous future for NOAO under Jeremy's leadership.

Sidney Wolff: Architect of the Future

Sidney Wolff is stepping down after more than 13 years as the Director of NOAO. Her legacy will be a new generation of national telescopes, a changed paradigm for the National Observatory, and a visionary blueprint for the future of ground-based optical and IR astronomy.

Sidney's unique combination of vision, persistence, eloquence, and high ethical standards were key to the success of a series of major initiatives.

She helped forge the WIYN consortium, which created a modern telescope that utilizes a mirror derived from NOAO's participation in development of the Steward Mirror Lab. The project was successful in several ways. It resulted in an excellent telescope that improved on the ground-breaking design of ARC and that validated the performance of borosilicate mirror technology. It proved that NOAO could work effectively in a complex partnership with universities. The use of active mirror support and thermal control laid the groundwork for Gemini and other large-aperture telescope designs. The consistent sub-arcsecond delivered image quality reminded the community that Kitt Peak remains a world-class site.

Sidney supported the innovative proposal from the National Solar Observatory and its community to develop the GONG project. That support came in the form of key technical resources and deft, often unappreciated allocation of finances to the project, sometimes in the face of sharp budget cuts.

Sidney Wolff, in her more than 13 years as NOAO Director, transformed mountaintops, her staff, and the national dialogue on ground-based O/IR astronomy

She launched the Gemini project by skillfully blending the growing support for high-performance large-aperture telescopes with the NSF's interest in international partnerships. As the first Gemini director, she assembled a project team focused on excellence and composed of the best from partner observatories and from industry. Her principled firmness guided the project through the turmoil of the primary mirror decision process and placed it firmly on the path toward completion within schedule and budget.

Sidney also backed the National Solar Observatory's initiatives for SOLIS and the Advanced Technology Solar Telescope by assigning a strong technical staff and by re-balancing solar and nighttime resources to reflect the evolving priorities of AURA and of NSF.

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Sidney Wolff continued

She facilitated and shaped the SOAR partnership to achieve the aspirations of its partners for a state-of-the-art 4-meter telescope in the south.

She was instrumental in the formation of the ACCORD consortium, where her patient and constructive approach engaged other major observatory directors in a productive and continuing dialogue on the complementary roles of public and independent observatories.

Her vision for the next decade anticipated and shaped the recommended roles for the new NOAO that appear in the McKee-Taylor Decadal Survey, *Astronomy and Astrophysics in the New Millennium*.

All of this was accomplished while she continued to ably direct the ongoing operations of NOAO at all of its diverse sites, interact with numerous oversight committees, and effectively represent NOAO to the funding agencies and to the community at large. Throughout these varied and often difficult activities, Sidney retained her essential warmth, humanity, and accessibility.

Sidney Wolff transformed mountaintops, her staff, and the national dialogue on ground-based O/IR astronomy during her tenure as NOAO Director. We are in her debt for her effective stewardship of national assets that created a new era of scientific opportunity for the nation's astronomers.

Richard Green and Dave DeYoung, for the NOAO Staff

The First Workshop on the Ground-Based O/IR System: Report Now Available

Todd Boroson

The "First Workshop on the Ground-Based O/IR System" was held 27–28 October 2000 in Scottsdale, Arizona. This workshop, attended by 80 astronomers from 45 different institutions, was the community's first opportunity to explore the implications of the recommendation of the McKee–Taylor Decadal Survey, and of the O/IR panel in particular, that the ground-based O/IR capabilities be viewed as a system. This perspective arises from the consideration that the US position will remain competitive and effective only through investment that recognizes the way in which public and private facilities together provide the resources that the community needs to carry out research. The goal of the workshop was to engage a broad segment of the community in discussions about the context and elements of the ground-based O/IR system and, through science-based arguments, to identify capabilities that might be missing or in short supply.

The report from this workshop is now available on the NOAO Web site at *http://www.noao.edu/gateway/oir_workshop/report.pdf*. The report includes a summary of the workshop activities, instrumental and other capabilities that are considered to be of high priority, and recommendations by the organizing committee. Appendices include the list of participants, the workshop agenda, reports of the six science-based breakout groups, and a set of tables presenting existing and planned capabilities on medium- and large-aperture telescopes.

"Science with LSST"—A Report on the Workshop

Todd Boroson

The Large-aperture Synoptic Survey Telescope (LSST) is a wide field-of-view facility that will repeatedly image the entire visible sky to substantial depths, opening up the time domain for studies of moving, transient, and variable objects. In addition, LSST will build up a static data set that will support studies requiring deep imaging over substantial fields or even the entire sky. LSST was given strong endorsement by the recent McKee–Taylor Decadal Survey, based on the potential of the LSST to make essential contributions to the search for earth-crossing asteroids, the discovery of Kuiper Belt objects, observations of supernovae, and the mapping of dark matter through weak lensing. LSST is envisioned to work in a mode unlike any existing telescope. It will perform a series of pre-programmed observations, with the goal of simultaneously addressing a number of important scientific problems. Data will be immediately released publicly, in order that follow-up observations of time-critical phenomena can be undertaken.

To further develop the performance requirements for the LSST system and to explore the constraints placed on the operations strategy by various scientific programs, a community-based workshop, "Science with LSST," was held 17–19 November 2000 at NOAO in Tucson. In attendance were 55 participants from 22 different institutions. The agenda and list of participants can be found on NOAO's web site at *http://www.noao.edu/gateway/lsst_workshop*.

Following a series of presentations that laid out straw man concepts for the telescope, the instrument, and the data system, and discussed issues relating to photometry and astrometry, breakout groups explored potential LSST science in four categories: (1) objects moving at non-sidereal rates, e.g., NEOs and KBOs; (2) transient or variable objects, e.g., supernovae, GRBs, microlensing events, and variable stars; (3) whole-sky imaging, e.g., stellar population studies in the Milky Way or nearby galaxies; and (4) ultra-deep imaging, e.g., mass tomography through weak lensing. Groups with expertise in each of these categories discussed the specific projects that LSST could undertake and developed a list of requirements in areas such as delivered image quality, astrometric precision, bandpass, and site characteristics. In addition, each group laid out its desires for operation, including exposure time, observation cadence, and requirements for data processing and follow-up observations. A final plenary session brought all these constraints and ideas together for a discussion of general conclusions and issues for further study.

It was agreed that LSST can address a broad range of important scientific questions by operating in two modes that are interwoven. Some fraction of the time (likely 50% or more) will be spent imaging the entire sky to a modest depth (m=24 in 20-30 second exposures) with a complex series of "revisit intervals" and filters. These exposures will also serve to generate a deep multicolor image of the entire sky that will form the principal data set that the broadest segment of the community will want. The rest of the time will be used to obtain much deeper images of a set of smaller fields in a few bandpasses. These exposures will be taken with a specified set of intervals to enable searches for much fainter variable objects.

The desirability of an LSST-precursor experiment was also acknowledged. Since both the data rate and the data volume represent two orders of magnitude increases over the most ambitious ground-based surveys to date, it is imperative that lessons learned from projects such as 2MASS and SDSS be remembered and that new approaches be tested with efforts where less is at stake. Ideas proposed and discussed at the workshop included using a planned 1° field-of-view imager on the WIYN telescope and using the LCO 1.0-m Swope telescope (3° field-of-view) for such an experiment.

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Science with LSST continued

A number of other issues were identified as needing further study. These include:

- More detailed development of the NEO observing strategy, including modeling the survey.
- Optimization of techniques for detecting variable or moving objects in crowded fields.
- Modeling observations of extrasolar planet transits.
- Exploration of limitations on photometric precision; better than 0.01 magnitude photometry is needed for some programs.
- Detector issues associated with achieving good sensitivity over the whole of the optical range, and minimizing fringing in the red.
- The manufacture of filters and how they would be changed within the instrument.
- Studies of the spatial and temporal variations of sky brightness in the far red.
- The desirability of auxiliary telescopes that would make simultaneous observations with LSST for calibration.
- A mechanism for ensuring that follow-up observations are made for time-critical applications.

A complete report on the workshop is being written and will be posted on the LSST Workshop Web site at *http://www.noao.edu/gateway/lsst_workshop/*.

NOAO Publication Lists Now Online

The publication lists for KPNO and CTIO going back to 1990 are now posted online at *http://www.noao.edu/noao/library/noaopubs.html*. This bibliography tracks publications that have used NOAO facilities as well as publications by the NOAO staff. The lists are ordered by fiscal year (October 1 to September 30).

We invite the community to review these lists and notify us of additions or corrections. Please send your corrections to Mary Guerreri, Librarian (*library@noao.edu*). As always, we would appreciate receiving preprints of any papers that make use of NOAO data.