



DIRECTOR'S OFFICE

An Observing System—What Does It Mean and How Do We Get There?

Sidney Wolff

The recently published report of the Astronomy and Astrophysics Survey Committee (AASC) makes a number of recommendations for ground-based O/IR astronomy. Two major new facilities are recommended—the 30-m Giant Segmented-Mirror Telescope (GSMT) and the Large-aperture Synoptic Survey Telescope (LSST). It is fairly easy to see how to go about defining the scientific requirements for these facilities and identifying the technical issues that must be addressed before construction could be initiated with some reasonable confidence about cost and schedule.

Much more challenging is the recommendation that “all facilities, whether nationally or independently operated, should be viewed as a single integrated system . . .” What does this really mean? How do we get from where we are today to this new paradigm? How do we balance greater coordination and planning for facilities as a whole with support of truly creative ideas that could never arise out of some bureaucratic process?

The next article in this newsletter describes several community workshops that we are sponsoring to begin to try to understand this issue, as well as to begin to define the requirements for the GSMT and LSST.

There are other projects that will by their nature require contributions from many institutions. Two examples

are the development of adaptive optics—both for today’s telescopes and for the GSMT—and the National Virtual Observatory (NVO). In each case, there are a series of tasks and activities that must be completed in order to achieve the overall set of goals, but these activities will necessarily be funded by multiple proposals from many different institutions.

It is important to have an overall road map that shows where we are trying to go and milestones to measure progress along the way so that we do not lose sight of our destination. To this end, NOAO worked with members of the community active in the adaptive optics program and the NVO to prepare white papers outlining the requirements for both programs and to present them to the NSF. Look for them at the NOAO Web site and please send me comments since these roadmaps should be viewed as evolving documents that will be updated regularly based on actual accomplishments of the many institutions that are contributing to these programs.

White papers such as these, which have the goal of defining what will best serve the community as a whole, can play an important role in moving toward greater optimization of the overall investment being made in what will remain a distributed system of capabilities, facilities, and programs.

NOAO—A Partnership with the Community

Todd Boroson

One of the important principles of the new paradigm for O/IR astronomy set out in the AASC report and the associated O/IR Panel report is that NOAO should work in partnership with the community. We take this principle to mean that efforts on specific projects—including instrument development—should include participation from outside NOAO. We also take it to mean that the activity of identifying NOAO's new directions should take into account what is being done at other institutions and should involve the community. We have found that a particularly effective way of doing this is to hold community workshops. Over the next six months, we plan to hold three workshops aimed at discussing (1) the system of public and private facilities for O/IR astronomy, (2) the science case for the Giant Segmented-Mirror Telescope, and (3) the science and operations for the Large-aperture Synoptic Survey Telescope. Following each of these workshops, a report will appear on the NOAO Web site.

Workshop on the "System"

The McKee-Taylor Decadal Survey report lays out a new paradigm for ground-based O/IR astronomy: that "all facilities, whether nationally or independently operated, should be viewed as a single integrated system . . ." The report argues that this view should guide discussions about what new capabilities are needed and how resources can be most effectively used. Most broadly, the "system" comprises all the capabilities that end-to-end allow scientific research to be carried out. Examples of such capabilities are telescopes, instruments, observing modes, data archives and analysis software, and funding that supports research.

As an initial step toward an understanding of the components of this system, how they work together and what capabilities are desirable over the next decade, NOAO is organizing the first workshop on the Ground-Based O/IR System. The strength and evolution of the system will be considered in the context of the international astronomy landscape, and desirable new capabilities will be identified based on the scientific aspirations of the participants, representing the broad community. The NSF Astronomy division has indicated interest in this workshop and plans to send a representative. The workshop will be jointly chaired by Alan Dressler (Chair of the AASC O/IR Panel) and Todd Boroson. Contact Todd Boroson (tyb@noao.edu) for further information.

Workshop on the Science Case for the GSMT

The Giant Segmented-Mirror Telescope is a 30-m class O/IR telescope recommended as a high priority for the coming decade by the McKee-Taylor Decadal Survey report. NOAO, through its New Initiatives Office, has initiated an effort to develop viable design concepts for this telescope. This work depends on substantial community involvement in all phases and aspects, from understanding the scientific drivers to carrying out the technical design studies. One of the early challenges is to achieve a deeper understanding of the scientific capabilities that will drive design decisions for GSMT and its instruments.

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A workshop is being organized for mid-September to bring together groups who will discuss how broad science goals of the future translate into prioritized capabilities of the telescope and instruments (e.g., wavelength optimization, field of view, AO requirements). As a result of these discussions, the groups will identify the scientific trade studies needed to improve the prioritization of telescope and instrument capabilities. In order to enable a focused discussion, the panels will consider science goals in the fields of galaxy evolution and large-scale structure, stellar populations, and star and planet formation. The group discussions will be chaired by Frank Shu, Marc Postman, and Rosemary Wyse. NOAO contacts for the workshop are Steve Strom (*sstrom@noao.edu*), Joan Najita (*jnajita@noao.edu*), and Arjun Dey (*adey@noao.edu*).

Workshop on Science and Operations for the LSST

The Large-aperture Synoptic Survey Telescope is a special-purpose facility, envisioned to conduct repetitive imaging surveys of the entire visible sky in search of moving, transient, or variable objects and to build up deep images of selected regions. The database generated will have a myriad of uses and will also provide a basic resource for observations in

other parts of the electromagnetic spectrum and for outreach. The concept for data distribution is to make all data available to qualified researchers as quickly as possible, though of course the sequence of telescope pointings must be determined by some scientific strategy.

In order to understand the facility design and operations requirements of various scientific programs that could be carried out with the LSST and how they could be combined into a coherent approach, NOAO is organizing a workshop on Science and Operations for the LSST. This workshop will bring together groups representing the major scientific programs that are being considered for LSST: (1) time-domain studies such as discovering Earth-crossing asteroids, searches for high-redshift supernovae, and microlensing surveys; (2) moderately deep very wide field studies such as searches for rare types of stars in the halo; and (3) very deep narrower field studies such as mapping dark matter through weak lensing. These groups will discuss the requirements of their various programs to better understand what combinations could be effectively merged—in terms of both the expected performance of the facility and its operations strategy. NOAO contacts for this workshop are Todd Boroson (*tboroson@noao.edu*) and Richard Green (*rgreen@noao.edu*).

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