

## The NOAO System Science Center

Verne V. Smith

The new fiscal year at NOAO has seen the transformation of the NOAO Gemini Science Center (NGSC) into the NOAO System Science Center (NSSC). This division handles all of the former duties of NGSC, as well as other existing NOAO activities related to connecting the US user community to the present and future science capabilities of the open-access, US ground-based optical/infrared (O/IR) system (System).

The structural organization of NSSC allows staff astronomers to more easily move between supporting current facilities and engaging the community with new facilities under development, as well as streamlining user access to the System as a whole. NSSC is divided into System User Support (which includes the functions of the former NGSC), System Data Management (previously known as Data Products Program), and System Community Development. The newly organized System Community Development program will track community desires for the evolution of capabilities within the System and guide development to provide such capabilities.

Overall, NSSC will provide the following services:

- User support for observing proposal preparation and submission for all of the System facilities as well as help with questions about post observing data processing
- Assist non-NOAO facilities as appropriate to help with their interface to the community-at-large
- Work with the community-at-large to define and prioritize new capabilities of the System
- Ensure that current and new capabilities of the System are being advertised to the widest possible audience

In short, NSSC will evolve over the coming year into a center for end-to-end user support of the System, as well as a focal point for developing new operational relationships between NOAO and other science facilities and capabilities within the System.

If you have any questions or comments about the role of NSSC in your System, do not hesitate to contact me at [vsmith@noao.edu](mailto:vsmith@noao.edu).

---

## NOAO at the 2010 Washington AAS Meeting

Ken Hinkle & Verne V. Smith

NOAO will have a booth in the exhibit hall of the January 2010 AAS meeting. A number of our scientific staff will be present. Please stop by. We look forward to talking you and to helping you with any questions or issues dealing with NOAO.

The January AAS meeting overlaps the range of dates that Gemini users have to complete their semester 2010A Phase II forms. As the US national representatives for Gemini, NOAO staff are the first contacts for the Phase II process. Many of the staff contacts will be present at the NOAO booth at the AAS meeting. We will have a high-speed Internet connection and can work with you to complete your Phase II. In the past, we have been able to condense days of email communications into less than an hour

of one-on-one interaction at our booth. If you have a Gemini observing program scheduled for 2010A, stop by and let us help you with your Phase II!

NOAO will also host two town hall meetings. The first one will be an NOAO Town Meeting on Tuesday, 5 January 2010, from 12:45 to 1:45 pm, where NOAO will seek community input and feedback on a variety of issues and opportunities relating to ground-based optical/infrared (O/IR) astronomy in the context of the Astro2010 process and other initiatives. NOAO will present a summary of its long-range planning and objectives for developing the US O/IR System of capabilities. We will discuss the status of the development activities for small- and large-aperture telescopes

resulting from the Renewing Small Telescopes for Astronomical Research and Access to Large Telescopes for Astronomical Instruction and Research proposals, respectively.

The second NOAO-hosted meeting is a US Gemini Town Hall on Wednesday, 6 January 2010, from 12:45 to 1:45 pm. For this meeting, NOAO is particularly interested in community views on desirable, general purpose (workhorse) instruments that could be deployed in the next three to five years. In addition, the topic of implementing large programs on Gemini (those requiring more than 10 nights) will be discussed. However, all topics related to Gemini and its relation to the US community-at-large will be open for discussion. Plan to attend and bring your questions and comments with you.

# FLAMINGOS-2 Achieves First Light

Knut Olsen

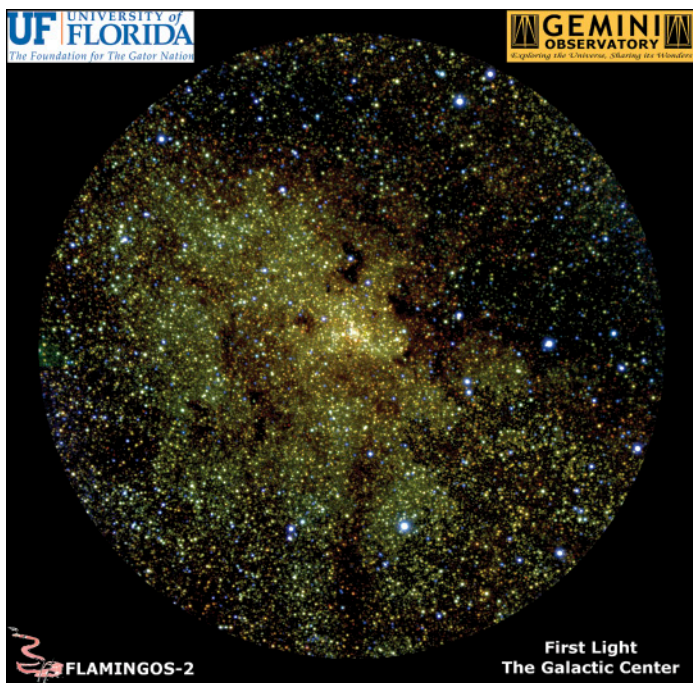


Figure 1: FLAMINGOS-2 image of the Milky Way Galactic Center. (Image credit: Gemini Observatory/University of Florida/AURA/Anthony Gonzalez)



Figure 2: FLAMINGOS-2 image of the Tarantula Nebula (30 Doradus) located in the Large Magellanic Cloud, a satellite galaxy to the Milky Way. (Image credit: Gemini Observatory/University of Florida/AURA/Anthony Gonzalez)

The Florida Array Multi-object Imaging Grism Spectrometer (FLAMINGOS-2), which brings capabilities of near-infrared imaging, long-slit spectroscopy, and multi-slit spectroscopy to Gemini South, delivered its first light images in September 2009. The JHK composite images, one of the Galactic center (figure 1) and the other of the giant H II region 30 Doradus in the Large Magellanic Cloud (figure 2), demonstrate the FLAMINGOS-2 promise of delivering both excellent image quality and large numbers of spectra in crowded fields. The images have spatial resolution of 0.6–0.7 arcseconds, limited only by the natural seeing at the time, and round point spread functions. Further information on the first light images can be found at the Gemini Web site, [www.gemini.edu/node/11328](http://www.gemini.edu/node/11328), or through the University of Florida's press release, [news.ufl.edu/2009/09/15/new-imager/](http://news.ufl.edu/2009/09/15/new-imager/).

FLAMINGOS-2, was conceived by the late University of Florida (UF) Professor Richard Elston, and completed by a team led by UF Professor Stephen Eikenberry. FLAMINGOS-2 provides imaging within a 6.1-arcminute-diameter circular field and  $R = 1200\text{--}3000$  spectroscopy within a  $2 \times 6$  arcminute-area at wavelengths of 0.95–2.4 microns. In addition to its use in seeing-limited mode, it is designed to take full advantage of the 2-arcminute field of the Multi-Conjugate Adaptive Optics system under construction at Gemini South. Further details are available at Gemini's instrument Web page, [www.gemini.edu/sciops/instruments/flamingos2/](http://www.gemini.edu/sciops/instruments/flamingos2/). Tests and commissioning are ongoing. Contingent on commissioning, Gemini will issue a special call for FLAMINGOS-2 Science Verification (SV) proposals. NOAO will publicize the SV call to the US community when it is issued. Watch [www.gemini.edu](http://www.gemini.edu) and [www.noao.edu/ngsc](http://www.noao.edu/ngsc) for the special call.

# NOAO Science Support of the Large Synoptic Survey Telescope

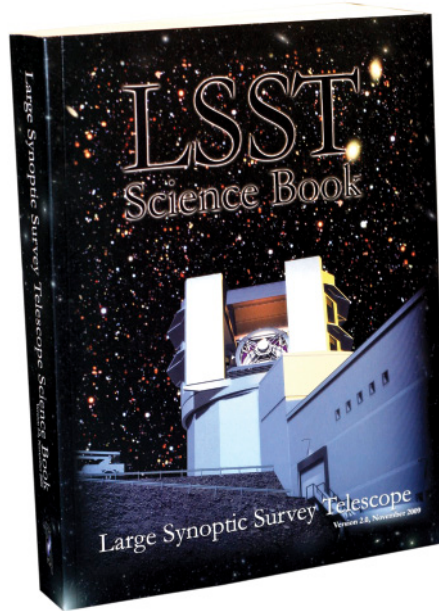
Abhijit Saha

The Large Synoptic Survey Telescope (LSST), to be located on Cerro Pachón in Chile, is designed to have an effective aperture of 6.7 meters and will have a camera with a field of view of 9.6 square degrees. It will repeatedly image over 20,000 square degrees of sky in six pass-bands (Sloan-u'g'r'i'z' and y) over a period of ten years. Individual images will reach point sources to a 5-sigma depth of  $r \sim 24$  magnitude, with co-added depth over the 10 years to reach  $r \sim 27.5$  magnitude. During the 10-year survey, LSST will generate tens of petabytes of data and processed data products. The data will address science problems in nearly every area of astrophysics ranging from the solar-system surveys through large-scale distribution of galaxies and mass tomography through dark matter distribution and dark energy and cosmology. Of particular interest is the discovery space that this repeated observing cadence will open up for temporal phenomena, both for moving objects as well as transients and variable objects. Further details of the design, capabilities, and science potential can be obtained from the LSST site ([www.lsst.org](http://www.lsst.org)). A detailed discussion of the scope of the science with LSST as current perspective allows was published as the LSST Science Book.

NOAO is a founding member of the LSST Corporation, which is a public-private partnership with 31 (and growing) partner institutions. The LSST project has committed to make the data and data products publicly available with no proprietary period. LSST also actively solicits participation from individual US scientists outside the formal institutional membership through its "science collaborations," which are topical groups of interested scientists who wish to participate intellectually towards getting the best return from the LSST survey.

The LSST Science Book has resulted from contributions by 243 individual authors, who are members of one or other LSST science collaborations. NOAO conducts an annual proposal-based selection process (for

details, see [www.noao.edu/lsst/collab\\_prop/Scicollab.htm](http://www.noao.edu/lsst/collab_prop/Scicollab.htm)) for membership in these collaborations, as well as for forming new ones. The recent call to the community generated 44 proposals including two to form new collaboration groups.



NOAO scientists are involved in various aspects of the design of the LSST survey, the requirements on the data system and data products, and the observatory operations plan. This activity is focused through the LSST Science Working Group (LSWG), which is a part of the System Community Development program of the NOAO System Science Center division of NOAO. It is envisaged that NOAO will be a portal for community access to LSST resources. Below are a few examples of the kinds of things in which the LSWG is currently involved.

An observation simulator, which works within the bounds of the technical specifications and the site and weather conditions on Cerro Pachón, has been developed, predominantly through efforts at NOAO. This tool establishes

the feasibility of the projected 10-year survey, and it is in further development that will help design and conduct the actual survey in a way that maximizes the total science return from LSST and can be used to balance science priorities. The simulations are being used by science collaboration members to study the efficacy of their particular science goals against various simulated observing scenarios. The LSWG is developing metrics to facilitate such evaluations.

NOAO scientists have been deeply involved with plans for how the LSST data are to be photometrically calibrated, including observing and analyzing real data to verify and establish procedures that serve the very demanding photometric requirements for LSST data.

A series of workshops that bring the geographically distributed membership of the LSST science collaborations as well as project personnel under one roof to discuss observational constraints and data product requirements are being hosted by NOAO in Tucson. A workshop with the Galaxies collaboration took place in May 2009, and in August, a joint workshop of the Stellar Populations and the Milky Way and Local Volume Structure collaborations was held. Collaboration members as well as project personnel designing the data processing, architecture, and management have reported finding these extremely useful. The community-wide workshop on "The Eventful Universe," which will be held at NOAO in Tucson, March 2010, as part of the Kitt Peak half-centennial celebration, is also clearly relevant to future LSST science.

We welcome your thoughts on how you think the scientific return from LSST can be maximized. We encourage you to consider making a personal commitment to contribute to the success of LSST; the most viable way is to become a member of one of the LSST science collaborations (or start a new one) and enter the exciting dialogue!