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Questions for Steve Kahn, Incoming LSST Director

Dr. Steven M. Kahn was recently announced by AURA as the next Director of the Large Synoptic Survey Telescope (LSST). He will succeed Sidney Wolff on 1 July 2013 and will retain his current affiliation with SLAC and Stanford. Steve previously served as the Associate Laboratory Director of SLAC National Accelerator Laboratory and as Chair of the Physics Department at Stanford and Columbia Universities. He has also served as the Director, Deputy Director, or Associate Director of major interdisciplinary research laboratories, including the Kavli Institute for Particle Astrophysics and Cosmology at Stanford, the Columbia Astrophysics Laboratory at Columbia, and the Space Sciences Laboratory at Berkeley. Steve has made significant contributions to X-ray astronomy, with particular emphasis on high-resolution X-ray spectroscopy of cosmic sources.

Currents sat down with Steve to learn his perspective on LSST and the opportunities and challenges it presents.



Currents: We've heard that LSST will be a transformative capability. How do you think LSST will change the face of US astronomy?

Kahn: I think LSST will change the way most astronomers think about astronomical research. In many ways, LSST is the culmination of a trend that began years ago with the commissioning of the Sloan Digital Sky Survey (SDSS). SDSS had a dramatic impact on many areas of astrophysics. For the first time,

large samples of various classes of astronomical sources could be studied statistically and coherently, leading to a wealth of new discoveries. LSST will go to much fainter magnitudes, increasing the sample sizes by factors of hundreds to thousands. With such large populations of sources, subtle effects can be discerned in the source distributions.

What is particularly new with LSST is the large number of repeat observations of each region of sky. We will get between 800 and 1,000 images of every part of the southern hemisphere. This will provide a kind of "celestial cinematography". We will find everything that moves in the sky, everything that varies in brightness in the sky, and since we can co-add these exposures to yield extremely faint images, we will find everything in the sky.

In many respects, LSST is a kind of time machine, allowing us to trace out the origin and evolution of the key constituents of the cosmos. Measurements of the orbits of large numbers of small moving bodies will allow us to constrain scenarios for the history of the solar system, and the effects of collisions and planetary impacts over cosmic time. Using parallax and proper motion measurements for vast numbers of resolved stars, we will be able to isolate structures in the Milky Way that map the formation of our galaxy and its impact on its local environment. Finally, measurements of the growth of structure using billions of distant galaxies will chart the expansion history of the universe with unprecedented precision, shedding light on the mysteries of dark energy and dark matter.

Currents: What are the greatest challenges facing you as LSST Director?

Kahn: I think there are three main aspects to my job as Director: (1) As the key responsible official for the Project, I will oversee and manage the construction and commissioning of the facility. (2) I will also represent the Project in Washington to its two respective federal agencies, the National Science Foundation and the Office of Science of the Department of Energy, helping to keep it on track as we make our way through a number of funding cycles. (3) Finally, I will provide the face of the Project to the scientific community and to the public at large. There are significant challenges associated with each of these roles.

First, LSST is a very complex and intricate facility, and its design pushes the state of the art in many different ways. Ensuring that the as-built facility will meet its scientific objectives within budgetary and schedule constraints will certainly be challenging.

Second, as a public-private, interagency project, the LSST development effort answers to several different "masters". We need to ensure that we have the funding profiles we need, from both agencies, to keep the Project on track. The two agencies also have very different management styles, and different requirements in terms of reporting and reviews. I expect to be spending a fair amount of time in Washington over the next few years.

Finally, as one of the centerpieces of the US ground-based astronomy program, it is essential for LSST that the Director be responsive to the views and wishes of the community at large. An open and effective communications program is the key to making this work. We will need to keep the community well informed of our progress in building LSST, and we will help to facilitate community preparation for the scientific exploitation of LSST when it eventually comes on line.

Currents: Regarding your last point, we've heard LSST described as "the people's telescope" because LSST data will be widely available for use. What are the opportunities for US community participation in planning for LSST?

Kahn: We have helped to organize the establishment of a number of scientific collaborations associated with LSST within the various subdisciplines that are served by this multi-faceted facility. I encourage interested members of the community to join these collaborations to get involved in learning about the capabilities of the survey and to plan ahead for how they will use LSST data for their respective science. There are LSST-related presentations on science collaboration activities at most AAS meetings.

We are also discussing further actions we can take to help engage the community. NOAO is likely to play a role here, in supporting the community's use of simulation tools and data management software that the Project has generated.

The Project will also maintain a Science Advisory Committee (SAC) that will meet regularly with LSST leadership to represent the interests of the community. We hope this SAC will prove to be an effective gateway for maintaining a close connection between the Project and external scientists that have strong interests in the program.

If you have questions or comments on LSST and how you can get involved, please contact me (skahn@slac.stanford.edu). I look forward to hearing from you.

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Contact Us

Your input is welcome on any of these issues. Please send your thoughts to: currents@noao.edu.

Currents is a sparkplug for communication between NOAO and our community. It provides updates—and solicits community input—on NOAO observing opportunities and NOAO programs and policies on a more rapid timescale than is possible with the *NOAO Newsletter*.

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