Large Synoptic Survey Telescope
E-News

LSST E- NEWS

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FROM THE DIRECTOR, STEVEN KAHN

The "parking lot" on Cerro Pachón, filled with red pick-up trucks, as their owners attended a pre-bid meeting for interested summit facility contractors. Image credit: Jeff Barr / AURA

As you know, construction of the LSST is a joint NSF/DOE effort to realize a facility that has been in design and development for more than ten years. Favorable budget news from Washington in March brings the project closer to a federal construction start. For NSF, we are expecting to receive the full amount requested for construction in FY14, and the FY15 President's Budget Request lays out a funding profile consistent with our current plans, with a MREFC total project cost of $473M. The DOE budget provided in FY14 for the LSST Camera is also consistent with our planned funding profile with an estimated total project cost for the camera fabrication of $165M. The National Science Board will meet on May 6 to consider authorizing the NSF to make an award for construction, which is planned to start on July 1.

The camera team has just completed a successful CD-3A Director's Review, with the formal DOE CD-3A review scheduled for May 6-7. The sensor "first article" procurement is in progress and should be completed by May 1. Other major procurements in progress involve the design/build contracts for the Telescope Mount Assembly, the L1/L2 lens assembly for the camera, and the summit facility construction on Cerro Pachón.

Other project news is described elsewhere in this issue of E-News: our LSST2014 workshop scheduled for the week of August 11 in Phoenix, a joint DES-LSST workshop, and the first face-to-face meeting of the Science Advisory Committee. All in all, an exciting time to be part of the LSST Project.

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DES-LSST Workshop Group Photo. Image credit: Reidar Hahn / FNAL

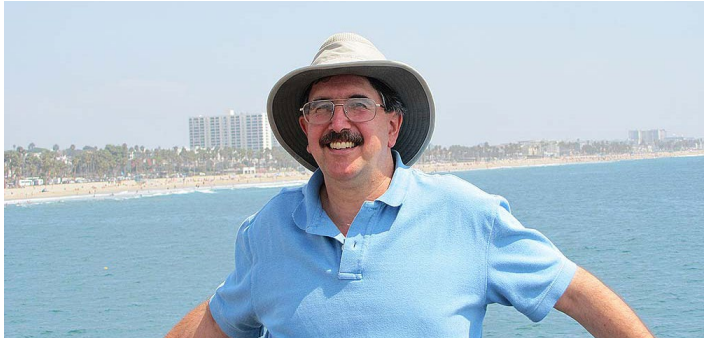
More than 100 participants took part in a Dark Energy Survey (DES) - LSST Joint Workshop at Fermilab on March 24-27, 2014. With the DES having officially begun survey operations on August 31, 2013, and the LSST making steady and impressive progress, lead organizers Zeljko Ivezic (LSST/UW) and Scott Dodelson (DES/FNAL) designed the workshop to provide a timely forum for people on both projects to share lessons learned and discuss future synergistic activities.

The four-day workshop emphasized Survey Characteristics on the first day, Data Management issues on the second, Simulations and Analysis on the third day with breakout sessions for calibration, data analysis, and education and public outreach on the fourth. Many talks were coordinated with representatives from both projects presenting information on the selected topic. The agenda, participant list, and most presentations are available at https://indico.fnal.gov/conferenceDisplay.py?confId=7946.

One popular topic was the use of the LSST software stack in other surveys, identifying which components are useful and adequately mature to share. Similar discussions about DES and LSST simulations, calibration experiences, and data release processing illuminated several opportunities for potential technical collaboration. An evening session on Data Quality Assessment tools actually used for DES observing was particularly informative, showing in detail how the interface works.

Final remarks from LSST Chief Scientist Tony Tyson described the incredible potential for science breakthroughs in the next decade, the result of technological advances that make DES and LSST possible. DES Director Josh Frieman closed with a substantial list of future synergistic projects that could move forward. Pointing out that DES will have 5+ seasons of data accumulated, analyzed, and publicly released by the time LSST starts survey operations, LSST development stands to gain considerably from the DES experience. Conversely the LSST project and collaborations are developing sophisticated tools that can be tested on and help improve the DES. Collaboration between the projects will strengthen this feedback loop to the benefit of both, furthering our eventual understanding of Dark Energy.

MICHAEL STRAUSS: SCIENCE COLLABORATOR, ALL-STAR



Michael Strauss, LSST Science Advisory Committee Chair.
Image Credit: Sofia Strauss

Like so many of the talented people who joined LSST early, Science Advisory Committee (SAC) Chair Michael Strauss' path to the Project was similar to that of a blue chip high school athlete committing to an elite college program. In 2006, Chief Scientist Tony Tyson, Project Scientist Zeljko Ivezic and now-Director Steven M. Kahn recruited Michael to define and lead the LSST Science Collaborations. Since then, he has been a Project all-star, liaising between LSST and the broader scientific community by leading the SAC and Science Collaborations, spearheading the writing and editing of the 598 page LSST Science Book, and serving on the LSST Corporation (LSSTC) Executive Board.

As chair of the LSST SAC, Michael sees his primary responsibility as juggling the tension between the huge range of different science that LSST enables and the need to keep the Project focused on the construction phase schedule and budget. The SAC advises the LSST Director on matters of science policy, interaction with the broader scientific community, and scientific impact of construction decisions. As an LSSTC board member, he has also been involved in negotiations with various potential foreign partners who wish to contribute to LSST during operations.

Michael brings a wealth of survey astronomy experience to LSST, having been involved with the Sloan Digital Sky Survey (SDSS) for more than 20 years and currently participating in a collaboration to carry out a wide-field imaging survey with Hyper-Suprime Cam (HSC) on the 8.2-meter Subaru Telescope of the National Astronomical Observatory of Japan.

"I have always been a survey astronomer; I enjoy the challenge of building large projects that map the sky," Michael said. "LSST really represents the next great survey of the sky after Sloan and HSC. And one of the things we learned from Sloan is the importance of strong and realistic project management and budget. LSST has taken this lesson to heart – in particular being very realistic about the challenge of the software needed to process all these data."

Michael identified software as the area where he feels LSST is pushing the state-of-the-art the hardest. LSST's software is being designed to capture, in the measured properties of each object, optimally calculated quantities from which people will be able to do their science. But, he said, it's more than a technical challenge.

"We have to remember that this is first and foremost a scientific project, and thus, we need to make sure the software team is given the freedom to think like scientists, and that the scientific community is in communication with the software team."

Michael's personal scientific interests include questions of cosmology, as well as the evolution of galaxies and quasars. LSST will explore the nature of faint, and thus, distant galaxies, providing new insights on their evolution. His passion for astronomy began in his senior year of high school when he took an introductory college-level course in astronomy. He earned both a bachelor of arts in Astronomy and Physics and a Ph.D. in Physics from University of California at Berkeley. His thesis was a full-sky redshift survey of IRAS galaxies. He served post-doctoral fellowships at Caltech and Princeton's Institute for Advanced

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Study, where he first became involved with SDSS. He has been a member of the Princeton Astrophysical Sciences faculty since 1994.

Michael is excited about the future LSST enables, "Astronomy is changing rapidly. The onset of large surveys like LSST means that top astronomy is no longer done solely by those lucky few at institutions with access to the largest telescopes. The field has become much more democratic, and the skill set that the next generation of astronomers needs will include the ability to manipulate huge datasets and to understand the nitty-gritty of the data, with all their power and their warts. In 5 years, we'll be madly preparing for LSST data to start flowing, and getting the scientific community to start drinking from the fire hose of data. In 10 years, I hope to be drinking from that flood myself, as part of large and small scientific collaborations to start tapping all the tremendous scientific potential of the data. "

Article by Robert McKercher and Michael Strauss

MARIO JURIC WINS 2014 AURA SCIENCE AWARD

Mario Juric, LSST Data Management Project Scientist.

Mario Juric, the LSST Data Management Project Scientist has been awarded the 2014 AURA Science Award. The award recognizes Mario as an intellectual leader of the astronomical community, who contributes not only through his individual research, but also by enabling scientific research by others.

Mario has played a crucial role in helping to prepare the LSST Data Management System (DMS) for an anticipated construction start. His work has focused on a) Updating the data products and technical baselines to assure they are aligned with the Science Requirements Document (SRD) and community expectations; b) Finalizing the algorithm and software development needed to ascertain that DM can be constructed on time and within the allocated budget; and c) Identifying the strengths and weaknesses of the DM team member institutions, and positioning them correctly for construction.

In addition to his LSST contributions, Mario was a principal developer of the SDSS Moving Object Catalog. He has held prestigious fellowships at Princeton University, the Institute for Advanced Study, and Harvard University. He also is a member of the astrophysics graduate faculty at Croatia's University of Split. His papers have already collected more than 8,000 citations, with an H-index of 30, and he is invited frequently to be a guest speaker at conferences and summer schools.

AURA's annual Outstanding Achievement Awards recognize exceptional accomplishments by individuals, or groups of individuals in the areas of science, service, technology, and innovation. Mario is the second AURA Award winner from the LSST Project Office. Systems Scientist Chuck Claver won the 2013 Technology / Innovation Award.

Article Written by Rob McKercher from press releases

MEET YOUR LSST SCIENCE ADVISORY COMMITTEE (SAC)

Members of the LSST SAC attending the April 7th meeting. Click for larger image and names of SAC members.
Image credit: Karen Fedida / Princeton University

The first face-to-face meeting of the LSST Science Advisory Committee (SAC) took place at Princeton University on April 7, 2014. This committee provides a two-way connection between the LSST Project Office and the external science community served by LSST. Meetings will occur monthly (by phone) and twice a year in person. Minutes of all meetings including presentations will be distributed through the LSST website; input from the community is strongly encouraged by contacting the committee members (listed below).

Topics discussed at the April 7 meeting included the following:

- The current status of LSST and the transition to construction.
- The role of the SAC; interactions between the SAC and the LSST Project, and ways to get input from the community to the Project. The SAC is advisory to the Director, and concerns itself with readying the scientific community for the LSST era.
- The current status of the LSST software pipelines. They are now approaching the level of sophistication of the SDSS imaging pipeline, and will significantly surpass it over the next years of development.
- The LSST observing cadence. The so-called "Universal Cadence" meets the core science goals of LSST, but it is likely that refinements of this can significantly enhance transient and variable star science. We discussed tools for exploring this question, and mechanisms for making final decisions on the cadence.
- LSST will have a two-year engineering and scientific commissioning period. Some of the resulting data will

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be scientifically valuable; how should these data be made available to the community?

- LSST Diversity and Workforce development: We discussed the gender balance within the project, as well as involvement by under-represented minorities, and explored strategies for improving this balance.

LSST SAC membership includes Niel Brandt (PSU), Harry Ferguson (STScI), Chris Hirata (OSU), Lisa Hunter (UCSC), Bhuvnesh Jain (UPenn), Jason Kalirai (STScI), Mansi Kasliwal (Carnegie), David Kirkby (UC Irvine), Renu Malhotra (UA), Rachel Mandelbaum (CMU), Dante Minniti (U Catolica de Chile), Ricardo Muñoz (U. Chile), Lucianne Walkowicz (Princeton), Beth Willman (Haverford) and Michael Wood-Vasey (U. Pittsburgh). Michael Strauss (Princeton) serves as chair.

Article written by S. Jacoby and M. Strauss

LSST PROJECT OFFICE WELCOMES TWO NEW EMPLOYEES

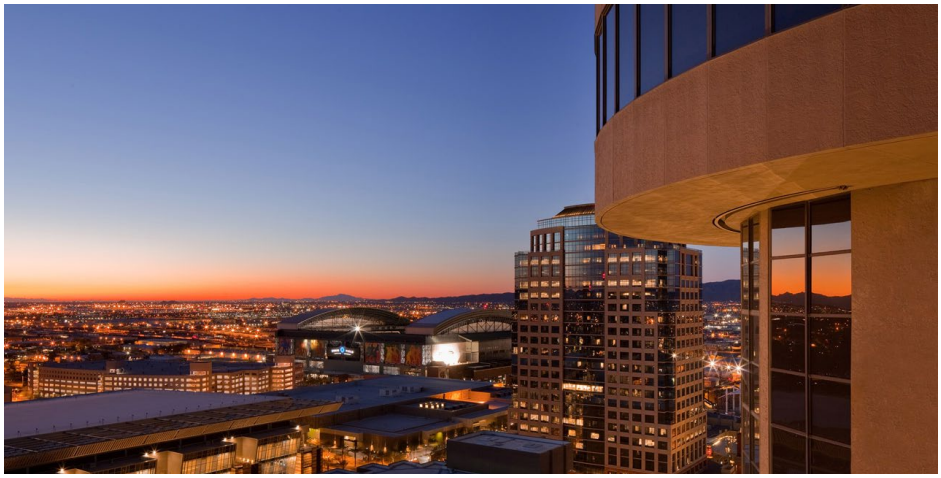
Glenaver Charles-Emerson (L) and Stefan Dimmick (R). Image credit: AURA

Glenaver Charles-Emerson (L) and Stefan Dimmick (R) joined the LSST Project Office in February and March respectively. As Administrative Assistant, Glenaver will be supporting the LSST team at NOAO, including the Telescope and Site, Data Management, and Systems Engineering groups. She brings a diverse skill set to LSSTPO with experience as an administrative professional in academic, finance, and medical settings. In addition to Tucson, she has lived and worked in Kansas, Guam, and her native England. Stefan will work alongside Iain Goodenow as IT Systems Administrator, supporting the ongoing development and maintenance of LSST computer systems. Stefan brings more than ten years of computer industry experience to LSST, starting as a Cryptologic Technician Operator in the United States Navy. He has an undergraduate degree in Business Information Systems (BSB/IS) and a graduate degree in Computer Information Systems (MSCIS). He also brings thorough knowledge and expertise in network structures, policies, and disaster recovery processes.

These individuals bring considerable skill and experience to the LSST Project Office - welcome aboard Glenaver and Stefan!

LSST 2014 WORKSHOP SCHEDULED

The LSST 2014 Project and Community Workshop is scheduled for August 11-15, 2014 at the Hyatt Regency in downtown Phoenix, Arizona. LSST 2014 will be similar to the All Hands Meetings held in the past with emphasis on project/community interaction and cross-subsystem technical topics. NOAO and LSST will concurrently host a workshop on the LSST cadence during the week; Communications and EPO issues will be emphasized through another meeting thread. The Phoenix location should make travel easier for attendees and provide an abundance of restaurants within walking distance of the meeting hotel.



Nighttime view of downtown Phoenix from the revolving Compass Restaurant at the Hyatt Regency. Image credit: Hyatt Regency

JUSTINE HAUPT (BNL/LSST) NAMED DESIGN NEWS 2014 RISING ENGINEERING STAR

Design News magazine has named Brookhaven National Laboratory/LSST engineer Justine Haupt as 2014 Rising Engineering Star. The magazine's editors selected Justine for her work designing test systems for LSST's focal plane components. She was chosen from an impressive slate of candidates including engineers working on underwater robotic fish, smart glasses software, and prosthetic limbs. She is the second person to receive the honor. Design News senior editor Rob Spiegel said, "Justine is impressive in her range of excellence. She has strong engineering skills, but she also gives back to her professional community."

The Brookhaven National Laboratory's communication group has written an excellent article about Justine's award: http://www.bnl.gov/newsroom/news.php?a=24570

Justine Haupt

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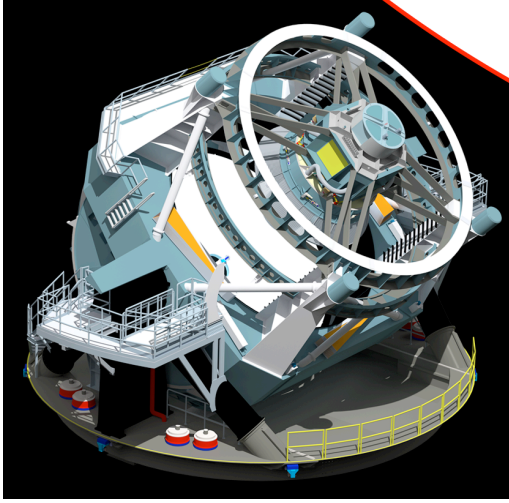

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