Kavli/NOAO/LSST Report

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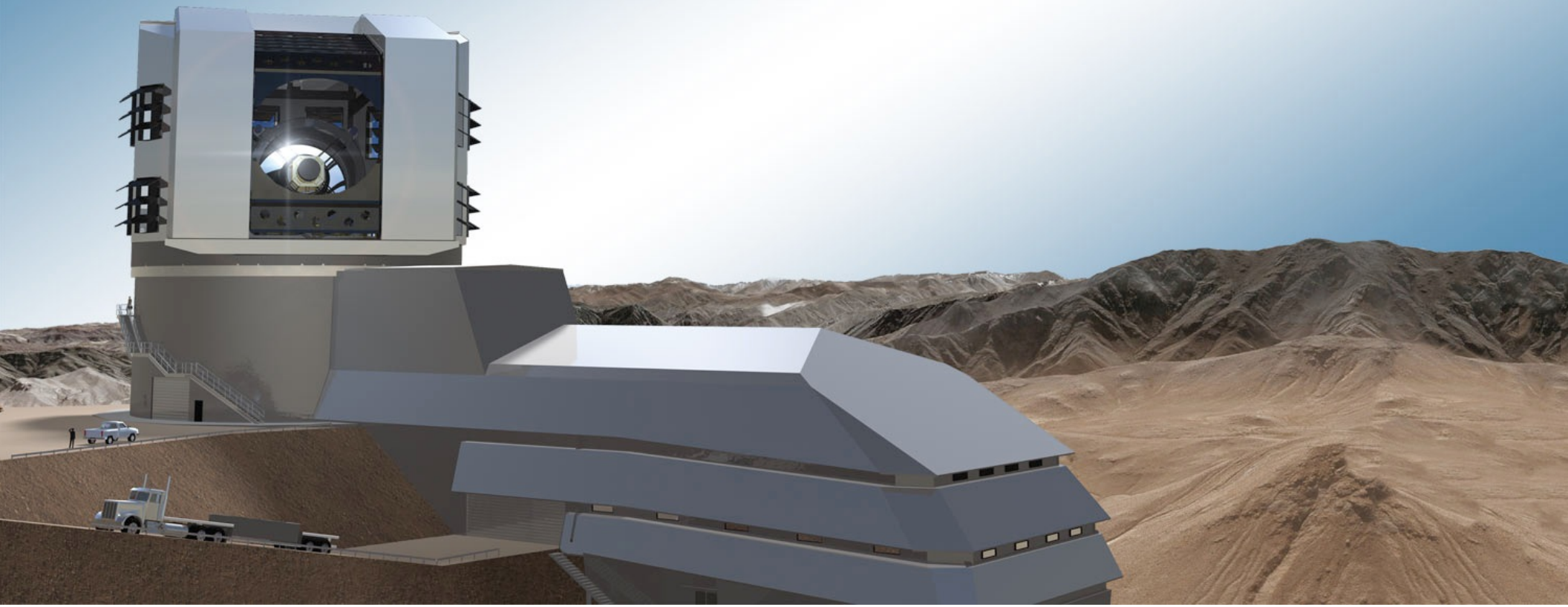

Background

- Follow-up to National Research Council report on “A Strategy to Optimize the U.S. Optical and Infrared System in the Era of the Large Synoptic Survey Telescope (LSST)”, led by Deborah Elmegreen (http://www.nap.edu/catalog/21722/optimizing-the-us-ground-based-optical-and-infrared-astronomy-system)
- Report made broad recommendations, but few details of implementation

Background

- NSF requested NOAO + LSST work together for report:
  - organized around 6-8 science cases with quantitative requirements
  - to assess and prioritize potential O/IR System resources (e.g., telescopes, instruments, and software infrastructure) that can fulfill the needs for these cases
  - to identify high priority future investments

- Intended to provide inputs to federal and private funding sources & observatories
- Kavli Foundation provided funding to enable the report; workshop held in May 2016

Study Group Topics

Study Organizing Committee (SOC):

Joan Najita (Co-chair, NOAO)

Beth Willman (Co-chair, LSST/University of Arizona)

Douglas Finkbeiner (Harvard)

Ryan Foley (University of Illinois)

Suzanne Hawley (University of Washington)

Jeff Newman (University of Pittsburgh)

Greg Rudnick (University of Kansas)

Josh Simon (Carnegie Observatories)

David Trilling (Northern Arizona University)

1. Using Small Solar System Bodies to Understand the Evolution of the Solar System
2. Rotation and Magnetic Activity in the Galactic Field Population and Open Star Clusters
3. Probing Galaxy Formation and the Nature of Dark Matter and Gravity in the Local Group
4. Characterizing the Transient Sky
5. The Co-Evolution of Baryons, Black Holes, and Cosmic Structure
6. **Facilitating Cosmology Measurements with LSST**

Study report should be released very soon!

Cosmology Study Group

Jeffrey Newman (U. Pittsburgh / PITT-PACC), Adam Bolton (NOAO), Will Dawson (LLNL), Mark Dickinson (NOAO), Ryan Foley (UCSC), Elise Jennings (FNAL), Anja von der Linden (SUNY), Eric Linder (DOE), Curtis McCully (LCOGT), Rachel Mandelbaum (CMU), Phil Marshall (SLAC), Tom Matheson (NOAO) Chad Schafer (CMU), Tomasso Treu (UCLA), Ben Weiner (Steward)

Study report should be released very soon!

Study Recommendations

Critical resources in need of a clear and timely development path

- **Develop or obtain access to a highly multiplexed, wide-field optical multi-object spectroscopic capability on an 8-m or larger class telescope, preferably in the Southern Hemisphere**

Critical resources that have a potential development path

- **Deploy a broad wavelength coverage, moderate resolution (R = 2000 or larger) OIR spectrograph on Gemini South (via existing Gemini Generation 4 #3 instrument call)**

- **Ensure the development and early deployment of an alert broker[s] scalable to LSST, and provide access to a diverse suite of facilities for alert triage and urgent follow-up**

Study Recommendations

Critical resources that exist today

- **Support into the LSST era high-priority OIR capabilities that are currently available, e.g. Blanco/DECam and Gemini/NIFS, among others. (NB: Solar System and Stars science cases for DECam require ~3 years each)**

Infrastructure resources and processes in need of timely development

- **Support development of observatory infrastructure that enables efficient deployment of follow-up programs**
- **Regularly review computing needs and support for analysis and discovery tools**
- **Continue community planning and development**

Interactions with Future Cosmic Surveys

- Proposed multi-object spectrograph would closely match SSSI
- Recommendation to retain DECam on Blanco could affect telescope options
- Some discussion of narrow band filters for DECam for stellar studies (but not nearly as many bands as low resolution science cases would require)
- Radio observations were beyond scope for Kavli committee; focused on O/IR resources