



NSF OIR System Report

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NRC/CAA OIR System Study

- “A Strategy to Optimize the U.S. Optical and Infrared System in the Era of the Large Synoptic Survey Telescope (LSST)”
- Recommended by AAAC in 2013
- Committee chaired by Debra Elmegreen, Vassar College, under auspices of NRC Committee on Astronomy & Astrophysics
- Three face-to-face meetings
 - July 31/August 1; October 12-13; December 2-3
- Report delivered in April 2015
- **NSF initial response in Dear Colleague Letter NSF 15-115, issued in August 2015**



NSF Goals of OIR Study

- Goal 1: Position the observational, instrumentation, data management, and support capabilities in U.S. OIR astronomy to best address the science frontiers and science goals as identified in the decadal surveys “*New Worlds, New Horizons in Astronomy and Astrophysics*” and “*Vision and Voyages for Planetary Sciences in the Decade 2013-2022*” in the era of LSST as the primary new federal asset in the OIR portfolio.
- Goal 2: Achieve the best science return from the NSF investment in night-time OIR astronomy, including, but not limited to, the role of the OIR system in delivering LSST-related science.



NSF-Desired Study Outcomes

- Working description of the OIR system, its capabilities and resources, inclusive of federal and non-federal assets
- Maximize access to system capabilities for the U.S. community, whenever possible
- Focus on science outcomes and needed coordination, not particular organizational structures
- Suggested paths forward on instrumentation & data management training/development



OIR System Recommendations-1

- R1: Direct NOAO to administer telescope-time exchange system
 - Under discussion with NOAO
 - First, need data on who wants to offer time in marketplace
 - Probably needs injection of capital to succeed
 - Previous experience indicates that long-term commitments and stability may be most important to community
- R2: NOAO to lead community-wide planning process and facilitate System organizing committee. NSF would solicit proposals to meet prioritized capabilities.
 - A natural role for NOAO
 - Relation to Mid-Scale Innovations Program (MSIP)?
 - See response to R3 below



OIR System Recommendations-2

- R3: Wide-field highly multiplexed spectroscopic capability
 - Community working group (R2) needed to define highest priority science case and instrument requirements.
 - NSF wrote a letter to NOAO and LSST in August asking them to work jointly to develop specific requirements for this item and all the parts of Recommendation R4
 - Kavli Institute is supporting a workshop in February 2016 to move toward development of specific instrument requirements



OIR System Recommendations-2

- R4a: Support development of event brokers for LSST
 - AST is funding several projects along these lines
 - Zwicky Transient Facility through MSIP
 - INSPIRE grant: Joint Arizona-NOAO
 - Special instance of the more global issue of development of Level 3 data products for LSST
- R4b: Position Gemini-S for faint object spectroscopy early in era of LSST operations
 - Gen 4#3 instrument for Gemini may meet this recommendation
 - Feasibility studies for Gen 4#3 completed, with summaries reported out at Gemini science meeting in June 2015
 - Gemini request for Proposals under construction, for release in 2016



OIR System Recommendations-3

- R4c: Ensure that OIR system time can be allocated for faint transient observations prioritized by LSST event broker
 - AST is in discussion with Gemini partners, also NOAO
- R4d: Enhance coordination among federal telescopes in Southern Hemisphere to optimize LSST follow-up
 - Active discussions between NOAO and LSST regarding collaboration on LSST operations proposal
 - Gemini (Gemini Board + Observatory) is presently developing a Strategic Science Vision that will incorporate the changed landscape of O/IR telescopes in the post-2020 time frame
 - “Follow up” should mean coordination for “a range of studies,” not just transient sources



OIR System Recommendations-4

- R5: Plan for an investment in one or both Giant Segmented Mirror Telescopes
 - Instrument proposals to MSIP are welcome
- R6: Continue to invest in development of critical technologies, including Adaptive Optics and precision Radial Velocities
 - Balance between MSIP and other AST instrumentation programs is under active discussion
 - Precision RV is a goal of NN-EXPLORE, with proposals for Extreme Precision Doppler Spectrometer now under evaluation
- R7: Coordinated suite of schools, workshops, and training networks for training in instrumentation, software, and data analysis
 - Is this adequate for maintaining instrumentation and data science expertise?