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?