

# Thirty Meter Telescope (TMT) News

Mark Dickinson

## Update on the TMT Site(s)

On September 28, the Board of Land and Natural Resources (BLNR) of the State of Hawai'i granted a new Conservation District Use Permit (CDUP) to the University of Hawai'i at Hilo for the construction of TMT on Maunakea. In December 2015, the Hawai'i State Supreme Court invalidated the previous CDUP on procedural grounds, and required that a new contested case hearing be conducted before a new permit could be considered. That hearing began in October 2016, and continued through 44 days of testimony by 71 witnesses over five months. On July 26, State Hearings Officer and former judge Riki May Amano released a 305-page report, recommending that the BLNR should issue a new permit, which it has now done. Any further appeal of this decision would likely be directed to the Hawai'i State Supreme Court.

In 2016, TIO selected Observatorio del Roque de los Muchachos (ORM) on La Palma, Spain, as the primary alternative site in case the observatory cannot be built in Hawaii (see article in *NOAO Newsletter #115* for details). Planning for TMT at ORM is proceeding in parallel with the Hawaii effort. The design modifications that would be required to site the TMT at ORM are well understood. A hosting agreement with the Instituto de Astrofísica de Canarias was signed in March 2017, and legal permitting is underway. An environmental impact assessment (EIA) will soon be submitted to the local government of the Canary Islands. The EIA review process is expected to take several months.

**TMT BEYOND FIRST LIGHT**  
तीस मीटर दूरबीन NEXT-GENERATION INSTRUMENT STUDIES  
तीस मीटर दूरबीन

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**NOVEMBER 7-9, 2017 - INFOSYS CAMPUS, MYSORE, INDIA**  
REGISTRATION DEADLINE: SEPTEMBER 18, 2017  
[HTTPS://CONFERENCE.IPAC.CALTECH.EDU/TMTSF2017](https://conference.ipac.caltech.edu/tmtsf2017)

TMT, NOAO, IUCAA, ARIES एरीज, and other logos are at the bottom.

## The 2017 TMT Science Forum in Mysore, India

<https://conference.ipac.caltech.edu/tmtsf2017/>

This year's Thirty Meter Telescope Science Forum will be held in Mysore, India, 7–9 November 2017. Each year, the Forum gathers members of the international astronomical community to meet, collaborate, and plan for future TMT science programs. It is the premier opportunity to learn about TMT, to discuss its capabilities, and to join in shaping the observatory's future.

The theme for the 2017 Forum is "TMT: Beyond First Light." Plans for TMT's first-generation instrumentation and adaptive optics systems are quite mature, and the time is ripe to start planning new capabilities beyond first light. Conversations about this began at the 2016 TMT Forum in Kyoto, Japan (<https://conference.ipac.caltech.edu/tmtsf2016/>), and as described below, TIO is issuing a call for instrumentation white papers and will launch feasibility studies early next year. The Mysore Forum will be an important opportunity to foster discussion and to deepen collaboration among members of the international TMT community.

The meeting program will include overviews of the TMT project status; presentations and discussion about the big science questions to be answered with TMT's next-generation instruments; novel technologies to enable these capabilities; and parallel sessions organized by the TMT International Science Development Teams (ISDTs) (<http://www.tmt.org/about-tmt/international-science-development-teams>) to discuss new instrument concepts and motivating science priorities.

Also, on Monday, November 6, before the Forum, there will be three supporting workshops focusing on particular capabilities and concepts: high-contrast exoplanet imaging, high-resolution optical and infrared spectroscopy, and the Wide-Field Optical Spectrometer (a first-generation TMT instrument).

The National Science Foundation, as part of its cooperative agreement to develop a model for US potential national partnership with TMT, provides travel support for US astronomers to attend the TMT Forum.

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## TMT Instrumentation White Papers

The TMT Project Office and Science Advisory Committee (SAC) have issued a call for white papers proposing design studies for new TMT instruments, adaptive optics (AO) systems, or other technical capabilities to enhance TMT's scientific capability beyond first light. AURA represents the US community as an associate member of TMT International Observatory (TIO), and US astronomers and instrumentalists are welcome to submit white papers and/or to collaborate with others in the international TMT community on authorship.

TMT's first-light capabilities include a near-infrared multi-conjugate AO system (NFIRAOS), an Infrared Imaging Spectrometer (IRIS), and a Wide-Field Optical Spectrometer (WFOS). Proposals for new capabilities should consider these early TMT instruments, as well as the landscape of other ground- and space-based observatories that will be operating in the mid- to late 2020s. White papers may address, but are not limited to, capabilities previously identified as priorities for TMT, including high-dispersion optical and near-infrared spectroscopy, multiplexed

medium-resolution near-infrared spectroscopy, extreme/high contrast AO and coronagraphy, and thermal infrared imaging and spectroscopy. Novel ideas that fall outside or between these existing concepts are also welcome.

The TMT SAC will review the submitted white papers and recommend a subset for feasibility studies to be funded by the TMT Project. Submitted white papers should provide a summary of the scientific benefits of the proposed development and a brief description of the work to be done and should address the suitability of the team for conducting the proposed study.

White papers should be submitted to [whitepapers@tmt.org](mailto:whitepapers@tmt.org) no later than 21 March 2018. Detailed submission instructions and links to useful information can be found at <http://www.tmt.org/news-center/tmt-begins-investigating-ideas-future-instruments-0>. Please address questions to [instruments@tmt.org](mailto:instruments@tmt.org). 

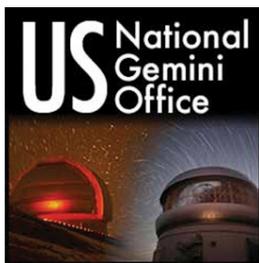
## NOAO Mini-workshop: “Target of Opportunity Observing”

Ken Hinkle

The US National Gemini Office (US NGO) will be holding a mini-workshop on Target of Opportunity Observing (ToO) at the January 2018 AAS Annual Meeting. This is the fourth meeting in the NOAO mini-workshop series. The mini-workshops focus on topics of interest to the US and Gemini user communities. The workshops are held concurrently with a 90-minute afternoon session of the winter AAS meeting.

The focus on queue observing at the Gemini Observatory has allowed ToO observations to be a regular part of the nightly program. ToO observing has numerous applications such as follow-up of astronomically rare events, observations of nova and supernovae at specific times, characterization of orbits of NEOs, and observation of unusual events on solar system ob-

jects. Follow-up ToO observations will be especially critical for LIGO and LSST discoveries. LSST presents a special challenge since it is expected to produce millions of alerts every night.



We will present an overview of ToO observing at Gemini, with a few programs reviewed in detail. Rapid data reduction and publication of results will be discussed. The session will finish with a review of plans for LSST event brokers and a coordinated system of alert follow-up telescopes. This workshop is a great opportunity to start thinking about new approaches to PI science in the era of LSST.

PowerPoint presentations for previous mini-workshops are posted on the US NGO website at <http://ast.noao.edu/csdc/usngo>.

## Preparing for Community Science with LSST

Dara Norman and Adam Bolton

The National Science Foundation (NSF)-funded Large Synoptic Survey Telescope is only four years away from taking data on-sky. Presentations at the recent LSST Project and Community Workshop featuring the construction site showed not just CAD drawings of the building enclosure but also actual pictures of the multi-sided building. With major systems being integrated monthly, it is clear that the time is now for scientific preparation to take advantage of the unprecedented survey the telescope will soon undertake.

NOAO has been preparing to support the astronomical community to take full advantage of the data from the LSST survey data as soon

as it becomes publicly available. Ongoing activities at NOAO include community and knowledge building through meetings and workshops, development of tools and services to support discovery and analysis of survey data sets, and development of plans for an LSST follow-up observing network.

Following guidance from the NSF, an LSST Community Science Center (LCSC) is being developed at NOAO to bring together many of the LSST support activities already underway at the observatory. High priority will be given to support for targeted meetings aimed at active community members, with the parallel goals of supporting researchers in their

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