



Participants at the 2017 TMT Science Forum, held on the Infosys training campus in Mysore, India. (Image credit: Local Organizing Committee, TMT Science Forum.)

Planning Future Capabilities for the Thirty Meter Telescope

Mark Dickinson

The Thirty Meter Telescope (TMT) International Observatory (TIO) unites astronomers from India, China, Japan, Canada, and the United States in a global scientific partnership. The annual TMT Science Forum is the main opportunity for scientists and engineers throughout that collaboration to meet face to face, to get to know one another, and to map out plans for working together on future TMT science programs.

The fifth TMT Science Forum was held 7–9 November 2017 in Mysore, India, on the magnificent and well-equipped 337-acre Infosys training campus. This was the largest Forum to date, with nearly 170 participants visiting from all the TMT partners. The meeting theme was “TMT: Beyond First Light,” with strong emphasis on planning future-generation TMT instrumentation and AO systems. Two first-light TMT instruments, the Infrared Imaging Spectrometer (IRIS) and the Wide Field Optical Spectrograph (WFOS), and the adaptive optics system NFIRAOS are well along their design paths. IRIS recently passed a 2-phase preliminary design review and is now in its final design phase. The major components of NFIRAOS will have final design reviews in summer/fall 2018. WFOS is currently undergoing significant redesign, with several new, innovative architecture options being considered for a down-select before summer.

Given the long lead time for planning and building instruments on the scale required for giant telescopes like TMT, it is none too soon to start

planning for the next generation of capabilities. Last September, the TMT Science Advisory Committee (SAC) issued a call for white papers proposing design studies for new instruments, AO systems, or enabling technologies (see “Thirty Meter Telescope (TMT) News” article in *NOAO Newsletter 116*), and the Mysore Forum offered a unique opportunity for a broad segment of the international science community to gather and discuss ideas, establish priorities, and form new collaborations to write white papers and to launch new design and development projects.

On the day before the main Forum, three workshops focused on WFOS and on concepts for high-contrast exoplanet instrumentation and high-resolution spectroscopy. The Forum plenary sessions featured presentations on high-resolution spectroscopy, extreme AO instrumentation, high-dispersion coronagraphy, thermal infrared instrumentation, near-infrared multi-object spectroscopy with deployable integral field units, and ground-layer adaptive optics (GLAO, now the subject of a TMT study for a possible adaptive secondary mirror). There were science talks on small bodies in our solar system, high-energy transient phenomena, stellar astrophysics at high spectral resolution, cosmological variations in fundamental constants, future observations of active galactic nuclei and supermassive black holes, and the physics of star clusters as well as a series of talks exploring the characterization of extrasolar planets and their atmospheres. The presentation slides are available at the

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Forum website (<https://conference.ipac.caltech.edu/tmtsf2017/>), and video recordings from the live webcast will be posted there soon.

On the second and third days of the Forum, the participants divided into breakout sessions to prioritize requirements and capabilities in the areas of high-resolution spectroscopy, near-IR multi-object spectroscopy, thermal IR instrumentation, high-contrast observing, and instrumentation for follow-up of time-domain events. The outcomes of these discussions were reported at a final plenary session, and many of the Forum participants have continued to work on white papers in response to the TMT SAC's request.

The Mysore Forum was an outstanding occasion to build new collaborative ties between scientists from the widely dispersed TMT partners. Astronomers from the Indian community at all career levels participated in the meeting, from senior scientists to postdocs and graduate students, as well as representatives from TMT-India's industrial and software engineering partners. Nearly 50 US scientists attended the Forum, including 22 from institutions outside the formal TMT partners (University of California and Caltech). Most of the latter received travel support provided by the National Science Foundation as part of its cooperative agreement with TMT to develop a model for potential US national partnership in the observatory. 



Science and Evolution of Gemini Observatory
Fisherman's Wharf, San Francisco – July 22 - 26, 2018

With San Francisco's historic Fisherman's Wharf as a backdrop, this meeting invites the Gemini community to review recent science highlights, identify needs in the context of Gemini's evolving capabilities, and develop strategies for the future. Mark your calendar now for: user and staff presentations featuring science highlights; instrumentation, observing modes; informal discussions and breakout sessions; a conference dinner; and more.

Invited Speakers

Michael Balogh	University of Waterloo
Mark Brodwin	University of Missouri
Sukanya Chakrabarti	RIT
Christine Chen	STScI
Ryan Chornok	Ohio University
Jacqueline Faherty	Carnegie Institution for Science
Ryan Foley	UC Santa Cruz
Ken Hinkle	NOAO
Yoonyoung Kim	Seoul National University
Yongjung Kim	Seoul National University
Tom Matheson	NOAO
Karen Meech	UH, IFA
John Monnier	University of Michigan
Rosemary Pike	ASIAA
Abhijith Rajan	Arizona State University
Carlos Saffe	Universidad Nacional de San Juan
Thaisa Storchi Bergmann	Universidade Federal do Rio Grande do Sul
Sabrina Stierwalt	University of Virginia
Kim Venn	University of Victoria
Jonelle Walsh	Texas A&M University

Registration Dates:
Early: 1/4 - 3/31 | Regular: 4/1 - 5/15 | Late: 5/16 - 6/30

Hotel reservations now open!

SOC
Letizia Stanghellini, NOAO, Chair
Lita Kostin, USFP
John Bakos, Gemini Observatory
Mark Brodwin, University of Missouri
Navee Hoang, LSST
Sandy Leggett, Gemini Observatory
Bruce Macintosh, Stanford University

LOC
Karen Meech, UH, IFA
Amita Reddy, STScI
Verne Smith, NOAO
Thaisa Storchi Bergmann, IRTG
Susan Thomas-Gibb, Gemini Observatory
Kim Venn, University of Victoria
Beth Williams, LSST

LOC
Terry Lee, Gemini Observatory, Chair
Jesse Salinas, Gemini Observatory
Peter Michard, Gemini Observatory
Jenna Thomas-Gibb, Gemini Observatory
Ken Hinkle, NOAO

<http://www.gemini.edu/seg2018> @GeminiObs #seg2018

Gemini Science Meeting

Letizia Stanghellini

The "Science and Evolution of Gemini Observatory" conference in San Francisco July 22–26 invites the astronomical community to review recent science highlights, identify needs in the context of Gemini's evolving capabilities, and develop strategies for the future.

The scientific program includes a general session with selected science topics, instrument themes, and panel discussions. Several workshops are also planned: Data Reduction Workshop, Speed Collaboration, and "Under the Hood" Talk.

Registration is now open, and contributed abstracts will be accepted through 15 May 2018.

For more information, please visit the conference website at <http://www.gemini.edu/seg2018>.