

- Principal Author: Freedman, Wendy, L. (GMTO Board Chair)
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- Institution of Principal Author: University of Chicago
- Co-Authors: GMTO Board members –Moses, E. (GMTO, President), Alcock, C. (Harvard, Smithsonian), Armandroff, T. (UT), Colless, M. (ANU), Couch, W. (AAO), DePoy, D. (TAMU), Franzen, R. (ANU), Hicke, L. (UT), Jannuzi, B. (UA), Kirshner, R. (Harvard), Kolb, R. (Chicago), McAuley, M. (AAL), Mulchaey, J. (CIW), Newton, J. (TAMU), Park, B.-G. (KASI), Scott, M. (CIW), Yuk (KASI)
- wfreedman@uchicago.edu
- Paper Title: Community Access to the GMT in the Era of the LSST

This White Paper is submitted on behalf of the Board of Directors and Founder Institutions of the Giant Magellan Telescope Organization. We summarize our vision for community engagement and participation in GMT during the 2020s and beyond – the era of LSST and the GMT. The GMT partners are committed to engaging the US community in the development of the scientific and technical programs for the GMT. We welcome public participation and suggest some mechanisms through which GMTO and the NSF could cooperate to further the goals laid out in the *New Worlds New Horizons* report. These include open peer-reviewed access to observing time on GMT, participation in key science programs, and the development of instrumentation.

WHITE PAPER QUESTIONS

3. Comment on the need for the U.S. community's access to non-federal O/IR facilities up to 30 meters in size.

The science case for the Giant Magellan Telescope¹ is closely aligned with the vision expressed by the community in the 2010 decadal survey *New Worlds New Horizons* report. The core science goals for GMT – exploring and characterizing exoplanets and probing first light and the early universe – map directly to the two pillars of the NWNH report. Other components of the GMT science case – understanding the origin of the chemical elements, the assembly of galaxies, the formation and growth of black holes, and the geometry and evolution of the universe on large scales, also align well with the priorities in the NWNH report. Many of these goals are best addressed with an adaptive-optics telescope with an aperture larger than any in operation today. For this reason the Giant Segmented Mirror Telescopes ranked highly in both the 2000 and 2010 decadal survey reports.

The GMT partner institutions, with support from the National Science Foundation, have retired the major technical risks associated with this project and have brought the design to a mature state. In particular, we successfully demonstrated the manufacturing of the highly aspheric and off-axis 8.4m diameter mirrors that are the heart of the GMT. The Board has received reports from exhaustive external reviews of the project's technical and cost programs and is satisfied that we are ready to proceed to the construction phase.

¹ <http://www.gmto.org/resources/>

Since the earliest days of the GMT project the Board, the consortium partners, and the project team have reached out and affirmed our desire to engage with the community and provide access for all US astronomers. In 2012 the GMTO Board issued a statement to the astronomical community that articulated this goal and the reasoning behind our decision to engage directly with the community using our own resources rather than federal funds. That statement read, in part:

“We propose an alternative path that will engage the U.S. community in the GMT in the years before NSF is ready to take significant actions. We want to demonstrate to the NSF, to the US community, and to potential international partners that we are open to their participation and seek to align our actions with their goals. We believe we can serve that end best ... with our own resources.”

The GMTO Board and leadership have reiterated and reinforced this message in many public forums – AAS town hall meetings, community workshops, the 2014 Kavli meeting and other venues.

As part of our engagement process we have appointed three community representatives to our Scientific Advisory Committee: Bob Blum (NOAO), Julianne Dalcanton (University of Washington), and Megan Donahue (Michigan State University) provide input to critical scientific, technical and policy decisions from the perspective of the full US community. GMTO sponsors an annual science conference focused on a topic of current interest that is also well aligned with the GMT and NWNH science goals. The vast majority of the speakers and participants at these meetings are from outside the GMT partner institutions. The first meeting was held at the Kavli Institute for Cosmological Physics in Chicago in 2013. This year’s meeting starts today at the Smithsonian Institution in Washington DC.

The GMTO Board is open to a variety of mechanisms for community participation. These include, but are not limited, to:

- Open peer-reviewed access in response to federal support through MSIP, a reinvigorated TSIP, or other grant program, or through a cooperative agreement with the NSF or its agent.
- Open community participation in Key Projects that utilize the power of GMT to advance the goals set out in the NWNH report, particularly in coordination with the LSST, ALMA, Gemini and other public facilities.
- Partnering with the NSF and institutions that are not founding members of the GMT organization to develop second-generation instrumentation and AO technology.
- Partnerships with NASA to provide mission-critical science support for spacecraft targeted at exoplanet science, dark energy, galaxy evolution, and other NWNH goals.

Over the next several years the GMT, LSST, JWST, and WFIRST will be under construction and preparing for the start of operations. We are committed to working with the community, with federal agencies and their affiliated organizations, and with other interested parties, to develop a strategy for achieving our collective science goals through cooperation and merit-based open access to a powerful OIR system. GMT will be a cornerstone of that system and we look forward to a stimulating and productive partnership with the community in the years to come.