



University of  
Massachusetts  
Amherst



Large Millimeter Telescope  
*Alfonso Serrano*

Call for Science Proposals  
2024-S1

Version	v1.1
Last update	22 August 2023
Doc ID	SCI-CFP-002
Keywords	Proposals
Pages	TBD

This document is approved for external LMTO use.



In publications, please refer to this document as **Call for Science Proposals 2024-S1**. For user support please contact the LMT HelpDesk at [lmthelpdesk@umass.edu](mailto:lmthelpdesk@umass.edu).

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## Revision History

Version	Date	Editor	Reviewer	Section (page)	Description
1.0	7/26/2023	FPS		All	Copied CfP for 2022
1.1	8/4/2023			selected	Final for Review

## Reference Documents

Document ID	Title
SCI-TUT-003	<a href="#">LMT Proposal Submission Checklist</a>
-	-
-	-

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## Announcement of Opportunity for Science with the Large Millimeter Telescope Alfonso Serrano

<b>Application Submission Deadline</b>	<b>06:00:00 UTC 29 September 2023</b>
<b>Expected Time Allocation Announcement</b>	<b>mid December 2023</b>
<b>Observing Period 2024-S1</b>	<b>8 January 2024 - 30 September 2024</b>

### Announcement of Opportunity (2024-S1)

This Announcement of Opportunity is an invitation to the user-communities of the LMT partners to submit scientific proposals requesting observing time on the 50-meter diameter LMT. **The deadline to receive proposals is 06:00 UTC on 29 September 2023. The schedule for the next observing season (2024-S1) is 8 January 2024 – 30 September 2024.**

The LMT was able to reopen for scientific observations in January 2023, after experiencing downtime in the fall of 2022 due to a need to adjust the telescope's balance. The scientific program during the 2023-S1 semester has been significantly impacted and delayed by a forest fire in February 2023 which damaged electrical power and fiber-optic cables. This was followed by a series of electrical storms in June 2023 which resulted in further damage to the electrical-grid power lines and also to the site's electrical substation. Repairs to the electrical substation are not expected to be completed until October 2023. Given the uncertainty in the precise schedule, and considering the engineering activities that must be completed once electrical power at the site is restored, we are forced to delay the start of the next observing season until early January 2024.

Given the lost telescope-time during the 2023-S1 observing season and the large number of excellent scientific proposals, the highest-priority A-grade projects that cannot be completed or attempted before the end of this year will automatically be carried over to the 2024-S1 observing season. We anticipate that approximately 630 hours will be committed to night-time observations of new approved projects from the 2024-S1 review process and of order 125 hours will be devoted to those carry-over projects from the previous season.

This estimate of available observing time for new scientific projects in the 2024-S1 season takes into account the continued engineering work at the telescope, the nominal loss of time due to weather, the

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standard observing overheads and the normal calibration observations that are made each night, as well as time expected to be committed to the TolTEC Legacy public surveys. Finally, we note that observers may anticipate that the on-set of the “rainy season” during the summer will increasingly impact the scheduling of the highest-frequency instruments towards the end of the 2024-S1 observing period ([LMT-site Weather Conditions](#)).

Given the anticipated significant demand for telescope time, the LMT user-community is encouraged to submit shorter, high-impact scientific projects that will lead to published research papers that demonstrate the unique capabilities of the telescope facility. Opportunities to submit longer-term large projects will be offered in future Calls for Proposals.

Further information about this proposal opportunity is presented on the [LMT website](#) and will be summarized in a series of webinars to be announced shortly.

## Eligible LMT user-communities

Principal Investigators that are affiliated with national institutions and universities within the eligible LMT user-communities (Mexico, USA and Spain) will be able to submit proposals and share LMT observing time during the 2024-S1 observing season in the following proportions:

- 70% Mexico – all members of the Mexican national research community (of which 50 hours will be jointly shared with the Spanish national research community in accordance with previous binational Mexico-Spain agreements to provide collaborative access to both the Gran Telescopio Canarias (GTC) and LMT);
- 15% University of Massachusetts Amherst (UMASS), USA – all members of the UMASS and Five Colleges research communities;
- 15% USA – all members of the US national research community.

The telescope time associated with each scheduled project will be allocated (charged) to a particular observing queue of the LMT user-communities according to the affiliation of the Principal Investigator. The affiliation of co-investigators, including those external to the eligible LMT user-communities, does not impact the time allocated (charged) to each user-community. For further information on time allocation, please refer to the [“Observing Procedures”](#) information page.

## Non-standard Types of Proposals

The LMT has developed new policies concerning non-standard proposals that may be submitted to the proposal review. We summarize each below:

- **Large Projects:** Policies have been developed for “Large Projects” which exceed a specific number of hours. At this time the boundary between a “Large Project” and a “Standard Project” is

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set to 35 hours. **For the 2024-S1 semester, we will not accept proposals in the “Large Project” category requesting more than 35 hours.** Please see the [“Types of Proposals”](#) page for further information.

- **Target of Opportunity (ToO) and Director’s Discretionary Time (DDT):** Policies for submission of ToO and DDT proposals are described in the [“Types of Proposals”](#) information page. As stated in the policy, ToO proposals, which involve targets requiring special scheduling, are considered as a part of our normal review process and should be submitted in response to this call for proposals. DDT proposals follow a special procedure for submission and review that falls outside the normal review process.
- **VLBI:** The policy for inclusion of LMT in VLBI experiments is stated on the [“Types of Proposals”](#) information page. As in past years, we require proposals for the participation of LMT in VLBI networks to be submitted to the normal review process by a member of one of the LMT user communities.

## Special Notice about “Carry-over” Proposals from 2023-S1 semester

Unanticipated mechanical problems and natural disasters (forest fires and damage to power infrastructure from severe storms) have greatly impacted the 2023-S1 observing season, both in terms of available observing time and the commissioning of TolTEC. Therefore all remaining A-ranked 2023-S1 projects (including TolTEC projects) that cannot be completed or attempted before the end of the year will automatically be carried over to 2024-S1 season. All PIs of those 2023-S1 proposals with lower ranks are encouraged to update and resubmit their proposals, taking note of referee’s comments, if they are not attempted during the 2023-S1 season.

## Available Scientific Instruments

In the observing period 2024-S1 the LMT will offer the opportunity to conduct observations with the following instruments: [TolTEC](#), [SEQUOIA](#), [Redshift Search Receiver \(RSR\)](#), [B4R](#) and [MSIP1mm](#). Summaries of instrument capabilities, observing modes, and time calculators can be found on the [“Instrumentation”](#) webpage. Please refer to the LMT [“Telescope Description”](#) page for details on the telescope design and function.

The [TolTEC](#), [SEQUOIA](#), [RSR](#) and [MSIP1mm](#) instruments and data reduction software are fully supported by the LMT and hence no collaboration with members of their instrument teams is required. All observations with these instruments are carried out by a trained observatory staff using a flexible scheduling queue and are processed by a dedicated data-reduction pipeline. Each proposing team should read the [instrument descriptions](#) carefully and propose only the supported observing modes for each instrument. Proposals requiring a non-standard mode should first contact the [LMT Helpdesk](#) at least one week before the proposal deadline to establish its technical feasibility prior to submitting the proposal.

In contrast, the 2mm [B4R](#) instrument has been developed and funded independently with no participation from the LMT partners. The B4R instrument team in Japan will provide the technical support and assistance during the preparation of proposals, scientific observations and the data-analysis for all scheduled projects. Therefore the use of the B4R instrument requires a scientific collaboration with members of the B4R team. Principal Investigators requesting to use the B4R instrument should contact the [LMT Helpdesk](#) in order to be put in contact with the B4R instrument team.

## Shared Risk Status of TolTEC Instrument

TolTEC will continue to operate as a “shared risk” instrument for the 2024-S1 observing season. At this time, the commissioning of TolTEC has not allowed an accurate estimation of the instrument mapping speed under the best weather conditions. As a consequence, our current estimates of this quantity are uncertain. Therefore, in order to allow TolTEC proposals to be submitted, we have estimated the mapping speed based on commissioning data and reasonable assumptions about the atmosphere and the telescope surface accuracy. Users requesting TolTEC time should make use of the [observing time calculator](#) provided with this Call for Proposals. It is important to consider the uncertainty in the mapping speed of TolTEC when planning projects for this proposal review.

**Given the uncertainty in the required observing time to reach a specific sensitivity and our interest in offering opportunities for TolTEC observations to as many members of the LMT user-communities as possible in this initial season, TolTEC proposals should be limited to a maximum of 5 hours as determined by the sensitivity calculator.**

## Proposal Submission Process

The proposal submission process is identical for all members of the eligible scientific communities. LMT observing proposals will be made through a simple web-based form ([lmtobservatory.org](http://lmtobservatory.org)). Proposals will be required to include a list of participating researchers, a description of the scientific goals and technical feasibility using the requested instruments, and a justification of any special scheduling or weather requirements. Please note that this year the scientific and technical justification documents are required to be submitted and uploaded in pdf format.

Further details, instructions, and resources on how to prepare and submit a scientific proposal to the LMT can be found on the [“Proposal Guidance”](#) information page.

## Dual Anonymous Proposal Review

The LMT proposal review will be carried out as a “dual anonymous” review, and all proposals must be submitted in a format that preserves the anonymity of the proposal team. Please see the information page describing the [dual anonymous](#) format and procedures for preparation of dual anonymous proposals.



## **LMT Proposal Review and Telescope Time Allocation**

All LMT proposals will be subject to a technical assessment prior to a scientific review conducted by a Time Allocation Committee constituted by members of the eligible user-communities, and supported by independent external expert evaluations. Each user-community will provide a unified prioritized list of proposals covering all scientific areas, based primarily on their anticipated scientific impact, that will be merged into the LMT observing schedule.

The full and proportionate allocation of observing time for the prioritized scientific projects from each user-community will be flexibly scheduled during the observing season to maximize the efficiency of the overall scientific program and the telescope operation. Further information regarding the proposal review process and Time Allocation Committee can be found on the [“Proposal Review”](#) webpage.

We anticipate the scientific and technical reviews to be completed by mid December 2023.

Principal Investigators of the highest-priority projects will be contacted regarding the creation of observing scripts prior to the flexible scheduling of the observations. For more information regarding science observing, see the [“Observing Procedures”](#) webpage.

## **LMT Help Desk**

For additional general information on the Call for Proposals, or for assistance with the proposal submission process, please contact the [LMT Help Desk](#).