

NASA's Infrared Telescope Facility (IRTF) Independent Review

Terms of Reference (ToR)

1. Background

The purpose of the IRTF Independent Review is to provide an independent assessment of the science return to NASA and effectiveness of the ground-based facility in support of planetary and astrophysics science missions and objectives, including Planetary Defense. The IRTF Independent Review is not a competition between the IRTF and other NASA missions, projects, or NASA-funded activities; it is an assessment that will be used by the Planetary Science Division (PSD) along with other inputs to balance science and strategic value of the IRTF within the broader context of NASA priorities. Furthermore, the assessment will help inform the planning for the next IRTF management and operations contract.

The IRTF is a 3-meter telescope and was established in 1979 to obtain infrared observations of interest to NASA, particularly in support of planetary spacecraft missions. The IRTF is one of the telescopes comprising the Maunakea Observatories (MKO) on the Island of Hawai'i. The observatory is operated and managed for NASA under contract by the University of Hawai'i Institute for Astronomy, located in Honolulu. Observing time is open to the entire astronomical community, and 50% of the IRTF observing time is reserved for studies of solar system objects. The IRTF is designed for infrared observations, during daytime and nighttime, taking advantage of ideal observing conditions (e.g., sky transparency and low thermal background) that characterize the atmosphere above the Maunakea volcano.

PSD provided operations costs of the IRTF through its Planetary Astronomy funding line until 2014, when costs were assumed by the Near-Earth Object Observations (NEOO) Program to provide a rapid response capability for Near-Earth Object (NEO) characterization through program direction when needed. Historically, the National Science Foundation (NSF) provided funding for new focal plane instrumentation through its peer review process, often with a NASA contribution. This was done under a 1984 Memorandum of Agreement (MoA) between NASA and NSF that supported a 50% split between NASA-required observations and observations of general interest to the astronomical community. This approach continues to be implemented with the current 50% programmatic split between solar system and non-solar system proposals, although the MoA is no longer recognized as active. The assumption of IRTF costs by the NEOO program has not altered the programmatic balance, as the frequency of NEO targets for physical characterization in support of Planetary Defense leads to competition for only a portion of the available observing time and thus allows the continued support of broader planetary science and astrophysics investigations.

2. Terms of Reference

The IRTF Review will independently assess NASA's investment in the IRTF using three core criteria: (A) Relevance and responsiveness to NASA strategic goals and objectives,

(B) Technical capability and Cost reasonableness, and (C) Management and Operations. Topics to be addressed include, but are not limited to:

(A) Relevance and Responsiveness to NASA's Strategic Goals and Objectives

- A-1. An assessment of the degree to which the IRTF operations support and advance the scientific objectives of NASA. Responsiveness of the IRTF to NASA goals as described in the latest Planetary and Astrophysics Decadal Surveys (including findings related to ground-based assets and planetary defense). An assessment of IRTF's relevance to Strategic Objective 1.2 of the [NASA 2022 Strategic Plan](#), "Understand the Sun, solar system, and universe."
- A-2. An assessment of the effectiveness of the IRTF in terms of scientific productivity in planetary science and astrophysics, i.e., performance metrics: papers, citations, etc. The Independent Review Panel (IRP) will compare productivity from IRTF vs. comparable facilities (e.g., Hubble, Keck, SOFIA, and ground-based observatories).
- A-3. An assessment of the effectiveness of the IRTF as a primary NEO physical characterization asset for Planetary Defense, including whether other similar assets duplicate this role.
- A-4. An assessment of data archiving and management, including data proprietary period, development of data reduction tools, etc. The IRP will comment on IRTF's alignment with NASA and community expectations for open science.

(B) Technical Capability and Cost Reasonableness

- B-1. An assessment of technical capabilities, including the current suite of instrumentation, to achieve Planetary and Astrophysics Decadal science.
- B-2. An assessment of enhanced capabilities, including scheduling responsiveness, targets of opportunity programs, and time domain observations.
- B-3. An assessment of cost reasonableness, including general budget details and status, yearly operational costs, level of effort, travel costs, Maunakea support services, projected costs for future operation, etc. This assessment may include comparison to other observatories.

(C) Management and Operations

- C-1. An assessment of how IRTF management gets inputs from the community, responds to their feedback, and stays competitive.
- C-2. An assessment of facility operations, including engineering risk matrix, carbon footprint compared to other telescopic facilities, and plans to be more energy-efficient while exploring the nature of the universe.
- C-3. An assessment of IRTF's strategic plan into the future (2023–2032), planned new capabilities, future needs, etc.
- C-4. An assessment of IRTF's contribution to the overall MKO effort to reach out to, include, and respect the local community.

Finally, the IRTF Independent Review will provide an overall assessment of the effectiveness of the IRTF as a NASA-owned facility and whether NASA's investment in the IRTF is a worthwhile and cost-effective endeavor based on the findings above.

3. Independent Review Membership

The Independent Review will be assembled and conducted by PSD and run by a designated Lead (the Review Lead) who is not the IRTF Program Scientist.

The Independent Review Panel will consist of subject matter experts (SMEs) from NASA and the broader scientific community, with approximately 5-7 members led by a Panel Chair. The committee will also include as *ex officio* members representatives from PSD and/or the Astrophysics Division (APD).

Panel members will be chosen by Review Lead in consultation with representatives from PSD and APD. The Review Lead will also ask IRTF management to provide NASA with a list of up to five suggested reviewers, and a list of up to three reviewers that should not be used. Suggested reviewers should have no unmitigable conflicts-of-interest (under prevailing community standards) or perceived biases (see SPD-01A for definitions of both community-standards-violating conflicts of interest and perceived biases).

4. Review Structure and Independence

The review panel shall be assembled and conducted by NASA as a peer review with support from the NASA Research and Education Support Services (NRESS).

The IRP will conduct the review, consistent with the general principles for peer review set out in NASA's SPD-22, "Management of ROSES peer review and selection processes." The review panel membership selection and the preparation of the evaluations and Final Report will occur independent of NASA PSD management input. The Review Lead will report to the PSD Director any significant matters of concern during the review, such as issues related to the ToR.

The review will be based on materials provided to the panel by the IRTF team. These materials include, but are not limited to, annual reports, recent community reports (including white papers), budgetary information (including administrative costs), and other relevant documents. In addition to the written documentation, a half-day presentation to the panel from members of IRTF leadership will be required. The panel can also request additional information pertinent to the review through the Review Lead and *ex officio* members according to the schedule below.

The IRTF Program Scientist (PS) may attend the IRTF Independent Review, following general guidelines in NASA's SPD-17, "Statement of Policy on Observers at Panel Reviews of Proposals." The IRTF PS may answer programmatic questions from the SME panel and shall not advocate for IRTF.

5. IRTF IRP Report and Communications Plan

The Final Report will be delivered by the Panel Chair to the PSD Division Director (DD), who will inform the SMD Associate Administrator and the Planetary Science Advisory Committee (PAC) of the overall assessment of the IRTF. The report is anticipated to contain findings pursuant to the ToR included in Section 2. An executive summary of the Independent Review Report will be posted on the PAC website hosted by the Lunar and Planetary Institute (LPI), including the ToR.

6. Target Schedule*

	Deadline	T-weeks	Activity	Assignee
	12/12/22	0	Send evaluation package guidelines/requirements to IRTF management team	Review Lead
	12/19/22	1	Provide list of awarded team members (observing awards) in the past 2 years Provide list of suggested and non-suggested reviewers	IRTF
	12/26/22	2	Complete SME recruitment	Review Lead
	1/2/23	3	Send evaluation package to Review Lead	IRTF
IRP activities begin	1/2/23	3	Provide IRTF evaluation package to IRP	Review Lead
	1/23/23	6	Panel reads information and provides questions to IRTF management team	IRP
	2/6/23	8	Quick IRTF management team presentation and response to panel questions (half day)	IRTF
	2/6/23	8	Review panel discussions (half day)	IRP
IRP activities end	3/6/23	12	Panel Findings (final report) due to PSD Director	Panel Chair
	3/13/23	13	Proceed with Communications Plan	PSD

IRP: Independent Review Panel
 IRTF: IRTF Management Team
 PSD: Planetary Science Division

APPROVAL:

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