

TELESCOPE SYSTEM INSTRUMENTATION PROGRAM

FY07 Program Announcement and Proposal Solicitation

Web Site: <http://www.noao.edu/system/> E-mail: syspo@noao.edu



National
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SYNOPSIS OF FY07 PROGRAM

The Telescope System Instrumentation Program (TSIP) supports new instrumentation, instrument upgrades, and operations/facilities improvements for the telescopes operated by the private (non-federally-funded) U.S. observatories. In return, observing time proportionate to the funding awarded is made available to the public community through the NOAO time allocation (TAC) process.

Created in 2002 in response to the decadal survey "Astronomy and Astrophysics in the New Millennium," the TSIP originally targeted the design/development of new instrumentation, specifically for the 6.5- to 10- m-class private telescopes. The program has since been expanded to include funding for improvements to existing instrumentation and/or operations considered to enhance significantly the scientific capability of the facility. In addition, proposals for instruments and upgrades for medium- aperture telescopes (3- m or greater) are now eligible for TSIP funding, and telescope consortia members in which NOAO has less than a 51% share are also free to propose. See full text of this Proposal Solicitation below for more information.

CATEGORIES OF TSIP PROPOSALS

System Improvement: Proposals for the design and development of new instrumentation, as well as proposals to upgrade existing instruments or otherwise improve facility operations. If awarded, improvement proposals are required to provide community observing time equivalent in value to 50% of the TSIP funds awarded.

System Access: Proposals offering a 1:1 exchange of telescope time for the value of TSIP funds awarded.

DUE DATE FOR LETTERS OF INTENT AND FULL PROPOSAL DEADLINE

Letters of Intent (required) are due by **Friday, May 11, 2007**.

Full proposals must be received by 5:00 P.M. (proposer's local time) on **Friday, August 31, 2007**.

ELECTRONIC SUBMISSION REQUIRED

Proposals must be submitted electronically as a single PDF file to syspo@noao.edu or to a secure ftp site provided by NOAO. For System Improvement proposals, proposal narrative (excluding budget pages) is limited to 30 pages; for System Access proposals, the limit is 5 pages.

ADDITIONAL REQUIRED DOCUMENTS

The standard NSF proposal Cover/Certification page and NSF budget forms are required. Electronic templates are available from the TSIP Web site at <http://www.noao.edu/system/tsip/> and from the NOAO System Project Office syspo@noao.edu. Other sections usually required in NSF proposals (Project Summary, Biographical Sketch, References Cited, etc.) are optional.

ELIGIBILITY

TSIP is open to non- public U.S. observatories and affiliated institutions having a mechanism for providing observing time on a telescope of 3 m or greater in aperture through the NOAO time allocation process.

ESTIMATED FY07 FUNDING

Pending availability of funds, the funding level for *new* TSIP initiatives in FY07 is requested at approximately \$2M (the TSIP request is a total of ~ \$4M in FY07 including previous commitments). The amount available in FY07 for proposals involving medium- aperture telescopes is about \$350K.



TABLE OF CONTENTS

Synopsis of FY07 Program.....	i
1 PROGRAM DESCRIPTION.....	1
Background, 1	
Projects Funded by TSIP, 1	
Categories of TSIP Funding, 2	
System Improvement Proposals, 2	
System Access Proposals, 3	
Aperture Ranges of Telescopes Eligible for TSIP Funding, 3	
Estimated FY07 Funding Levels, 3	
Duration of Funding, 3	
Program Administration, 4	
Eligibility Information, 4	
2 REQUIRED CONTENT OF TSIP PROPOSALS.....	5
Proposed Community Access Time, 5	
Valuation of Proposed Community Access Time, 5	
Estimating Cost Per Night for Telescopes < 6.5- Meters Aperture , 5	
Project Management, Phasing, Staffing, Costing, and Science, 6	
Science Justification and System Priorities, 6	
3 PROPOSAL PREPARATION AND SUBMISSION.....	7
Letters of Intent, 7	
Full Proposals, 7	
Required Sections for Full Proposals, 8	
Cover and Certification pages, 8	
Proposal Narrative: System Improvement Proposals, 8	
Proposal Narrative: System Access Proposals, 9	
Formatting Guidelines for Full Proposals, 10	
Questions about Proposal Preparation, 10	
Program Contacts, 11	
4 PROPOSAL REVIEW.....	12
NSF Merit Review Criteria, 12	
Additional Review Criteria Specific to TSIP, 12	
5 AWARD ADMINISTRATION AND PROJECT OVERSIGHT.....	13
NOAO System Project Office, 13	

BACKGROUND

The highest priority “moderate initiative” for ground-based O/IR astronomy in the current decade, as defined in the NRC decadal survey *Astronomy and Astrophysics in the New Millennium*, was a Telescope System Instrumentation Program (TSIP). The decadal survey envisioned TSIP as a \$5M per year grants program for the independent observatories that would support the development of advanced new instrumentation, while expanding public access to the first rank of U.S. telescopes. It was hoped that by subsidizing new instrumentation in exchange for greater public access, TSIP would promote a more integrative view of U.S. public/private astronomy assets as a coherent and powerful “system.”

The system concept suggests a new paradigm for U.S. astronomy, one in which complementarity and coordination of observing facilities provide the motivation for strategic scientific decisions. As proposed in the decadal survey, TSIP would have three goals:

- Guid[ing] the evolution of the telescope system so that it becomes more powerful and more diverse. [TSIP] would do this by, for example, favoring instruments with unique capabilities and those that would be particularly effective in reaching ... scientific goals...
- Achieving greater public access to these [private] facilities
- Encouraging and leveraging the contribution of institutions that contribute non-federal funds to the U.S. astronomy enterprise

Formally established by the National Science Foundation (NSF) in 2002, TSIP is funded through the Division of Astronomical Sciences (AST). These funds pass to successful TSIP proposers through sub-awards which are pre-approved by the NSF, then issued and administered by the Association of Universities for Research in Astronomy (AURA) through the National Optical Astronomy Observatory (NOAO). NOAO is responsible for oversight of TSIP projects so as to assure cost and schedule performance.

TSIP remains a high priority for the US community. At the recent “Third Community Workshop on the Ground-Based O/IR System: Building a Strategic Plan for Instrumenting Large Telescopes,” TSIP was identified as a key program that should continue to receive strong support. More information on the 3rd Workshop is available at <http://www.nao.edu/system/system3.html>, including individual presentations on future capabilities and the scientific rationale for developing them.

PROJECTS FUNDED BY TSIP

TSIP has contributed significant funding to the development of seven major instruments:

- For the Keck telescopes: OSIRIS (\$3.9M), an integral field IR spectrograph, preliminary design work for the near-IR multi-object spectrograph KIRMOS (\$2.6M), and funding (\$7.3M) for the Multi-Object Spectrograph for IR Exploration, MOSFIRE.
- For the MMT and Magellan telescopes: MMIRS (\$2.5M), a “fast-track” multi-object IR spectrograph, and a detector upgrade to the facility imager/MOS IMACS.
- MODS-2 (\$2.6M), an optical multi-object spectrograph for the Large Binocular Telescope (LBT)
- The One Degree Imager (ODI) for the WIYN telescope (\$1.6M).

Proposal Description

Thanks to TSIP, the community has received, or will have received, access to 138 nights on the Keck telescopes, 27 nights on the MMT telescope, 42 on the Magellan telescopes, 25 on the LBT, and 40 on WIYN.

CATEGORIES OF TSIP FUNDING

In May 2004, NOAO sponsored a community workshop, "Building the System from the Ground Up," in Alexandria, Virginia. The meeting was designed as a forum for the community to discuss how the TSIP program should evolve to develop and strengthen the overall O/IR system. Four broad recommendations emerged from these discussions.¹

- Acknowledge that improvements to current instruments or scientific operations can have as much scientific impact as the creation of a new instrument
- Simplify the process by which independent observatories can sell telescope time to the public community
- Incorporate the community's need for access to software pipelines and archives into TSIP-sponsored instrument development, and
- Provide a path for medium- sized telescopes to become part of the system

As a result of these recommendations and subsequent discussion with the AURA Coordinating Council of Observatory Research Directors (ACCORD), the categories, definitions, eligibility requirements, and types of funding for TSIP were expanded to include two categories of proposals: *System Improvement* proposals and *System Access* proposals.

System Improvement Proposals

These are proposals for projects that will lead to enhanced scientific capability within the overall ground- based optical/IR system. System Improvement proposals provide community observing time equivalent in value to 50% of the TSIP funds awarded. (A proportional reduction in public observing time is allowed in the case of private institutions in telescope consortia in which NOAO is also a partner; see section III. below on *Proposed Community Access Time* for details.)

System Improvement proposals can request funding in one of three areas:

1. **Design and construction of new, facility- class instruments** for existing or pending telescopes: i.e., optical or infrared instrumentation of any kind (including adaptive optics systems) for any telescope now in operation or under construction. Proposals of this type may request multiple (up to five) years of funding.

Proposals for new instrumentation must include plans for two clearly distinct project phases: (1) a definition and design phase (Phase AB), and (2) a construction and commissioning phase (Phase CD). The design phase concludes with a Critical Design Review (CDR) that verifies the cost and schedule for the construction phase.

All funded projects for new instrumentation will be reviewed at the time of Critical Design Review (CDR). If the CDR leads to significant changes in cost and schedule compared to the original proposal, the decision to renew TSIP funding through the construction phase will be contingent on an external peer review and re- evaluation.

¹ For the full report of the 2nd System workshop, see http://www.noao.edu/meetings/system2/ system2_report.pdf

2. **Improvements or upgrades to existing instrumentation:** e.g., new focal plane detectors, improved pipeline data reduction software, or new optical components. These proposals are limited to one year of TSIP funding.
3. **Significant upgrades to current facilities or operations.** As with proposals to upgrade instrumentation, proposals to upgrade facilities or operations are limited to one year of TSIP funding.

TSIP awards in (3) may not be used for salaries of observatory personnel; TSIP funds may only be used for capital items or external contracts relating to the significant upgrade of facilities or operations. The intent is to prevent TSIP funds from being used to replace existing operating funds or to fund upgrades that were already part of the planned operation activity.

System Access Proposals

The second type of TSIP funding is for proposals that seek to sell telescope time to the community—i.e., to provide community observing time equivalent in value to 100% of TSIP funds awarded. System Access proposals may request funding for up to five years.

System Access proposals should present the capabilities to be offered, including the suite of available instrumentation, the performance of the instruments, and the delivered image quality and site characteristics. No explanation of how the TSIP funds will be used is required.

Funding for System Access proposals is provided in annual increments, contingent on the satisfactory experience of community observers, which will be evaluated on an annual basis by NOAO and reported to NSF.

Aperture Ranges of Telescopes Eligible for TSIP Funding

Both System Improvement and System Access proposals will be accepted for telescopes of aperture 3 m or greater. However, the total funding granted for telescopes in the range $3.0\text{m} \leq D < 6.5\text{m}$ (including both System Improvement proposals and System Access proposals) is limited to 25% of the total TSIP funding available.

Proposers seeking funds for either improvements or access on telescopes smaller than 6.5-m aperture should bear in mind that one of the primary objectives of TSIP is to *significantly* increase the power of the U.S. telescope system. Successful proposals for projects on these smaller telescopes will have demonstrated the potential to significantly enhance the scientific capabilities of the system or to provide community access to a highly desirable capability.

ESTIMATED FY07 FUNDING LEVELS

Approximately \$4.0M in new funds is being requested in FY 2007 for the TSIP program. Of this total, \$2M is already committed to past year sub-awards. Note that total funds available for awards involving telescopes with aperture range $3.0\text{-m} \leq D < 6.5\text{-m}$ is limited to 25% of TSIP funding. As a consequence of funding already committed to the WIYN One-Degree Imager (ODI), about \$350K will be available in FY07 for these medium-telescope projects.

Proposal Description

DURATION OF FUNDING

1. System Improvement proposals for the design and construction of new, facility- class instruments for any telescope now in operation or under construction—including proposals for adaptive optics systems—may request up to five years (60 months) of funding.
2. System Improvement proposals to upgrade/improve existing instrumentation or to upgrade/improve facilities or operations, are limited to one year (12 months) of TSIP support.
3. System Access proposals, in which observing time is sold to the public community in exchange for 100% of the TSIP funds awarded, may also propose funding for up to five years (60 months).

PROGRAM ADMINISTRATION

TSIP is administered by the System Project Office (<http://www.noao.edu/system/>) of the National Optical Astronomy Observatory (NOAO) on behalf of the NSF Division of Astronomical Sciences (AST). NOAO's role is limited to soliciting and processing proposals; organizing, coordinating, and providing support for the external peer review meetings, and—subject to NSF approval and availability of funding—making awards, negotiating and executing agreements with sub-awardees, disbursing funds, and monitoring the progress of awarded projects. To eliminate conflicts of interest, NOAO employees are not eligible for funds under TSIP and are excluded from participation as reviewers in proposal reviews.

TSIP awards are fixed price grants administered as sub-awards to sponsoring institutions from the NOAO Contracts Office. Disbursement of funds is typically divided into multiple stages. New instrument sub-awards will have a minimum of two stages (AB and CD); these may be further subdivided during post-award negotiations. Payment will be made annually in advance for Phase AB. The funding profile for Phase CD will be negotiated at the time of Critical Design Review. Other Improvement and Access proposals will be funded annually, in advance, subject to satisfactory progress reviews.

ELIGIBILITY INFORMATION

The TSIP is open to non-public U.S. observatories and affiliated institutions having a mechanism for providing observing time on a telescope through the NOAO time allocation process. This includes U.S. institutions that operate such telescopes, as well as U.S. institutions that can provide assured access on U.S. or non-U.S. optical/IR telescopes. The non-federally-funded consortium partners and observatories in which NOAO holds less than a 51% interest (e.g., WIYN, SOAR) are also free to submit proposals to TSIP—with a proportional reduction in the amount of Community Access time required, as described below under *Proposed Community Access Time*.

2 Required Content of TSIP Proposals



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PROPOSED COMMUNITY ACCESTIME

All TSIP proposals must contain a description of the amount, scheduling, and nature of observing time to be made available to the community if the requested funding is awarded. System Improvement proposals that seek funding for new instrumentation will be considered based either upon current availability of observing time or upon anticipated availability of observing time at future dates. Other System Improvement proposals and all System Access proposals will be considered only for telescopes *already in operation* as of the first incremental funding date, so that observing time can be made available as soon as the proposed effort begins.

For System Access proposals, the value of the time offered must be equal to 100% of the TSIP funds awarded. For System Improvement proposals, the value must be equal to 50% of the TSIP funds awarded. An exception is made in the case of System Improvement proposals from consortia in which NOAO is a partner at 51% or less. In this case, the requisite community observing time (50% of the TSIP dollars awarded) may be reduced by NOAO's fractional ownership. For example, in a consortium that includes NOAO as a 30% partner (i.e., 30% of the science time on the telescope is available to the broad community through NOAO), the System Improvement proposer(s) would need to provide telescope time to the community equal to 35% (50% times 70%) of the TSIP funds received. Telescope partnerships in which NOAO is a partner at a fraction greater than 51% are not eligible for TSIP funding.

The community observing time resulting from successful TSIP proposals is allocated by NOAO through the same mechanisms of merit review used to evaluate observing proposals and allocate time on NOAO telescopes.

Valuation of Proposed Community Access Time

Each TSIP proposal must contain a specific commitment of observing time to be made available to the public community on the telescope for which the instrument or improvement is being proposed. The value of community access time proposed must be defined and justified by an explicit calculation in the proposal narrative. The methodology and assumptions used to determine and justify the cost of the community time are at the sole discretion of the proposer.²

Proposers must specify in the proposal narrative any conditions they wish to impose on the community access offered. NOAO is willing to provide interface and support services to facilitate community access; the details of such arrangements can be negotiated following the successful review of a TSIP proposal. *Note particularly that it is not necessary that access be granted as individual observing runs.* An alternate possibility is to undertake a large survey or surveys, defined, at least in part, through community input, from which the data would be made publicly available.

Estimating Cost Per Night for Telescopes < 6.5- Meters Aperture

Because the existing telescopes < 6.5 meters in aperture are typically older, the method of amortizing their original construction costs over 20 years following their completion may not be the most appropriate formula for estimating cost per night. We propose the following guideline for estimating the value of time on these older telescopes:

² Examples of acceptable cost per night valuations on the telescopes of previous TSIP awardees—Keck, MMT and Magellan, LBT, WIYN—can be found on the TSIP Web site: <http://www.noao.edu/system/tsip/>

Required Content of TSIP Proposals

Assume that the capital value is the current estimated cost to build a telescope of similar characteristics, reduced by a factor equal to inflation over the last ten years. This resulting capital value should still be amortized over a 20- year period. An example using this calculation can be found on the TSIP Web site (<http://www.noao.edu/system/tsip/>).

Project Management, Phasing, Staffing, Costing

System Improvement proposals must present clear staffing and budgeting profiles and explicit schedules for development of the proposed instrument or upgrade. A management plan with well- defined milestones is essential. In particular, instrument proposals should be clearly divided into a concept and design phase (Phase AB), and a development and construction phase (Phase CD). Staffing and budgeting profiles for the two phases should be distinct. Proposals should contain full costs for both phases, and sources of uncertainty or needs for contingency should be clearly addressed.

Science Justification and System Priorities

Proposals for system improvements and new instrumentation should also contain a science justification explaining how the proposed instrument or improvement fits into the overall context of scientific capability needed by the entire U.S. astronomical community. Proposals may reference scientific priorities and needs as expressed in various community studies or workshops³. Feedback from the most recent review cycle indicates proposers should put more emphasis in their proposals on science justification and the overall system context of the instrument's science case.

³ See, for example, the "Report of the First Community workshop on the Ground- based O/IR System," at http://www.noao.edu/gateway/oir_workshop/report.pdf

3 Proposal Preparation and Submission



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LETTERS OF INTENT

Letters of Intent to propose to the TSIP are required. Letters of Intent may be submitted in electronic version, in the body of an e-mail, or in paper copy. Letters of Intent will be individually acknowledged within 24 hours of receipt. If submitted electronically, they should be sent to syspo@noao.edu. If submitted by mail or fax, send to:

Telescope System Instrumentation Program
National Optical Astronomy Observatory
P.O. Box 26732 – 950 N. Cherry Ave
Tucson, AZ 85726- 6732
Tel: (520) 318- 8000 Fax: (520) 318- 8170

The due date for Letters of Intent is **May 11, 2007**.

Purpose and Content of Letters of Intent

The purpose of obtaining Letters of Intent is to assemble a peer review panel without conflicts of interest and with expertise appropriate to the anticipated proposals. Letters of Intent should include (a) designation of the proposal as either a System Improvement or a System Access proposal, (b) the names, institutions, and contact information of the PI and Co-I's, (c) a general description of the instrument or improvement if a System Improvement proposal, (d) anticipated funding period in months, (e) the anticipated cumulative funding requested, and (f) a description of telescope facilities to which community access will be available if proposal is successful.

Questions about proposals, content, administration, and awards should be sent electronically to the System Project Office at syspo@noao.edu. All questions will be given immediate attention; collected questions and answers (excluding confidential or proprietary content) deemed useful to other proposers will be posted (without reference to the proposal or team asking the original question) on the TSIP FAQ Web page:

<http://www.noao.edu/system/tsip/faq.html>

FULL PROPOSALS

Proposals must be submitted electronically as a single PDF file containing all required sections, including the NSF budget page(s) and the Cover and Certification pages.

There are two ways to submit TSIP proposals electronically: (1) the electronic PDF file can be sent as an attachment to syspo@noao.edu or (2) the electronic PDF file can be posted to a secure ftp site to be created by NOAO. (The latter option is needed if the proposal file is too big to be sent as an e-mail attachment.) In either case, proposals must be received by 5:00 P.M. (proposer's local time) on the date due.

The NSF budget pages, of which EXCEL templates are available from the System Project Office and the TSIP Web site, must also be submitted in PDF format, one budget page for each year of requested funding, plus a cumulative budget page showing total funding requested (for multi- year proposals). Proposals will be individually acknowledged within 12 hours of receipt.

The deadline for full proposals is 5:00 P.M. (proposer's local time) **August 31, 2007**.

REQUIRED SECTIONS FOR FULL PROPOSALS

Cover and Certification Pages

The 2- page NSF Cover/Certification sheet should be attached as a PDF document to the front of each proposal. A WORD version of the Cover page is on the TSIP Web site (<http://www.noao.edu/system/tsip/>) and is also available from the System Project Office (syspo@noao.edu). Signed copies of this document must be received by mail (or by fax to 520- 318- 8270) within five days of proposal submission. Electronic signature is acceptable.

Proposal Narrative: System Improvement Proposals

System Improvement proposals must contain five sections: (1) Science, (2) Technical, (3) Management, (4) Budget (including the NSF-style budget sheets), and (5) Community Access. The length of the proposal narrative without the Budget section may not exceed 30 pages. There are no page limitations on the Budget section.

1. The **Science** section describes the scientific capability that the proposed instrument or improvement provides or enables. Proposers should explicitly state how the proposed development will improve or enhance the overall ground- based O/IR System. This section might reference the scientific motivations for particular capabilities as formulated via community meetings or workshops; if not, the proposal should make the scientific case that the proposed capability is as desirable as those that have been prioritized through community consensus. Specific scientific goals for the instrument or improvement and/or scientific studies that could be undertaken with community time may also be described.
2. The **Technical** section should describe the technical approach that will be used to provide the proposed capability. The intent of this section is to convince the proposal review committee that the technical approach is viable and that the proposing team has the resources and expertise to carry it out.

This section should include an overview of the instrument or improvement, including optics, mechanical design, electronics, and software. It should present a discussion of the technical issues/concerns and strategies for addressing them. It should also describe the flow down from scientific goals to functional performance requirements, and should provide evidence that the proposed instrument will satisfy these requirements.

3. The **Management** section must describe the management approach to be used on the proposed project, including the following:
 - Overall project structure and organization, including an organization chart
 - Project risks and key challenges and strategies for addressing them
 - Procedures and process to be used to manage the project, including, for example:
 - Procedures to assign tasks and to control project personnel
 - Metrics to monitor and assess progress
 - Procedures and tools to plan and organize the project work

⁴ E.g., "The First Workshop on the Ground- Based O/IR System:" see: http://www.noao.edu/gateway/oir_workshop/

3 Proposal Preparation and Submission



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- Plant and equipment
- Personnel or subcontractors
- Dependencies among aspects of development, design, or fabrication
- Project management documentation that will be generated

■ A hierarchical analysis of the work to be performed with associated budgets for each item organized as a Work Breakdown Structure (WBS), as well as a schedule based on the WBS, showing time line of major tasks, resource loading, task durations, and task costs built up to the overall project cost, including:

- Dates of planned meetings and reviews and other critical milestones
- Processes and procedures for quality assessment and control
- Proposed mechanisms to facilitate NOAO oversight activities (See section on Award Administration and Program Oversight below.)

4. The **Budget** section should present the *total cost* (not just the TSIP request) of the instrument or improvement and an annual payment schedule or funding profile for the TSIP funds requested. The payment schedule should be justified on the basis of the Work Breakdown Structure and planned commitments for large capital items.

The budget should explicitly identify payroll, benefits, non-payroll, and agency-agreed overhead costs as they would be determined in a proposal to the NSF. For instrument proposals, summary budgets should be given separately for phase AB and phase CD. Annual and summary budgets (for multi-year proposals) must be included in all proposals in the format required for NSF proposals. (EXCEL spreadsheet templates for the NSF budget forms are available on the TSIP Web site <http://www.noao.edu/system/tsip/> and from the System Project Office (syspo@noao.edu).

5. The **Capabilities/Community Access** section must detail the manner in which telescope time is to be made available, including the total number of nights and their distribution over time, any constraints on their use, the facilities to be made available, and so forth.

This section must include an explicit calculation of the value of observing time used to determine the nights to be made available to the community if the proposal is funded. This valuation should be calculated using such items as total construction cost, together with annual costs for operations and instruments. To provide accountability to the community, the explicit calculation and explanation of the value of nights provided for successful TSIP proposals will later be published on the System Web site: <http://www.noao.edu/system/tsip/>. For guidelines on how to value the cost of a night on telescopes < 6.5-m aperture, see above, Section 2 "Required Content of TSIP Proposals" of this Proposal Solicitation.

In addition, the Capabilities/Community Access section should include a comprehensive description of instruments available to visitors, services for visitors, data quality, data analysis capabilities, and any other factors that may affect the reviewers' assessment of the value of observing time on a particular telescope. Proposals should state a clear schedule and any contingency planning for providing the allocated community observing time.

Proposal Narrative: System Access Proposals

The System Access proposal narrative must contain two sections: (1) Capabilities/Community Access, and (2) Budget (including the NSF-style budget page(s)). The length of the proposal narrative without the budget section should not exceed five pages. There are no page limitations on the Budget section.

1. The **Capabilities/Community Access** section must detail the manner in which telescope time is to be made available, including the total number of nights and their distribution over time, constraints on their use, the facilities to be made available, services for visitors, and so forth. It must list the instruments to which access will be permitted, their performance characteristics, and their operating modes. Site characteristics, including typical clear and photometric fractions and seeing distribution, should also be noted, as well as any other factors that may affect the assessment of the value of observing time. Proposals should state a clear schedule and any contingency planning for providing the allocated community observing time.

This section must include an explicit calculation of the value of observing time used to determine the nights to be offered to the community if the proposal is funded. This valuation should be calculated using such items as total construction cost, together with annual costs for operations and instruments. To provide accountability to the community, the explicit calculation and explanation of the value of nights provided for successful TSIP proposals will be published on the System Web site: <http://www.noao.edu/system/tsip/>. For guidelines on how to value the cost of a night on telescopes < 6.5- m aperture, see above, Section III. *Required Content of TSIP Proposals*.

2. The **Budget** section should present the total funds requested, and an annual payment schedule or funding profile in the format used for budgets in NSF proposals. (EXCEL spreadsheet templates for these budgets are available from the TSIP Web site <http://www.noao.edu/system/tsip/> and from the System Project Office syspo@noao.edu).

FORMATTING GUIDELINES FOR FULL PROPOSALS

- **Page Limits:** Excluding the Budget section, the proposal narrative should not exceed 30 pages (Improvement proposals) or five pages (Access proposals). There is no limit on the number of pages for the Budget section.
- **Margins and Spacing:** Proposals should be single or double- spaced and formatted with margins of at least 1.0 inch at the top, bottom, right, and left sides of the page. Type size should not be smaller than 10 point, and tables and charts (especially Gantt charts) should be clear and easily legible in PDF form. Proposers are urged to proofread the PDF versions of their proposals before submission to check the legibility of tables, charts, and budget pages.
- **Budget Forms:** The standard NSF budget page is required. Each proposal must include a single budget page in this format for each year of support requested, as well as a cumulative budget page (for multi- year proposals only) showing the total funding requested over the full term of proposed TSIP support. Definitions of the line item categories found in the NSF budget form can be found in the NSF Grant Proposal Guide, section III.C.g: "Proposal Contents–Budget," <http://www.nsf.gov/pubs/2003/nsf032/start.htm> _

3 Proposal Preparation and Submission



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The budget forms must be submitted as single- page PDF documents attached to the main proposal narrative file. Budgets should be not submitted as separate EXCEL files or workbooks.

- **Size of PDF Files:** Proposers are urged to compress/distill images, pictures, and other graphics such that the size of the PDF file can be successfully mailed electronically to the syspo@noao.edu address. All submissions will be acknowledged by the System Project Office within 12 hours of receipt; if your submission is not acknowledged, it is likely that the file was too big to be transmitted successfully. For files too big to be sent as attachments to syspo@noao.edu, a secure ftp site to which the file can be uploaded will be created.

QUESTIONS ABOUT PROPOSAL PREPARATION

Scientific, technical, and programmatic questions should be documented and sent to the System Project Office at syspo@noao.edu. All questions will be answered promptly and those judged of interest to other proposers (excluding proprietary or confidential information) will be published on the TSIP FAQ page: see for example: http://www.noao.edu/system/tsip/2002_faq.html . Previous years' FAQ's on TSIP are archived on this Web site.

PROGRAM CONTACTS

Science/TechnicalR. Blum, NOAO, e- mail: rblum@noao.edu
AdministrationR. Blum, NOAO, e- mail: rblum@noao.edu
ContractsA. Commissaris, NOAO, e- mail: andy@noao.edu
System Project Office <http://www.noao.edu/system/> E- mail: syspo@noao.edu
TSIP Web Site <http://www.noao.edu/system/tsip/> _
TSIP FAQ <http://www.noao.edu/system/tsip/faq.html> _



NSF MERIT REVIEW CRITERIA

Reviews and rankings of all TSIP proposals are carried out by a peer review panel pre-approved by NSF and assembled by NOAO. (NOAO staff are specifically excluded from TSIP reviews.) The review panel typically meets within two months of the proposal deadline date. Reviewer comments are documented and communicated to proposers following the review meeting.

The merit review criteria for TSIP proposals are those established by the National Science Board for all NSF proposals. (Additional review criteria apply specifically to the TSIP program: see below.) The NSF review criteria, intellectual merit and broader impacts, are described as follows:

What is the intellectual merit of the proposed activity?

How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

What are the broader impacts of the proposed activity?

How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

ADDITIONAL REVIEW CRITERIA SPECIFIC TO TSIP PROPOSALS

- Overall cost-effectiveness of the proposed effort
- Overall value of the proposed amount of time to the U.S. astronomical community
- Degree to which the proposed effort will improve, enhance, or strengthen the overall capabilities of the ground-based O/IR system. The context for judging such improvement rests on community strategic planning activities and also includes consideration of both long-term and short-term returns and of priorities not necessarily addressed in previous TSIP cycles. An example of such a strategic community priority is the **development of data reduction pipelines and data archives**—either as upgrades to existing instruments or as elements of new ones.
- Overall quality of the management and technical plans for accomplishing the effort
- Broader impacts of the proposed effort on, for example, the improvement of infrastructure for education through involvement of students in the proposed efforts, or the improvement of research infrastructure through the training of instrumentalists

Based on the review panel rankings and available funding, NOAO will request NSF approval of sub-awards to fund successful proposals.



NOAO SYSTEM PROJECT OFFICE

Contracts

Following NSF approval of the recommendations made by the peer review panel, the NOAO Sponsored projects Office negotiates sub-award contracts with the selected proposers. TSIP contracts typically include the following elements:

- Description of instrumental capability or improvement to be provided
- Time line, including milestones and payments
- Telescope time to be provided, together with contingencies and limitations
- Management plan
- Reporting and review schedule

Project Oversight

NOAO's role is to provide ongoing oversight of the progress of awarded projects. Listed below are some examples of project oversight activities in which NOAO is typically involved. NOAO makes every effort to accommodate its oversight activities to the awardee's established project management schedules, reviews, and reporting mechanisms.

■ **Approval of Management Plan**

The Technical Project Manager of the NOAO System Project Office will review and approve the management plan for the work. This is to ensure that sufficient project management is being provided by the proposing institution, that sufficient resources are identified to carry out the work, and that the budget and schedule are credible. An acceptable management plan is required before a sub-award can be recommended to NSF for approval.

■ **Regular Periodic Reports**

During the design and/or construction of instruments, the instrument PI or Project Manager will be required to submit monthly reports to keep the System Project Office informed of progress and problems. These reports will summarize work completed, equipment or parts purchased, issues identified, and progress relative to the accepted management plan. All reports and review results can be made publicly available on the NOAO System Web site (less confidential financial information and/or proprietary technical information).

■ **Quarterly Reviews for Instrument Projects**

It is expected that instrument development projects will have formal management and will include regular reviews, typically every three months. These may be attended by the System Project Office Technical Project Manager and any associated technical personnel who might provide needed expertise. Documentation and response to formal reviews (CoDR, PDR, CDR) will be made publicly available.

■ **Annual Status Reports**

At each annual TSIP proposal review meeting, the panel reviews the status of ongoing TSIP projects. Annual status reports on TSIP-funded projects must therefore be submitted to the System Project Office by the due date of TSIP proposals. The annual status report should describe work completed over the past 12 months, work planned for the next year, progress relative to the original proposal, and problems encountered.

■ **Formal Decision on Continuation of Funding Following CDR**

Following the Critical Design Review at the end of Phase AB, a formal decision on continuation of TSIP funding through Phase CD is required. If the project is maintaining the cost and schedule in the original proposal within contingency, continuation will be automatic, subject to availability of NSF funds for TSIP. If there are projected cost overruns or schedule slips, the NOAO System Project Office will convene a panel to evaluate the project in context of other existing or proposed TSIP projects and determine if the project should be continued with a revised cost and schedule. A revised sub-award would require NSF approval.

■ **Review of Progress on Non- Instrument System Improvement Proposals**

It is expected that infrastructure improvement projects will also have regular reviews, typically every six months, similar in nature to the quarterly reviews for instrument projects. Review materials and reports will be publicly available. The generic criteria to be used in evaluation are successful completion of the work according to the original plan and the improvement in performance of the facility described in the technical proposal. If improvements are not being made as proposed, the NOAO System Project Office will convene a review panel to evaluate the project in context of other existing or proposed TSIP projects and determine whether the project should be continued. A revised sub-award would require NSF approval.

■ **Review of Progress on System Access Proposals**

It is expected that observatories that are providing observing time to the community in return for funding received through a TSIP System Access proposal will make available to the NOAO System Project Office all feedback from community observers concerning the success of their observing runs or the problems encountered. In the case of multi- year awards, an annual report will be required, due at the annual TSIP proposal cycle deadline, summarizing community use of the facility. This report will be reviewed by the TSIP review panel for continuation into the next year.