

## Michelson Fellowship Program Guidelines

The Michelson Fellowship Program aims to advance the scientific and technical goals of the NASA's Navigator Program<sup>1</sup>, namely the engineering development and scientific application of exo-planet-related technologies such as optical/near-IR interferometry and coronagraphy, while at the same time broadening the research community that is actively involved in developing and applying these technologies. The Michelson Fellowship is an annual series of fellowship awards to promising young researchers at US institutions. The fellowship program is open to applicants in astronomy, physics, engineering, or related disciplines at the graduate and post-graduate level, and is renewable for a period of up to three years (subject to review and available funding). Fellowship applications proposing technology development and/or astronomical applications of optical/IR interferometry and/or coronagraphy are particularly encouraged; proposals relevant to the technology development or science of Navigator projects, both experimental and theoretical, will also be considered.

The program further sponsors a series of activities intended to increase and facilitate open exchange of information and ideas in the field through personal contacts of students, postdoctoral researchers, young faculty members and established researchers.

The Michelson Fellowship Program is administered for NASA and the Navigator Program by the Michelson Science Center (MSC<sup>2</sup>) at the California Institute of Technology (Caltech).

### **A. Graduate Student Fellowships**

The purpose of the fellowship is to enable promising graduate students to pursue their research within a PhD program unencumbered by financial concerns.

#### **A1. Eligibility**

Eligible are students in good standing at a university in the United States enrolled in a graduate program typically leading to a PhD in astronomy, physics, engineering, or related discipline. The university or research institution shall have an established program in the field of the proposed research. An established program shall be defined as at least one faculty member who is engaged in the proposed field through dedicated facilities or instruments, collaborations with existing projects or projects under development, or a record of significant contributions to the field. The intent of this requirement is to guarantee the student a rich and stimulating environment rather than restricting the field of eligible institutions.

Applications from previous and current Michelson Fellowship recipients are *strongly discouraged*; fellowship awards to former and current Michelson fellows will be granted only under exceptional circumstances.

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<sup>1</sup> Please see [http://planetquest.jpl.nasa.gov/Navigator/navigator\\_index.html](http://planetquest.jpl.nasa.gov/Navigator/navigator_index.html).

<sup>2</sup> <http://msc.caltech.edu>.

## A2. Application Process

To be considered for a Michelson fellowship, the applicant must send a proposal to arrive before the application deadline to the program director at the address below. This proposal shall consist of the title of the proposal, an abstract not to exceed 200 words, the name of the host institution, and the name of the faculty advisor at the host institution and a clear description of the research project. The proposal should also include a description how this research will relate to the already existing efforts at the proposed host institution. The proposal must not exceed **five** letter size (8.5 by 11 inch) or European A4 pages and the font size shall not be smaller than 12 points. These five pages must include the abstract, research description, and all figures, tables and references. Material in excess of the page limit will not be considered for the selection process. The Jet Propulsion Laboratory shall retain the right to publish funded proposals in electronic format and hardcopy within the context of promoting the fellowship program only. Additionally, a *curriculum vitae* (CV), including a list of publications if applicable must be included with the proposal. The curriculum vitae and the publication list together must not exceed **two pages**. A one-page cover letter may be added to the proposal.

The applicant must submit **five paper copies** of the proposal (optional cover letter, research proposal and curriculum vitae) preferably double sided and an electronic copy (**one file** in Postscript or PDF-Format) prior to the application deadline. The electronic copy of the research proposal shall be send by electronic mail to the address provided. No application shall be accepted without the timely receipt of the five paper copies of the proposal. The applicant must also arrange for a letter of reference and support from the faculty advisor at the proposed host institution to be sent prior to the deadline. The letter of support must confirm that the applicant is a student in good standing at the host institution or is accepted for enrollment and will be a registered student prior to the start of the funding period. The letter shall also describe the impression of the advisor of the suitability of the applicant to the task proposed and shall evaluate the likelihood for success of the applicant in respect to the proposed research project.

## A3. Selection Process

The selection of the fellowship recipients will be made by the selecting official of the fellowship program (the MSC Director) based on the recommendation of an independent review panel. The review panel shall consist of at least three members where not more than one member shall be affiliated with the Jet Propulsion Laboratory or the California Institute of Technology. The director of the fellowship program shall convene and facilitate the meeting of the review panel but will not vote on the recommendation of the review panel.

## A4. Contracts and Budgets

Following selection, the Jet Propulsion Laboratory shall write a University Subcontract with the host institution to support the successful applicant for the duration of the fellowship. The fellowship will cover three years of graduate research of the successful applicant including a student stipend at a rate compatible with the graduate research stipends of the National Science Foundation (NSF<sup>3</sup>), currently at \$27,500 for a 12-month tenure, and an annual research budget not to exceed \$7,000 per year (for fellowships selected in FY2004) to cover research related expenses such as but not limited to travel, page charges, small equipment and computers. The

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<sup>3</sup> Please see <http://www.ehr.nsf.gov/dge/programs/grf>.

fellowship shall also provide funds for appropriate health and dental coverage for the fellow. In addition to the funds for stipend payments, the MSC will provide the fellowship institution, on behalf of each Fellow, a cost-of-education allowance of \$10,500 per tenure year. During tenure, Fellows at U.S. institutions will be exempt from paying tuition and fees normally charged to students of similar academic standing, unless such charges are optional or are refundable. At international institutions, all tuition and assessed nonrefundable fees will be paid by the Fellow, with reimbursement by the NSF, up to a maximum of \$10,500 per fellowship year.

The research budget may be phased to cover the purchase of more expensive equipment at the beginning of the funding period as long as the total of the expense does not exceed the sum of the annual allocations. With the approval of the fellowship director personal computer and equipment that is considered to have reached the end of its useful lifetime at the end of the fellowship will not need to be returned to the funding agency.

#### **A5. Early Termination of Tenure**

Should the student leave the host institution and/or graduate student status prior to the end of the funding period through graduation or other event the fellowship funding will end with the date at which the student is no longer enrolled at the host institution. It is the responsibility of the host institution to notify MSC and JPL of the early termination of fellowship tenure, and arrange for the termination of the fellowship contract.

#### **A6. Change of Host Institution**

As the interaction of the fellow with the faculty member at the host institution is an integral part of the proposal evaluation, the fellowship shall not be transferable to another institution or faculty advisor except under extraordinary circumstances such as transfer, illness or death of the faculty advisor. Should the faculty advisor move to another institution during the funding period, it will be the fellow's choice, to be approved by the director of the fellowship program, whether the fellow wants to remain at the initial host institution or wants to stay with the initial advisor at a new institution. Providing all fellowship requirements are satisfied at the new institution, with the fellowship director's approval the Jet Propulsion Laboratory shall write a new contract for the remaining funding period with the new host institution.

### ***B. Postdoctoral Fellowships***

The purpose of this fellowship is to enable recent PhD recipients to pursue independent research in the development and application of technologies related to exo-planetary search and characterization.

#### **B1. Eligibility**

Eligible are applicants who have received a PhD in astronomy, physics, engineering, or related discipline within the last six years. Also eligible are current PhD students who will have fulfilled all requirements to receive a PhD before the start of the funding period. The applicant must propose to conduct research at a university or research institution in the United States with an established program in the field of the proposed research. An established program shall be defined as at least one faculty member who is engaged in the proposed field through dedicated facilities or instruments, collaborations with existing projects or projects under development, or a

record of significant contributions to the field. The intent of this requirement is to guarantee the student a rich and stimulating environment rather than restricting the field of eligible institutions.

Starting in 2004 we are adding *Resident Michelson Postdoctoral Fellowships* at the Michelson Science Center. These resident fellowships are to be conducted at the MSC along lines of mutual scientific interest with MSC science staff. The MSC will offer no more than one such resident postdoc fellowship per year.

Applications from previous and current Michelson Fellowship recipients are *strongly discouraged*; fellowship awards to former and current Michelson fellows will be granted only under exceptional circumstances.

## B2. Application Process

To be considered for a Michelson fellowship, the applicant must send a proposal to arrive before the application deadline to the program director at the address below. This proposal shall consist of the title of the proposal, an abstract not to exceed 200 words, the name of the proposed host institution, the name of a faculty member of the host institution who has agreed to serve as faculty contact and a clear description of the research project. The proposal should also include a description how this research will relate to the already existing efforts at the proposed host institution. The proposal shall not exceed **eight** letter size (8.5 by 11 inch) or European A4 pages and the font size shall not be smaller than 12 points. These eight pages have to include the abstract, research description, and all figures, tables and references. Material in excess of the page limit will not be considered for the selection process. The Michelson Science Center and the Jet Propulsion Laboratory shall retain the right to publish funded proposals in electronic format and hardcopy within the context of promoting the fellowship program only. Additionally, a *curriculum vitae* (CV), including a list of publications must be included with the proposal. The curriculum vitae and the publication list together shall not exceed **three** pages. A one-page cover letter may be added to the proposal.

The applicant must submit **five paper copies** of the proposal (optional cover letter, research proposal, curriculum vitae and publication list) preferably double sided and an electronic copy (**one file** in Postscript or PDF-Format) of the research proposal prior to the application deadline. The electronic copy of the research proposal shall be send by electronic mail to the address provided. No application shall be accepted without the timely receipt of the five paper copies of the proposal.

The applicant must also arrange for three letters of reference to be sent prior to the application deadline. One of the three letters of reference must be written by a member of the proposed host institution. This letter must state that the faculty agrees to serve as the faculty contact for the fellow should the proposal be selected for funding. The letter must further state that the faculty member supports the research as proposed, that the host institution will welcome the successful fellow and will provide support as required to complete the proposed research including access to required facilities. The letter should finally give an assessment of the likelihood for success of the applicant in respect to the proposed research project.

### B3. Selection Process

The selection of the fellowship recipients will be made by the selecting official of the fellowship program (the MSC Director) based on the recommendation of an independent review panel. The review panel shall consist of at least three members where not more than one member shall be affiliated with the Jet Propulsion Laboratory or the California Institute of Technology. The director of the fellowship program shall convene and facilitate the meeting of the review panel but will not vote on the recommendation of the review panel.

### B4. Contracts and Budgets

Following the selection, the Jet Propulsion Laboratory shall write a subcontract with the host institution to support the successful applicant for the duration of the fellowship. The fellowship will cover initially two years of postdoctoral research with an additional year of funding pending the review of a progress report before the end of the first two-year period. The guidelines here are intended to be functionally similar to those presented for the Hubble Fellowships.<sup>4</sup> The annual (12-month) stipend for the 2004-2005 academic year will be \$50,000 for new Fellows, \$50,500 for second-year Fellows, and \$51,000 for third-year Fellows.

A health-insurance program must be provided by the Host Institution for the Fellow or purchased separately, and may be provided for the Fellow's dependents, if any. Funds for this purpose should be requested in the submitted budget (see example below), up to the stated limits. Although Michelson Fellows receive stipends (rather than salaries), the Host Institution may apply its applicable negotiated Fringe Benefit rate to the stipend in order to fund the health insurance. Note, however, that the institution's Indirect Cost Rate may not be applied to either the Fellowship stipend or the Fringe Benefits. If the health insurance is not provided through the applicable Fringe Benefits rate, it may be purchased separately by the Institution or Fellow, up to a limit of \$7,500 per year. Fringe Benefits must be in accordance with the Standard Policies and Practices related to handling postdocs at the Host Institution. For first-year Fellows, relocation costs must be in accordance with the Standard Policies and Practices of the Host Institution and should not exceed \$6,500.

Further, the fellowship shall include an annual research budget not to exceed \$15,000 per year (for fellowship awarded in FY2003) to cover research related expenses such as but not limited to travel, page charges, small equipment and computers. The research budget may be phased to cover the purchase of more expensive equipment at the beginning of the funding period as long as the total of the expenses does not exceed the sum of the annual allocations. With the approval of the fellowship director personal computer and equipment that is considered to have reached the end of its useful lifetime at the end of the fellowship will not need to be returned to the funding agency.

It is expected that Fellows will devote their full-time effort to their research programs. No additional stipend, salary, or other remuneration may be accepted from another appointment, fellowship, or similar grant/contract during the period of the Fellowship.

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<sup>4</sup> <http://www.stsci.edu/institute/org/spd/hubble-fellowship/guidelines>.

### B5. Early Termination of Tenure

Should the selected fellow leave the host institution and/or postdoctoral position prior to the end of the funding period, the fellowship funding shall end with that termination date. It is the responsibility of the host institution to notify MSC and JPL of the early termination of fellowship tenure, and arrange for the termination of the fellowship contract.

### B6. Change of Host Institution

As the interaction of the fellow with the faculty member at the host institution is an integral part of the proposal evaluation, the fellowship shall not be transferable to another institution or faculty advisor except under extraordinary circumstances such as transfer, illness or death of the faculty advisor. An exception shall be where more than one institution is named on the initial proposal. Should the fellow request to move to one of the other institutions named on the proposal this move should be approved with the concurrence of the initial faculty contact. If the new institution fulfills the selection requirements, with the approval of the fellowship director the Jet Propulsion Laboratory shall write a new contract for the remaining funding period with the new host institution.

### B7. Performance Review for Continued Funding

Four months before the end of the initial two-year funding period, the fellow shall submit a report on the work accomplished to this point including a list of publications related to the research conducted. If the fellow request at this point continuing funding for one additional year for the end of the first two-year period, this request needs to be endorsed by the faculty contact at the host institution. Upon review of the report and the request for continued funding, the director of the fellowship program shall make a decision whether to grant the continuation no later than three months before the end of the initial two-year period. Continued funding shall only be denied, if the success of the proposed research appears to be in serious jeopardy and no equivalently valuable alternative results have been achieved or are likely to be completed or if no report is submitted in time.

## **C. *Michelson Educational Awards***

Michelson Educational Awards are aimed at supporting undergraduate and graduate education, and specifically educators and institutions in the preparation and presentation of educational material relevant to Navigator Program science (e.g. exo-planet research) and/or technology.

### C1. Eligibility

Eligible for Michelson Educational Awards are individual educators or groups (herein applicant(s)) who are members in good standing of the teaching staff at accredited US undergraduate and/or graduate educational institutions. We anticipate that successful applicants will be involved in teaching physics, astronomy, engineering, or related disciplines at their host institution, but proposals that further the engineering and/or scientific interests of the Navigator Program are welcome from all disciplines.

### C2. Application Process

To be considered for a Michelson Educational Award, the applicant(s) must send a proposal to arrive before the application deadline to the program director at the address below. This proposal shall consist of the title of the proposal, an abstract not to exceed 200 words, the name

of the proposed host institutions, and the names and *curriculum vitae* (CV) of all educators on the proposal. All proposals must designate exactly one applicant as the Principle Investigator (PI) for the proposal. The proposal should also include a textual description including a detailed outline of the educational materials to be prepared and/or presented (or other proposed activities), a plan for how they are to be incorporated into ongoing or new educational opportunities for undergraduate or graduate students, and a proposed budget for the activity (see Contracts and Budgets below). Further, a discussion how the proposed course of study is relevant and beneficial to Navigator Program goals will be required of all applications. The proposal materials (exclusive of budget and CVs) should not exceed **six** letter-sized (8.5 by 11 inch) or European A4 pages and the font size shall not be smaller than 12 points. These six pages have to include the abstract, proposed activity description, and all figures, tables and references. Material in excess of the page limit will not be considered for the selection process. The Michelson Science Center and the Jet Propulsion Laboratory shall retain the right to publish funded proposals in electronic format and hardcopy within the context of promoting the fellowship program only. A one-page cover letter may be added to the proposal.

Examples of possible educational activities include preparation of coursework or written material relevant to Navigator Program science (e.g. exo-planet studies) or technology at either the undergraduate or graduate level; participation of undergraduate or graduate students in seminars or in small-scale observing programs or laboratory efforts focused on Navigator Program science or technology; summer visits of students to JPL, MSC, or other foci of Navigator Program activities, etc.

The applicant(s) must submit **five paper copies** of the proposal (optional cover letter, educational proposal, CVs) preferably double sided and an electronic copy (**one file** in Postscript or PDF-Format) of the research proposal prior to the application deadline. The electronic copy of the research proposal shall be sent by electronic mail to the address provided. No application shall be accepted without the timely receipt of the five paper copies of the proposal.

### C3. Selection Process

The selection of the award recipients will be made by the selecting official of the fellowship program (the MSC Director) based on the recommendation of an independent review panel. The review panel shall consist of at least three members where not more than one member shall be affiliated with the Jet Propulsion Laboratory or the California Institute of Technology. The director of the fellowship program shall convene and facilitate the meeting of the review panel but will not vote on the recommendation of the review panel.

### C4. Contracts and Budgets

Following the selection, the Jet Propulsion Laboratory shall write a University subcontract with the PI's host institution to support the successful applicant(s)/activity for the duration of the award. The anticipated sizes of awards under this program are between \$35,000 and \$75,000 FY04, and the award duration shall not exceed two years. Allowable expenses include salaries of applicants or assistants, publication and material costs, travel expenses, appropriate institutional overheads, and other expenses that might be related to the production and/or presentation of the proposed educational materials.

### ***D. Michelson Sabbatical Program***

In order to foster advances in science themes within the Navigator Program, the MSC and Caltech will host a Michelson Sabbatical Program resident at the MSC. This program will provide resources for extended visits by notable scientists and engineers to MSC, Caltech, and JPL to perform research along themes within the Navigator Program. Michelson Sabbatical awardees will be selected by the MSC Directors, and invitations to participate in the Sabbatical Program will be extended by the MSC Executive Director.

The announcement of sabbatical availability will be made in conjunction with the annual call for Michelson Fellowship applications, and applications to the sabbatical program will be solicited and reviewed as a part of that same opportunity call. Further, the MSC Directorate reserves the right to proactively invite individuals to participate in the sabbatical program. Sabbatical stays at MSC will range from four weeks to six months in duration.

### ***E. Provisions Applicable to Awards***

#### **E1. Acknowledgement of Funding**

All publications that report on research results funded in part or completely under this fellowship program shall include the following acknowledgement: “This work was performed [in part] under contract with the Jet Propulsion Laboratory (JPL) funded by NASA through the Michelson Fellowship Program. JPL is managed for NASA by the California Institute of Technology.”

#### **E2. Employment during Tenure**

A fellow may not receive funds from another major fellowship, scholarship, assistantship or similar award. However, fellows are permitted to solicit and accept support from any appropriate source for research expenses connected with their fellowship activities. The program is not concerned with gifts or loans of any kind that a fellow may receive.

During the tenure of the fellowship (except for scheduled short vacation periods) fellows are expected to devote full time to the advancement of their research project. Employment at an on- or off-campus site that does not jeopardize a fellow's full-time commitment to the research project and is consistent with policies of the host institution is usually permitted. However, before a fellow engages in such work, permission of the Program Director must be obtained. Requests for approval of employment during tenure are reviewed on a case-by-case basis. Such requests should include the following information: nature of employment, relation to degree program or research project, number of hours per week or month, permission from the faculty contact or representative of the host institution.

#### **E3. Annual Reports**

Every fellow must provide a brief report once per year on the accomplishments and experience during the previous year. This report will be requested by the program director and must be sent within 30 days of the request. All fellows are invited to send captioned photographs and information on noteworthy events or accomplishments at any time to the program director. The program director will make such material available to the public at his discretion. Also, comments and suggestions regarding the administration of the program are always welcome.