



# INSTITUTE OF GEOPHYSICS AND PLANETARY PHYSICS (IGPP) LOS ALAMOS NATIONAL LABORATORY (LANL)

FY09 Call for Research Proposals  
(Both New and Renewal Proposals)

Deadline for receipt: April 4, 2008

## 1. INTRODUCTION

The Institute of Geophysics and Planetary Physics (IGPP) at Los Alamos National Laboratory (LANL) is a branch of the University of California's Systemwide Institute of Geophysics and Planetary Physics. Its mission is to promote and coordinate basic research on the understanding of the origin, structure, and evolution of the Earth, the Solar System, and the Universe, and to develop the science base to predict future changes as they affect human life. As part of the mission, IGPP at LANL is committed to promoting and supporting high quality, cutting edge science in the areas of astrophysics and cosmology; space physics; solid earth geoscience; and complex dynamical climate systems. These subject areas are selected based on their breadth of scientific challenges facing the international scientific community as well as on the strategic need to extend scientific excellence supporting LANL mission. IGPP/LANL makes a special effort to promote and support new research ideas, which can be further developed through seed funding into major programs supported by federal and/or other funding sources. Collaboration between LANL scientists and a combination of university scientists, (LANL or University) postdocs, and (LANL/University) graduate students is viewed by IGPP as an effective arrangement to promote creativity and extend science beyond today's understanding.

The Director of the Los Alamos National Laboratory provides funds for collaborative research involving LANL postdocs and LANL collaborations with University principal investigators (PIs), i.e., in the form of a minigrant program. This financial support has historically been augmented by a small contribution from the Regents of the University of California, to support collaborative projects involving University of California faculty, postdocs, and/or graduate students.

Graduate student and/or postdoc participation is an essential component of all approved minigrant projects. While many minigrants extend up to three years duration, IGPP issues minigrant awards on a one-year basis with renewals decided as per scientific progress. In most cases, minigrants are dedicated to support salary and travel costs for the participating graduate student and/or postdoc, some equipment costs, and a minimal amount of support for the PIs.

**TWO TYPES OF MINIGRANTS.** IGPP supports two types of minigrants. The first type emphasizes a collaborative arrangement between a LANL co-PI and a University co-PI, where a University postdoc and/or graduate student is the centerpiece. The second type of minigrant is dedicated to LANL postdoc support, i.e., mainly LANL programmatic postdocs, where IGPP provides up to 50% support to Time and Effort, plus travel needs. In both cases, IGPP will provide support for publication costs, for work conducted as part of a minigrant; IGPP support for publication costs is handled on a separate request to the Director, IGPP, Gary Geernaert ([geernaert@lanl.gov](mailto:geernaert@lanl.gov)).

- More details on the first type: University/Laboratory collaborative research. Each proposal is required to have a University PI and a Laboratory PI. A University PI is any University scientist entitled by the University to be Principal Investigator on an extra-mural grant. A Laboratory PI is any Technical Staff Member (TSM). Visiting scientists, adjunct faculty and postdocs do not qualify as co-PI unless an exception is granted by the University. Successful proposals of this type are **required** to include some form of matching support from the universities. Acceptable forms of matching support are the same as, but not restricted to, those accepted by the National Science Foundation or other Federal research funding agencies. Proposals may be submitted from any U.S. university. On average, 60% of all approved IGPP minigrants awarded at Los Alamos originate from non-UC campuses. Typical grants are \$25K-\$55K, per annum, and approximately 25-35 grants are issued each year.
- More details on the second type: partial support to LANL programmatic postdocs. Each proposal must demonstrate that programmatic support for at least 50% of the postdoc's salary has been secured. Proposals will be for one year only, though renewal proposals for an additional year will be considered. Postdocs entering their first, second, or third year will be considered for support. Proposals must be submitted by a LANL PI, and it is expected that the named postdoc will provide significant contributions to the writing of the proposal. For this type of minigrant, there is no requirement for University collaboration.

This FY09 call for proposals is for both collaborative research proposals and LANL postdoc proposals. All proposals must respond to the scope of science outlined in the focus areas specified in Section 2 of this announcement.

## 2. SCIENTIFIC DISCIPLINES INCLUDED IN THIS CALL

IGPP is comprised of two broad centers, where each center has two subject areas, or four focus research areas, included in this call for proposals:

- Astro- and space-physics (Leader: Richard Epstein, [epstein@lanl.gov](mailto:epstein@lanl.gov))
- Geosciences, including climate research (Leader: Claudia Lewis, [clewis@lanl.gov](mailto:clewis@lanl.gov))

Each of these broad centers is managed by leading LANL scientist (identified in parentheses) who is responsible for coordinating research efforts so that individual projects will benefit from the best available resources and expertise. Prospective grantees are encouraged to contact the IGPP Director Gary Geernaert ([geernaert@lanl.gov](mailto:geernaert@lanl.gov)), Richard Epstein and/or Claudia Lewis for further information on technical issues related to the two centers and/or visit the IGPP website at <http://www.igpp.lanl.gov/> for additional information and answers to frequently asked questions.

When selecting a subject for possible funding and proposal preparation, please consider the following topics of current research interest.

### **Center for Astro- and space- physics**

Proposals are solicited with emphasis on theoretical research, observational research, and instrumentation research. We favor multidisciplinary projects that are at the boundaries between

disciplines, e.g., astrophysics and nuclear physics, particle physics, condensed matter physics, space physics, plasma physics, and/or general relativity. Use of LANL facilities is highly desirable, e.g., exploitation of the Milagro gamma-ray observatory, linkage to multi-cluster satellite experiments, and/or advancement of MHD computer simulation codes, is strongly encouraged.

The following specific topics are of interest:

- cosmology and galaxy formation
- cosmic microwave background
- supernovae
- gamma ray, cosmic ray, and radio astrophysics
- neutron star and black hole physics
- physics of accretion disks
- space instrumentation
- planetary space physics, e.g., fine scale dynamics and instabilities of the magnetosphere including the near-earth plasma sheet
- planetary geology and climate
- global structure of the solar wind in the Heliosphere
- kinetic fine structure of the solar wind
- new sensors and instrumentation that provides data gaps and/or more complete validation of astrophysical, space weather, MHD, and other relevant models

Leveraging against LANL facilities and databases, e.g., linkage to multi-cluster satellite experiments or computer simulation codes, is strongly encouraged.

### **Center for Geoscience**

This Center supports a breadth of basic research concerning planetary surfaces and interiors as well as climate change research involving the Earth's atmosphere, ocean, land surfaces and solar forcing. Research focus areas encompassed by this Center are: 1) Solid Earth Geosciences; and 2) Complex Dynamical (Climate and Environmental) Systems. It is strongly recommended that proposals exploit unique LANL resources, such as high-performance computing resources, the Los Alamos Neutron Science Center (LANSCE), the DOE ARM field sites, the LANL climate-ecology field stations, and/or other unique laboratory facilities. Furthermore, IGPP is committed to excellent students who have completed the LANL-sponsored Summer Applied Geophysics Experience (SAGE) course; applicants are encouraged to indicate their affiliation with SAGE if relevant. If you wish to obtain more information about SAGE, contact Scott Baldrige, SAGE co-director ([sbaldrige@lanl.gov](mailto:sbaldrige@lanl.gov); 1-505-667-4338).

For FY09, we are particularly interested in innovative research projects in areas of current, strong international scientific interest such as the following:

- New techniques in passive (imaging) or active (e.g., lidar, radar) remote sensing and digital data analysis for the geosciences
- Earthquake seismology and seismotectonics, including rupture processes, rheology and friction of fault zones, and earthquake clustering
- Earth materials: dynamics, elasticity, strain localization, low temperature thermal evolution, effects of ionizing radiation
- Transient and steady-state behavior in geologic and hydrologic processes, including multi-

phase fluid flow in porous and fractured media and dynamic interactions among climate, tectonics, and surface processes

- Atmospheric processes, with particular attention to aerosols, clouds, and climate change
- Dynamics of severe phenomena, e.g., hurricanes, forest fires, drought, or flood
- Statistical and model-based interpretation of paleoclimatic data
- Field geophysical experiments and modeling of ice sheets and effects of global climate change
- Observations and process modeling of components of the carbon cycle, from the local to global scale

### **SPECIAL LARGE PROJECT COMPETITION**

In addition to the above projects, IGPP is soliciting proposals for a single project in one of the focus areas for up to \$100K for particularly innovative research. Examples of such needs are:

- Concentration of effort on a specific topic that needs rapid advance
- A multi-campus/laboratory project
- An important project requiring salary for Laboratory PI
- A project requiring specific funds for laboratory apparatus, field trips, etc.

The intent is for IGPP to support a single project whose results would be of considerable interest to the community at large and to the Laboratory, and could only be completed with a higher level of financial support. The project would be supported for up to three years (assuming adequate yearly progress and available IGPP funding). Interested investigators should directly contact the IGPP Director for additional information and assistance.

### **3. FUNDING INTERVAL AND IN-KIND CONTRIBUTIONS FOR MINIGRANTS INVOLVING UNIVERSITY/LABORATORY COLLABORATIVE RESEARCH**

The funding interval is October 1, 2008, through September 30, 2009. PIs should note, however, that the availability of funds is contingent upon the date the University minigrant contract is awarded by the LANL Contracts Office; and the LANL Contracts Office is not permitted to issue minigrant contracts until Congress approves and the President signs the Energy Bill. (In recent years, Congress has entered a Continuing Resolution that has resulted in delays of 1-2 months in issuing minigrants to Universities.)

For all minigrant projects supported with LANL financial resources, it is imperative (with no exceptions) that the LANL-originated funds are spent by close of business September 30, 2009.

The University of California (UC) waives overhead for this program. Non-UC institutions are encouraged to do the same; if this is not possible, some alternate in-kind contribution is expected. In many cases, proposals may be submitted as multi-year efforts, usually with a maximum of three years. Renewals for the second or third year are determined based on progress during the previous year and timely delivery of progress reports.

### **4. FUNDING INTERVAL FOR MINIGRANTS THAT SUPPORT LANL POSTDOCS**

The funding interval may be up to 12 months, with work performed entirely within FY09. Renewal proposals will be required for scientific activity which extends into FY10. The LANL PI will be required to include in the proposal details on all other funding sources that will be required to cover

postdoc salary costs during the fiscal year.

Because LANL LDRD funds are used to support LANL postdocs under this IGPP minigrant program, the PI and postdoc will be required to spend the LDRD funds by close of business September 30, 2009; there are no possibilities to carryover LDRD funds into the next fiscal year.

## 5. GUIDANCE: PREPARATION OF NEW PROPOSALS

The following format is recommended for all proposals:

**Cover Sheet**, to include on one page:

- Title of proposed project
- Name of University Campus if the minigrant is for University/Laboratory collaborative research, or name of Group and Division if proposed project supports a LANL postdoc
- Is this a new proposal or renewal? If you are submitting a proposal for renewal, please indicate if the proposal is a second year renewal or third year renewal.
- To which IGPP focus area(s) is this proposal most relevant?
  - Astrophysics
  - Space Physics
  - Solid Earth Geosciences
  - Complex Dynamical Climate and Environmental Systems
- Proposed start date, and proposed duration of project (usually 1, 2, or 3 years).
- Name, title, address, email address, and phone number for PIs.
- Name and email of postdoc and/or graduate student(s), if known.

**Main Body** (including budget information)

Use the following outline in formatting the main body; please limit to **five total pages** of text (for Sections I through IX), plus figures and a budget page:

- I. Title of project, and short abstract
- II. Principal investigators and team, including all contact information
  - i. University PI (if relevant): address, telephone number, fax, and email address
  - ii. LANL PI: Group, telephone number, fax and email address
  - iii. Name and email address of participating postdoc and/or graduate student(s)
- III. Start date, and project duration
- IV. Objectives
- V. Background
  - i. History of problem
  - ii. Scientific debate
  - iii. Hypotheses to test
  - iv. Why now?
- VI. Approach
  - i. Theoretical, numerical, or experimental activity
  - ii. Methods used (describe comprehensively)
  - iii. Any relevant leveraging or necessary coordination, e.g., other projects or facilities

- VII. Resources to be used in the project
  - i. Resources at Los Alamos
  - ii. Resources at the University
  - iii. Other Resources
- VIII. Statement of Work
  - i. Tasks to be performed
  - ii. Milestones
  - iii. Deliverables
  - iv. For collaborative proposals: schedule of visits (and work performed) at LANL or Campus
  - v. For LANL postdoc proposals: schedule of any visits to other institutions, in particular for work to be performed outside of the Laboratory
- IX. References
- X. Proposing Team
  - i. Role of University PI (if relevant)
  - ii. Role of Laboratory PI, including efforts at mentoring
  - iii. Role of postdoc or graduate student
    - a. Identify if MSc or PhD project, if grad student
  - iv. Other participants
- XI. Significance and timeliness
  - i. What is the significance of the project? One way of getting at this is to answer the question, “When this project is finished and published, who will use the results?” This question should be dealt with explicitly, with significant input from the Laboratory PI.
  - ii. Why should this project be funded now instead of, for example, next year?
- XII. Budget summary
  - i. Indicate separately those amounts to be spent on campus(es) and at LANL:
    - a. Salaries, providing details of salary needs
    - b. Supplies
    - c. Computer usage and related costs
    - d. Travel
    - e. Equipment
    - f. Other expenses
    - g. TOTALS: for campus, for laboratory
  - ii. Supplemental budget information (including a section on current and pending support for research from other sources)
- XIII. Biographical sketches of PIs including already identified postdocs and/or graduate students, ~1 page each.

While IGPP supports publication page charges, such charges are NOT to be included in the proposed budget. PIs are asked to send an email to the IGPP director Gary Geernaert ([geernaert@lanl.gov](mailto:geernaert@lanl.gov)) at which time funding is needed to cover page charges for publications associated with IGPP research.

## 6. GUIDANCE: PREPARATION OF RENEWAL PROPOSALS

Proposals submitted for renewal must contain the following information:

1. Cover Sheet, to include the same information as for a new proposal
2. Copy of original proposal
3. Progress report
  - a. If this is a first time renewal (from year one to year two), only a brief statement of progress during the first year of work will be needed (max one page); see below.
  - b. If this is a second time renewal (from year two to year three), a much more extensive progress report of order 5 pages is required; see below.
4. Revised work plan for FY09
5. Updated declaration of other ongoing research projects related to the IGPP funded project
6. Detailed budget request, noting any changes from the original proposal.

The statement of progress for first time renewal proposals (year 1 to year 2) should include a summary of activity that took place during FY08: scientific activity; presentations and publications; visits and exchanges of personnel between the University and Laboratory; etc.

For renewal proposals (only for proposals that go into the third year of work), the requirement is for a formal progress report to be included that follows the following format (approx 5 pages total):

- Project objectives and brief summary of work plan (maximum half page)
- Summary of research results to-date (1-3 pages), plus any relevant graphics
- Any new insights or challenges in meeting project objectives
- Any complications in meeting project objectives
- List of publications, including submissions
- List of Presentations
- Name of grad student and/or postdoc
- Progress towards PhD, if graduate student
- Documentation of visits to LANL and/or to University, or other facilities/sites
- LANL and/or facilities used in the research
- Budget details
- Efforts to secure further funding from other agencies.

## **7. FINAL REPORT AFTER COMPLETION OF PROJECT**

At the completion of each project, whether it be one, two, or three years duration, a final report must be submitted. Projects that are completed at the end of FY09 must submit their final report by close of business, October 9, 2009. The format for the final report must be:

- Project objectives and brief summary of work plan (maximum half page)
- Summary of research results to-date (1-3 pages), plus any relevant graphics
- Any new insights or challenges in meeting project objectives
- List of submitted and already published manuscripts, including a very brief (no more than one paragraph) description of the key results of each publication.
- List of presentations
- List of patents and awards
- Name of grad student and/or postdoc
- Progress towards PhD, if graduate student
- Documentation of visits to LANL and/or to University, or other facilities/sites
- Discoveries that have led to new research challenges, based on the research

- Efforts to secure further funding from other agencies.

## **8. PROCESS OF REVIEWING, SELECTING OR REJECTING PROPOSALS**

All new proposals undergo peer review by scientists in the broad research community who are familiar with the research topic. Reviewers are given a set of questions to address, i.e., concerning scientific merit, risks in reaching objectives, depth of multi-institutional collaborations, growth potential of research topic, qualifications of participants, and budget.

With only unusual exceptions, renewal proposals are reviewed by the IGPP Director and focus leaders, and input is also solicited from relevant members of IGPP's External Advisory Committee. Renewal proposals going into their second year of work are generally approved, unless there are indications from the LANL PI or Focus Leader that collaborations are ineffective. Renewal proposals going into the third year are evaluated not only on the written proposal but also on an oral presentation by the LANL PI to the IGPP Director and focus leaders (to be conducted in May 2009). Effective contributions by the University PI / LANL postdoc to these presentations will greatly enhance the likelihood of renewal.

Final decisions on acceptance and/or denial of all proposals will be reached during the annual meeting of IGPP's External Advisory Committee, typically in June of each year. Formal announcements of acceptance / denial of proposals will be made no later than August 1, 2008.

In preparing proposals, PIs should be aware of the following reasons why some proposals are rejected:

- Objectives and background are unclear or inadequately argued.
- Methods are inadequately described or do not reflect state-of-the-art.
- Approach is not convincing enough to satisfy the objectives.
- For research proposals involving University/Laboratory collaborations, collaborations are weak.
- Important and relevant LANL facilities are not considered or exploited.
- No graduate student or postdoc is involved in the research.
- Laboratory PI lacks commitment to the research or mentoring process.
- Subject matter is not relevant to IGPP's scientific interests or research priorities.

## **9. SECURITY CONSIDERATIONS**

Classified work is not supported under the IGPP minigrant program. Therefore, all research facilities (including office space and computing) conducted under IGPP funding will be carried out in unclassified space.

## **10. POLICY REGARDING PREJUDICE AND BIAS**

While minigrant applications must originate from US institutions, there is no prejudice based on race, gender, or nationality, for PI's, postdocs, and students.

## **11. MAILING INSTRUCTIONS AND DEADLINE**



Proposals (title, abstract page, main body including budget) must be submitted electronically to be received by IGPP no later than **April 4, 2008**.

- Send to: Gary Geernaert ([geernaert@lanl.gov](mailto:geernaert@lanl.gov)).
- Copy sent to Richard Epstein ([Epstein@lanl.gov](mailto:Epstein@lanl.gov)), if for astro- or space physics research
- Copy sent to Claudia Lewis ([clewis@lanl.gov](mailto:clewis@lanl.gov)), if for geosciences or climate research

**Mandatory for proposals involving the University of California:** Please send an information copy by either email or surface mail to:

Gary P. Zank (Professor of Physics, and IGPP System-wide Director)  
 Institute of Geophysics and Planetary Physics (IGPP)  
 University of California  
 Riverside, CA 92521  
 Tel: (951) 827-4508  
 Email: [gary.zank@ucr.edu](mailto:gary.zank@ucr.edu)

## 12. REQUIREMENT FOR SIGNATURE PAGES

Signature pages are no longer required at the time proposals are submitted. IGPP will request signatures from the co-PI's, and their respective institutional officials, if and only if IGPP recommends the proposal for funding. Before initiation of a PR for funds transfer to campuses, signatures will be required from the University Department Chair or Director of campus-organized research unit, Management Service Officer or Fiscal/Budget Person, and Contract and Grants Officer. For LANL, the proposing Laboratory PIs must receive approvals from their respective Group Leaders.

## 13. FOR FURTHER INFORMATION:

LANL IGPP Office  
<http://www.igpp.lanl.gov/>  
 1-505-667-0920

Gary Geernaert, Director IGPP  
[geernaert@lanl.gov](mailto:geernaert@lanl.gov)  
 1-505-667-6020

Richard Epstein, Center for Astro- and Space-physics  
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 1-505-667-9595

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 1-505-665-7728