

# **FY14 CALL FOR RESEARCH PROPOSALS (BOTH NEW AND RENEWAL PROPOSALS)**

Deadline for receipt: Monday, April 5, 2013

## **1. INTRODUCTION**

The Institute of Geophysics, Planetary Physics and Signatures (IGPPS) at Los Alamos National Laboratory (LANL) is one of the Los Alamos National Laboratory science institutes. Its science 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, to develop the science base to predict future changes as they affect human life. As part of the mission, IGPPS at Los Alamos National Laboratory is committed to promoting and supporting high quality, cutting edge science in the areas of astrophysics and cosmology; space physics; solid earth geoscience; an integrated understanding of the Earth's climate system, and the understanding, identification and exploitation of significant signatures that leads to an improved understanding of the relevant phenomenology. 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 the Los Alamos National Laboratory mission.

In order to encourage highly creative and innovative ideas and concepts, IGPPS encourages revolutionary and moderate to high-risk research. Projects supported by IGPPS often involve students and/or postdocs, with project durations up to three fiscal years.

Collaboration between Los Alamos National Laboratory scientists, university scientists, (LANL or University) postdocs, and (LANL/University) graduate students is viewed by both IGPPS and the Laboratory as an effective arrangement to promote creativity, extend science beyond today's understanding, and build a long term opportunity for program growth for both the Laboratory and its collaborating partners.

### **NEAR TERM GOALS**

IGPPS seeks proposals that enhance our understanding of the origin, structure, and evolution of the earth, the solar system, and the universe, and on the prediction of future changes as they affect human life. IGPPS includes the identification and exploitation of signatures that can result in an improved understanding of key events. We address the problem within four specific disciplines:

- Geophysics
- Global climate
- Solar system
- Cosmology

## **IGPPS Portfolio**

1. Astrophysics, space physics, and cosmology, with the goal of advancing theoretical, modeling, simulation, and technical sciences that map to capabilities needed in divisions involved in weapon simulation (e.g., Magneto HydroDynamics (MHD), uncertainty quantification) and national security (e.g., nuclear detection, transients, sensing, imaging, space weather);
2. Solid earth geoscience, with the goal of advancing theoretical, modeling, simulation, sensing, and technical sciences that advance capabilities needed in understanding natural hazards (e.g., earthquakes, volcanoes), carbon sequestration, repository science, natural resources, glacial-land isostatic adjustments and nuclear monitoring.
3. Climate and energy science, with the goal of advancing and integrating theoretical, modeling, simulation, sensing, and observational sciences that push the frontiers of predictability of weather/climate variability, its response to anthropogenic forcings, and to understand how to strengthen the resilience of interdependent infrastructure, both in today's and in future climate states.
4. Signature Science addresses emerging challenges in the above disciplines by developing the scientific underpinning of signatures and backgrounds, new measurement techniques and strategies for signature identification, the discovery of alternate or nontraditional signatures, and new analysis and interpretation tools for development of knowledge from these signatures.

The Los Alamos National Laboratory IGPPS funds collaborative research involving Laboratory staff members, postdocs, university PI's and their students and postdocs. A small amount of funding may be provided to conduct a technical feasibility analysis of a revolutionary concept, and funding for this class of projects can be awarded to a Los Alamos National Laboratory staff member. While many collaborative projects extend up to three years duration, funding in each successive year is contingent upon adequate progress in the previous year. **NOTE: The three year limitation on IGPPS funding is based on three Federal fiscal years. That is, no project will bridge four years to compensate for a late initial start.**

## **UNIVERSITY/LOS ALAMOS NATIONAL LABORATORY COLLABORATIVE RESEARCH**

Each proposal is required to have a University Principal (PI) Investigator and a Laboratory PI. A University Principal Investigator may be any University scientist entitled by the University to be a Principal Investigator on an extra-mural grant or contract. Visiting scientists, adjunct faculty and postdocs do not qualify as Principal Investigators unless the University grants an exception. A Los Alamos National Laboratory Principal Investigator is any Technical Staff Member. Successful proposals typically include some form of matching support from their universities or other institutions. 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 US university. Typical project budgets are \$25K-\$75K, per annum, and approximately 6-9 new projects (that can extend up to a three year duration) are likely to be issued in FY14. Universities should note that, unlike many federal science-funding agencies, the funding mechanism for IGPPS collaborative projects involving universities is based on subcontracts (not grants). Full details of the proposal process are summarized in Section 3.

### **LANL POSTDOC SUPPORT**

IGPPS solicits proposals from Los Alamos National Laboratory programmatic postdoctoral researchers and/or their mentors to conduct postdoctoral research on an independent, revolutionary scientific idea that has Los Alamos National Laboratory mission relevance. The proposed work must not be related to the programmatic research already providing support to the postdoc, and the budget request cannot exceed 50% of the postdoc's total salary for the fiscal year. Proposals will be for one year only, though renewal proposals for an additional year may be considered. Postdocs entering their first, second, or third year may be considered for support. A Los Alamos National Laboratory PI must submit proposals. It is expected that the named postdoc provides significant contributions to the writing of the proposal. There is no requirement for University collaboration. We anticipate that up to 2-6 programmatic postdocs may be supported with half-time research using IGPPS funds in FY14. Full details of the proposal process are summarized in Section 3.

### **FEASIBILITY ANALYSES OF EMERGING SCIENTIFIC IDEAS**

IGPPS solicits proposals for one-year studies that explore the technical feasibility of a new scientific concept that has the potential for further development into a Los Alamos National Laboratory LDRD proposal, IGPPS project proposal, IGPPS special large project (see below), or external support. Scientific feasibility analyses are reserved for revolutionary scientific ideas that are mission relevant, at their early stage of development, and involve a multi-disciplinary approach. Funds are restricted to Los Alamos National Laboratory Technical Staff Members, TSMs and/or Los Alamos National Laboratory postdocs and students, for one year only. Requests may not exceed \$50K, and funds may be used for Los Alamos National Laboratory salary, small equipment purchases, publication costs, and collaborative visits. We anticipate that up to 1-2 feasibility studies may be supported in FY14. Full details of the proposal process are summarized in Section 3.

### **SPECIAL LARGE PROJECT COMPETITION**

In addition to the above projects, IGPPS solicits proposals for a single larger project on a subject within the IGPPS scientific disciplines, for up to \$100K per year for particularly innovative and revolutionary research. Large projects must satisfy some combination of the following:

1. The specific topic requires a concentration of effort in order to rapidly advance the

- concepts due to some level of scientific or institutional urgency;
2. An opportunity will otherwise be lost due to available facilities, equipment, or field programs; and/or
  3. The project cost is more advantageous if concentrated during a given period of performance.

Examples of projects that fall into this category are distributed (thinking) sensor network design and applications to geo-, space-, and astrophysical sciences; contributing to the challenge of energy independence; providing new tools for climate prediction, monitoring, and mitigation; adding new capabilities to space situational awareness; advancing predictability and/or mitigation of extreme phenomenology. The project may be supported for up to three years (in two phases as described in **Change In Proposal/Project Structure - Section 3**), assuming adequate yearly progress and availability of IGPPS funding. Interested PI's are asked to contact the IGPPS director for clarification before proposing, insofar that the proposal process may follow the guidance in Section 3, depending on the scope and affiliations of PI's.

#### **PROPOSAL SUBMITTAL INSTRUCTIONS AND DEADLINE**

Proposals (title, abstract page, main body including budget) must be submitted by email, to be received by IGPPS no later than **April 5, 2013**.

Send to: Georgia Sanchez ([georgia@lanl.gov](mailto:georgia@lanl.gov)) with copies to: Harald O. Dogliani ([dogliani@lanl.gov](mailto:dogliani@lanl.gov)) and the appropriate discipline leader:

- Astrophysics and Cosmology: Edward Fenimore; [efenimore@lanl.gov](mailto:efenimore@lanl.gov)
- Space physics: Josef Koller; [jkoller@lanl.gov](mailto:jkoller@lanl.gov)
- Solid earth geosciences: Scott Baldrige; [sbaldrige@lanl.gov](mailto:sbaldrige@lanl.gov)
- Climate system and impacts: Manvendra Dubey [dubey@lanl.gov](mailto:dubey@lanl.gov)
- Signature Science: Jon Schoonover; [schoons@lanl.gov](mailto:schoons@lanl.gov)

A confirmation of receipt will be sent by email to the Principal Investigator of each proposal submitted.

## 2. SCIENTIFIC DISCIPLINES INCLUDED IN THIS CALL

IGPPS has five subject research areas, included in this call for proposals:

- Astrophysics and Cosmology (IGPPS discipline leader: Edward Fenimore; [efenimore@lanl.gov](mailto:efenimore@lanl.gov))
- Space Physics (IGPPS discipline leader: Josef Koller; [jkoller@lanl.gov](mailto:jkoller@lanl.gov))
- Solid Earth Geosciences (IGPPS discipline leader: Scott Baldrige; [sbaldridge@lanl.gov](mailto:sbaldrige@lanl.gov))
- Climate System and Impacts (IGPPS discipline leader: Manvendra Dubey; [dubey@lanl.gov](mailto:dubey@lanl.gov))
- Signature Science (IGPPS discipline leader: Jon Schoonover; [schoons@lanl.gov](mailto:schoons@lanl.gov))

Each of these subject areas is directed by a discipline leader (identified in parentheses) who is responsible for coordinating research efforts so that individual projects will benefit from the best available Los Alamos National Laboratory resources and expertise. Prospective project leaders are encouraged to contact the respective discipline leaders for information on technical scope of the IGPPS disciplines and/or visit the IGPPS website <http://www.IGPPS.lanl.gov/> for additional information.

IGPPS has identified the following scope and priorities, as guidance for proposal preparation with start dates in FY14.

### ASTROPHYSICS

Proposals are solicited with emphasis on theoretical research, observational research, and instrumentation research. General interests are multidisciplinary projects at the boundaries between astrophysics and nuclear physics, particle physics, condensed matter physics, plasma physics, and/or general relativity. Use of facilities where the Los Alamos National Laboratory is a participating institution is highly desirable, e.g., the Milagro gamma-ray observatory, Very Long Baseline Array, SWIFT, Sloan Digital Sky Survey, National Solar Observatory, etc.)

The following specific topics are of interest:

1. Gamma ray astrophysics,
2. Space instrumentation,
3. Stellar dynamics, in particular neutron star physics and radio pulsars
4. Cosmic ray, and the cosmic microwave background,
5. Solar neutrinos,
6. Intergalactic magnetic fields,
7. Active galactic nuclei,
8. Supernovae,
9. Energetics of supermassive black holes,
10. Physics of accretion disks,
11. Dynamics of the interactions between superfluids and normal matter, and
12. Exoplanets.

## **SPACE PHYSICS**

Proposals are solicited that advance theoretical, computational, and/or observational research of space physics and space plasma physics encompassing topics including sun, solar wind, Earth/planetary magnetospheres, ionospheres, thermosphere, auroras and cosmic rays. Space physics is a fundamental part of the study of space weather and has important implications not only to understanding the universe, but also to practical everyday life, including the operation of communications and weather satellites. Space physics is unique from other fields of astrophysics, which study similar phenomenon, in that space physics utilizes *in-situ* measurements from high altitude rockets and spacecraft.

All topics leveraging against Los Alamos National Laboratory capabilities in space physics and space weather are of interest. Including

1. Solar dynamics responsible for the solar wind,
2. Magnetohydrodynamics of the magnetosphere, ionosphere, and thermosphere including solar wind interactions and coupling processes,
3. Magnetospheric substorms,
4. Magnetotail current sheet dynamics,
5. Dusty plasmas,
6. Magnetospheric models using LANL specific data for validation and assimilation,
7. Data analysis and scientific studies using LANL specific data including LANL geosynchronous, GPS, RBSP, IBEX, etc.
8. Physics affecting the performance and reliability of space-borne and ground-based technological systems,
9. Statistics and predictability of magnetospheric storms, substorms, and other space weather events,
10. Physics governing satellite to ground communications,
11. Physics of thermospheric density variations with applications to satellite drag and orbital dynamics
12. Space environment instrumentation development, modeling, and calibrations
13. Dynamics of planetary magnetosphere such as Jupiter or Saturn,
14. Modeling of planetary physical evolution, including hydrology, and
15. Remote sensing of planetary geology and climate by planetary orbiters.

Project ranging from fundamental to applied space science studies showing a strong linkage to LANL specific multi satellite experiments, data, computer simulation codes, and algorithms, are strongly encouraged.

## **SOLID EARTH GEOSCIENCE**

This focus area supports a breadth of basic research concerning planetary surfaces and interiors, including numerical, experimental, and field studies of the structure, properties, processes, and dynamics of terrestrial planets. It is strongly recommended that proposals exploit unique Los Alamos National Laboratory resources (e.g., Los Alamos National Laboratory high-performance computing resources; the Los Alamos Neutron Science Center (LANSCE); geochemical analyses facilities resident in EES and C divisions;

and/or sensor technology capabilities resident in C, EES, ISR, and N divisions). We are particularly interested in innovative and collaborative research projects in areas of current, strong international scientific interest such as the following:

1. New techniques in passive (imaging) or active (e.g., lidar, radar) remote sensing and digital data analysis for the geosciences,
2. Strain measured by GPS or InSAR for applications in natural hazards and hydrology,
3. Strain localization, dynamics and elasticity of Earth geomaterials,
4. Earthquake seismology and seismotectonics, including rupture processes, rheology and friction of fault zones, and earthquake clustering,
5. Transient and steady-state behavior in geologic and hydrologic processes, including multi-phase fluid flow in porous and fractured media,
6. Exploiting low-temperature thermal evolution of geomaterials or effects of ionizing radiation on geomaterials,
7. Dynamic interactions between climate, tectonics, and surface processes, with particular interest in polar regions, including mechanics of erosion, biogeochemistry of permafrost thaw, and ecological feedbacks to climate change on all time and space scales, and
8. Ice field fracturing and its role in melting.
9. Paleo-environments.

The following areas reflect continuing IGPPS interest:

1. Planetary interiors,
2. Planetary tectonics,
3. Earth's interior--composition and state, and rheology of crust, lithosphere, and mantle,
4. Geomagnetism and electromagnetics,
5. Dynamics of lithosphere and mantle,
6. Tomography, and
7. Heat generation and transport.

## **COMPLEX DYNAMICAL CLIMATE AND ENVIRONMENTAL SYSTEMS**

This focus area emphasizes process to predictive level understanding of the coupled atmosphere, ocean, hydrosphere, terrestrial and biogeosphere of planet Earth by studies at multiple scales. We encourage measurements and model integration to fill outstanding gaps, particularly in sensitive regimes and high impact regions of our climate system (e.g. Arctic, tropics, coastal areas, climate adaptation and management). Our focus examines fundamental climate processes, multi-decadal variability and centennial projections with topics such as:

1. Physical, chemical and biological mechanism from microbe to plant, aerosol to cloud, eddy to circulation scales to improve parameterizations in models,
2. Rapid change and extreme events on global to regional scales,
3. Couplings between the ocean, atmosphere, land and cryosphere components,

4. Exploitation of emerging sensors and data for climate signal quantification and attribution, and
5. Climate change impacts on national security.

Use of Los Alamos National Laboratory's science base, resources and data sets (climate observational systems; COSIM/CESM models and/or ARM/ASR/Ecosystem/NGEE project data; ecosystem and power-plant monitoring sites, field activity in Arctic, tropics and US southwest, systems models of climate change, economic impact; exploitation of new sensor systems) as part of transformational scientific concepts are strongly encouraged. Staff in LANL's B, C, CCS, EES, D, ISR, Institutes, MPA and T Divisions has typically served as LANL-PIs with focus on climate science areas. However, unique capabilities exist elsewhere to satisfy LANL's national security mission and utilization of these to push climate science frontiers are welcome.

Specific areas of interest include the following:

1. Mechanisms of the rapid erosion of sea ice, glaciers, and hydrology in the Arctic to improve forecasts,
2. Arctic monitoring and simulations to enable early detection or forecast of tipping points (e.g. release of CH<sub>4</sub> and CO<sub>2</sub>, soot deposition, sea ice erosion and shrub invasion),
3. Delineating effects of anthropogenic forcing from natural variability in climate change (and couplings between them) to quantify climate sensitivity at global to regional scales,
4. Incorporation of observational data and high performance computing to enhance high resolution coupled ocean-atmosphere-cryosphere-land models,
5. Aerosol processes (anthropogenic and biogenic) and their effects on radiation, clouds, precipitation and ice albedo,
6. Ecosystem response to climate change, its impacts on CO<sub>2</sub> and volatile organic aerosol precursor fluxes and the atmospheric feedbacks they trigger in the climate system,
7. Targeted laboratory and field studies of physical, chemical, biological and ecological processes at plant, microbe and aerosol scales that are important for climate models,
8. Next generation sensors, networks and platforms for climate change signal and process discovery and analysis,
9. Analysis of paleoclimate data to calibrate the rate and scale of climate change,
10. Forecasts of storms, fires and hurricanes and how their frequency and intensity changes with climate change, and
11. Assessment of impacts of regional climate change on people, infrastructure and energy and food resources.

## **SIGNATURES**

Signatures targets the scientific understanding of the origin and evolution of signatures and backgrounds, new measurement techniques, new strategies for signature identification, and predictive modeling capability to aid in the



interpretation of these signatures. Proposals that address either the fundamental science required to discover useful signature(s) in the above four disciplines in a complex environment or a technological innovation that revolutionizes a measurement are encouraged.

The following areas reflect IGGPS interests:

1. Novel signature collection platforms,
2. Persistent monitoring, autonomous or semi-autonomous remote platforms, especially in hostile environments (e.g. extreme temperatures, remote locations, severe weather or turbulence),
3. Combining signatures or a suite of signatures in new or novel ways to identify and characterize complex events,
4. Algorithms and approaches to evaluate combinations of signatures and provide insight to complex events,
5. Novel approaches to assessing large data sets and how to evaluate critical components of a data set of signatures,
6. On-board or real-time signal processing and data analysis,
7. New approaches for satellite-based electromagnetic pulse (EMP) monitoring and particle, gamma ray, X-ray, and neutron detectors,
8. Acoustic and seismic high sensitivity sensors,
9. New materials (hard; nanomaterials, biomaterials, and macromolecules; metamaterials) and new physical approaches (e.g. quantum effects, accelerators, bio-inspired signal transduction) for sensor applications, and
10. Miniaturization (including micro and nano) of sensors and platforms.

We seek revolutionary improvement, not incremental advances. Proposals are strengthened when they quantify an advancement of at least an order of magnitude in one or more dimensions of performance. Signature/measurement advances should be relevant to understanding critical planetary science, cosmology, geoscience or global climate phenomenology.

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Prospective PI's should note that proposals involved with the design of distributed sensors may be found in all subject research areas. Similarly, climate related proposals may be found in space physics, geophysics, as well as climate systems and impacts; and plasma physics may easily fit into astrophysics and space physics. PI's should recognize that IGGPS strongly encourages a multi-disciplinary approach in proposed work; and there is no bias against proposals that do not adequately fit into only one of the four subject areas.

### 3. PROPOSAL PROCESS

#### Change In Proposal/Project Structure

Any new IGPPS three-year proposals submitted for initial work beginning in 2014 must be structured in two phases. The first phase covers the first year of research. The second phase can cover the second and final third year. No proposal will be funded for more than a total of three fiscal years by IGPPS. The two-phase structure is a result of the need to comply with restrictions imposed by DOE/NNSA and Los Alamos National Laboratory rules governing the use of the specific types of funds that IGPPS Los Alamos uses. Specifically, Phase 1 can **NOT** extend beyond 30 September 2015 and Phase 2 does not begin before 1 October 2015. The Phase one/two transition “DMZ” is the federal fiscal year boundary between 2014 and 2015, October 2014.

Phases 1 and 2 must result in distinctly different deliverables. Phase 2 may not simply be an extension in-kind of the work performed in Phase 1. For example, if Phase 1 research uses a specific database for analysis, Phase 2 cannot simply expand the database for the same type of analysis. Phase 1 could deliver a new type of sensor while Phase 2 might deploy or test the performance of the sensor, comparing its performance with other sensor systems. Or, Phase 2 could consist of fielding the sensor for collection of data used for further analysis. Phase 1 could consist of the creation of new original computer programs to model certain phenomenology and Phase 2 could involve detailed comparison of its fidelity/performance when compared to real-world data or other computer modeling approaches presumably for the same type of phenomenology codes. Phase 1 may consist of field data collection in one region or area and Phase 2 might consist of deep analysis of the data collected. Or, Phase 2 could consist of field measurements in another region or season.

#### PROPOSAL SUBMITTAL INSTRUCTIONS AND DEADLINE

Proposals (title, abstract page, main body including budget) must be submitted by email from the email account of either the Los Alamos National Laboratory or University PI, to be received by IGPPS no later than **April 5, 2013**. All externally submitted proposals must be reviewed and agreed upon by the internal Los Alamos Principal Investigator prior to submission to IGPPS.

Send to: Georgia Sanchez ([georgia@lanl.gov](mailto:georgia@lanl.gov)) with copy to: Harald Dogliani ([dogliani@lanl.gov](mailto:dogliani@lanl.gov)) and to appropriate discipline leader.

## **UNIVERSITY-LABORATORY COLLABORATIVE RESEARCH PROPOSALS AND LABORATORY POSTDOC PROPOSALS**

The next funding interval is October 1, 2013, through September 30, 2014. Principal Investigators should note, that the availability of funds is contingent upon the date the subcontract is awarded by the Los Alamos National Laboratory Contracts Office, which may, in certain circumstances, take up to several months after the start of the fiscal year for new proposals. For all projects supported with Los Alamos National Laboratory financial resources, it is imperative (with no exceptions) that the LANL-originated funds issued in FY14 be spent by Close Of Business September 30, 2014. (Note that Universities may submit invoices after Sept 30, 2014, for work conducted prior to Sept 30, if allowed under the Los Alamos National Laboratory subcontract that supports the University research.) That is, funds allocated in one Federal fiscal year can **NOT** be rolled over into following fiscal years!

Universities are encouraged to provide in-kind support, e.g., by waiving overhead, providing leveraged salary support to the University PI, etc. In many cases, proposals may be submitted as multi-year, two-Phased efforts, with a maximum total of three years (see sidebar). No new proposal will receive funding beyond September 2016. Renewals for following years are determined based on availability of funds, progress during the previous year(s) and timely delivery of progress reports.

### **FUNDING TO LOS ALAMOS NATIONAL LABORATORY PROGRAMMATIC POSTDOCS**

The funding interval may be up to 12 months, with work performed entirely within FY14. Renewal proposals will be required for scientific activity that extends work originating in FY13 (or earlier) into FY14. The Los Alamos National Laboratory Principal Investigator (postdoc mentor) will be required to include in the proposal details on all other funding sources that will be required to cover postdoc salary costs during FY14.

Because Los Alamos National Laboratory LDRD funds are used to support Los Alamos National Laboratory postdocs under this IGPPS program, the Principal Investigator and postdoc will be required to spend the LDRD funds by COB September 30, 2014; there are no possibilities to carry over LDRD-originated funds into a subsequent fiscal year.

### **GUIDANCE: PREPARATION OF NEW (COLLABORATIVE PROJECTS AND/OR LOS ALAMOS NATIONAL LABORATORY POSTDOC) PROPOSALS**

The following format is recommended for all collaborative LANL-University subcontract proposals and Los Alamos National Laboratory postdoc proposals:

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

1. Title of proposed project,
2. Name of University Campus if the “subcontract” is for University/Laboratory collaborative research,

3. Is this a new proposal or renewal? If you are submitting a proposal for renewal, please indicate if the proposal is for the second year or third and final year. Note that no proposal will be funded beyond three fiscal years.
4. Which IGPPS discipline area(s) is this proposal most relevant to?
  - a. Astrophysics
  - b. Space physics
  - c. Solid Earth Geosciences
  - d. Climate Science
  - e. Signatures
5. Proposed start date, and proposed duration of project (1 year/Phase 1; and 2<sup>nd</sup> and/or 3rd year if this is a multiyear proposal, Phase 2).
6. Total cost by fiscal year
7. Name, title, address, email address, and phone number for PI(s).
8. 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 VIII), plus figures and a budget page:

### **Approach**

- I. Theoretical, numerical, or experimental activity
- II. Methods used (describe comprehensively) History of problem, Scientific debate, Hypotheses to test, Why now?
- III. Any relevant leveraging or necessary coordination, e.g., other projects or facilities
- IV. Resources to be used in the project such as resources at Los Alamos National Laboratory, at the University, if relevant and other Resources
- V. Statement of Work
  - i. Tasks to be performed
  - ii. Milestones
  - iii. Deliverables
  - iv. For collaborative proposals: schedule of visits (and work performed) at Los Alamos National Laboratory or Campus
  - v. For Los Alamos National Laboratory postdoc proposals: schedule of any visits to other institutions, in particular for work to be performed outside of the Laboratory
- VI. References
- VII. Proposing Team
  - i. Role of University Principal Investigator (if relevant)
  - ii. Role of Los Alamos National Laboratory PI, including efforts at mentoring
  - iii. Role of postdoc or graduate student
    - a. Identify if MSc or PhD project, if graduate student
  - iv. Other participants
- VIII. 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 Los Alamos National Laboratory PI.

- ii. Why should this project be funded now instead of, e.g., next year?
- IX. Budget summary (1 page max)
  - i. Indicate separately those amounts to be spent on campus(es) and at LANL:
    - a. Salaries. Details of computations to be provided.
    - b. Supplies
    - c. Computer usage and related costs
    - d. Travel
    - e. Equipment
    - f. Other expenses
    - g. TOTALS by fiscal year and cumulative for multiyear projects: for University (if relevant); and for LANL
  - ii. Supplemental budget information (including a section on current and pending support for research from other sources)
- X. Biographical sketches of PIs including already identified postdocs and/or graduate students, ~1 page each.

While IGPPS supports publication page charges, such charges are NOT to be included in the proposed budget. PI’s are asked to send an email to the IGPPS director at which time funding is needed to cover page charges for publications associated with IGPPS research. If desired, proposal preparers may identify unbiased, subject matter experts to technically review their proposal.

**GUIDANCE: PREPARATION OF RENEWAL (UNIVERSITY COLLABORATIVE PROJECTS AND/OR Los Alamos National Laboratory POSTDOC) PROPOSALS**

Proposals must be submitted by September 15 of the relevant calendar year for renewal and must contain the following information:

- 1. Cover Sheet, to include the same information as for a new proposal
- 2. Copy of original proposal

**PROGRESS REPORTS**

If this is a first time renewal (after less than one year of research), only a brief statement of progress during the first year of work is required (1 page maximum); see below.

If this is a second time renewal (covering more that one year’s work), a progress report of about 5 pages is required; see below.

The revised work plan/proposal for FY13 must include:

- 1. Updated declaration of other ongoing research projects related to the IGPPS

- funded project,
2. Reiteration of the entire, original budget request for the relevant year ... Requests for changes from the original proposal cost must be highlighted and a detailed justification must be included,
  3. The statement of progress for first time renewal proposals (year 1 to year 2) should include
    - a. Summary of activity that took place during FY11,
    - b. Scientific activity,
    - c. Presentations and publications (with complete citation), and
    - d. Visits and exchanges of personnel between the University and LAN.

For renewal proposals that go into the third year of work, the formal progress report must be formatted as follows (approx. 5 pages total):

- I. Title, project objectives and brief summary of work plan (maximum half page),
- II. Summary of research results to-date (1-3 pages), plus any relevant graphics,
- III. Any new insights or challenges in meeting project objectives or any complications in meeting project objectives,
- IV. List of publications, including submissions,
- V. List of presentations,
- VI. Name of graduate student(s) and/or postdoc(s)
  - a. Progress towards PhD or MSc, if graduate students are involved
- VII. Documentation of visits to Los Alamos National Laboratory and/or to University, or other facilities/sites,
- VIII. LANL and/or other facilities used in the research,
- IX. Budget details, and
- X. Efforts to secure further funding from other agency.

## **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, balance of risk versus innovation or importance, depth of multi-institutional collaborations, growth potential of research topic, quality of participants, and budget. With only unusual exceptions, renewal proposals are reviewed by the IGPPS Director and discipline leaders, and input may also be solicited from relevant members of IGPPS's Advisory Committee. (IGPPS's advisory committee is comprised of subject matter experts primarily from academia). Renewal proposals going into their second year of work are generally approved, i.e., unless there are indications from the Los Alamos National Laboratory Principal Investigator or Discipline Leader that collaborations are ineffective or little progress is being made. Renewal proposals going into the third year are evaluated not only based on the written renewal proposal but also on an oral presentation by the Los Alamos National Laboratory Principal Investigator to the IGPPS management team (generally conducted in May). Effective contributions by the University Principal Investigator / Los Alamos National Laboratory postdoc to these presentations will greatly enhance the likelihood of renewal. Final decisions on acceptance and/or denial of all proposals will be reached after the

annual meeting of IGPPS's Advisory Committee, typically held in June/July of each year. Formal announcements of acceptance and denial of proposals will be made at the beginning of FY14, after 1 November, 2013.

IGPPS assumes that the proposal cost is accurate and when a project is approved for funding IGPPS expects the out year budgets to be as originally proposed and approved. Requests for exceptions to changes in funding must be well justified and will be considered on a case-by-case basis.

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

1. The proposal was good but could not be funded because of insufficient funds.
2. Objectives and background are unclear or inadequately argued.
3. Ideas are not innovative.
4. Methods are inadequately described or do not reflect state-of-the-art.
5. Approach is not convincing enough to satisfy the objectives.
6. For research proposals involving University-LANL collaborations, collaborations are weak.
7. Important and relevant Los Alamos National Laboratory facilities are not considered or exploited.
8. No graduate student or postdoc is involved in the research.
9. Lack of commitment by the Los Alamos National Laboratory Principal Investigator to the research or mentoring process.
10. Subject matter is not relevant to IGPPS's scientific interests or research priorities.

## **FINAL REPORT AFTER COMPLETION OF UNIVERSITY COLLABORATIVE PROJECT OR POSTDOC 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 FY14 must submit their final report by close of business, October 15, 2014. The format for the final report is:

- I. Title, project objectives and brief summary of work plan (maximum half page).
- II. Summary of research results to-date (1-3 pages), plus any relevant graphics.
- III. Any new insights or challenges in meeting project objectives.
- IV. List of submitted and already published manuscripts with citations, including a very brief (max one paragraph) description of the key results of each publication.
- V. List of presentations.
- VI. List of patents and awards.
- VII. Name of participating graduate student(s) and/or postdoc(s).
  - a. Progress towards PhD or MSc, if graduate students are involved.
- VIII. Documentation of visits to Los Alamos National Laboratory and/or to University, or other facilities/sites.
- IX. Discoveries that have led to new research challenges, based on the research.
- X. Efforts or prospects to secure further funding from other agencies

## 4. MISCELLANEA

### **AUTHORITY TO START WORK**

Work cannot begin until the Los Alamos contracting officer formally authorizes the initiation of work. All proposers must understand that there will likely be a delay of about two months (no earlier than December 1 of a given year) when the “start work” order is issued. Invoices submitted for work initiated prior to the “start work” order will not be reimbursed. The delay in “start work” authorizations is caused by the delay of funds being released by the DOE to Los Alamos during each fiscal year and the time required to complete contract negotiations. This implies that any faculty Principal Investigator cannot plan on using IGPPS award funds to cover a student at the beginning of the Fall semester and must wait until the “start work” authorization is received.

### **REQUIREMENT FOR SIGNATURE PAGES**

Signature pages are not required at the time proposals are submitted. IGPPS will request signatures from the co-PI’s, and their respective institutional officials, only if IGPPS recommends the proposal for funding. Before initiation of a PR (LANL procurement request) to support the university project, 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.

### **SECURITY CONSIDERATIONS**

Classified work is not supported under the IGPPS collaborative University-Laboratory program. Therefore, all research facilities (including computing) conducted under IGPPS funding involving Universities shall be carried out in unclassified space.

### **POLICY REGARDING PREJUDICE AND BIAS**

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

### **FOR FURTHER INFORMATION:**

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