



NIF Discovery Science: Full Proposal Instructions

Please prepare your full proposal according to the following instructions. Append biographical sketches (CVs) for the Principal Investigator (PI) and no more than 5 additional key team members to the end of this proposal.

Submission Deadlines: Save the entire document as a single file in pdf format, and submit via the Web submission tool before **11:59 p.m. on September 18, 2024, PDT**.

I. COVER SHEET: (1 page)

- 1) Please provide the proposal title, and category (data acquisition or platform development).
- 2) List the Principal Investigator, with institutional affiliation, address, telephone number, and email address.
- 3) List the team members and collaborators and their affiliations.

II. EXECUTIVE SUMMARY: (1 page)

Please provide a 1-page summary covering the following:

- 1) Scientific objectives: a single paragraph describing the science to be addressed, expected impact to the field, and the need for NIF to pursue this science.
- 2) Experimental approach: a single paragraph describing the experimental method, such as indirect drive or direct drive, radiography with backlighting, implosions with nuclear yield/non-yield shots, which existing platform will be used, or if new capabilities will be required.
- 3) Laser requirements: number of laser beams, total laser energy, total peak power, pulse shape, routine or non-routine laser pointing and delays, etc.
- 4) Diagnostic requirements: DIM-based diagnostics, other diagnostics, new diagnostics.
- 5) Target types: hohlraums, direct drive, planar convergent, expected materials in the targets, cryogenic/room temperature, gas-filled/vacuum targets, etc.
- 6) New facility developments required: targets, diagnostics, laser capabilities, etc.
- 7) Number of shot days: number requested and expected number of shots.



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III. FACILITY EXPERIMENTAL CONFIGURATION SUMMARY: (not more than 2 pages)

- 1) Laser configuration:
 - i) Drive pulse shape.
 - ii) Number of beams.
 - iii) Energy and peak power per beam
 - iv) Phase-plate needs (standard vs. non-standard, or no phase plates).
 - v) Backlighter beams (number of backlighters, pointing, delays, phaseplate requirements).

- 2) Primary Diagnostic Configuration:
 - i) DIM based diagnostics.
 - ii) Nuclear diagnostics.
 - iii) Modifications to existing diagnostics.
 - iv) New diagnostics or diagnostic techniques.

- 3) Target requirements:
 - i) Hohlraum, half-hohlraum, or other (specify).
 - ii) If hohlraum or halfraum, provide the length, diameter, wall material and thickness.
 - iii) If spherical, specify diameter, wall thickness, materials, and fill gas.
 - iv) If other types of targets, please describe.

IV. PROPOSAL NARRATIVE: (No more than 6 pages, including text, figures, tables, and references)

- 1) Scientific Motivation: The proposal should include the purpose of the experiment, the scientific questions to be addressed, the proposed experimental method, and a discussion of the degree to which the experiment is uniquely suited to NIF. The proposal should provide a quantitative description of the goals, a description of what is to be measured, and the accuracy required. The experimental design should be described, including simulations and predictions that show the goals can be achieved. Please provide previous results (NIF, OMEGA, Z, other facilities), if any, that support the proposed experiments.

- 2) Proposed Experiments and Expected Results: Please include the basic experimental details: the total laser energy, peak laser power, laser pulse shape, number of laser beams to be used, beam delays required (such as for backlighter beams), nonstandard laser pointing (such as for backlighter beams), primary diagnostics, number of shot days required, and a preliminary shot plan. Also indicate whether this will be direct drive or indirect drive, planar or spherical, and whether the experiment will use an existing platform and existing diagnostics on NIF or will require new capabilities and/or new diagnostics. Also indicate whether this proposal is for data acquisition, platform development, or new proposal development. Note: requests for very high laser energy or laser power will require additional justification due to the stress placed on the facility for such shots.



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- 3) Project Timetable: a) Shot plan. b) Decision points. c) Backup plan, if results differ significantly from predicted.
- 4) The Team: a) Please comment on the composition of the team and its ability to execute the proposed experiments; b) List the key co-investigators (Co-Is), and describe the roles of the participants.
- 5) Merit Review Criteria Discussion: In conclusion, please comment on the following criteria for which the proposals will be evaluated and judged: 1. Scientific merit and impact to the field; 2. Quality of the proposed work and how it will accomplish the scientific objectives; 3. Quality of team and its ability to carry out the proposed work; 4. Uniqueness of NIF to accomplish the proposed work and science.

V. BIBLIOGRAPHY AND REFERENCES:

Provide a bibliography for any references cited in the Project Narrative section. This section must include only bibliographic citations from the Narrative and initial summary sheets.

VI. BIOGRAPHICAL SKETCHES:

Append 1-2 page biographical sketches (CVs) for the principal investigator and no more than 5 additional key team members to the end of the proposal.