2023 Proposal Template for Runtime to Carry out Frontier Research on Frontier Plasma Science Collaborative Research Facilities

The length of the proposal narrative (excluding cover page and the personnel section) should not exceed five U.S. letter-size pages (including figures and references) with a minimum of 11-point main font size. The cover page should include the title of the proposal, the abstract, and the names and institutions of the proposers. Sections 4 and 5 (Personnel and PIER Plan) should be on a separate page and will not be counted toward the page limit. This is to easily remove identifying information for the double-anonymous review process. Please also avoid using your and your collaborators' names in the proposal narrative to allow for a fair double-anonymous review process.

***The completed proposal document along with the Record of Discussion should be emailed to* Joseph Olson *at joseph.olson@wisc.edu with 'Joint call for runtime proposals package' as the subject,** who will distribute the proposals to the independent review panel for assessment.*

Proposal Title

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Abstract

Include a brief (<200 words) summary of your proposal's motivation and anticipated goals. If your white paper is approved, this abstract will be posted on the facility's website.

Collaborative Research Facility: Check all that apply

___ DIII-D
___ BaPSF
___ WiPPL
___ MPRL
___ Data analysis
___ Not sure

Proposal Title

Abstract

Include the abstract here, as well.

1. Background & Scientific Rationale

Include information sufficient for someone with a background in plasma science or engineering, but not necessarily an expert in your subfield, to understand your proposal.

Some questions to consider: What fundamental question or problem will the experiment seek to address? What specific area of plasma physics (solar, magnetospheric, plasma astrophysics, fusion, etc.) does this work inform? What is novel about the proposed experiment? What makes it compelling to do this experiment on this particular CRF? What capabilities of this particular CRF are required for success (e.g., plasma parameters, configurations, diagnosis)?

Proposals will be reviewed based on the **Intellectual Merit** in advancing the frontiers of plasma physics[1], which spans a broad range of applications such as solar physics, astrophysics, magnetosphere, magnetic confinement, implosion, low temperature, and industrial plasmas. Proposals will also be considered in terms of the **Technical Approach, Qualification of the team** and a **PIER plan**, as set out below.

- **Intellectual Merit:** Prospects for fundamental advance, new approach, understanding, or valuable results? Uniqueness, originality, and scientific merit compared with other efforts? Impact on the field?

- **Technical Approach:** How well developed is the idea? Logical and/or feasible and/or innovative? Well thought out? Likelihood of valid conclusion or success? Potential problems recognized and alternative strategies considered?

- **Team and Facility readiness**: How well prepared are the PI and team? Necessary skills represented amongst proponents? CRF research environment and available resources adequate? Level of technical support needed from the CRF team? Needs for additional diagnostic or equipment?

- **Promoting Inclusive and Equitable Research (PIER) Plan**: Involve participation and training of students or postdocs or individuals from diverse background? Support an encouraging, safe, professional research environment for all participants? Make contributions to the broader community using the CRF (e.g., will the project bring new techniques or hardware that could be utilized by others)?

Proposers should ensure that the goal of the experiment is clear in the proposal and that the resources requested (run time, measurements to be made, etc.) are reasonable.

Applicants who have previously been allocated runtime at a Frontier Plasma Science CRF and are seeking new runtime to extend their current work should provide a status report on the results

[1]Recent reports, such as the NASEM Plasma 2020 Decadal Report and the DOE FESAC Long Range Planning Report (2021) provide guidance on frontier topics in plasma science and engineering

achieved from the prior runtime (including any presentations or publications that have resulted from the previous runtime).

A review panel consisting of plasma science experts from the community will review all proposals in a two stage process. The first stage will utilize a double-anonymous review process to evaluate the intellectual merit and technical readiness criteria. All proposals will be stripped of the cover page, personnel, and PIER plan sections to remove identifying information about the proposers and collaborators for the review panel. These sections will be added back for the second stage to evaluate the team readiness and PIER plan criteria. Ranked lists will be sent to facility directors to make the final decision on runtime allocations and comments from the review panel will be forwarded to the proposers.

2. Experiment Design

2.1 Experimental Setup and Diagnostics

Details on facilities and plasma parameters, available diagnostics, digitizers, and in-house equipment can be found at each of the facility's websites. Applicants are encouraged to engage relevant experts from within the Frontier Plasma Science CRFs to assist in developing proposals and carrying out experiments and addressing the following questions.

- What is the required plasma system (magnetic structure, confinement configuration, boundary conditions, transient or steady, plasma source, heating method, etc.?)
- What is the required range of plasma parameters (magnetic field, current, density, temperature, heating power, etc.?)
- What diagnostics are needed (magnetic probes, Langmuir probes, particular profile measurements, turbulence, spectroscopic, interferometers, etc.?) Please describe measurements and precision needed, indicating particular desired systems if known.
- Is other particular equipment or particular conditions needed (e.g., heating and current drive, fueling system, gas species, vacuum pressure?)
- Is there any new equipment to be purchased or fabricated by the proposers? Do the proposers have the funding to purchase and/or the technical skills required to build the necessary hardware?

2.2 Experimental Run plan

Describe how the resources in section 2.1 will be employed to answer the proposed scientific question(s). How much setup time, including on- and off-site work, will be needed to prepare for the proposed runtime? How many days of runtime in the appropriate calendar year are required to carry out the proposed plan?

3. References

4. Personnel

Describe the roles of each proposer and what each will do to execute the goals of the project. Mention any CRF team members these ideas have already been discussed with, or who plan to help. Please attach this as a separate page to the proposal narrative.

5. Promoting Inclusive and Equitable Research (PIER) Plan

The PIER plan should describe the activities and strategies of the applicant to promote equity and inclusion as an intrinsic element to advancing scientific excellence in the research project within the context of the proposing institution and any associated research group(s). For further guidance on developing a PIER plan, visit the US DOE's PIER plan webpage.