**Director’s R&D Fund FY 2018 Call for Late-Start Proposals in Artificial Intelligence**

ORNL has begun an Artificial Intelligence (AI) initiative with the objective of establishing expertise in AI and advanced data analytics, and leadership in the use of these methods for science and national security applications.

Interest in AI and machine learning (ML) for science and engineering has increased rapidly, driven by the amount of data that can be collected and stored, as well as the computational power available to process this data. Interest is also driven by recent successes in applying AI in a wide range of applications, ranging from fundamental science and engineering to applications such as transportation and healthcare.

For the purposes of the initiative, AI is a class of data-analytics algorithms in which the model or rules are not known a priori and must be learned (via machine learning algorithms) based on the data and the application domain knowledge. Within this scope, this call is soliciting proposals that specifically demonstrate AI capabilities (or the potential impact of AI) for DOE and ORNL-relevant science and engineering applications. These applications may include, but are not limited to, materials and neutron science, healthcare analytics, biosciences, cybersecurity, mobility or additive manufacturing.

An assessment of ORNL applications of AI have prioritized six research areas of interest.

* Dealing with issues regarding the quality of data, including dealing with noisy or missing data, and the creation and collection of training data,
* The development and application of specific machine learning algorithms for ORNL applications,
* The computation and characterization of uncertainties and bias and the verification and validation of AI systems,
* The use and blending of theory or traditional equation-based models with AI-based data analytics models, for example as prior knowledge or auxiliary information,
* The use of HPC architectures (e.g., Summit), including both node-level performance and the scaling of AI systems to large HPC systems, and
* Designing and implementing complex workflows including the data collection, transfer, storage, and access in both the training and deployment phases.

This call seeks high-quality proposals in the area of Artificial Intelligence for work to be performed in FY18. Proposals in response to this call should identify clearly challenges in one or more of the above research areas that will be addressed in the context of a specific application.

Proposals will be evaluated based on the following criteria:

* Identifies and completes a specific application demonstration problem within FY18
* Leverages OLCF capabilities, especially Summit
* Identifies research challenges that must be addressed within the context of the application being proposed.
* Leverages large datasets generated at ORNL user facilities, including OLCF.

Research staff submitting proposals should also be aware of the following.

* Full proposals only (not preliminary proposals) are sought.
* Proposals may request up to $300,000 for up to 6 months.
* LDRD projects must be distinct from projects directly funded by DOE programs.
* Proposals responding to this call must be responsive to the specified research priorities.
* Proposals that include early career staff as Principal and/or Co-Investigators are highly encouraged.
* Proposals that include multidisciplinary teams from across ORNL and, where appropriate, external collaborations, are highly encouraged.

**Review process**

To facilitate the proposal review process, the Deputy for Science and Technology (DST) and the Associate Laboratory Directors (ALDs) have designated a review committee, led by David Womble, who also serves as the initiative Science & Technology (S&T) Lead, that will review proposals and make funding recommendations to the DST.

**Eligibility**

ORNL research staff members may submit a proposal to the LDRD Director’s Fund as the principal investigator or participate as a co-investigator. Distinguished Staff Fellows may submit a proposal as the principal investigator in the last year of their fellowship or participate as a co-investigator. Postdoctoral research associates may participate as co-investigators but are not eligible to be principal investigators.

University faculty holding a joint appointment with the Laboratory may submit proposals as a principal investigator (PI) with the understanding that these are ORNL projects and that the proposed effort must primarily involve Laboratory personnel and resources. LDRD projects must benefit ORNL and DOE.

If an LDRD project requires expertise or capability that is not available at the Laboratory, non‑ORNL personnel may be subcontracted to fill that need, with the understanding that projects must primarily involve Laboratory personnel and resources.

**Miscellaneous guidance**

* Each PI is responsible for contacting the Classification Office at 865-576-4610 for guidance concerning handling of a proposed classified research proposal.
* Each PI is also responsible for contacting the Export Control Office at 865-576-7230 to determine whether proposal content or deliverables are subject to export control restrictions.
* Each PI must submit the proposal using the Laboratory Overhead Investment System (LOIS). A schedule (Table 1) for this call is also provided on the LDRD website.

**Schedule**

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| --- | --- |
| Date (2018) | Director’s R&D Call Activities/ Milestone |
| February 13 | Call for proposals issued by Director for Science and Technology (DST) |
| February 26 | Deadline for PI submittal of full proposals in LOIS. |
| March 12 | Funding decisions communicated to PI's |
| March 26 | Open FY 2018 accounts |

**Additional Information**

Questions concerning the Director’s R&D Fund should be directed to the LDRD Program Manager ([LDRD\_manager@ornl.gov](mailto:LDRD_manager@ornl.gov)). Questions concerning the scientific and technical content of this call should be directed to the S&T Lead, David Womble (576-9087, womblede@ornl.gov).