

# Harnessing the Data Revolution (HDR): Institutes NSF 21-519

*The meeting will  
start in a few  
minutes:*

Please hold on...

# Webinar

**November 17, 2020**

**2:00 pm – 3:15 pm ET**



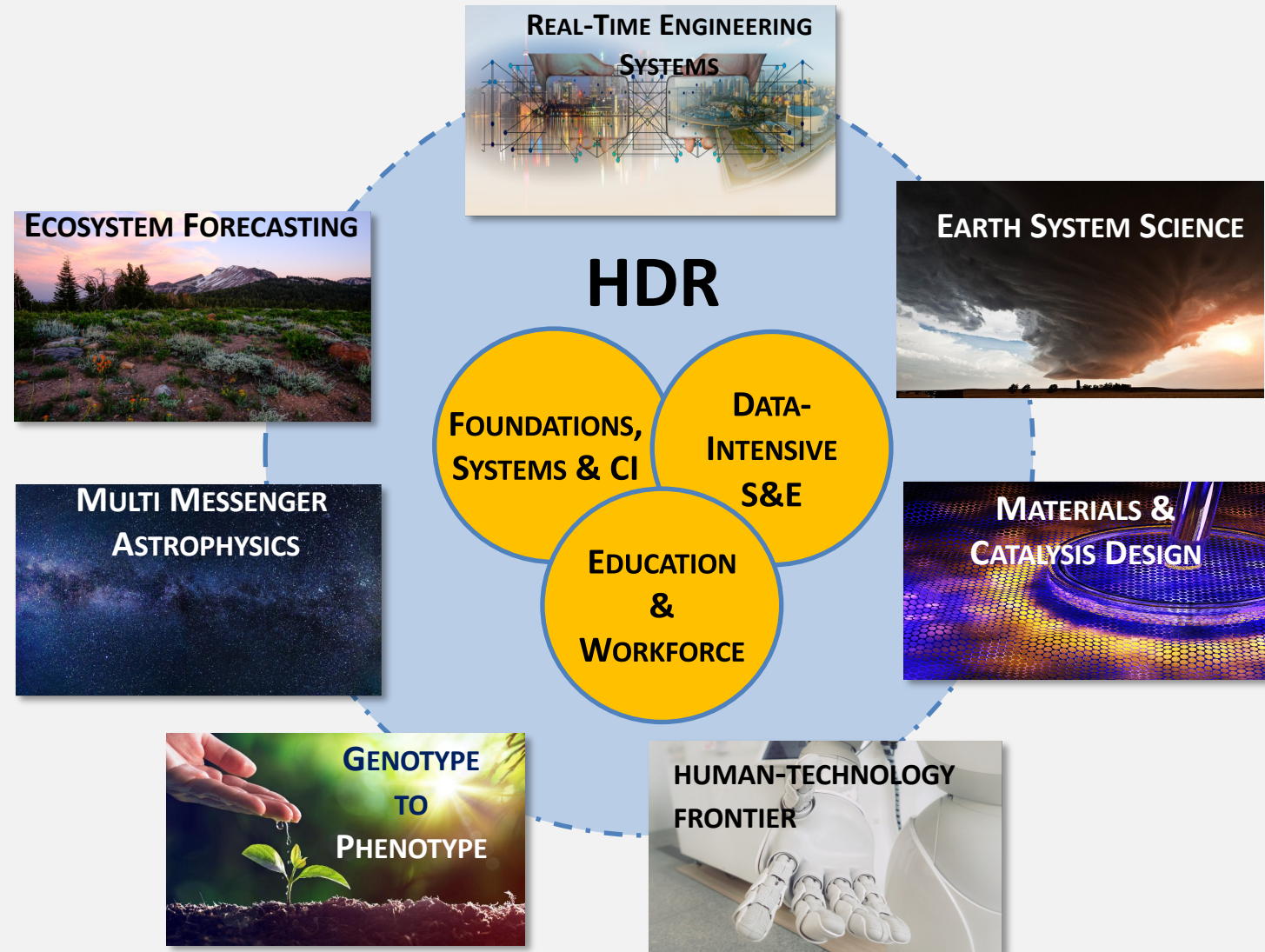
# Agenda

- Introduction
- Welcome from NSF Leadership  
**Dr. Margaret Martonosi, Assistant Director, CISE**
- Overview of the Harnessing the Data Revolution Big Idea  
HDR Co-Chairs: **Juan Meza (MPS/DMS)**  
**Manish Parashar (CISE/OAC)**
- FY21 HDR Institutes Solicitation (**NSF Program Officers**)
- Q&A



# HARNESSING THE DATA REVOLUTION: VISION

*HDR will enable new modes of data-driven discovery that will allow fundamental questions to be asked and answered at the frontiers of science and engineering*



# HDR Ecosystem Components

- **HDR TRIPODS** - develops theoretical foundations
- **DATA SCIENCE CORPS** - builds capacity for HDR by providing practical experiences, teaching new skills, and offering learning opportunities
- **INSTITUTES FOR DATA-INTENSIVE RESEARCH IN SCIENCE AND ENGINEERING** creates an integrated fabric of interrelated institutes that can accelerate discovery and innovation
- **HDR CENTRAL** - coordinates these efforts, amplifies the impact





# Developing the Ecosystem: 2019 Activities

To address the HDR vision, the three major theme areas were represented by four solicitations in FY 2019

	IDEAS LABS [NSF 19-543]	FRAMEWORKS [NSF 19-549]	TRIPODS [NSF 19-550]	DATA SCI CORPS [NSF 19-518]
Awards				
- # Projects	15	13	15	9
- # Awards	75	30	18	24
Awards (\$M)	\$26.3	\$ 26.5	\$22.2	\$ 10.3
PIs + co-PIs	79	76	81	64

**Institute Conceptualizations**



# HDR Institutes for Data-Intensive Research in Science and Engineering: Goals

Address **science and engineering areas** that:

1. are at a “**tipping point**” where a timely investment in data-intensive approaches has the maximum potential for a transformative effect,
2. have needs that can benefit from **interdisciplinary investments in data analytics infrastructure**, and
3. represent **investment priorities** for the participating NSF directorates during, and beyond, the lifetime of the HDR Big Idea



# HDR Institutes for Data-Intensive Research in Science and Engineering: Next Steps

- Proposals are now invited for broad and comprehensively-scoped HDR Institutes, that bring together multiple and new science and engineering communities with computer and computational scientists, mathematicians, statisticians, and information scientists around data science approaches
- The competition is open to any team that can put together a proposal that meets the vision, scope, and readiness called for in the Program Description



# HDR Institutes for Data-Intensive Research in Science and Engineering: Attributes

- A ***vision*** for transformative outcomes in science and engineering through data-intensive research
- ***Convergence*** among domain scientists, data scientists, and cyberinfrastructure experts
- ***Coordination and Management*** that crosses institutional boundaries in new ways
- A ***collaboration strategy*** for how the Institute will be an effective member of the broader HDR ecosystem
- A plan for ***transforming communities of practice*** in how data-intensive approaches can advance science and engineering
- A common means of openly ***sharing outcomes***





# Award Information

**Anticipated Type of Award:** Cooperative Agreement

**Estimated Number of Awards:** 4 to 7

**Anticipated Funding Amount:** \$70,000,000

Award size is contingent upon the scope, scale, and complexity of the proposed project, with a minimum total budget of \$10 million.

The size and complexity of any individual request should be justified by the amount and complexity of the work to be accomplished and expected impact on the research community.



# Eligibility

- **Proposals may only be submitted by:**
  - Universities and Colleges
  - Non-profit, non-academic organizations
- **Limit on Number of Proposals per PI/Co-PI/Senior Personnel: 1**
  - An individual may participate as PI, co-PI, and/or other Senior Personnel in at most one Institute proposal pursuant to this solicitation.
  - Note that any individual whose biographical sketch is provided as part of the proposal will be considered as Senior Personnel in the proposed activity, with or without financial support from the project.
- **See solicitation for details**



# Proposal Preparation

The NSF proposal and award process is detailed in the Proposal & Award Policies & Procedures Guide (PAPPG, NSF 20-1).

[https://www.nsf.gov/pubs/policydocs/pappg20\\_1/](https://www.nsf.gov/pubs/policydocs/pappg20_1/)

**Even if the project is a multi-organization activity, the proposal must be submitted as a single, integrated proposal by the lead organization, with proposed subawards to the other partner organizations. Separate proposals from each partner will not be accepted.**



# Proposal Preparation (cont'd)

- **Proposal Title**
  - Proposal titles should begin with the term “HDR Institute:”
- **Project Summary**
  - ***Overview:* This section should begin with a comma-separated list of keywords as the first sentence.**
  - It should then provide a brief overview of the proposed activities, planned deliverables, and the anticipated impacts on the research community.





# Supplementary Documents

Each proposal is required to include a ***Management and Coordination Plan*** (3-page limit) which includes:

- 1) the specific roles of the PI, co-PIs, other senior personnel, and paid consultants at all organizations involved;
- 2) how the project will be managed across organizations and disciplines;
- 3) identification of the specific coordination mechanisms that will enable cross-organization and/or cross-disciplinary scientific integration;
- 4) metrics that will be used to assess and demonstrate the effectiveness of the Institute, including a timeline of anticipated milestones;
- 5) to the budget line items that support these management and coordination mechanisms; and
- 6) a strategic plan that integrates the research, education, broadening participation, and knowledge transfer activities across all levels.

**Proposals without this Supplementary Document will be returned without review.**



# NSF Review Criteria

The reviewers and review panel will address:

- Intellectual Merit,
- Broader Impacts, and
- Solicitation-Specific Criteria



Standard NSF  
Review Criteria

Criteria Specific to  
HDR-Institutes

in their reviews, panel discussions, and panel summaries

# Solicitation-Specific Review Criteria (I)

1. How well does the proposal articulate the ***vision*** of the future Institute to contribute transformative new knowledge in relevant science and engineering domains through data-intensive research?
2. How well does the proposed Institute support ***convergence*** among domain scientists and data scientists, providing new approaches not possible through individual efforts?
3. How does the proposed Institute's ***coordination and management*** allow it to carry out the functions of the Institute, cross organizational and departmental boundaries, leverage existing research infrastructure, and support metrics for success? Does the project have an effective strategic plan that integrates the research, education, broadening participation, and knowledge transfer activities across all levels?



## Solicitation-Specific Review Criteria (II)

4. How well defined is the ***collaboration strategy*** for this Institute to participate in the broader HDR ecosystem?
5. What potential does the proposed Institute have to ***transform communities of practice*** in data-intensive research? How will the Institute serve as an agent of change for how research questions are conceived and addressed through interdisciplinary collaboration? To what extent will the impacts of the Institute propagate and evolve beyond the lifetime of the award?
6. How does the Institute plan to ***share outcomes***, including but not limited to scientific and education outcomes, data, algorithms, and models?





# A Few Words About Cooperative Agreements

- Custom terms and conditions created for each award
- Reporting frequency/methods determined in project terms
- Funding increments are not applied automatically
- Terms and conditions can specify specific deliverables with conditions for NSF approval
- Additional (internal or external) review of deliverables are possible including, but not limited to, (reverse) site visits at major project milestones



# Pre-award Agreement to Terms and Conditions

- Award generally contains two sections of terms and conditions
  - Financial/Administrative Terms & Conditions
  - Programmatic Terms & Conditions (PTCs)
  - Most recent overarching terms can be found at:  
[https://www.nsf.gov/awards/managing/co-op\\_conditions.jsp](https://www.nsf.gov/awards/managing/co-op_conditions.jsp)
- Example Sections for Programmatic Terms and Conditions
  - Project Description
  - Project Governance & Governing Responsibilities
  - Reporting Requirements
  - NSF Ongoing Management & Oversight
  - Project Execution Plan (PEP)
  - Deliverable Deadlines



# Schedule

Proposal Deadline:	January 21, 2021
Review:	Spring, 2021
Cooperative Agreement:	Early Summer, 2021
Announcement of Awards:	End of FY 2021



# Cognizant Program Officers

- Amy Walton
- Giovanna Biscontin (ENG/CMMI)
- Daryl W. Hess (MPS/DMR)
- Anthony Kuh (ENG/ECCS)
- Peter McCartney (BIO/DBI)
- Nigel Sharp (MPS/AST)
- Finbarr Sloane (EdHR/DRL)
- Patricia Van Zandt (SBE/BCS)
- Christopher Stark
- Cheryl Eavey (SBE/SES)
- Pui Shing Ho (MPS/CHE)
- Vyacheslav (Slava) Lukin (MPS/PHY)
- Rebecca Peebles (MPS/CHE)
- Shahab Shojaei-Zadeh (ENG/CBET)
- Sylvia Spengler (CISE/IIS)
- Eva Zanzerkia (GEO/EAR)





# THANK YOU!

## *Questions?*

During Webinar: Via Zoom Q&A

After Webinar: [HDR-DIRSE@nsf.gov](mailto:HDR-DIRSE@nsf.gov)



# Questions (I)

***Q: Is the HDR-Institutes solicitation an open solicitation?***

The competition is open to any team that can put together a proposal that meets the vision, scope, and readiness called for in the Program Description.



## Questions (II)

***Q: If I am the PI, co-PI or Senior Personnel on a proposal to this solicitation (NSF 21-519):***

- Can I be the PI on any other proposal to NSF 21-519?*** NO
- Can I be a co-PI on any other proposal to NSF 21-519?*** NO
- Can I be Senior Personnel on any other proposal to NSF 21-519?*** NO

An individual may participate as PI, co-PI, or other Senior Personnel on at most one proposal for this solicitation.

In the event that any individual exceeds this limit, any proposal submitted to this solicitation with this individual listed as PI, co-PI, or Senior Personnel after the first proposal is received at NSF will be returned without review.



## Questions (III)

***Q: How are Harnessing the Data Revolution (HDR) Institutes related to / different from Artificial Intelligence (AI) Institutes?***

The goal of HDR Institutes is to advance science and engineering enabled through data-intensive research.

AI Institutes target use-inspired research areas to both inform foundational AI advances and drive innovations in targeted areas.

