

Harnessing the Data Revolution (HDR)

Harvesting the Data Revolution: 2022 HDR PI Meeting

Welcoming Remarks from the National Science Foundation

Alexandria, VA

October 26, 2022



Topics

- A Brief History
- The First HDR In-Person Meeting: Introductions
 - NSF
 - TRIPODS
 - Data Science Corps
 - HDR Institutes
- Takeaways



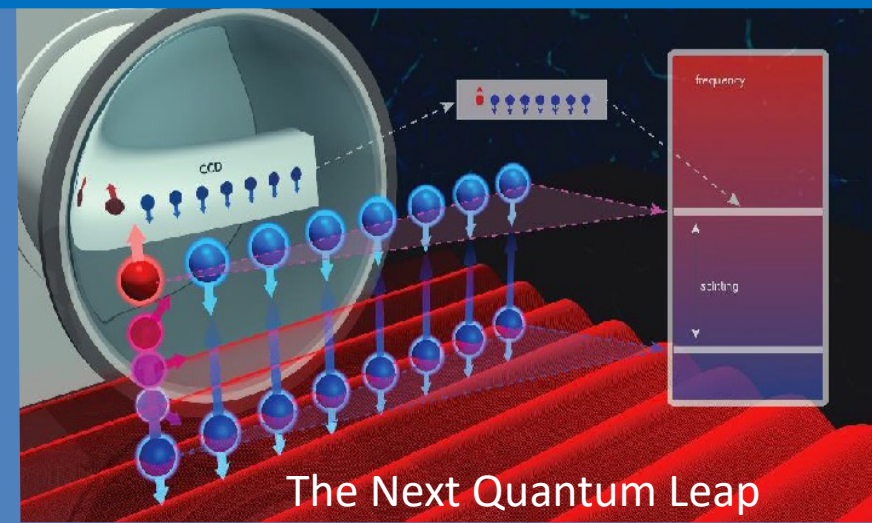
INFERENCE MATHEMATICAL, STATISTICAL, COMPUTATIONAL FOUNDATIONS SEMANTICS EHR ANALYTICS PRIVACY OPEN PUBLIC ACCESS DISCOVERY REPOSITORIES EDUCATION WORKFORCE DATA SCIENCE

HARNESSING THE DATA REVOLUTION

FUNDAMENTAL RESEARCH CYBERSECURITY BIO SCIENCE CHALLENGES SYSTEMS ARCHITECTURE INTERNET OF THINGS STATISTICS RESEARCH DATA MODELING INTEROPERABILITY HUMAN DATA INTERFACE MACHINE LEARNING VISUALIZATION DATA MINING GIS



Windows on the Universe



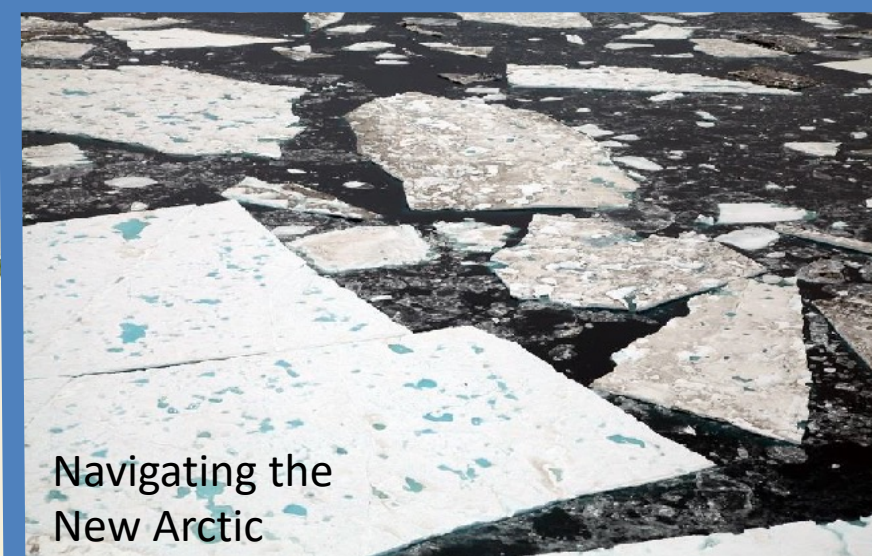
The Next Quantum Leap



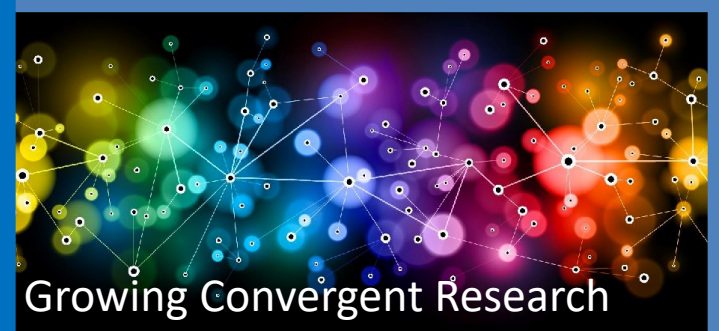
Rules of Life



Work at the Human Technology Frontier



Navigating the New Arctic



Growing Convergent Research



MidScale Infrastructure



NSF 2026



NSF INCLUDES

HARNESSING THE DATA REVOLUTION (HDR): OVERVIEW

COMPONENTS OF HDR

- FOUNDATIONS OF DATA SCIENCE
- EDUCATION AND WORKFORCE DEVELOPMENT
- DATA-INTENSIVE SCIENCE AND ENGINEERING



HDR PROGRAMMATICS

HDR TRIPODS

[NSF 19-550] [NSF 21-604]

DATA SCIENCE CORPS

[NSF 19-518] [NSF 21-604]

HDR INSTITUTES

- IDEAS LABS

[NSF 19-543]

- FRAMEWORKS

[NSF 19-549]

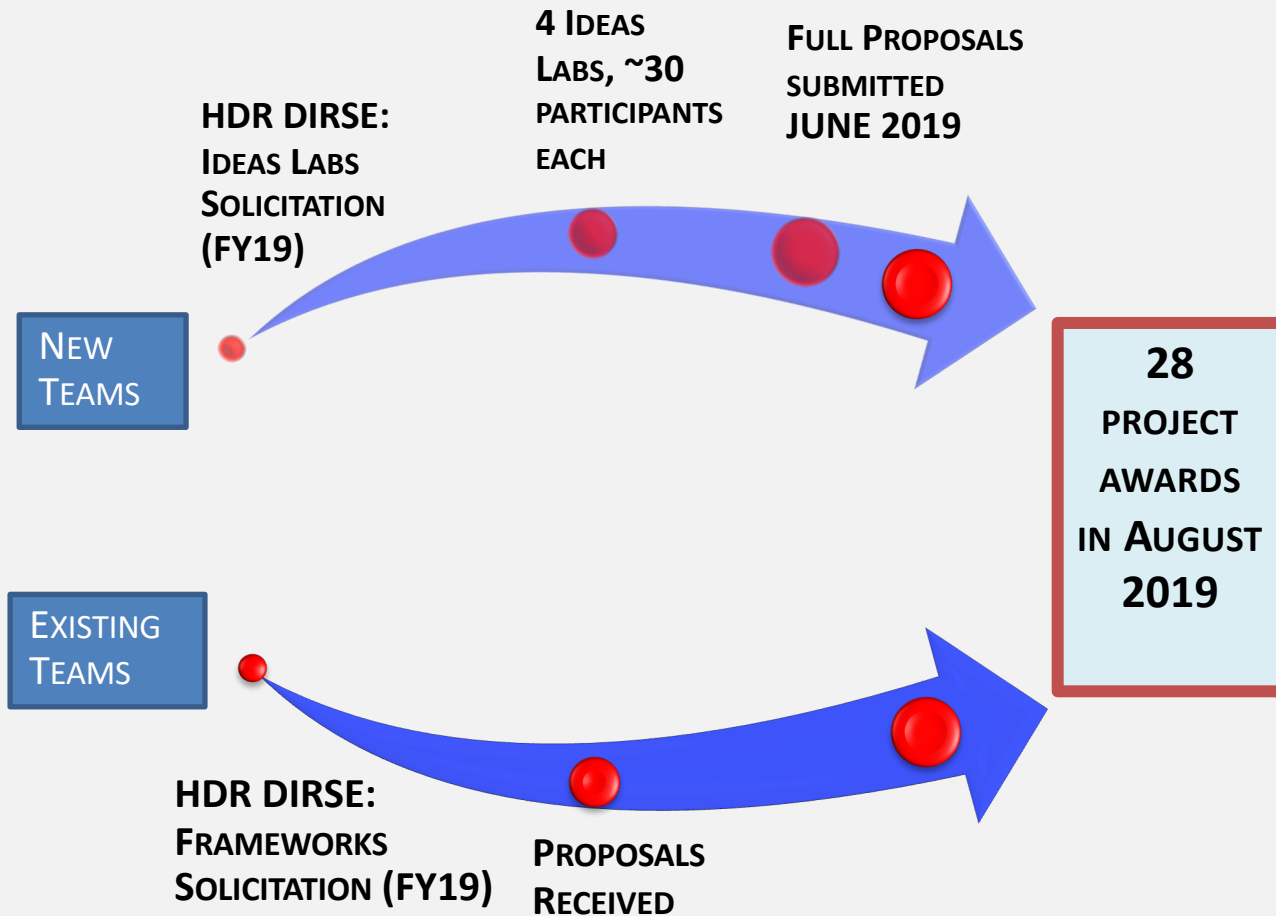
[NSF 21-519]



HDR Institutes Roadmap

.....HDR INSTITUTES: CONCEPTUALIZATION.....

.....HDR INSTITUTES: CONVERGENCE.....



2021 TIMEFRAME

**OPEN COMPETITION FOR 4-5
INSTITUTES THAT BRING TOGETHER
MULTIPLE SCIENCE AND ENGINEERING
COMMUNITIES**



HDR by the Numbers

2019	DATA SCI CORPS [NSF 19-518]	IDEAS LABS [NSF 19-543]	FRAMEWORKS [NSF 19-549]	TRIPODS [NSF 19-550]
Awards				
-- # Projects	9	15	13	15
-- \$M	\$ 10.3	\$26.3	\$ 26.5	\$22.2

2021	DATA SCI CORPS [NSF 21-523]	DATA INTENSIVE INSTITUTES [NSF 21-519]	TRIPODS [NSF 21-604]
Awards			
-- # Projects	10	5	2
-- \$M	\$ 15.1	\$78.5	\$20.0



TRIPODS – 2022 Awards

Award #	Name	Institution	Title
2217023	Reyzin, Lev	University of Illinois at Chicago	IDEAL: The Institute for Data, Econometrics, Algorithms, and Learning
2216899	Blum, Avrim	Toyota Technological Institute at Chicago	
2216912	Gao, Chao	University of Chicago	
2216926	Duan, Jeffrey	Illinois Institute of Technology	
2216970	Vijayaraghavan, Aravindan	Northwestern University	
2217058	Saha, Barna	UCSD	EnCORE: Institute for Emerging CORE Methods in Data Science:
2217033	Meka, Raghu	UCLA	
2217062	Hassani, Hamed	U Penn	
2217069	Ward, Rachel	UT Austin	



Data Science Corps – 2021 Awards

Award #	Last	First	Institution	Title
2122967	Prudic	Kathleen	U of Arizona	Collaborative Research: HDR DSC: Building Capacity in Data Science through Biodiversity,
2122991	Binford	Greta	Lewis and Clark Colleg	Conservation, and General Education
2123247	Jun	Mikyoung	U of Houston	HDR DSC: Data Science for Energy Transition
2123260	Christlieb	Andrew	Michigan State Univer	Collaborative Research: HDR DSC: Increasing Accessibility through Building Alternative Data
2123259	Stephens	Monica	Spelman College	Science Pathways
2123264	Bianco	Federica	University of Delawar	Collaborative Research: HDR DSC: Delaware and Mid-Atlantic Data Science Corps
2123321	Ward	Mark	Amer Statistical Assoc	HDR DSC: National Data Mine Network
2123343	Napolitano	Rebecca	PA St U University Par	Collaborative Research: HDR DSC: Infusion of data science and computation into engineering
2123237	Lattanzi	David	George Mason Univer	curricula
2123244	Paal	Stephanie	Texas Engineering Exp	
2123285	Wu	Wentao	Tennessee State Univ	
2123346	Moreu	Fernando	University of New Me	
2123366	Shahbaba	Babak	U of Cal Irvine	Collaborative Research: HDR DSC: Data Science Training and Practices: Preparing a Diverse
2123380	Behseta	Sam	Cal State U Fullerton I	Workforce via Academic and Industrial Partnership
2123384	Castro	Alma	NOCCCD	
2123440	Kolaczkowski	Bryan	University of Florida	HDR DSC: AI across the statewide curriculum
2123444	Salloum	Mariam	U of Cal Riverside	Collaborative Research: HDR DSC: DS-PATH: Data Science Career Pathways in the Inland Empire
2123271	Hou	Yunfei	UEC at CSUSB	
2123313	Nguyen	Kasey	Riverside Cmty Col Dis	
2123447	van der Lee	Suzan	Northwestern Univers	Collaborative Research: HDR DSC: The Metropolitan Chicago Data Science Corps (MCDC):
2123329	Insel	Nadja	Northeastern Illinois U	Learning from Data to Support Communities
2123401	Potosnak	Mark	DePaul University	
2123486	Paschos	Paschalis	Chicago State Univers	
2123503	Santos	Eunice	U of Ill Urbana-Champ	



HDR Institutes – 2021 Awards

Award #	PI/Last	PI/First	Institution	Title
2118240	Berger-Wolf	Tanya	Ohio State University	HDR Institute: Imageomics: A New Frontier of Biological Information Powered by Knowledge-Guided Machine Learning
2117997	Hsu	Shih-Chieh	U of Washington	HDR Institute: Accelerated AI Algorithms for Data-Driven Discovery
2118285	Janeja	Vandana	U of MD Baltimore County	HDR Institute: iHARP- Harnessing Data and Model Revolution in the Polar Regions
2118201	Toberer	Eric	Colorado School of Mines	HDR Institute: Institute for Data Driven Dynamical Design
2118329	Wang	Shaowen	U of Ill Urbana-Champaign	HDR Institute: Geospatial Understanding through an Integrative Discovery Environment



Takeaways

- ***Status***
 - *NSF has funded >70 data-intensive projects through this HDR initiative*
 - *Key goals for the future are to provide value – new algorithms, approaches, applications, and lessons learned – to a growing and interdisciplinary research community*
- ***Challenges***
 - *Creating the ecosystem*
 - *Engagement of a broad range of institution types: R1, R2....HBCU, Tribal Colleges, many communities*
 - *Identifying sustained communication and interaction mechanisms*
- ***Thank you: To the incredibly hardworking group throughout the program***

