Presentation Outline

NSF/ENG/CMMI: A Brief Overview

CMMI Core Programs: DCSD, EDSE, MSI

CMMI- and NSF-Wide Opportunities

Final Reminders!

Dan L

Something to Remember: Now and Later

NSF Program Officers, in partnership with the engineering community, fulfill NSF's mission for the benefit of the American public.

So, DON'T be afraid to
ask questions.
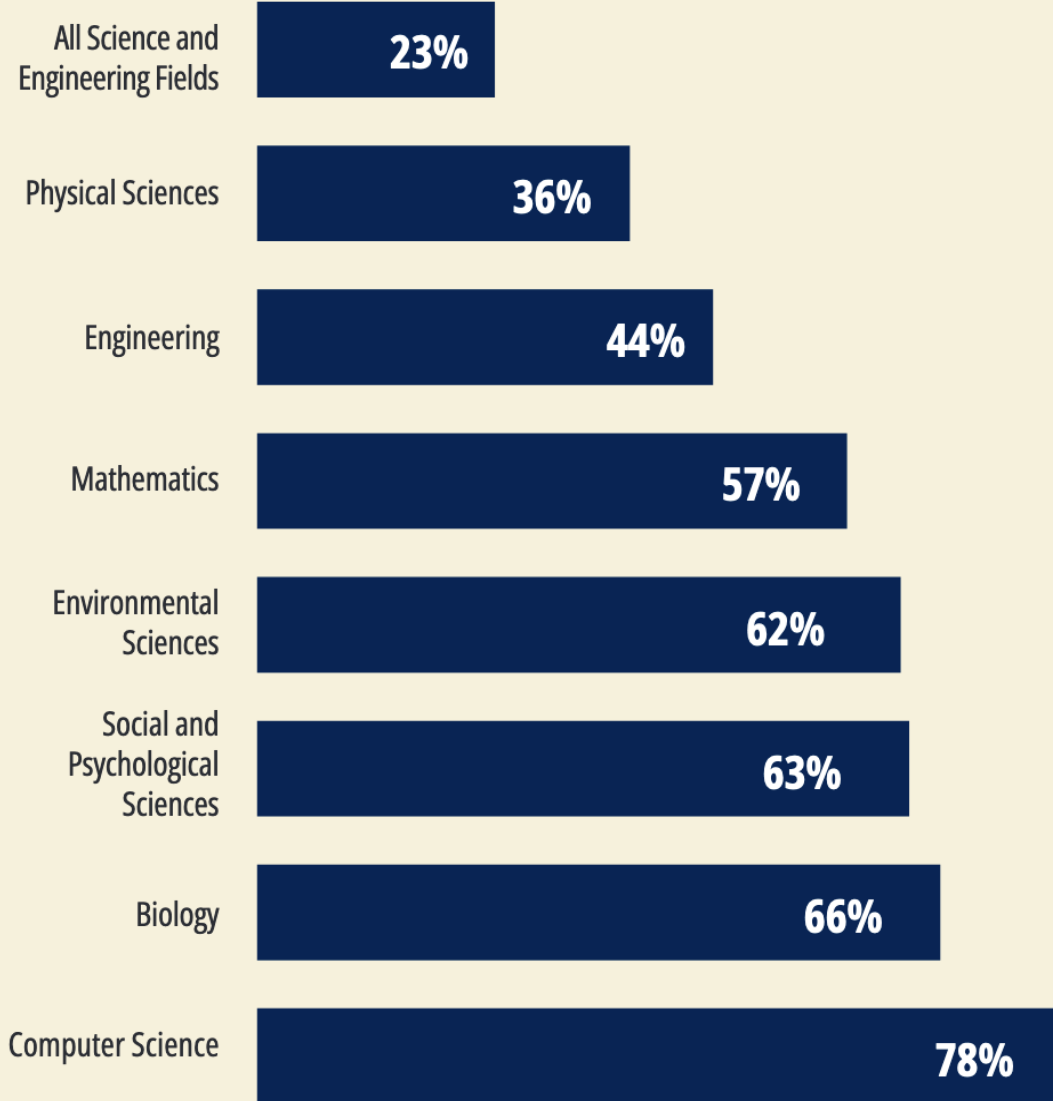
In fact, Ask Early and Ask Often!

National Science Foundation

A BRIEF OVERVIEW

Dan L

NSF SUPPORT OF ACADEMIC BASIC RESEARCH IN SELECTED FIELDS (as a percentage of total federal support)

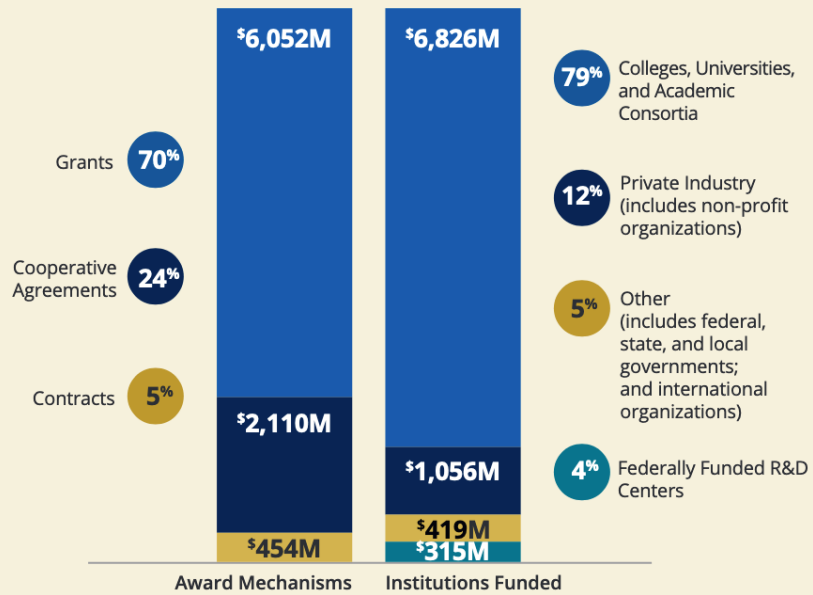| Field	Percentage
All Science and Engineering Fields	23%
Physical Sciences	36%
Engineering	44%
Mathematics	57%
Environmental Sciences	62%
Social and Psychological Sciences	63%
Biology	66%
Computer Science	78%

What NSF Does

- Supports all fields of fundamental science and engineering, <u>except for medical sciences</u>.

- Ensures that research is integrated with education so that today's revolutionary work will also be training tomorrow's top scientists and engineers.
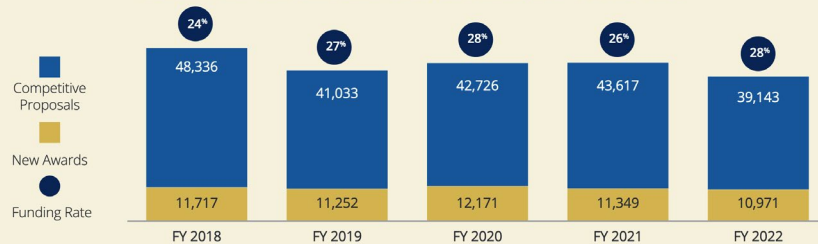
NSF by the Numbers

WHERE IT GOES AND HOW IT GETS THERE:
FY 2022 Obligations for Research and Education Programs:
$8,616 Million

Award Mechanisms ($6,052M, $2,110M, $454M)
- Grants **70%**
- Cooperative Agreements **24%**
- Contracts **5%**

Institutions Funded ($6,826M, $1,056M, $419M, $315M)
- **79%** Colleges, Universities, and Academic Consortia
- **12%** Private Industry (includes non-profit organizations)
- **5%** Other (includes federal, state, and local governments; and international organizations)
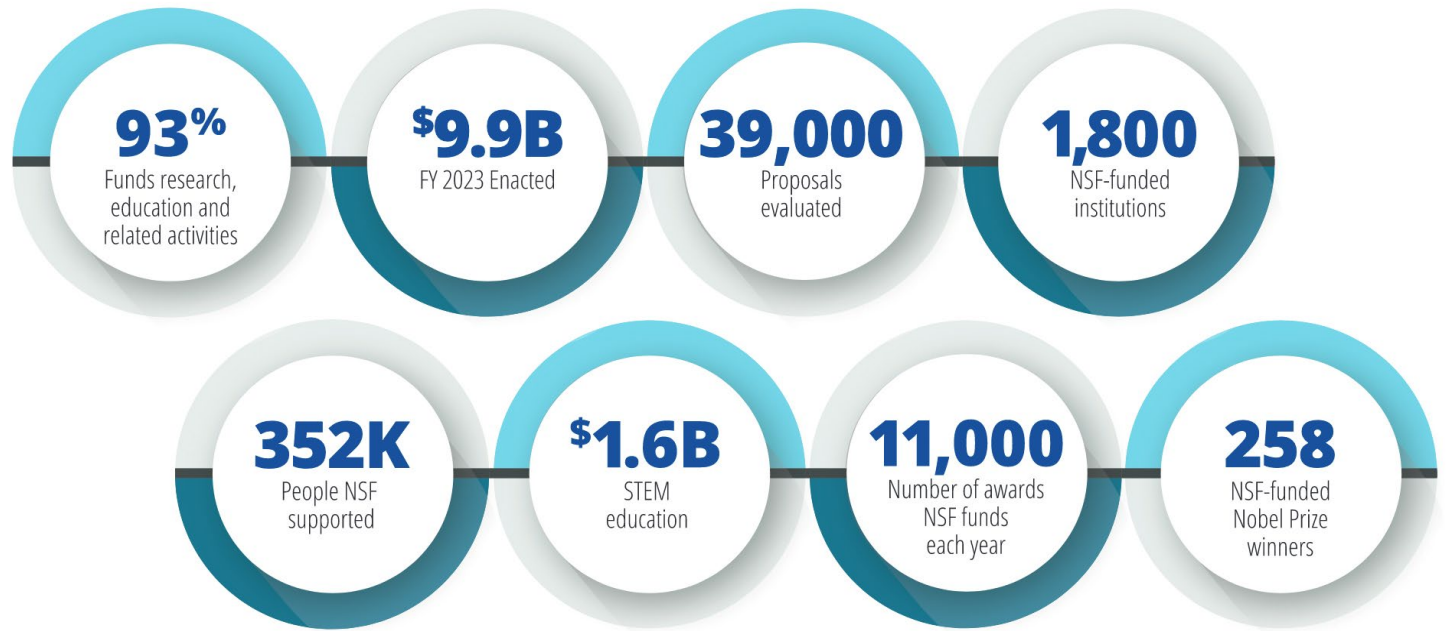- **4%** Federally Funded R&D Centers

Notes: NSF Research and Education Programs include Research and Related Activities, Education and Human Resources, and Major Research Equipment and Facilities Construction appropriations. Totals may not add due to rounding. R&D - Research and Development.

NUMBER OF NSF COMPETITIVE PROPOSALS, NEW AWARDS, AND FUNDING RATES

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Competitive Proposals	48,336	41,033	42,726	43,617	39,143
New Awards	11,717	11,252	12,171	11,349	10,971
Funding Rate	24%	27%	28%	26%	28%

Note: The number of new awards is a subset of the total number of competitive proposals.

- **93%** Funds research, education and related activities
- **$9.9B** FY 2023 Enacted
- **39,000** Proposals evaluated
- **1,800** NSF-funded institutions
- **352K** People NSF supported
- **$1.6B** STEM education
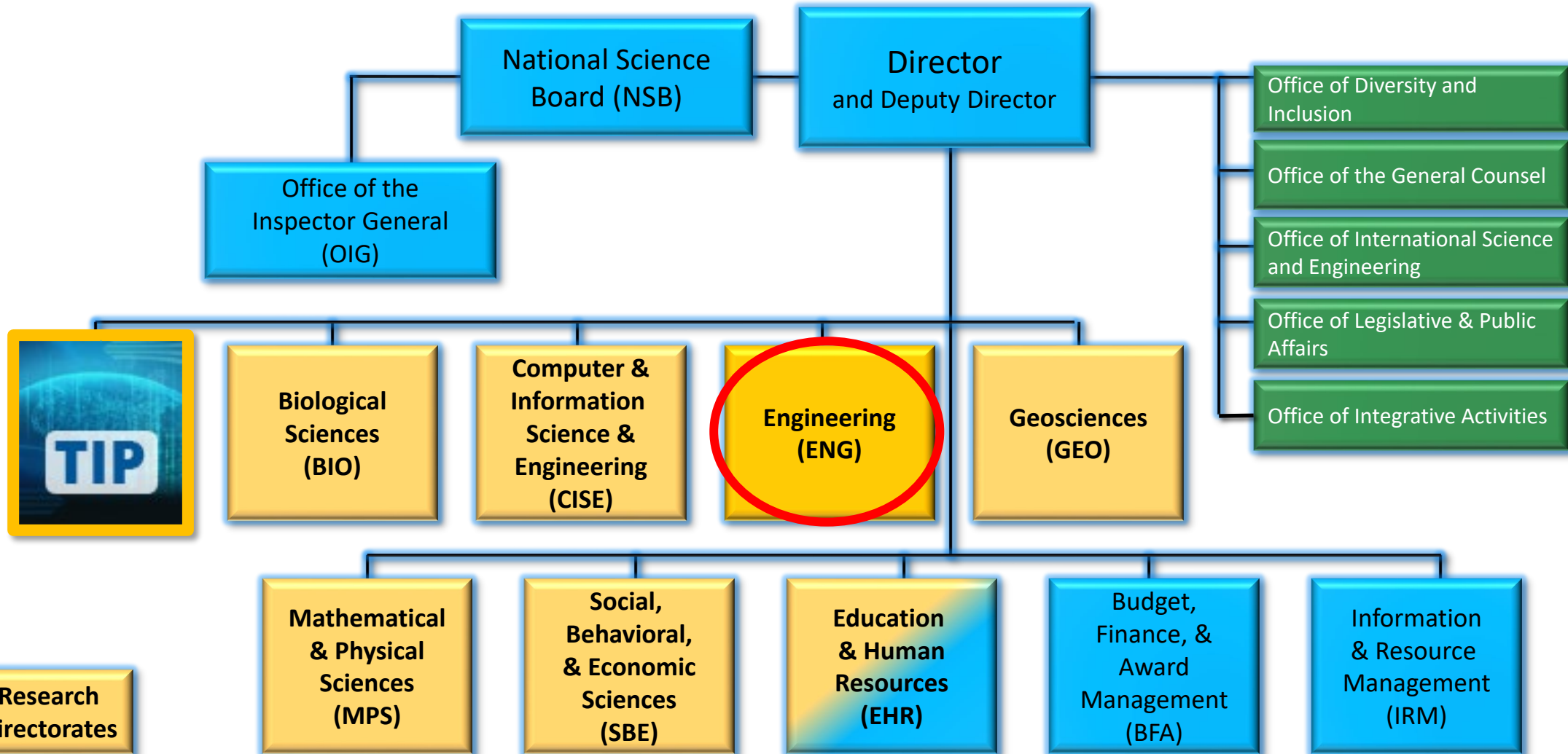- **11,000** Number of awards NSF funds each year
- **258** NSF-funded Nobel Prize winners

Data represents FY 2022 Actuals unless otherwise indicated.

National Science Foundation (NSF)

Engineering Directorate (ENG)

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┌─────────────────────────┐     ┌─────────────────────────────┐     ┌─────────────────────────┐
│ Senior Advisor          │     │ Assistant Director          │     │ Budget Officer          │
│ Sohi Rastegar           │─────│ Susan Margulies             │─────│ Darren Dutterer         │
├─────────────────────────┤     │                             │     ├─────────────────────────┤
│ Senior Science &        │     │ Deputy Assistant Director   │     │ Operations Officer      │
│ Engineering Advisor     │─────│ Don Millard                 │─────│ Erica Chiang (Acting)   │
│ Mihail Roco             │     │                             │     │                         │
└─────────────────────────┘     └─────────────────────────────┘     └─────────────────────────┘
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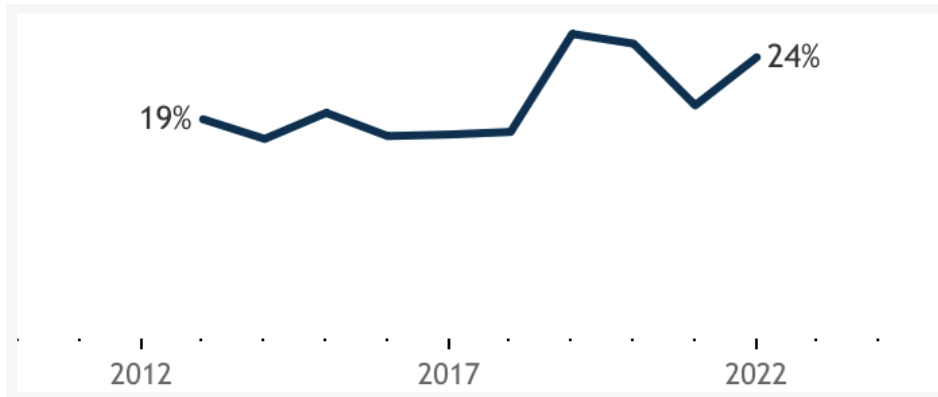
- **Engineering Education and Centers (EEC)** — José Zayas-Castro
- **Chemical, Bioengineering, Environmental, and Transport Systems (CBET)** — Jeanne VanBriesen
- **Civil, Mechanical, and Manufacturing Innovation (CMMI)** — Daniel Linzell
- **Electrical, Communications, and Cyber Systems (ECCS)** — Anthony Maciejewski
- **Office of Emerging Frontiers and Multidisciplinary Activities (EFMA)** — Louise Howe

ENG by the Numbers

Proposals Evaluated

8,635 ... 6,498
2012 ... 2017 ... 2022

Funding Rate

19% ... 24%
2012 ... 2017 ... 2022
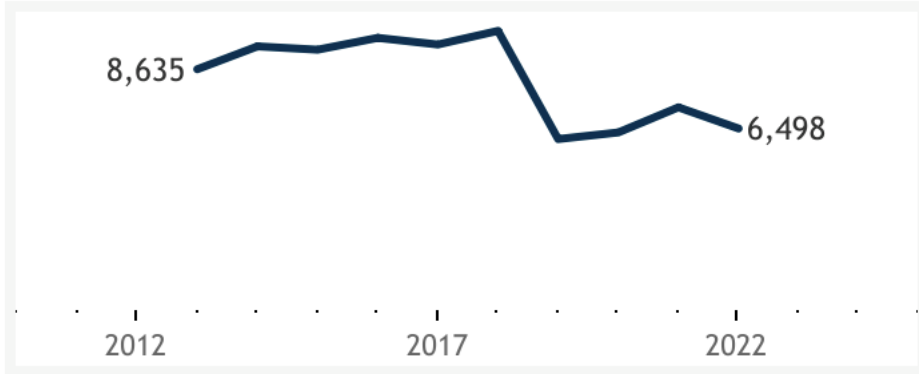
DIRECTORATE FOR ENGINEERING (ENG)

$940,280,000
+$175,850,000 / 23.0%

ENG Funding[1]
(Dollars in Millions)

	FY 2021 Actual	FY 2021 ARP Actual	FY 2022 (TBD)	FY 2023 Request	Change over FY 2021 Actual Amount	Percent
Chemical, Bioengineering, Environmental and Transport Systems (CBET)	$199.87	-	-	$226.17	$26.30	13.2%
Civil, Mechanical, and Manufacturing Innovation (CMMI)	241.58	3.00	-	265.86	24.28	10.1%
Electrical, Communications, and Cyber Systems (ECCS)	124.00	-	-	137.20	13.20	10.6%
Engineering Education and Centers (EEC)	127.23	-	-	144.46	17.23	13.5%
Emerging Frontiers and Multidisciplinary Activities (EFMA)	71.76	-	-	166.59	94.83	132.1%
Total	**$764.44**	**$3.00**	**-**	**$940.28**	**$175.84**	**23.0%**

[1] The Division of Industrial Innovation and Partnerships (IIP) was dissolved in FY 2022, with the bulk of its programs moving to the new Directorate for Technology, Innovation, and Partnerships (TIP) and the remainder to EEC.

Civil, Mechanical and Manufacturing Innovation (CMMI) Division

CLUSTERS AND CORE PROGRAMS

Dan L

CMMI Clusters and Programs

Advanced Manufacturing Program

Manufacturing Systems Integration

Dynamics, Control and Cognition Cluster

- Dynamics, Controls and System Diagnostics
- Foundational Research in Robotics
- Mind, Machine and Motor Nexus

Engineering for Civil Infrastructure Program

Mechanics and Engineering Materials Cluster

- Biomechanics and Mechanobiology
- Mechanics of Materials and Structures

Operations and Design Cluster

- Civil Infrastructure Systems
- Humans, Disasters and the Built Environment
- Engineering Design and Systems Engineering
- Operations Engineering

CMMI by the Numbers – FY '23 *Approximates*

- Proposals received > 2000

  - EPSCOR Eligible 15%

  - MSI 14%
    - HHE 13%, HBCU 1%

  - PUI 5%

  - Non-R1 24%

- Requested > $1.7B

- CMMI budget approx. $240M

- ENG Hit Rate approx. 20%

- How do we support as many great proposals as possible?

COLLABORATION

© 2023 Mapbox © OpenStreetMap
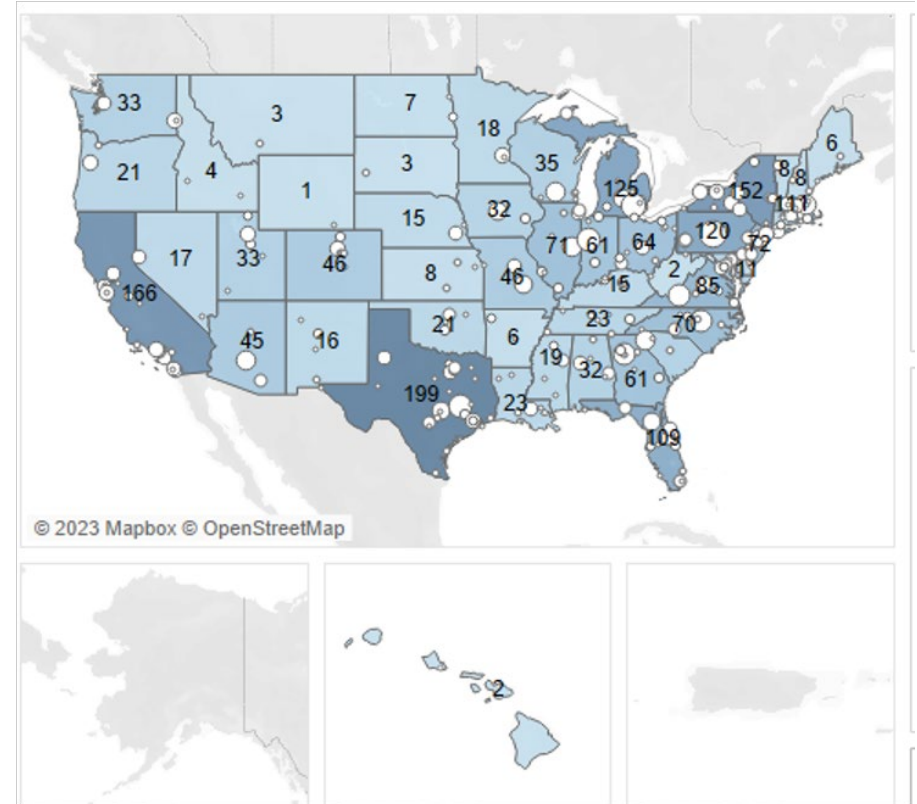
Some CMMI Core Programs

EDSE, MSI, AND DCSD
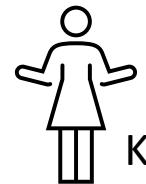
Kathryn

Basic Research Consideration

IMPORTANT

- Basic knowledge mission → not applied research

- Winning proposals focus on research, not development

- If the focus of the proposal is an *artifact* (a device, system, product, process,…) → it's probably development

- If the focus of the proposal is *knowledge* (the truth of a hypothesis/phenomenon) → it's probably research

Funding Mechanisms

o **Core/Unsolicited:** Two to four years; Individual/small collaborative teams: funds increase for collaboration—*ask the program director*

o **Solicitations:** Small to large funding size; multiple divisions/directorates can be involved

- Special research calls – LEAP-HI, EFRI, DMREF, NRI, …

- Career focused – ERI, CAREER, BRITE

- Instrumentation & Infrastructure – MRI, CDS&E, CSSI

- Centers – ERC, STC, I/UCRC

o **Workshops/Conferences:** Focused events to review state of art, identify gaps and challenges, suggest paths forward, and build consensus

EDSE: Engineering Design & Systems Engineering

FORGING NEW DIRECTIONS FOR DESIGN RESEARCH
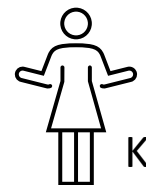
Kathryn

Engineering Design and Systems Engineering (EDSE) Program

o EDSE supports fundamental research that advances *design science* **and/or** *systems science* through the creation of **new knowledge about the design of engineered artifacts.**

o *New knowledge*: new design principles, frameworks, algorithms, techniques, methods, processes, etc., that are **generalizable** and **transferable**

o *Engineered artifacts* include, but are not limited to, **devices**, **products**, **processes**, **platforms**, **materials**, **organizations**, **systems**, and **systems of systems.**

Design as a System

Research among

People
Research within
Users, designers, manufacturers, suppliers, investors, other stakeholders

Processes/Methods
Conception to distribution

Research between

Artifacts
Nanomachines to aircraft carriers

Environment
"Local" to global
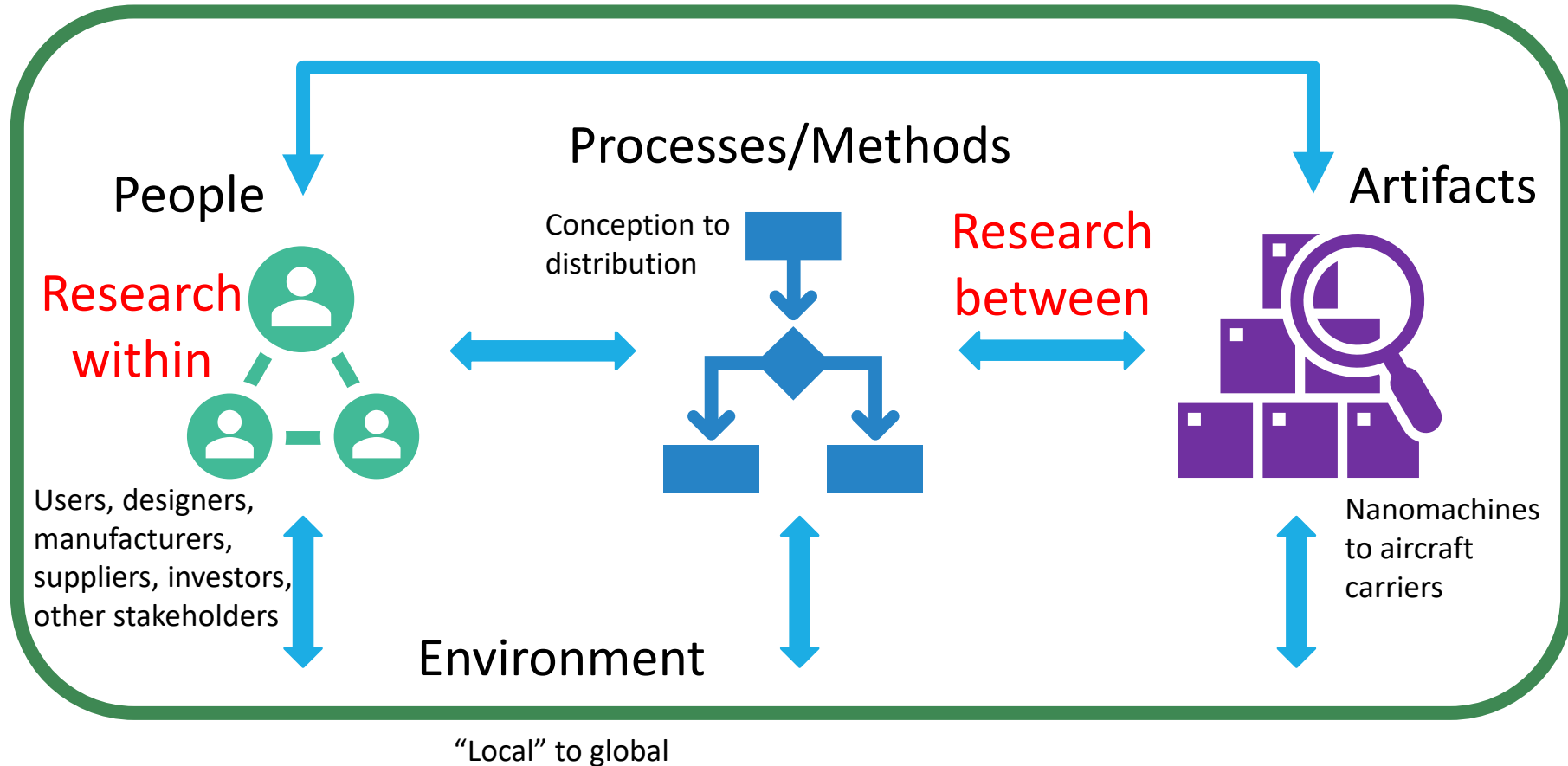
A (partial) EDSE Wishlist for Design Research

- Design representation
- Design optimization
- Design validation
- Mechanism design
- Intelligent system design
- Design of engineered materials systems
- Data science and AI in design
- Immersive design
- *Design cognition*
- *Design collaboration*
- *Design in under-resourced/utilized communities*
- *Extreme design*

NATIONAL SCIENCE FOUNDATION
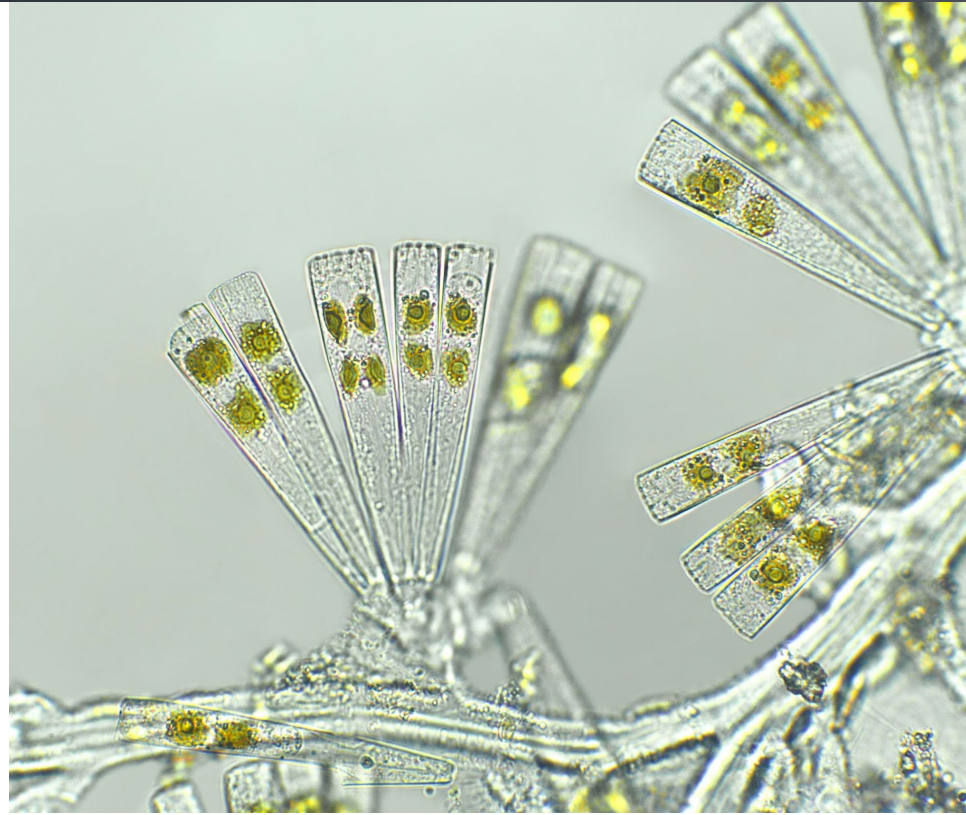
Extreme Design

- Extreme scales
- Extreme environments
- Extreme physical qualities
- Extreme constraints
- Extreme risks
- What about "impossible things"?
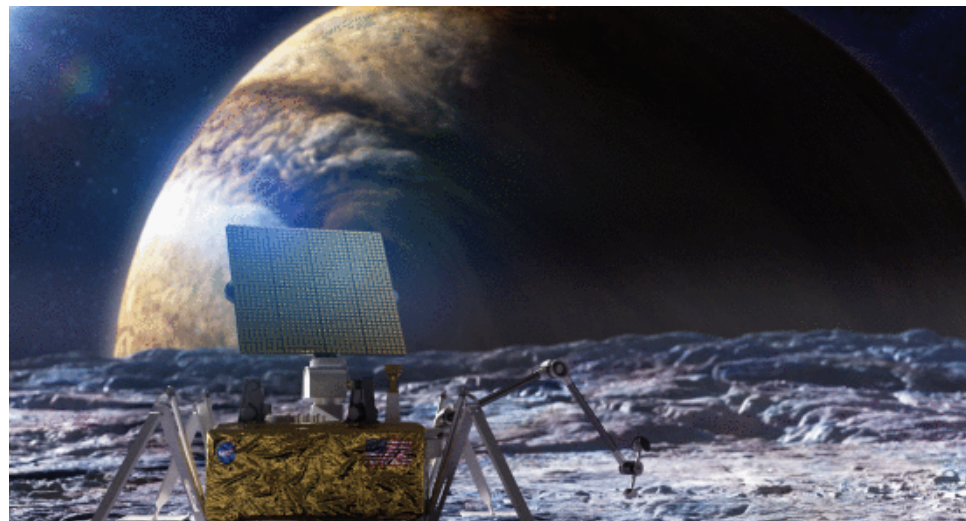
Janis Terpenny
jterpenn@nsf.gov

MSI: Manufacturing Systems Integration

WEAVING THE DIGITAL THREAD
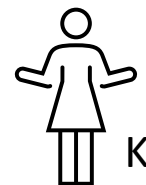
Kathryn

Manufacturing Systems Integration (PD 23-229Y) New Core Program in CMMI

MSI program supports fundamental research addressing opportunities and challenges that digital technologies present toward the next industrial revolution

Results of MSI research have potential to:

- Strengthen data infrastructure and security across manufacturing stages
- Streamline interactions between various stakeholders in digital manufacturing environments
- Improve control and optimization of production processes

Motivation for New MSI Program

- Technological advances can bring greater productivity and value of manufactured systems and products

  - Industry 4.0, IoT, Smart Manufacturing

- Challenges in the implementation of fully digital design and manufacturing

  - Lack of fundamental principles for organizing the data that describe products
  - Difficulties with identifying the appropriate methods for manufacturing products
  - Challenges in integrating supply chains and incorporating humans and robots in the loop

- Need for generalizable and scalable methods and tools

Research funded by MSI might include:

- Digital representation, protocols, and processes for integration and collaboration in manufacturing systems (machines and/or humans)

- Automation of production system configuration

- Seamless integration of technologies, machines, and humans

- Service-oriented architectures and systems

- Data sets that are compatible and usable across platforms

- Reliable and secure communications within and across manufacturing value chains

- Networked integration of distributed manufacturing systems

- Methods for assessing the impact and value of externalities throughout the life cycle within the digital environment

The Dynamics, Control and Cognition Cluster

CORE PROGRAMS & SOLICITATIONS

Harry

Dynamics, Control and Systems Diagnostics (DCSD)

Mind, Machine and Motor Nexus (M3X)
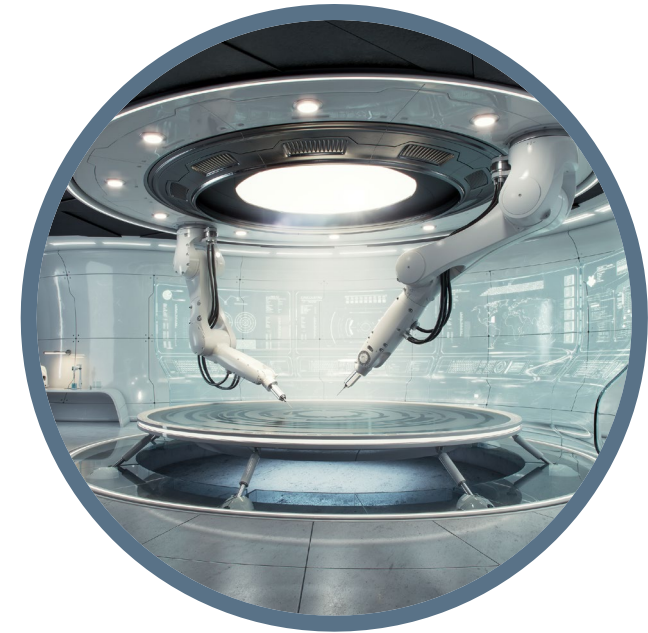
Foundational Research in Robotics (FRR)

Dynamics, Control and Systems Diagnostics (DCSD)

Supports fundamental research on the analysis, modeling, measurement and control of dynamic systems.

https://new.nsf.gov/funding/opportunities/dynamics-control-systems-diagnostics-dcsd-0

Mind, Machine and Motor Nexus (M3X)

Supports research on the reciprocal interactions — mediated by motor manipulation — between human cognition and embodied and intelligent engineered systems.

https://new.nsf.gov/funding/opportunities/mind-machine-motor-nexus-m3x

Foundational Research in Robotics (FRR)

Supports research on robotic systems that exhibit significant levels of both computational capability and physical complexity.

https://new.nsf.gov/funding/opportunities/foundational-research-robotics-frr

DCC Program Directors, Experts and Specialists

Eva Kanso,
Program Director

Harry Dankowicz,
Program Director

Jordan Berg,
Program Director

DCC Program Directors, Experts and Specialists
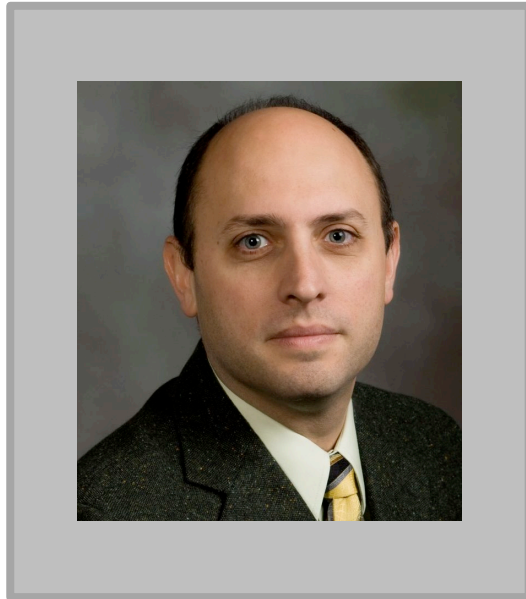
Alexander Leonessa,
Program Director
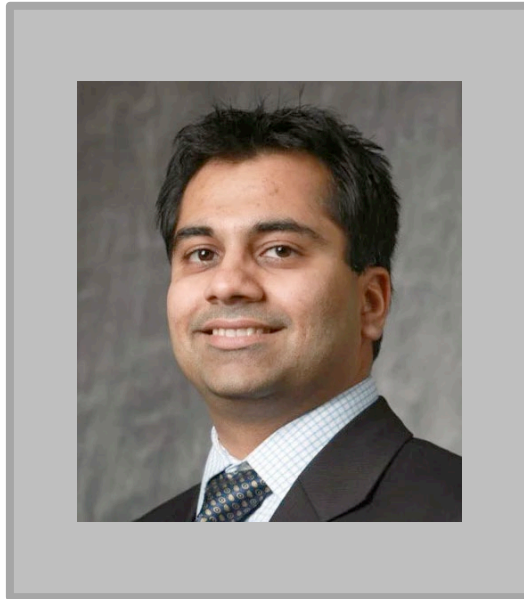
Sandipan Mishra,
Expert
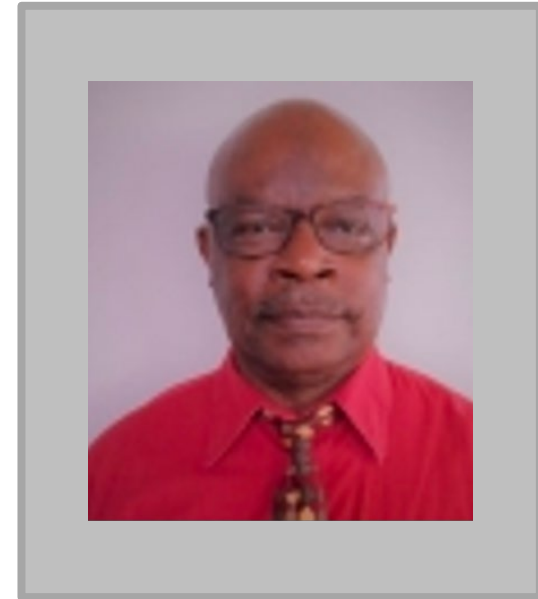
David Nyiiro,
Program Specialist

To ensure that a project is appropriate for a program in the DCC cluster prior to the submission of a full proposal, principal investigators are strongly encouraged to prepare a one-page draft Project Summary and send this to:

DCSD: dcsd@nsf.gov (Jordan Berg, Harry Dankowicz, Eva Kanso)

M3X: aleoness@nsf.gov (Alexander Leonessa) mendonca@nsf.gov (David Mendonca)

FRR: robotics@nsf.gov (Jordan Berg)

Subscribe to the DCSD Newsletter by sending a blank email to: dcsd-subscribe-request@listserv.nsf.gov

CMMI- and NSF-Wide Opportunities

SOME EXAMPLES OF INTEREST

Harry

Engineering Research Initiation (ERI)

- **Support new investigators as they initiate their research programs and advance in their careers as researchers, educators, and innovators.**

- **Broaden the base of investigators involved in engineering research.**

○ Researchers at non-R1 institutions who have not yet received federal research funding.

   ○ Non-R1 = R2 and "smaller" (see latest Carnegie Classifications)

○ Participating Divisions: CBET, CMMI, ECCS

○ Scoping: Single PI, 2 years, $200K, shorter proposal (10 pages)

○ Read solicitation for other special features (e.g., Senior Personnel *are* allowed this year)

○ Deadline for next year's proposals is **September 15, 2023**

https://beta.nsf.gov/funding/opportunities/engineering-research-initiation-eri

Boosting Research Ideas for Transformative and Equitable Advances in Engineering (BRITE)

Enable and create opportunities to advance scientific discoveries and research using a variety of new approaches that harness the entire national talent ecosystem of experienced faculty.

- Tenured professor (associate level and higher) or equivalent at a qualifying institution

- Single PI (no co-PI/collab. proposals)

- Provides PI time and resources

- Three Tracks: Pivot, Relaunch, Fellow

- Budget: up to $100-200k per year

- Anticipated funding: 2-5 Fellow awards; 8-10 awards per track (Pivot, Relaunch)

- Deadline for first year's proposals was May 2021: keep an eye out for updates

https://beta.nsf.gov/funding/opportunities/nsf-boosting-research-ideas-transformative

DCL: CiviL Infrastructure research for climate change Mitigation and Adaptation (CLIMA)

Goal: forward-thinking, convergent, ambitious civil infrastructure research on transformative ideas or approaches that will contribute equitable solutions to climate change mitigation and/or adaptation.

- CLIMA proposals (NSF 23-079) should develop **novel, creative, and fundamental** approaches drawing from multiple scientific fields to create holistic pathways to infrastructure and community resilience, social equity, and improved long-term performance.
- Contributions from **interdisciplinary teams** with expertise in the research areas of the participating programs (ECI, AM, EDSE, DCSD, OE, HDBE, MoMS, CIS, MSI).
- Proposals suitable for submission to individual programs will not be considered responsive.
- Proposals will be accepted at any time.
- Prospective principal investigators (PIs) must send an email inquiry to clima@nsf.gov.

https://www.nsf.gov/pubs/2023/nsf23079/nsf23079.jsp

DCL: Next Generation Supply Chains (NSF 23-080)

Objectives: to significantly advance our understanding of global supply chains, especially their ability to provide industrial goods, critical healthcare and medical products, consumer products, and key services reliably and equitably under a wide variety of operating conditions, including disruptions and emerging threats.

- Computational and data-driven methods that provide transparency and insight into the competitive behavior arising from the multilayer network structure of supply chains.

- New physical and cyber infrastructure to support the design of products, systems, and services and the supply chains that produce and distribute them.

- Methods and cyber infrastructure that will allow firms of different sizes and competencies to participate in global supply chains in an economically sustainable manner.

Core Programs inviting submissions: Operations Engineering (OE), Engineering Design and Systems Engineering (EDSE), Advanced Manufacturing (AM), Manufacturing Systems Integration (MSI)

Convergence Research

Dan M

Convergence Research

Convergence research is a means of solving vexing research problems, especially those focusing on societal needs. It has two primary characteristics:

It is driven by a specific and compelling problem, whether that problem arises from deep scientific questions or pressing societal needs.

It shows deep integration across disciplines. Convergence research intentionally brings together intellectually diverse researchers to develop effective ways of communicating across disciplines. As experts from different disciplines pursue a common research challenge, their knowledge, theories, methods, data and research communities increasingly intermingle.
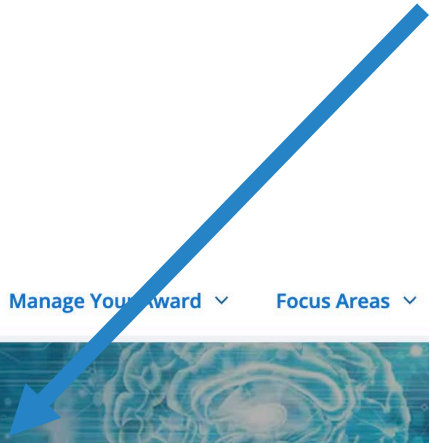
New frameworks, paradigms or even disciplines can emerge from convergence research, as research communities adopt common frameworks and a new scientific language. In this sense, convergence research is similar to transdisciplinary research, which is seen as the pinnacle of integration across disciplines.

Convergence research is a means of solving vexing research problems, especially those focusing on societal needs. It has two primary characteristics:

It is driven by a specific and compelling problem, whether that problem arises from deep scientific questions or pressing societal needs.

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New frameworks, paradigms or even disciplines can emerge from convergence research, as research communities adopt common frameworks and a new scientific language.

Examples: PIPP

Driven by a compelling problem

Program contents

Expertise from across different and multiple disciplines

PIs should send inquiries to PIPP@nsf.gov in place of contacting individual program directors.

Katharina Dittmar	PIPP@nsf.gov	(703) 292-7799	BIO/DEB
Mitra Basu	PIPP@nsf.gov	(703) 292-8649	CISE/CCF
Goli Yamini	PIPP@nsf.gov	(703) 292-8910	CISE/IIS
Rebecca Ferrell	PIPP@nsf.gov	(703) 292-7850	SBE/BCS
Zhilan J. Feng	PIPP@nsf.gov	(703) 292-7523	MPS/DMS
Daniel McAdams	PIPP@nsf.gov	(703) 292-4654	ENG/CMMI
Joanna Shisler	PIPP@nsf.gov	(703) 292-5368	BIO/IOS
Joseph M. Whitmeyer	PIPP@nsf.gov	(703) 292-7808	SBE/SES
Catalina Achim	PIPP@nsf.gov	(703) 292-2048	MPS/OAD
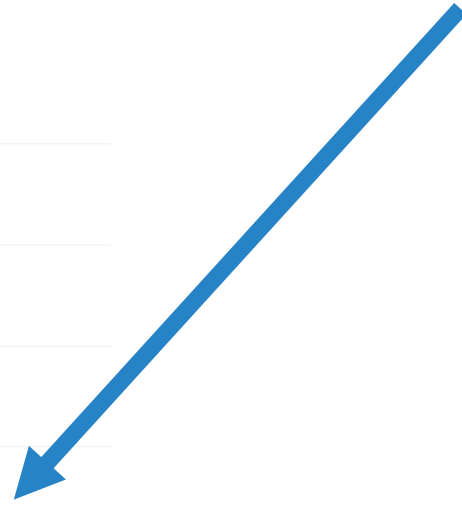
Multiple themes, multiple disciplines, but Design (and other expertise in the room) key to a successful PIPP center.
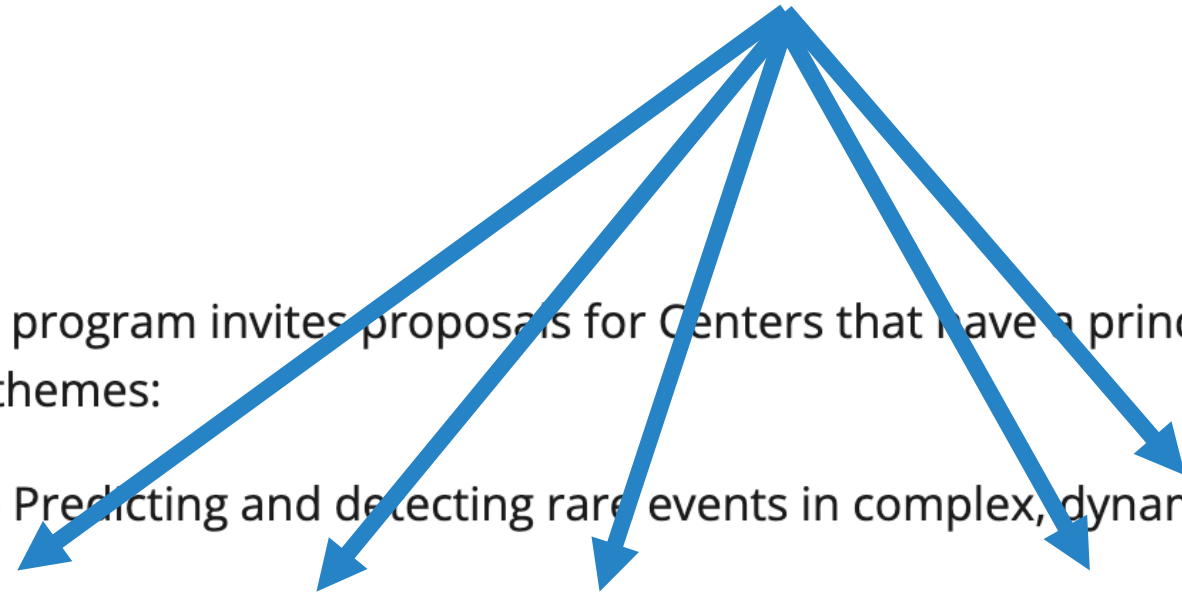
activities (PIPP Phase I), the program invites proposals for Centers that have a principal focus in one of the following multidisciplinary themes:

Theme 1: **Pre-emergence** - Predicting and detecting rare events in complex, dynamical systems

Theme 2: **Data, AI/ML and Design** - Computing, manufacturing and technology innovation for pandemics

Theme 3: **The Host as the Universe** - Identifying host-pathogen tipping points that dictate control or spread of an infection

Theme 4: **Human Systems** - The role of human behavior, activities and environments in disease emergence, transmission, and response or mitigation

Sufficient funding levels to support work that can have high impact results

… awards in the amount of $15-18M each (total over 7 years) ….

The bad news, maybe

Letter of Intent Due Date(s) *(required)* (due by 5 p.m. submitter's local time):
August 25, 2023

EPSCoR

ESTABLISHED PROGRAM TO STIMULATE COMPETITIVE RESEARCH

Pinhas

EPSCoR within the NSF Organization
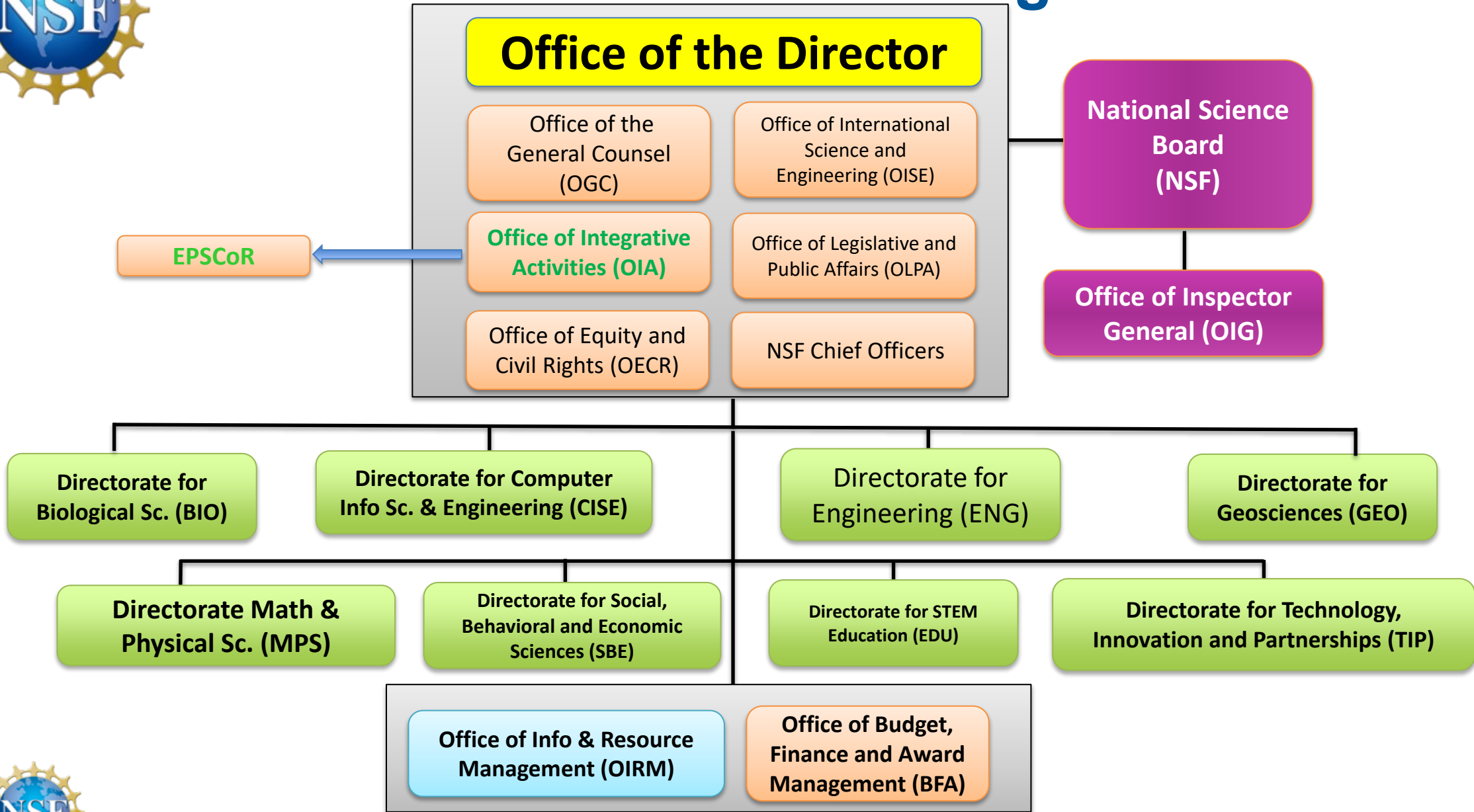
EPSCoR: Mission and Strategic Goals

Mission

Enhances research competitiveness of targeted jurisdictions (states, territories, commonwealth) by strengthening STEM capacity and capability

Strategic Goals

- Catalyze research capability across and among jurisdictions

- Establish STEM professional development pathways

- Broaden participation of diverse groups and institutions in STEM

- Effect engagement in STEM at national and global levels

- Impact jurisdictional economic development

Discovery & Innovation   Education & Workforce   Economic Development

Building Capacity

EPSCoR Trivia

➢ How many EPSCoR jurisdictions exist?

➢ Which **non-EPSCoR** jurisdiction receives highest % of NSF research funding?

➢ Which **EPSCoR** jurisdiction receives the least?

DE State Fair: Oyster, DE

Agricultural Robotics, NE

Top five states received 37.6% of NSF research funds.

ALL EPSCoR States receive ~12% of NSF research funds

EPSCoR Jurisdictions, FY23 Eligibility

States

AL Alabama	**NH** New Hampshire
AK Alaska	**NM** New Mexico
AR Arkansas	**ND** North Dakota
DE Delaware	**NV** Nevada
HI Hawaii	**OK** Oklahoma
IA Iowa	**RI** Rhode Island
ID Idaho	**SC** South Carolina
KS Kansas	**SD** South Dakota
KY Kentucky	**VT** Vermont
LA Louisiana	**WV** West Virginia
ME Maine	**WY** Wyoming
MS Mississippi	**Other**
MT Montana	**GU** Guam
NE Nebraska	**PR** Puerto Rico
	VI U.S. Virgin Islands

➢ **These jurisdictions receive ≤ 0.75% of NSF funding (based on 5-year average).**
➢ Eligibility table updated annually and publicly available. The CHIPS and Science Act of 2022 effectively freezes NSF EPSCoR jurisdiction eligibility through Fiscal Year (FY) 2027.

EPSCoR Investment Strategies

- **Research Infrastructure Improvement (RII) Programs – RII Track-1 (sunsetting), E-CORE, E-RISE, Track-2, Track-4** (78-84% of EPSCoR budget)

  Support physical, human, and cyber infrastructure within academic institutions across each jurisdiction

- **Co-Funding w/ NSF Directorates & Offices** (16-22% of budget)

  Meritorious proposals reviewed in other NSF programs that also satisfy EPSCoR programmatic criteria

- **Outreach and Workshops** (0.5-1% of budget)

  Interaction among EPSCoR Community and NSF to build mutual awareness and develop areas of potential strength

GU Team at SACNAS

IA Strategic Plan – Integration of Project

Research Infrastructure Improvement

➢ Up to $20M over 5 years

- Grow statewide research capacity in alignment with specific priorities described in Science & Technology Plan

Track-1

➢ Up to $1.5M per year for up to 4 years

- Form Interjurisdictional collaborations
- Theme chosen by NSF EPSCoR to align with Foundation-wide priority areas

Track-2

➢ Up to $300k over 2 years

- Provide fellowships for non-tenured faculty to have extended research visits to premier private, governmental, or academic institutions in the U.S.

Track-4

FY22 Funding = $231.7M

Complementary Investment Strategies

RII Track-1

Jurisdiction-based; topic in alignment with State Sci. & Tech. priorities

Builds jurisdiction wide research capacity

Co-funding and Workshops

Supports EPSCoR Scientists across all NSF Directorates

RII Track-2

Focused EPSCoR (interjurisdictional) Collaborations

Networks jurisdictions together

RII Track-4

EPSCoR Research Fellows

Allows early career and research faculty to network beyond EPSCoR

RII Track-1 Goals (NSF 23-582)

➢ **Up to 5 years and up to $20 million total**

- Additional 20% **cost share** is required from jurisdiction of NSF request

➢ **Focus on research and capacity building**

➢ **Multi-institutional:** research universities, PUIs, community colleges, HBCUs, tribal colleges, private, NGO, and government partners

➢ **Research and education should align with jurisdiction S&T plan**

➢ **Awards are Cooperative Agreements**

- Close interaction with, and oversight by NSF EPSCoR Staff
- Strategic Planning occurs within first 90 days
- Includes Reverse/Site Visit reviews by external panels in Years 2 and 4

NSF EPSCoR
ADVANCING GEOGRAPHIC DIVERSITY IN STEM

EPSCoR Collaborations for Optimizing Research Ecosystems Research Infrastructure Improvement Program (E-CORE RII)

View guidelines
23-587

EPSCoR Research Incubators for STEM Excellence Research Infrastructure Improvement (E-RISE RII)

View guidelines
23-588

E-CORE supports jurisdictions in building capacity in one or more targeted research infrastructure cores that underlie the jurisdiction's research ecosystem.

E-RISE builds a jurisdiction-wide network of teams of researchers that incubate research in a STEM topical area aligned with priority areas for jurisdiction.

Based on the Total Research Ecosystem of a Jurisdiction

E-CORE and E-RISE are aimed at different levels of the jurisdictional research ecosystem
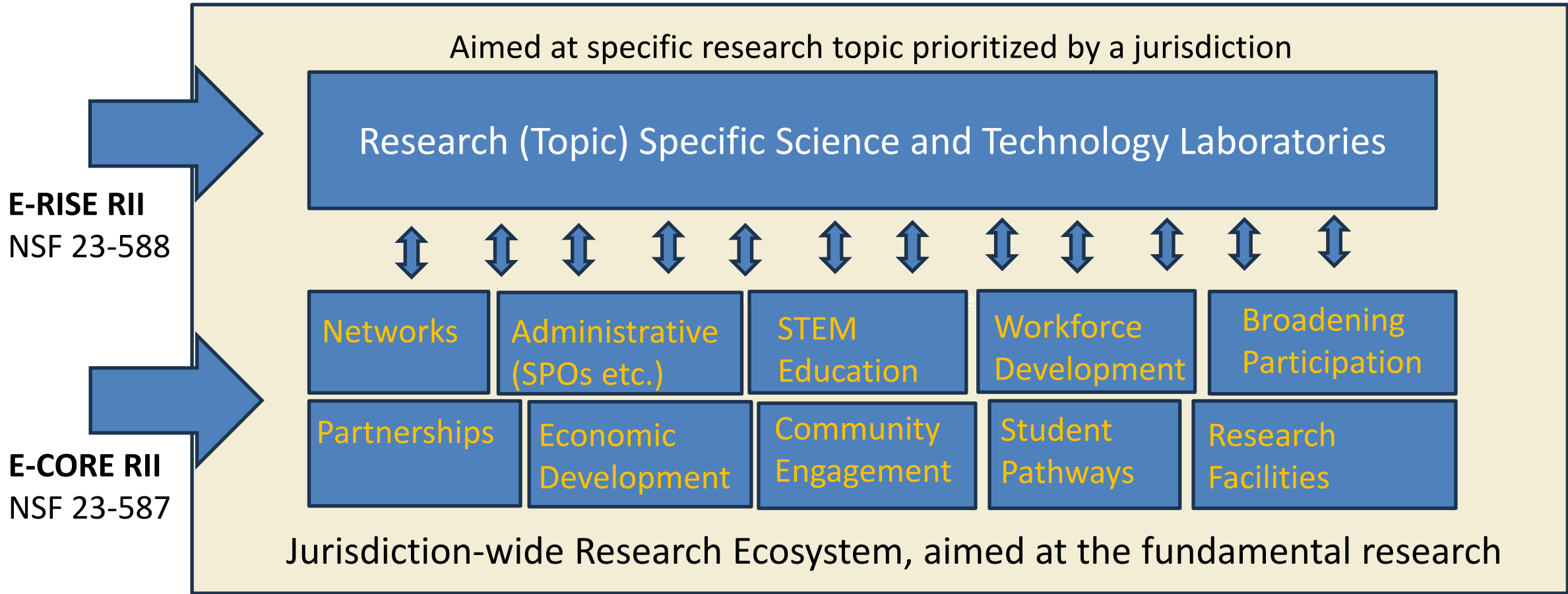
	RII Track-1* NSF 23-582	E-CORE RII NSF 23-587	E-RISE RII NSF 23-588
Duration of award	5 yrs	4 yrs + 4 yrs renewal	4 yrs + 3 yrs renewal
Max budget amount	$20M over 5 yrs	$8M + $8M in renewal = **$16M** over 8 yrs	$7M + $4.5M in renewal = **$11.5M** over 7 yrs
Max # of active awards per jurisdiction	1	N/A – not a limited submission competition	N/A - not a limited submission competition
Min # institutions	N/A	N/A	N/A
Max # institutions	N/A	N/A	N/A
Cost share amount	20% of budget	% requirement only in renewal (TBD)	% requirement only in renewal (TBD)
Due Dates	August 23, 2023	December 6, 2023 July 9, 2024 2nd Tuesday in July thereafter	January 16, 2024 August 13, 2024 2nd Tuesday in August thereafter

*The NSF EPSCoR RII Track-1 Program will be archived in fiscal year 2024.

For more information about E-CORE/E-RISE

➢ Two webinars are available on the NSF EPSCoR Website

➢ Reach out to
  – For E-CORE questions
    • EPSCoR-CORE@nsf.gov
  – For E-RISE questions
    • EPSCoR-RISE@nsf.gov

RII Track-2 Goals (NSF 22-633)

- **Up to $1.5M per year for up to 4 years**

- **Builds research capacity** through <u>interjurisdictional collaborative teams</u> in focus area(s) aligned with NSF-wide priorities

- **Combines expertise distributed in different EPSCoR jurisdictions** into a "critical mass" capable of productive research and related activities in the focus area

- **Exemplifies diversity** through strategic, broad inclusion and meaningful integration of different types of individuals, institutions, and sectors

- **Develops diverse early-career faculty**

- **Promotes productive, <u>balanced</u> collaborations** that are capable of sustained activities beyond the award period

FY23 RII Track-2 (NSF 22-633)

- ➢Focus area: "**advancing climate change research and resilience capacity to expand opportunities for disproportionately affected communities.**"

- ➢Aligned with NSF's Strategic Plan (2022-2026)

- ➢Must address the societal and economic impact aspects of the solicitation

- ➢Participation in climate change research with disproportionally affected individuals should be considered as the centerpiece of the project

- ➢Must develop a workforce that is relevant to the topic

- ➢Involvement and mentoring of early-career faculty is required

- ➢LOI: Third Tuesday in December (2023), Deadline: Fourth Tuesday in January(2024)

- ➢4 yrs. award, $4M to $6M

NM SmartGrid-Early faculty workshop

FY23 RII Track-2 AWARDS

Supporting rural livelihoods in the water-stressed Central High Plains: Microbial innovations for climate-resilient agriculture (MICRA), Kansas State University, University of Nebraska-Lincoln and Langston University

Developing effective adaptation strategies to enhance the resilience of farmers under changing climate, Auburn University

Center for Climate Conscious Agricultural Technologies (CCAT), South Dakota State University

RURAL CONFLUENCE: Communities and Academic Partners Uniting to Drive Discovery and Build Capacity for Climate Resilience, Oklahoma State University, Louisiana State University, **and** University of Nebraska-Lincoln

An interdisciplinary program for research, education, and outreach on climate change and adaptive resilience in the Yazoo - Mississippi Delta, Mississippi State University

Community-Driven Coastal Climate Research & Solutions (3CRS) for the Resilience of New England Coastal Populations, Brown University

STORM: Data-Driven Approaches for Secure Electric Grids in Communities Disproportionately Impacted by Climate Change, University of Maine, South Dakota State University, University of Puerto Rico at Mayagüez and University of Alaska Fairbanks

Where We Live: Local and Place Based Adaptation to Climate Change in Underserved Rural Communities, University of Idaho; University of South Carolina; and University of Nevada, Reno

Advancing Social and Environmental Equity through Plastics Research: Education, Innovation, and Inclusion (ASPIRE), University of Southern Mississippi

Sustainable Engineering Infrastructures and Solutions for Tribal Energy Sovereignty, University of North Dakota

Promoting N2O- and CO2-Relieved Nitrogen Fertilizers for Climate Change-Threatened Midwest Farming and Ranching, Iowa State University and Wichita State University

RII Track-4 EPSCoR Research Fellows Vision

➢ **Provides opportunities for non-tenured (or equivalent) and tenured investigators** to further develop their individual research potential through <u>extended collaborative visits</u> to the nation's <u>private, governmental, or academic research centers</u>.

➢ **Fellows will be able to:**

- – Learn new techniques
- – Benefit from access to state-of-the-art equipment and facilities
- – Strengthen collaborative partnerships
- – Extend their research toward transformative directions

➢ **Experiences gained through fellowships are intended to provide:**

- – Time to develop new or extend current research directions
- – A pathway to strengthen research connections with partners nationwide
- – Benefits that will impact the recipient's career in years to come

Sinte Gleska University (SGU) and South Dakota State University. improve sustainable production of prairie turnips and buffalo berries

➢ **PIs may bring a trainee-level researcher along for the fellowship visit**

➢ **These benefits to the Fellows are also expected to in turn <u>enhance the research capacities of their institutions and jurisdictions</u>.**

EPSCoR Track-4 Solicitation (NSF 23-535)

1) Budgets may include up to 6 months of salary for the PI and one additional trainee-level participant.
Proposals may be for up to 24 months.
2) Total funds requested may not exceed $300,000.
3) Sub-Track with NASA
4) Target ~April 2024
5) New solicitation coming soon.

Research Day in HI

EPSCoR Research Fellows Now Features Two Tracks

- ➢ **RII Track-4:NSF,** host sites may be any research institution within the United States or its territories/possessions.
  - – Generally expected to be beyond easy commuting distance from the home institution
  - – Must identify a single host site
  - – Does not need to be in an EPSCoR jurisdiction

- ➢ **RII Track-4: @NASA,** host sites are selected NASA Research Centers
  - – Specific topics are eligible based on the NASA Research Center (links to these topics are available in the solicitation)
  - – Specific Institution types are eligible
  - – Research Focus Areas: https://www.nasa.gov/stem/epscor/rii-track-4/index.html

KY – Plant Genetics

Bridge HS to BS – TCU ND

Reminders

DON'T MISS THESE OPPORTUNITIES

WHAT TO DO NEXT
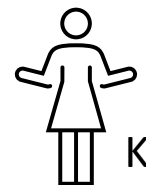
Kathryn

Commonly Overlooked or Misunderstood Opportunities

o Award Supplements:

- *REU supplement:* up to two students in one year; $8,000/student; strongly encouraged to involve members of underrepresented groups, veterans, and first-generation college students

- *General supplement:* Up to 20% of the original award, evaluated by the managing PD. Example: addition of data science/AI aspects to projects

o *EAGER:* to develop preliminary data or evidence for a high-reward (transformative) idea; leads to a full proposal. Cultivate idea with PD first: we may ask for a full proposal

o *RAPID:* severe urgency regarding the availability of or access to data, facilities or specialized equipment, including quick-response research on natural or anthropogenic disasters and similar unanticipated events

INTERN: Non-Academic Internships for NSF Grad Students

- Host organizations may include:
  - Industry laboratories or research and development groups
  - Start-ups or small businesses
  - Government agencies and National Laboratories
  - Policy think-tanks
  - Non-profit organizations
- Up to $55K for up to 6 months of internship
- Need an Intellectual Property agreement between university and Host
- Discuss idea both with award & INTERN POs

Grad Students: Access real world immersion

Industry: Mentor and access a new generation of talent

NSF: Catalyze workforce Development

Universities: Build pathways to new/stronger links with industry

INTERN announcement:
https://www.nsf.gov/pubs/2021/nsf21013/nsf21013.jsp

How to Find Opportunities—Sign Up!

What is Next: Target a Program

- Begin with:
  - **White paper**, i.e., one-page project summary
  - **Absolutely recommended: Dialog** with program officer
- Have proposal number handy for a submitted proposal
- Be an NSF **proposal reviewer—**best place to learn about what makes a winning proposal!
- **Remember, Program Directors are here to help!**
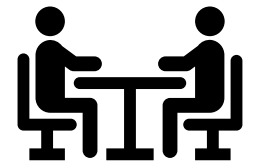
NSF Program Officers *in partnership* with the engineering community fulfill NSF's mission for the benefit of the American Public

More questions?

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