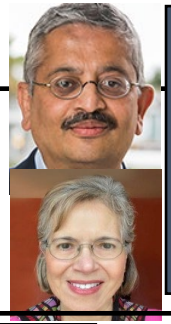
# NSF 22-534 ASCENT Webinar

## Division of Electrical, Communications and Cyber Systems (ECCS)

Please use the **Q&A** panel in Zoom to submit questions.
After the webinar, email questions to ascent@nsf.gov
Webinar Materials and updated FAQ are available online

**ECCS, ENGINEERING, NSF**

# Electrical, Communications, and Cyber Systems (ECCS)

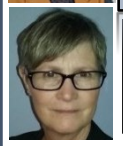


**Shekhar Bhansali**
Division Director

**Carmiña Londoño**
Deputy Division Director

## Administrative Professionals

**Tatiana Makarow**
Program Support Manager



**Ann Fay Larrow**
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**Irma Johnson**
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**Tracey May**
Program Specialist

**Sara Rudolph**
Program Specialist

**Wendy Simmons**
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**Pamela Sumpter**
Program Specialist

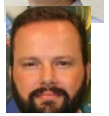
## Electronic, Photonic, and Magnetic Devices (EPMD)

**Prem Chahal**
Program Director

**Dominique Dagenais**
Program Director

**Vikram Dalal**
EXPERT

**Ruyan Guo**
Program Director



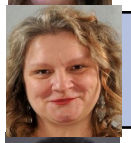
**Matt McCune**
EXPERT

**Usha Varshney**
Program Director

## Communications, Circuits, and Sensing-Systems (CCSS)

**Jenshan Lin**
Program Director

**Rosa (Ale) Lukaszew**
Program Director



**Svetlana Tatic-Lucic**
Program Director

**Zhengdao Wang**
Program Director

## Energy, Power, Control, and Networks (EPCN)

**Eyad Abed**
Program Director

**Aranya Chakrabortty**
Program Director

**Mahesh Krishnamurthy**
EXPERT

**Donald Wunsch**
Program Director

## Office of the Division Director

**Larry Goldberg**
Senior Engineering Advisor

**Vanessa Simon (Acting)**
Operations Specialist

**Richard Nash**
**Associate Program Director**

**Olga Cheltsova**
Pathway Student

**Kiki Ikossi**
AAAS Fellow

Division Director

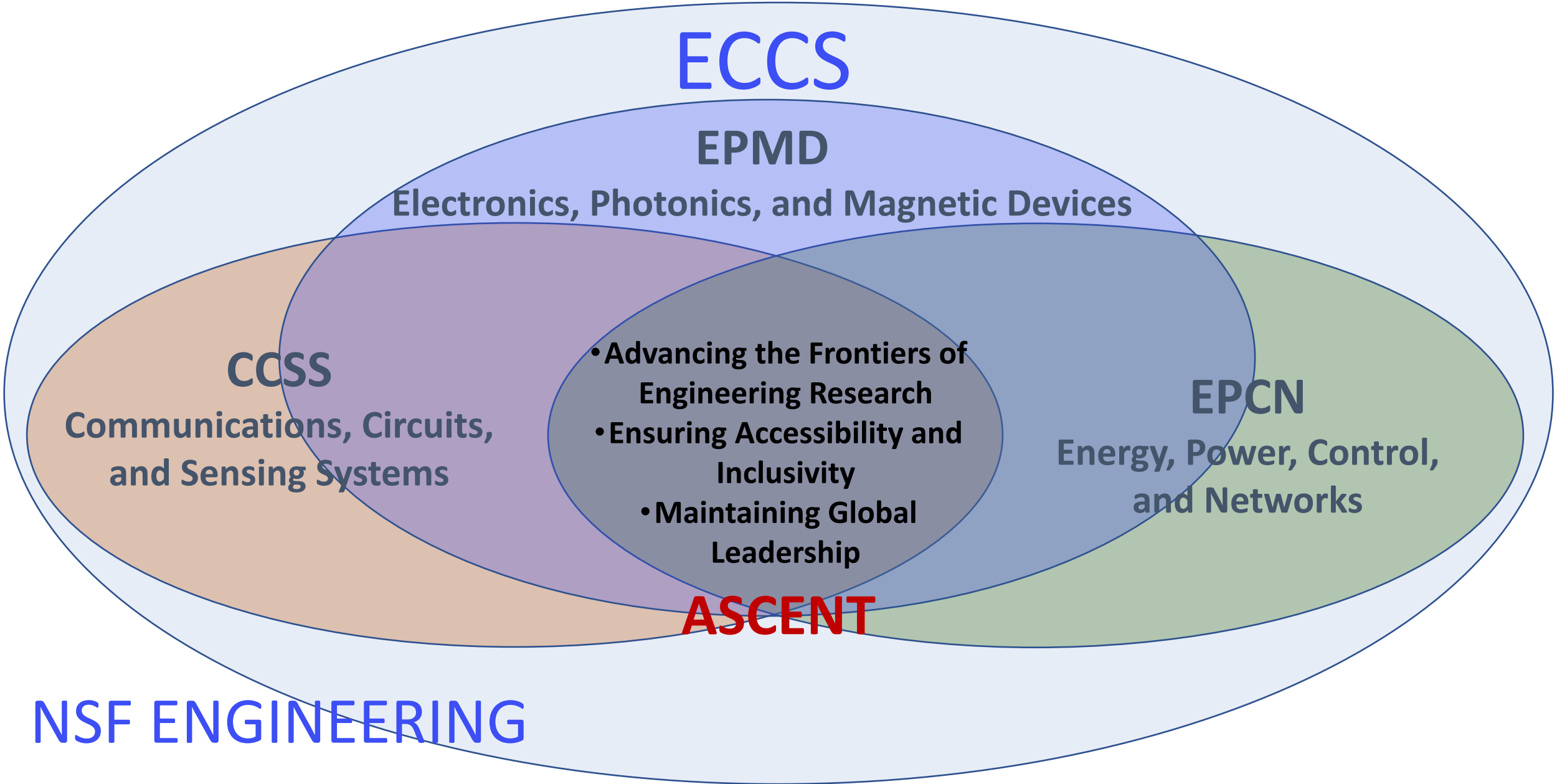
Dr. Shekhar Bhansali

# Division of Electrical, Communications and Cyber Systems (ECCS)

## Mission and Priorities

- Address fundamental research issues at the nano, micro, and macro scales underlying device and component technologies for energy and power, controls, networks, communications, computation and sensing applications.
- Support research on systems and networks for advanced engineering applications.
- Support education of a diverse workforce in electrical and computer engineering to meet the technological challenges of a 21st century global economy.

# Three Interwoven Core Program Clusters



# Addressing Systems Challenges through Engineering Teams (ASCENT)

FY2022

Solicitation page:

**NSF 22-534**: Addressing Systems Challenges through Engineering Teams

https://www.nsf.gov/pubs/2022/nsf22534/nsf22534.htm

Preliminary Proposal Deadline: **March 2, 2022**

Full Proposal Deadline: **May 31, 2022**

# ASCENT: Proposal/Award Characteristics

- **Collaborative:** At least three collaborating PIs and co-PIs contributing complementary expertise relevant to the project proposed.
- **Duration**: **4 years**
- **Total budget:** $1 million to $1.5 million
- **Estimated Number of Awards:** 4 to 5
- **Anticipated Funding Amount:** $6,000,000
- **FY22 solicitation has two major themes:**
  1) Future Semiconductor Technology (FST)
  2) Sustainable Micro- and Nano-electronics (SMN)
- **Limit** on Number of Proposals per PI/CoPI/SrP: **1**
- **Limit** on Number of Proposals per organization: **None**

# ASCENT Program

one of the **principal strategic investments** of ECCS

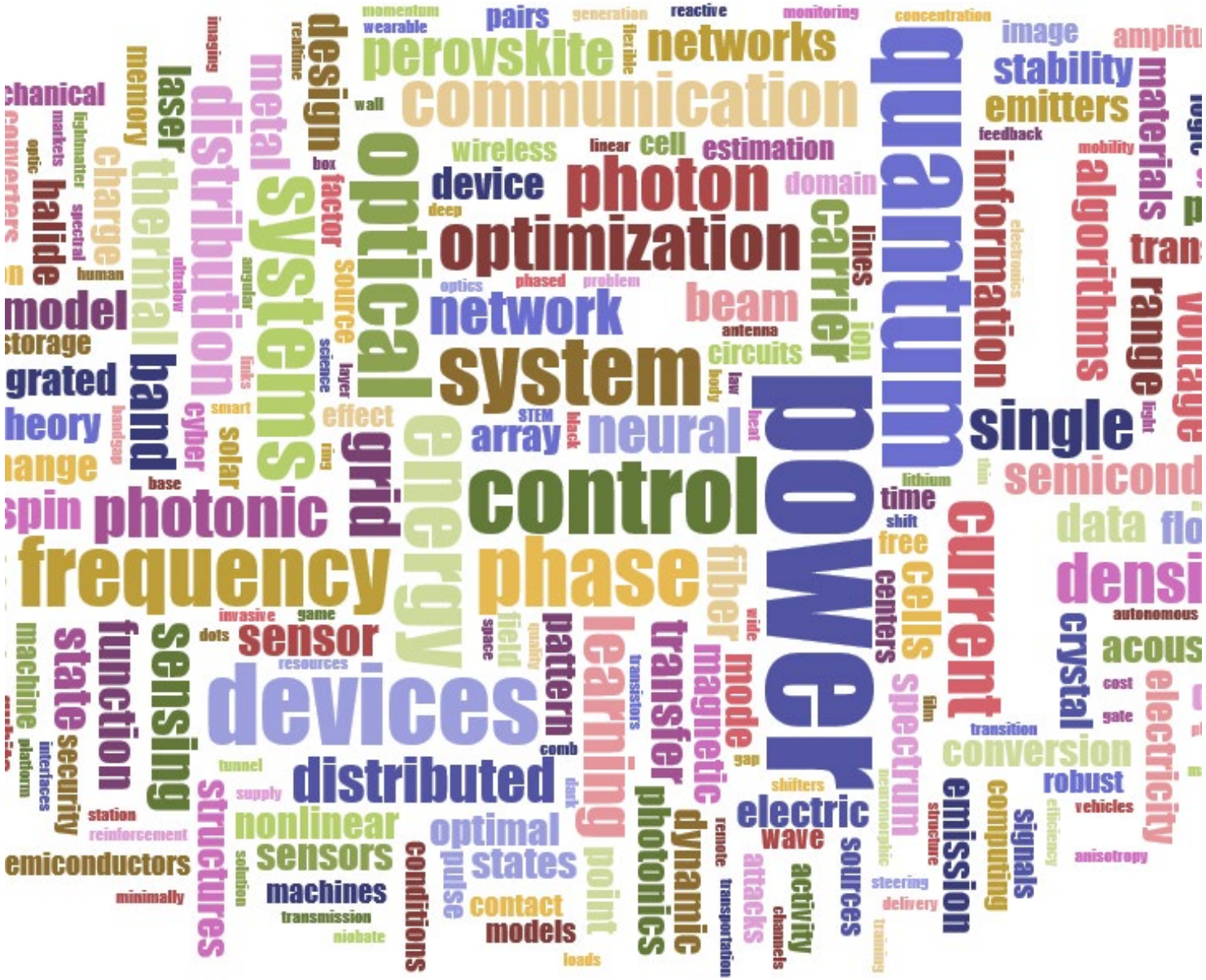
"The intent of the ASCENT program is to stimulate collaborations among different ECCS sub-communities and to enable synergistic effort addressing **large-scale cross-disciplinary** problems whose solutions are beyond the scope of individual or divided efforts."

- ❑ Emphasizes on **new collaboration modalities** among various sub-disciplines of ECCS-supported research
- ❑ Is envisioned to bring **significant impact** on a variety of application domains

# ASCENT emphasizes new collaboration modalities among various sub-disciplines of ECCS-supported research

**ASCENT supports all research areas under ECCS Core Programs**

Collaborations across research communities in devices, circuits, algorithms, communications, dynamics and controls, and machine learning, are highly encouraged.



# Each ECCS Core Program Supports a Range of Research Areas

More details at https://www.nsf.gov/funding/programs.jsp?org=ECCS
or consult an ECCS Program Officer

**Electronics, Photonics and Magnetic Devices (EPMD)**

- Electronic Devices
- Photonic Devices
- Magnetic Devices
- Cross-Cutting Activities

**Communications, Circuits, and Sensing Systems (CCSS)**

- RF Circuits and Antennas for Communications and Sensing
- Communication Systems and Signal Processing
- Dynamic Bio-Sensing Systems

**Energy, Power and Control Networks (EPCN)**

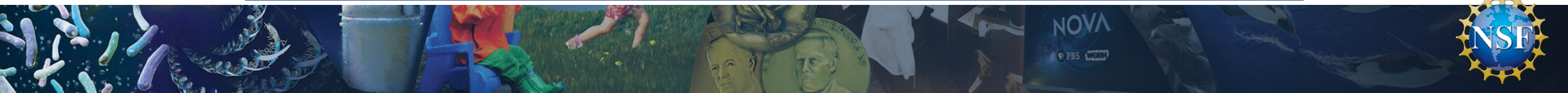
- Control Systems
- Energy and Power Systems
- Power Electronics Systems
- Learning and Adaptive Systems

ASCENT project teams are to solve compelling research problems that demand a connected portfolio of multiple integrated ECCS research areas

**Innovative ASCENT Projects**

Robust collaborations among devices, circuits, algorithmic, or network research communities

Proposals for which the research topic or the set of skills of the PIs is primarily within one research area are not appropriate for ASCENT.



# ASCENT Program is envisioned to bring significant impact on a variety of application domains

ASCENT projects are expected to lead to disruptive technologies or nucleate entirely new research fields motivated by the most pressing societal challenges the global community faces.

# ECCS supports enabling and transformative research

for engineering system applications with high societal impact in health, security, and economic prosperity of the nation

and aligns with national priorities:

- Semiconductors and Nanotechnology
- Quantum Information Science
- Communications Resiliency
- Artificial Intelligence
- Secure and Resilient Power Systems
- Advanced Manufacturing, Industries of the Future
- NSB Vision 2030 Developing STEM Talent for America, etc.

# FY22 ASCENT Identified Two Themes for High Impact

ECCS invites ASCENT proposals that address fundamental cross-disciplinary research challenges in semiconductor and microelectronics

**(1) Future Semiconductor Technology (FST)** and

**(2) Sustainable Micro- and Nano-electronics (SMN).**

An **Enabling** and **Transformative** ASCENT Project

- Inspires **convergence** research - research driven by a specific and compelling problem and deep integration across disciplines
- **Advances** the state of current engineering endeavors
- Responds to emerging **opportunities** and/or national **priorities**

FY22

# Future Semiconductor Technology (FST)

ASCENT research in this theme must advance fundamental understanding or create knowledge and innovations that

- **extends** semiconductor device frontiers beyond Moore's Law
- **enables** systems and architectures beyond the von Neumann paradigm
- **empowers** functionalities or **enhances** performance by integration with semiconductor integrated circuits

FY22

# Sustainable Micro- and Nano-electronics (SMN)

ASCENT research in this theme focuses on energy efficiency and environmental impact of micro- and nano-electronics

- green energy transduction
- high energy efficiency
- low environmental impact

for low power electronics, ubiquitous sensing, always available communications, and Internet-of-Things edge computing

# Proposals may leverage other activities/resources and broaden opportunities for participation

- HBCU and Minority Serving Institutions
- Institutions of EPSCoR States
- Industrial collaborations
- Research Experience for Undergraduate or Teachers
- International collaborations

- Industrial Collaborations - Grant Opportunities for Academic Liaison with Industry (GOALI) mechanism can be used in conjunction with this solicitation.

# Merit Review Criteria (see solicitation for details)

- **Intellectual Merit**
- **Broader Impacts**

**ASCENT Specific Review Criteria:**

- **Project Scope**: compelling large-scale convergent engineering research that critically integrates more than one ECCS research area
- **Commitment of the Investigators**: work synergistically to accomplish the project objectives including engaging and training students in collaborative and convergent research
- **Composition of the Team**: Investigators have the necessary expertise in related research fields to accomplish the project objectives.
- **Justification for Support**: Project scope commensurate with requested budget, size of the team, and project duration.

# Preliminary Proposals

**Project Summary** (1-page) must specify Research Theme: FST or SMN

**Project Description** (5-page)

- **Vision and Goals** - identify knowledge gaps or engineering challenges to address
- **Innovation and Approach** - describe the main innovation and the approach
- **Interdisciplinary and Transformative Impact**

- Identify fundamental research problem - allow assessment of main ideas and approaches for potential transformative impact
- Establish sound rationale and team's ability - allow assessment of the concepts and the team as to pursue such a project

Preliminary Proposals are panel or *ad hoc* reviewed for NSF to invite full proposal submissions.

Reviews and available Panel Summaries will be provided to PIs – valuable feedback on responsiveness and competitiveness of the preliminary proposal.

# Timelines for ASCENT 2022

## Preliminary Proposal – Required

**Due March 2, 2022,** Submit through FastLane or Research.gov

Cover Sheet with Title and (minimum 3) PI and CoPIs

Project Summary – 1 page: identify Research Theme(s) Targeted

Project Description – 5 pages

References, Budget & Justification (lead institution only)

**List of Key Personnel Involved – 1 page**

Bio Sketches and C&P support – for PI/CoPIs listed on cover page only

COA (Collaborators and Other Affiliations Information)

**Full Proposal Invitation**: Middle of April 2022

## Full Proposals – by Invitation only: Due May 31, 2022

Project description (15 pages) must contain a section labeled "**Addressing ASCENT Solicitation Specific Review Criteria**"

Requires a **Research Integration Plan** – 2 pages

# ASCENT Solicitation FY22 – different from FY21

- The current solicitation will accept proposals that address **specified research themes** described in the solicitation.
- Instructions for **preliminary proposal** preparation are updated with **theme selection requirement**.
- Current and pending support information **not required for Non-PI/co-PI** personnel for preliminary proposal submission.
- Biographical sketches **not required for Non-PI/co-PI** personnel for preliminary proposal submission.
- Instructions for full proposal preparation are updated with **theme selection** requirement.
- Others
  - Preliminary and Full Proposal submission dates are updated.
  - Estimated Number of Awards is updated to be 4 to 5.
  - The list of Cognizant Program Officers is updated.

# Examples of ASCENT Funded Research

- What Has Been Funded
  - ➢ Browse projects funded by this program
  - ➢ Map of recent awards made through this program
  - ➢ Or through Award Advanced Search using keyword “ASCENT” at

    https://www.nsf.gov/awardsearch/advancedSearch.jsp

# For More Information

**Visit ASCENT funding page** with links to solicitation and events

**Contact Program officers listed in the solicitation by email: ascent@nsf.gov**

**Ruyan Guo**
Program Director

**Zhengdao Wang**
Program Director

**Aranya Chakrabortty**
Program Director

## Reach out to more ECCS Program Officers

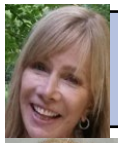
**Prem Chahal**
Program Director

**Dominique Dagenais**
Program Director

**Vikram Dalal**
EXPERT

**Usha Varshney**
Program Director

**Jenshan Lin**
Program Director



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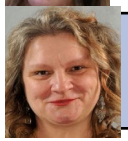
Program Director



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EXPERT

**Matt McCune**
EXPERT

**Kiki Ikossi**
AAAS Fellow

# Q&A

- During the webinar, use the **Q&A** panel in Zoom to submit questions.

- Check the webinar materials and updated ASCENT FAQ online

https://beta.nsf.gov/funding/opportunities/addressing-systems-challenges-through-engineering-teams-ascent-0

- Email additional questions to ascent@nsf.gov

**THANK YOU**