

# **NSF 25-539: Verticals-enabling Intelligent Network Systems (VINES)**



## **Introduction to NSF VINES and Track 1 Overview**

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**NSF VINES Informational Webinar**

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# VINES Objectives

- Support [use-inspired fundamental research](#) and [vertical-driven technology development](#) that will drastically improve and shape the future generations of advanced wireless and intelligent networked systems (NextG)
- Focus on innovations across various disciplines that lead to [leaps in performance and capabilities](#) without compromising resilience and interoperability
- Enhance [U.S. competitiveness](#) and leadership in NextG as well as address the need for skilled [workforce](#)
- Enable formation of [U.S. and international collaborations](#) with like-minded countries to [speed up the rate of innovations](#) towards open, global, interoperable, reliable, resilient, and secure networks
- Focus on emerging topics potentially critical to future generations of wireless networks and networked systems, such as cloud, AI & machine learning native designs, dynamic spectrum sharing and integrated sensing and communications



# VINES Motivation

(Public + Private + International) + (fundamental research + translational research)

+ use-driven / industry verticals

- **The innovation space for NextG is vast and covers many disciplines**
  - Innovation covers both fundamental research & active translation pathways from innovation to successful products
- **NextG innovation involves international players**
  - Joint Statement Endorsing Principles for 6G: Secure, Open, and Resilient by Design
- **Multi-sector partnerships needed**
  - Academia / Industry / Government / International



# VINES Partners

- NSF (Lead/Coordinating Agency)
  - Directorates: CISE/TIP/ENG/MPS
- Industry Partners (T1)
  - Ericsson
  - Intel
  - Qualcomm
- International Partners
  - Finland: RCF (T1) and BF (T2)
  - India: MeitY (T1 & T2)
  - Japan: JST (T1) and NICT (T2)
  - Sweden: SRC (T1)
- Federal Partners
  - NIST, OUSD (R&E), and DHS
- Up to ~\$100M total



# VINES: Program Structure

## Track 1: Use-inspired Fundamental Research: ~33M US + International

- Use-inspired fundamental research
- 3 years, ~1.5M /award

Funding source: Governments + Track 1 Industry Partners

International funding for int teams.

## Track 2: Verticals-driven Translational Research: ~33M US + International

- Verticals-driven translational research
- Mix of industry and university awardees
- 3 years, ~\$6M /award

Funding source: Governments

International funding for int teams.



# Deadlines

- Track 1:
  - August 25, 2025: Full Proposal Deadline
- Track 2:
  - August 25, 2025: Concept Outline Deadline
  - September 25, 2025: Full Proposal Deadline
- (due by 5 p.m. submitting U.S. organization's local time)



# Proposal Submission Instructions

- Pls read instructions closely – additional guidelines for each track
- Additional guidelines for international collaborative proposals
- Title:
  - Must begin with "**VINES: Track 1:**" or "**VINES: Track 2:**"
  - International collaborative proposals must begin with "**VINES: Track X:** (where X: is "1" or "2") **NSF-international funding agency:**" where 'international funding agency' is replaced by one of the following acronyms as applicable for the proposal: 'RCF', 'BF', 'SRC', 'JST', 'NICT' or 'MeitY'.
    - e.g.: "**VINES: Track 1: NSF-RCF:**", "**VINES: Track 2: NSF-BF:**" etc.
- Other guidelines: please check the solicitation



# International Collaborative Proposals: Eligibility Letters

- “International collaborative proposals”
  - involve at least one US-based organization and at least one organization based in, and seeking funding from, one of the international partner agencies
- Review
  - International collaborative proposals will be reviewed by NSF in accordance with the NSF standard review process
- Eligibility Letter is required
  - VINES international partner agency provides a "PI(s) Eligibility Letter" to the foreign PIs, **which must be included in the proposal submission to NSF**
- How to obtain the eligibility letter
  - Foreign collaborators should follow instructions **on international partner websites**, listed in this solicitation, to determine the process for obtaining the eligibility letter from the respective agency



# VINES Track 1: Use-inspired Fundamental Research

## **Group A: Advanced Network Capabilities**

- A1. Enabling Emerging Verticals
- A2. Energy Efficiency
- A3. Accessibility
- A4. Resilience
- A5. Convergence
- A6. Manageability and Control
- A7. Exploratory Capabilities

## **Group B: Enabling Technologies**

- B1. AI-native Design
- B2. Spectrum Sharing-native Design
- B3. Integrated Sensing and Communications (ISAC)
- B4. Security and Privacy
- B5. Exploratory Enabling Technologies / Paradigms

Each Track 1 project must target at least one Group A capability and one Group B enabler



# VINES Track 1: Group A: Advanced Network Capabilities

## A1. Enabling Emerging Verticals

- Proposals choosing this research vector need to clearly specify the target emerging vertical and the challenges that it presents to NextG

## A2. Energy Efficiency

- Focuses on innovative system level solutions to address this challenge to make a significant impact on managing the total energy consumption

## A3. Accessibility

- Refers to challenges to ensure that everyone, regardless of location, socioeconomic status, or physical ability, can connect and use networks effectively

## A4. Resilience

- Resilience continues to be a major requirement for NextG networked systems that requires continued research and innovation

## A5. Convergence

- Involves the integration of multiple network types (e.g., fixed, mobile, wireless, terrestrial, and non-terrestrial) into a unified architecture

## A6. Manageability and Control

- Is increasingly challenging with the expansion and diversity of the supported capabilities and services

## A7. Exploratory Capabilities

- Proposers are free to suggest other new and emerging network capabilities that require innovation to enable in future networks
- A proposer should make a compelling case for such alternative RV(s) in the project description



# VINES Track 1: Group B: Enabling Technologies

## B1. AI-native Design

- Refers to NextG networks designed with (AI) as an integral component, rather than as an add-on
- This RV aims to overcome some of the fundamental challenges of applying AI for advancing NextG

## B2. Spectrum Sharing-native Design

- Sharing-native networks refers to communication networks designed to operate well in shared spectrum bands
- Sharing-native networks integrate spectrum-sharing principles and technologies as foundational features

## B3. Integrated Sensing and Communications (ISAC)

- ISAC innovations enabling more adaptive and context-aware NextG

## B4. Security and Privacy

- Innovations to significantly improve security and privacy in NextG networks

## B5. Exploratory Enabling Technologies / Paradigms

- Proposers are free to pursue research in other emerging technologies, such as quantum communications and sensing, that have the potential to enable new advanced capabilities or features in NextG
- Alternatives must be compellingly argued and justified



# VINES – Track 1: Project Budget

- Duration: Up to 3 years
- Budget limit up to \$1.5M total
  - U.S.-only project: Up to \$1.5M
  - International collaborative project: Up to \$1.5M total from both countries; U.S. funding up to \$750K for U.S. team
- Track 1 proposals must address one or more research vectors (RV) from each of the two Groups A and B
- Each proposal should clearly identify the RVs chosen in the text of the project description and keywords



# VINES - Track 1: Submission Guidelines

- **Limit on Number of Proposals per Organization:**
  - There are no restrictions or limits.
- **Limit on Number of Proposals per PI or co-PI for Track 1: 3 as follows**
  - No more than 2 Track 1 U.S.-only proposals (i.e. proposals that do not have an international collaboration)
  - In addition, an individual may be listed as PI, co-PI, and/or Senior/Key Personnel on no more than 1 Track 1 international collaborative proposal
  - These limits are independent of Track 2
- **Keywords:**
  - Track 1: Each proposal must include the relevant Research Vectors (RVs) as keywords using the format "RV:". For example, a proposal addressing RVs A1 and B3 should list keywords as "A1, B3" along with other project-relevant keywords.
- Please read the guidelines and conditions closely



# VINES - Track 1: Project Description

- Must include a section titled "**Addressing VINES Solicitation-Specific Review Criteria**" (about 1 page in length). This section should explain how the proposal meets the solicitation-specific review criteria for the track that the proposal is addressing
- Must include a section titled "**Evaluation Plan**" that provides enough details about the evaluation of the proposed research. Additional details can also be provided under the Management Plan in supplementary documents.
- Senior/Key Personnel and Supplementary Documents: see solicitation
- Letters of Support/Collaboration:
  - Letters of support are not permitted.
  - Letters of collaboration should follow the PAPPG guidelines (Chapter 2, Section C.2(j)).
  - Industry Partners will not provide letters of collaboration and/or commitment for proposals submitted to Track 1 of this program.



# VINES - Track 1: Management Plan

- Must be submitted as a supplementary document. Not considered part of the 15-page project description limitation
- Should not exceed a total of 4 pages for Track 1 proposals
- Must include the following numbered sections:
  1. a list of project personnel, including their affiliation, expertise and project roles
  2. a plan for collaborative team coordination and project management
  3. a detailed project schedule identifying major tasks, inputs to each task, milestones with matching demonstrations/ deliverables (including a Gantt chart), associated risks and mitigation approaches.
  4. a brief plan for establishing and maintaining an up-to-date project website.



# VINES - Track 1: Intellectual Property Rights

- Track 1 recipients supported by NSF (i.e., U.S. teams) must grant the sponsoring entities (the U.S. Government and the industry partners named in this solicitation) a non-exclusive, worldwide, paid-up, non-transferable, royalty-free license to any intellectual property resulting from research conducted under the program. [Note: the [Bayh-Dole Act](#) provides similar rights to the U.S. Government for patents on inventions made under federal funding.] This license extends to each industry partner's subsidiaries and contractors, at its discretion, specifically for use in connection with the partner's products and/or services. recipients shall grant the license to each industry partner unless the industry partner opts to decline the license. Track 1 recipients will not be required to license any background intellectual property, but they may voluntarily negotiate agreements regarding background IP with industry partners. NSF will not enforce or participate in these negotiations, and no NSF funding will be contingent on them.
- Track 1 recipients may delay publication of data and software describing inventions to allow for patent applications. Nevertheless, NSF's terms and conditions will require that recipients promptly publish all results, data, and software generated during their research.



# NSF VINES Track 2 Focus: Technology Development, Demonstration & Translation

Support development, demonstration and translation of potential NextG technologies that will result in performance or capabilities critical to enabling emerging vertical application industries.

Accelerate the flow of technologies derived from use-inspired research to proofs of concept, including prototype development and testing, to product/solution development, to market creation and to ultimately the desired societal, national security and economic impacts.

NSF VINES Track 2 Informational Webinar:  
Tomorrow June 17, 2025



# VINES Program Contacts

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# **NSF VINES**

## **General Overview & Track 1**

**Q&A**

