



NATIONAL SCIENCE FOUNDATION  
2415 EISENHOWER AVENUE  
ALEXANDRIA, VIRGINIA 22314

NSF 23-065

## Dear Colleague Letter: SII-NRDZ-SBE: Radio Spectrum Sharing – The Human Environment

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February 28, 2023

Dear Colleagues:

The purpose of this Dear Colleague Letter (DCL) is to inform researchers in the social, behavioral and economic sciences (SBE) of a funding opportunity under the [Spectrum Innovation Initiative](#) (SII) of the National Science Foundation (NSF). The electromagnetic spectrum has disparate users including commercial companies (wireless communication, navigation, etc.), scientists (radio astronomy, geospace sciences, etc.), air traffic controllers and first responders. A major objective of the SII, pursued through its [National Radio Dynamic Zones \(SII-NRDZ\) program](#), is to advance dynamic and agile sharing of the electromagnetic spectrum. The term dynamic and agile sharing refers to methods enabling electromagnetic spectrum users to safely operate closer together in space or frequency or to safely alternate spectrum access more rapidly than is possible with the geographic exclusive licenses used in traditional spectrum management. Widespread use of dynamic and agile spectrum sharing is essential to mitigate spectrum congestion problems that constrain growth in many sectors of society and the economy.

Through this DCL, NSF invites both proposals and requests for supplements to active NSF awards. Both proposals and supplemental funding requests should focus on research that helps advance the use of dynamic spectrum sharing by studying its human environment, which includes studying the economic, social, and incentive issues associated with: (a) adoption by private and public sector entities; (b) understanding by and support from the general population; and (c) paths to overcome barriers to deployment and use.

Topics of particular interest include:

- *Mechanism design for dynamic spectrum sharing*: incentive-compatibility, strategy-proofness, efficiency, feasibility based on technological constraints
- *Competition preservation in spectrum sharing*: Mechanisms to prevent collusion among spectrum users (since spectrum sharing requires information sharing), mechanisms to

- ensure impartiality of spectrum band managers
- *Market design for spectrum sharing among or with current exclusive license holders:* multi-unit auctions, bilateral auctions, other ways to enhance efficiency
- *Political economy of spectrum regulation:* policy measures that facilitate adoption of dynamic spectrum sharing, economic methods to assess the value of shared spectrum
- *Ethical issues of dynamic spectrum sharing:* privacy issues and protections, impacts on and mitigations for marginalized communities
- *Waiting times and service quality under dynamic spectrum sharing:* assessment using queuing theory or other methods, impacts on service utility and desirability
- *Sociology of technology adoption:* positive and adverse effects of the electromagnetic spectrum on society that influence the adoption of dynamic spectrum sharing, general study on barriers to adoption of new technologies

The SII-NRDZ program seeks to foster a collaborative research community. Investigators responding to this DCL are strongly encouraged to include the following in the proposed effort.

- Consider synergies and conflicts between the SBE issues being studied and the choice of technological spectrum sharing approach or its parameters.
- As one part of the envisioned project, take the system, facility, site, or application of an active SII-NRDZ project as a concrete case study.
- Attend SII-NRDZ community open meetings held twice a year, alternating in-person and virtual, each two days in duration. In-person meetings will notionally be in the Washington, DC area.

Information about active SII-NRDZ projects is available from presentations made at the first SII-NRDZ community open meeting, NRDZCOM1, held December 14-15, 2022. Briefings and video recordings may be found on the [SII web site](#). NSF encourages but does not require including a Letter of Collaboration from a current SII-NRDZ awardee in proposals submitted in response to this DCL. NSF will provide an opportunity for interested proposers to meet PIs of the active SII-NRDZ projects in a virtual setting on a date to be announced. NSF encourages applicants who are not collaborating specifically with NRDZ awardees to collaborate with spectrum subject matter experts; strong proposals will make it clear that the proposed research is focused on spectrum sharing.

The following funding mechanisms are available for proposals submitted in response to this DCL.

1. Supplemental funds awarded to active NSF awards (SII-NRDZ or other programs). Supplemental funding requests must be prepared according to the requirements contained in Chapter VI.E of the [NSF Proposal & Award Policies & Procedures Guide](#) (PAPPG). Supplemental funding requests should be submitted by using the

“Supplemental Funding Request” function in Research.gov and should include a description of the proposed work, a budget and a budget justification.

2. Full proposals should be submitted to either the [Economics Program](#) or the [Sociology Program](#) by COB submitter’s local time on May 30, 2023.

All submissions (full proposals and supplemental funding requests) will go through external merit review, with funding decisions beginning in July 2023.

Requests should follow the following guidelines to be fully competitive for available funds:

- The budget request should not exceed \$300,000.
- Proposals and supplemental funding requests must be received on or before May 30, 2023.
- Upon submission, proposers **MUST** send notification by email to [SII@nsf.gov](mailto:SII@nsf.gov).
  - For proposals: Send the title and NSF Proposal ID.
  - For supplemental funding requests: Send the original award number and the NSF Proposal ID assigned to the supplemental request upon submission.
- Full Proposals: titles should start with the keyword “SII-NRDZ-SBE.”
- Supplemental Funding Requests: Contact one of the program officers listed below in advance of submitting your request to be sure they are aware you are planning to send a request in response to this DCL.

Cognizant Program Officers:

Please note that the following information is current at the time of publishing. See the [SII web site](#) for updates to the Cognizant Program Officers. For general inquiries, send email to the Spectrum Innovation Initiative program team at [SII@nsf.gov](mailto:SII@nsf.gov).

- Eric Bahel (SBE/SES), [ebahel@nsf.gov](mailto:ebahel@nsf.gov)
- Nancy Lutz (SBE/SES), [nlutz@nsf.gov](mailto:nlutz@nsf.gov)
- John Chapin (MPS/AST), [jchapin@nsf.gov](mailto:jchapin@nsf.gov)
- Jonathan Williams (MPS/AST), [jonwilli@nsf.gov](mailto:jonwilli@nsf.gov)
- Alhussein Abouzeid (CISE/CNS), [aabouzei@nsf.gov](mailto:aabouzei@nsf.gov)
- Murat Torlak (CISE/CNS), [mtorlak@nsf.gov](mailto:mtorlak@nsf.gov)

Sincerely,

Kellina M. Craig-Henderson  
Assistant Director  
Directorate for Social, Behavioral and Economic Sciences

Sean L. Jones  
Assistant Director  
Directorate for Mathematical and Physical Sciences

Margaret Martonosi  
Assistant Director  
Directorate for Computer and Information Sciences and Engineering