NATIONAL SCIENCE FOUNDATION
2415 EISENHOWER AVENUE
ALEXANDRIA, VIRGINIA 22314

NSF 20-079

Dear Colleague Letter: Supplemental Funding Opportunity to explore feasibility of National Radio Dynamic Zones (NRDZ)

May 5, 2020

Dear Colleagues:

With this Dear Colleague Letter (DCL), the National Science Foundation (NSF) announces a supplemental funding opportunity to explore the feasibility of National Radio Dynamic Zones (NRDZ), under the purview of the Foundation's new ***Spectrum Innovation Initiative***.

SPECTRUM INNOVATION INITIATIVE

The **NSF *Spectrum Innovation Initiative*** (SII), described in the President's FY 2021 Budget Request for NSF[1], seeks to make advancements in the three research & development priorities identified in *R&D Priorities for American Leadership in Wireless Communications*[2], progress in which is seen as critical to United States economic, science, and technology leadership: (1) Pursue spectrum flexibility and agility to use multiple bands and new waveforms, (2) Improve near real-time spectrum awareness, and (3) Increase spectrum efficiency and effectiveness through secure autonomous spectrum decision making. Through a multi-pronged approach, the ***Spectrum Innovation Initiative*** seeks to promote dynamic and agile utilization of the electromagnetic spectrum, while fostering innovation and security for all users, passive and active. This DCL describes one of those approaches: National Radio Dynamic Zones.

NATIONAL RADIO DYNAMIC ZONE

A key goal of the SII is to facilitate at-scale test capabilities that will support ongoing research and development of enhanced, next-generation spectrum management techniques, and thereby promote the nation's leadership in the efficient use of the electromagnetic spectrum. To this end, NSF intends to support the development and establishment of NSF National Radio Dynamic Zone[3] (NSF-NRDZ) test beds in a few geographic areas. NRDZ seeks to protect normal receivers outside a defined geographic region from transmitters inside the

zone. Such transmitters could include experimental wireless systems utilizing novel waveforms, new spectrum bands and/or high power levels. NRDZ will be governed by rules that determine what power levels may escape from the zone. NSF intends to coordinate the establishment of such a zone by working with the Federal Communications Commission (FCC) and the National Telecommunications and Information Administration (NTIA). NSF-NRDZ test beds will foster innovation by enabling new paradigms in dynamic spectrum sharing between electromagnetic transmitters and receivers, while enabling transition-to-practice through robust partnerships with public- and private-sector organizations.

We envision that the NSF-NRDZ test beds could be built and expanded upon current experience with national quiet zones, innovation zones, and coordination zones, for example the National Radio Quiet Zone[4], Table Mountain, the Puerto Rican Coordination Zone, and the NSF-funded Platforms for Advanced Wireless Research[5] (PAWR) platforms in Salt Lake City, New York City (both designated as FCC Innovation Zones[6]), and Raleigh, NC.

The long-term goal of the NSF-NRDZ is to provide enhanced spectrum usability and access for both passive and active users of the spectrum, piloting the technology in a few limited, yet diverse, geographic areas, to enable wider future deployments.

SUPPLEMENTAL FUNDING OPPORTUNITY

With this DCL, NSF is offering an opportunity to explore the feasibility of establishing NRDZ and identify the underlying research and deployment challenges, through supplements to existing NSF awards. Existing awardees of facilities and/or platforms owned/operated/funded by NSF are encouraged to submit supplemental funding requests, building on their expertise in national quiet zones, innovation zones, and coordination zones.

The NRDZ-relevant questions that NSF seeks answers for through these supplements include:

a. What geographic areas could act as potential NRDZ test zones?
b. What frequency bands can be reasonably supported by a NRDZ?
c. How can the radio frequency environment in the test zone be characterized to support real-time situational awareness, including baseline radio noise data?
d. How can experiments designed to increase spectrum-use efficiency be supported?
e. What is the necessary hardware and software infrastructure needed in a NRDZ?

Supplemental funding requests should be aligned with the statement of work in the original award. Potential applicants should propose a scope of work that has the potential to answer the above questions within an appropriate period that does not exceed the end date of the original award.

Additional information can be found on the *Spectrum Innovation Initiative* program website.

SUBMISSION GUIDELINES

Prior to submitting an NRDZ supplemental funding request, proposers are required to submit a white paper, not exceeding three pages, summarizing their request, via email to sii@nsf.gov for consideration. The SII program team will subsequently invite submission of supplemental funding requests from those proposers who demonstrate their ability to answer the above questions.

Guidance on the preparation and submission of supplemental funding requests is contained in the NSF *Proposal and Award Policies and Procedures Guide (PAPPG)*, Chapter VI.E.4. Requests should be submitted using the "Supplemental Funding Request" function in FastLane and should include a brief description of the proposed activity, a budget and a budget justification. Requests must demonstrate how the proposed activity addresses the questions relevant to the ***NRDZ***, as identified in this DCL. Additionally, the SII program team must be notified when a supplemental funding request is submitted, to sii@nsf.gov.

If data are being collected, the request should address how any standards for requirements related to spectrum monitoring will be followed[7]. If the total supplemental funding for a project received over the lifetime of the project exceeds 20% of the original award amount, including the proposed request, then the proposer is asked to bring this to the attention of the cognizant program officer prior to submitting the supplemental funding request.

This DCL will expire on July 1, 2021. For consideration for funding in FY 2020, proposers should email sii@nsf.gov of their intent to submit a supplemental funding request with the information identified above by June 1, 2020. Invited supplemental funding requests must be received no later than July 1, 2020.

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[1] https://www.nsf.gov/about/budget/fy2021/pdf/fy2021budget.pdf

[2] https://www.whitehouse.gov/wp-content/uploads/2019/05/Research-and-Development-Priorities-for-American-Leadership-in-Wireless-Communications-Report-May-2019.pdf

[3] National Radio Quiet and Dynamic Zones, https://www.doncio.navy.mil/CHIPS/ArticleDetails.aspx?ID=10299

[4] https://greenbankobservatory.org/about/national-radio-quiet-zone/

[5] Platforms for Advanced Wireless Research (PAWR); see https://www.advancedwireless.org.

[6] https://www.fcc.gov/document/fcc-establishes-first-two-innovation-zones

[7] For example, https://nvlpubs.nist.gov/nistpubs/ir/2015/NIST.IR.8053.pdf

COGNIZANT PROGRAM OFFICERS

Please note that the following information is current at the time of publishing. See the Spectrum Innovation Initiative program website for any updates to the Cognizant Program Officers To contact any of the program officers listed below on matters relating to this DCL, it is highly preferable to send an email to the ***Spectrum Innovation Initiative*** **Program Team at** sii@nsf.gov. This will ensure consistent and quick responses to your queries.

- Robert D. Fleischmann (BIO/DBI) (703) 292-7191
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Sincerely,

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