



NATIONAL SCIENCE FOUNDATION
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ARLINGTON, VIRGINIA 22230

NSF 16-096

Dear Colleague Letter: Advanced Wireless Research Platforms: Sustaining U.S. Leadership in Future Wireless Technologies

June 9, 2016

Dear Colleagues:

With this Dear Colleague Letter (DCL), the National Science Foundation (NSF) is announcing its intention to support, subject to the availability of funds, the development of a sophisticated array of advanced wireless research platforms enabling at-scale experimentation for the next generation of wireless technologies.

The burgeoning Internet of Things (IoT) coupled with the increasing desire for real-time data analytics and augmented/immersive reality applications will accelerate the proliferation of wireless devices and massive growth of wireless traffic in the coming decades, yielding a new era of communication that will require ubiquitous high-speed wireless connectivity with improvements in coverage, reliability, and latency. Conventional "4G LTE" and WiFi networks will not be able to meet these expectations, prompting wireless carriers globally to look toward [the next generation of wireless technologies \(popularly called &"5G"\) and beyond](#).

NSF has long supported pioneering research in developing advanced wireless technologies, including Massive MIMO, millimeter-wave (mmWave) networks, dynamic spectrum sharing, network virtualization, emergent wireless network architectures, software-defined cognitive radios, wideband antenna designs, and dynamic tunable filters. These areas are likely to be critical components of next-generation standards in wireless technologies for both local-area and wide-area networks.

NSF intends to establish an array of mid- to large-scale advanced wireless research platforms that provide key infrastructure for research and evaluation across critical technology spaces, including those named above.

The research enabled by these new national resources will provide the at-scale testing infrastructure necessary to advance wireless communications over the next five to 15 years, while also fostering synergies with ongoing NSF investments in cloud computing, software-defined networking (SDN; e.g., through [the Global Environment for Network Innovations, or GENI](#)), and [Smart & Connected Communities](#), to name a few.

Participation by a wide array of industry partners, ranging from wireless service providers and network equipment makers to device vendors, will be essential to enabling the success of the advanced wireless research platforms. To this end, NSF aims to establish a diverse public-private partnership that will offer the benefit of addressing new research challenges, increasing education and learning about wireless technologies and data networking, enhancing industry-academic cooperative research, and accelerating technology transfer and commercialization.

The public-private partnership shall be open to all industry participants with an interest in promoting advanced wireless networking research. Any organizations interested in learning more about the public-private partnership are encouraged to contact Thyaga Nandagopal, Program Director for Networking Technology and Systems (NeTS), at tnandago@nsf.gov.

The advanced wireless research platforms will be realized through a phased approach that will:

- Develop a broad public-private partnership to support funding, planning, and governance of the advanced wireless research platforms;
- Establish and manage individual research platforms; and
- Support pre-competitive, fundamental, open research on the research platforms, in addition to allowing some proprietary research by industry partners.

Through this effort, NSF aims to sustain US leadership in the data networking and wireless communications sector, while potentially creating new disruptive economic models that will foster innovation and job growth over the next decade and beyond.

If you have questions concerning this DCL, please contact Thyaga Nandagopal at tnandago@nsf.gov.

Sincerely,

Jim Kurose
Assistant Director, CISE