

## US Network for Advanced NMR

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NMR spectroscopy is one of the most versatile methods available for investigating matter, able to probe the composition, structure, and dynamics of complex liquid solutions and solids. Recent advances, including the development of powerful superconducting magnets employing high-temperature superconductors, are enabling advances in structural biology, metabolomics, and material science. However the barriers to accessing and using state-of-the-art NMR instrumentation remain unacceptably high. The US government funds several national and regional facilities, yet there is no single source of information on availability and capabilities of instruments. Once a scientist has identified an instrument, there are no resources enumerating best practices for sample preparation, experiment design, or processing and analysis workflows. High-field NMR remains largely the domain of specialists who have apprenticed in one of the cathedrals of NMR. The US Network for Advanced NMR (NAN) is being developed to address these and other barriers to the wider application of NMR to problems that are manifestly important. NAN will deploy state-of-the-art 1.1 GHz NMR spectrometers, for solid-state applications in Madison, WI, liquid-state applications in Athens, GA, and will be connected via a portal developed in Farmington, CT. In addition to providing resource discovery, scheduling and remote access, and resources for data stewardship, NAN will provide knowledgebases of vetted protocols for solid-state applications in structural biology and material science, and liquid-state applications for structural biology and metabolomics. When fully operational, NAN will provide access to 26 networked NMR spectrometers. Data from networked spectrometers will be automatically uploaded to a secure archive, with opt-in tools for depositing data in publicly accessible data resources. The overall goal of NAN is to democratize NMR for scientific applications in the US.

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