

A group of six diverse individuals, three men and three women, are shown in circular frames. They are looking towards the camera with professional expressions. The background behind them is a dynamic, abstract pattern of blue and green lines, suggesting a network or data flow.

# SONIC:

## Advancing the science of networks to enable effective cyberinfrastructure

**NCSA** is committed to developing, deploying, and supporting robust cyberinfrastructure (CI) for the nation's scientists and engineers. For CI tools to effectively empower researchers, they must meet the specific social and knowledge networking needs of each community. At NCSA, the **Science of Networks in Communities** research group (**SONIC**) aims to help determine and meet the needs of diverse research communities by using social network analysis tools to improve collaboration within CI domains.

**SONIC**, led by Noshir Contractor, develops cutting-edge techniques to **measure, mobilize, and modify** the social and knowledge networks in large scientific communities. The group uses a comprehensive analytic methodology to computationally model, empirically assess, statistically validate, and iteratively influence the emergence of social and knowledge networks within communities. Understanding and assisting in the development of communities will enable NCSA to design the cyberinfrastructure and cyberenvironments that match each community's unique attributes and network referral needs, facilitate collaborative work, and propel researchers to fresh insights and innovations.

### **SONIC:**

- **invests** in the development of a computationally intensive methodology that focuses on engaging with communities and advancing the science of networks in communities;
- **engages** with the communities NCSA supports, providing them with network asset maps, metrics, and iterative design strategies that allow them to leverage cyberinfrastructure for their growth; and
- **develops** infrastructure for the design, development, and deployment of a suite of Web-based network referral tools to enable global communities.

**SONIC's** research on the science of networks provides specific recommendations for the design of cyberinfrastructure and cyberenvironments. It feeds into efforts to design collaboration tools to leverage the knowledge and social networks within cybercommunities. **SONIC** helps communities **discover** their existing communication and knowledge networks; **diagnose** a network's health (measuring its robustness, absorptive capacity, connectedness, vulnerability, bottlenecks, etc.); and **design** the social incentives and technical infrastructure needed for networks to function at optimal effectiveness.

### **For more information:**

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