



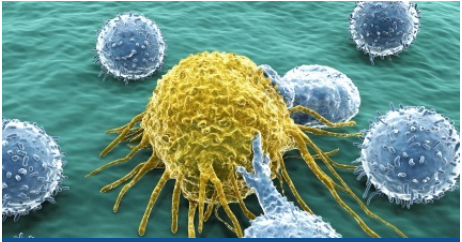
# National Science Foundation (NSF)



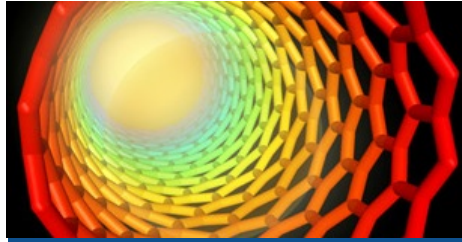
*“To promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense...”*



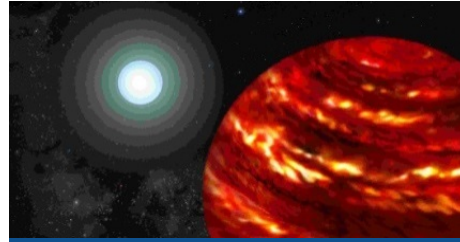
# NSF Champions Research and Education Across All STEM Fields



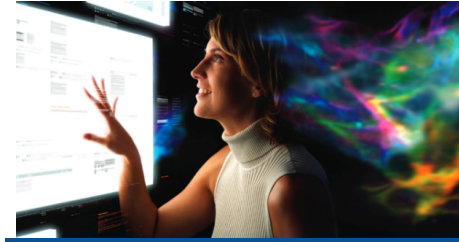
**Biological  
Sciences**



**Engineering**



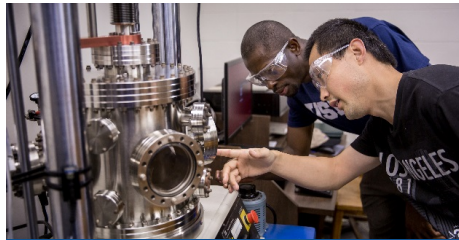
**Mathematical &  
Physical Sciences**



**Computer & Information  
Science & Engineering**



**Geosciences**



**Integrative  
Activities**



**Education &  
Human Resources**



**Social, Behavioral &  
Economic Sciences**



**International Science  
and Engineering**

# NSF and the Scientific Landscape



- Part of larger research ecosystem
- NSF invests in basic, fundamental research
- Leverage partnerships across federal and international agencies, foundations, private industry





# NSF's 10 Big Ideas

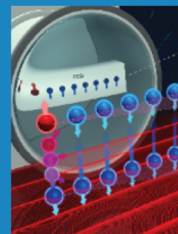
MATHEMATICAL, STATISTICAL, COMPUTATIONAL FOUNDATIONS  
ANALYTICS  
HARNESSING THE DATA REVOLUTION  
FUNDAMENTAL RESEARCH  
MACHINE LEARNING  
RESEARCH DATA  
CYBERINFRASTRUCTURE  
MODELING  
DATA MINING  
SYSTEMS AND SOFTWARE  
INTERNET OF THINGS  
HUMAN DATA INTERFACES

**Harnessing the Data Revolution**

**The Future of Work at the Human-Technology Frontier**



**Navigating the New Arctic**



**The Quantum Leap: Leading the Next Quantum Revolution**

**Understanding the Rules of Life: Predicting Phenotype**



**Windows on the Universe: The Era of Multi-messenger Astrophysics**



**Mid-scale Research Infrastructure**



**NSF 2026: Seeding Innovation**



**Growing Convergence Research at NSF**



**NSF INCLUDES: Enhancing STEM through Diversity and Inclusion**



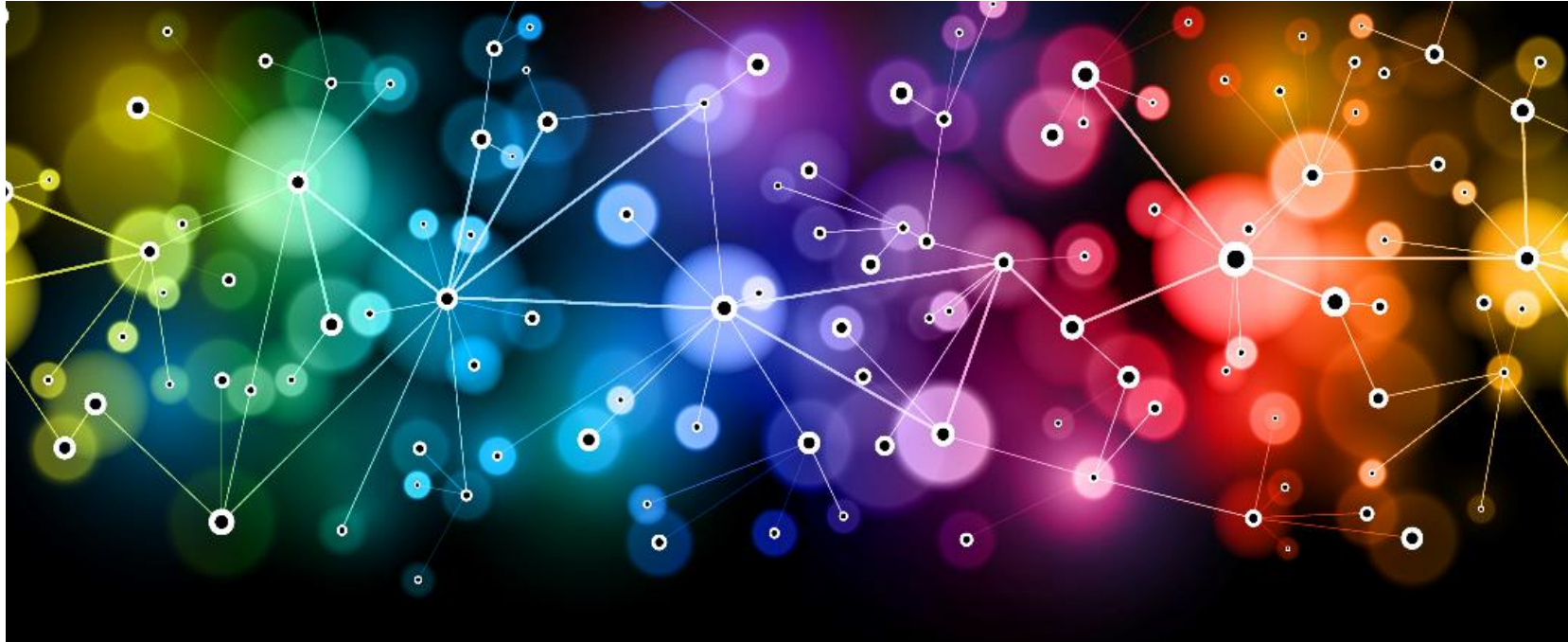


# Identifying and Closing Gaps





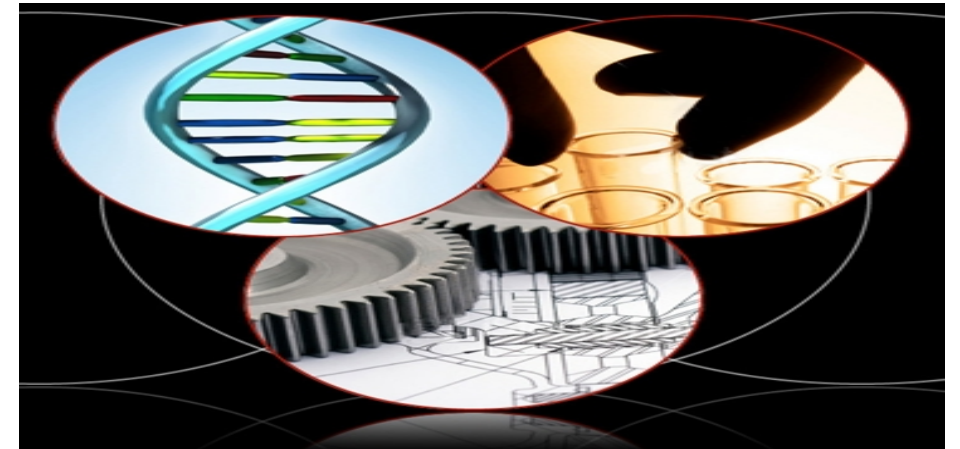
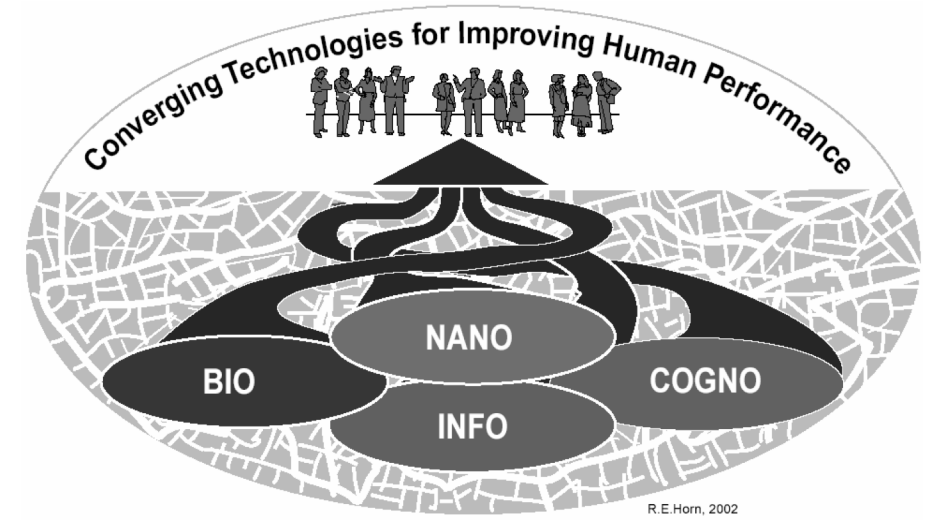
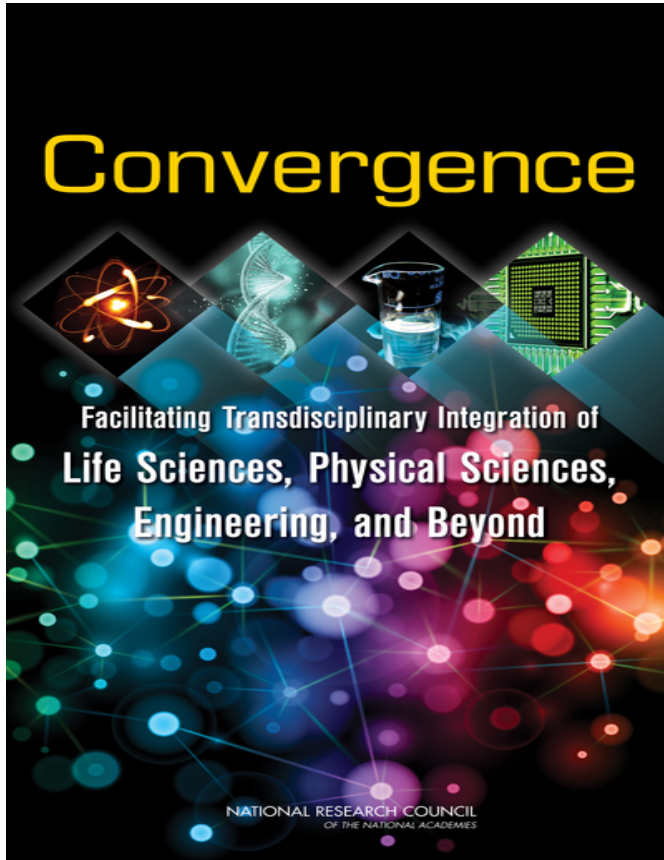
# Growing Convergence Research at NSF



***“Framing challenging research questions at inception, and fostering the collaborations needed for successful inquiry.”***

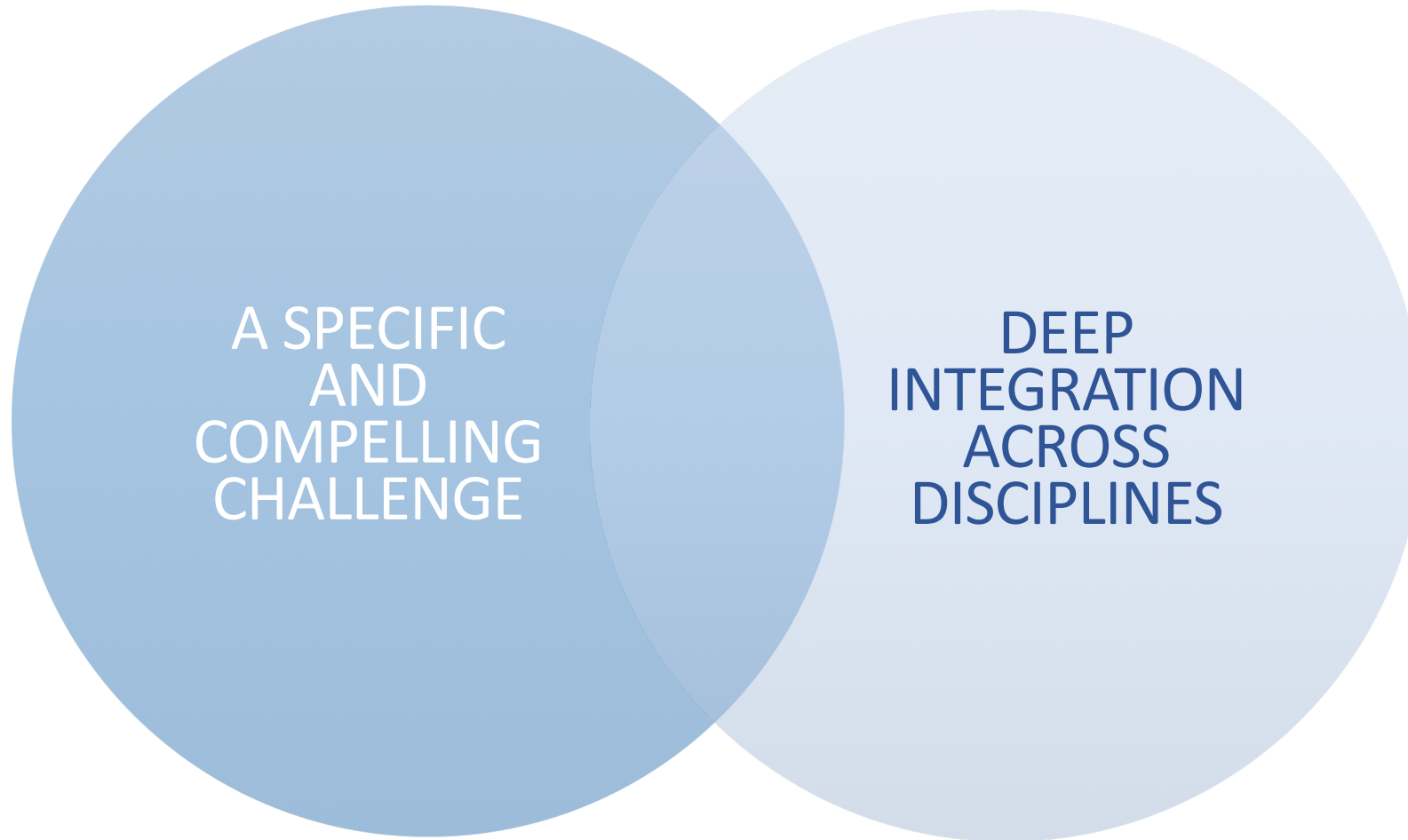


# History of Convergence at NSF

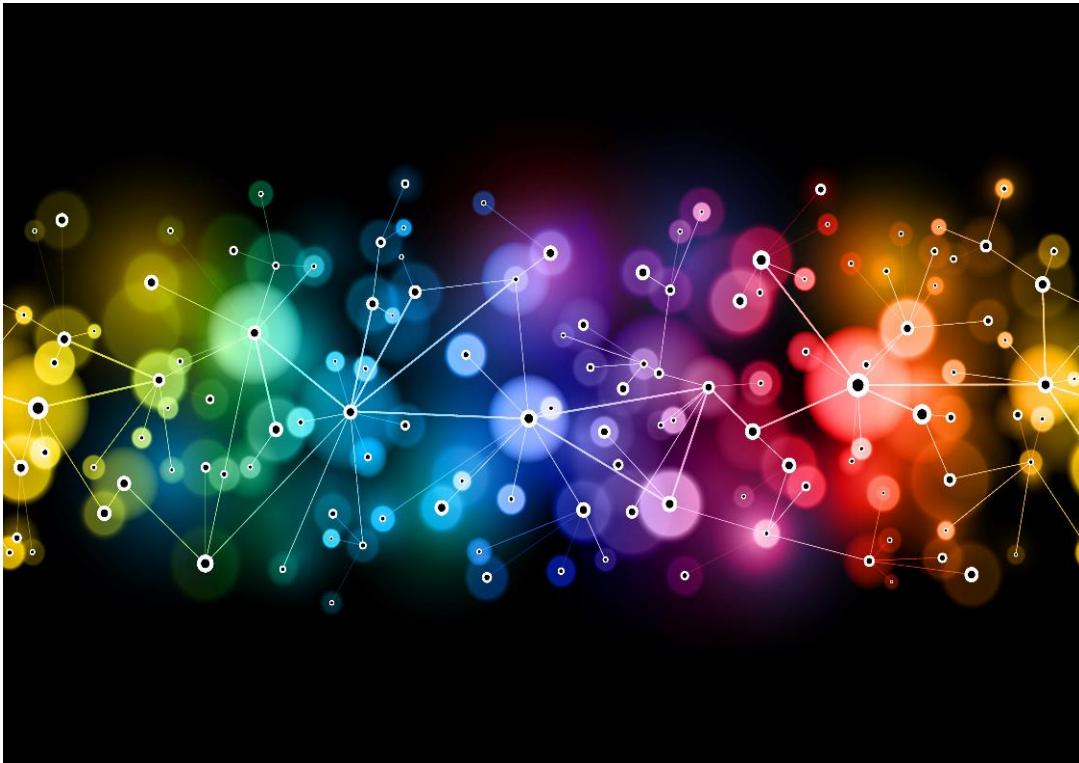




# How is NSF thinking about convergence now?



# What are the essential elements of successful convergence research?



- **Need** for a convergent approach
- **Readiness** to engage in convergence
- **Integration** of knowledge, tools, and modes of thinking
- **Involvement** of the next generation of convergence researchers



# What are we converging on?

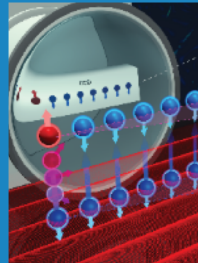
MATHEMATICAL  
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## Harnessing the Data Revolution

## The Future of Work at the Human-Technology Frontier



## Navigating the New Arctic



## The Quantum Leap: Leading the Next Quantum Revolution

## Understanding the Rules of Life: Predicting Phenotype



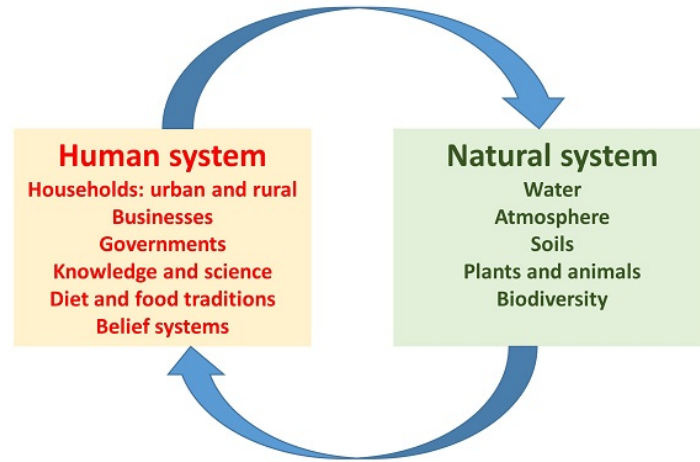
## Windows on the Universe: The Era of Multi-messenger Astrophysics



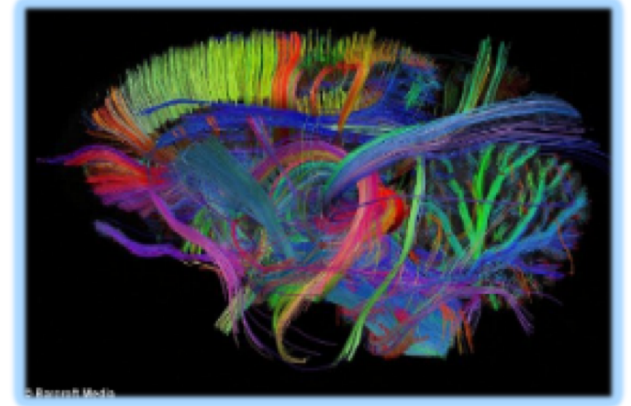
# How can convergence happen organically?



- Use different tactics and specific skill sets to ask the same question



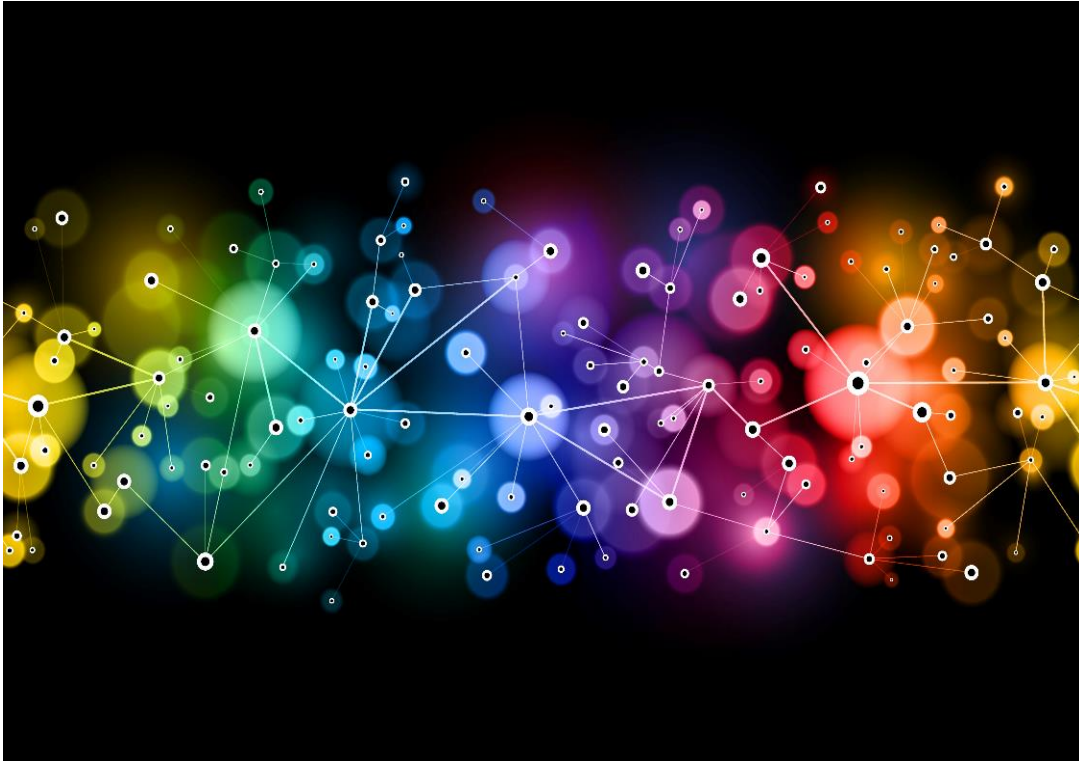
- Investigate different aspects of a common problem



- Use similar tools and technologies to ask different questions



# What is NSF doing to support/enable convergence research?



- Big Ideas
- Dear Colleague Letters

# Dear Colleague Letters: Growing Convergence Research



NSF 17-065

## Dear Colleague Letter: Growing Convergence Research at NSF

April 3, 2017



NSF 18-058

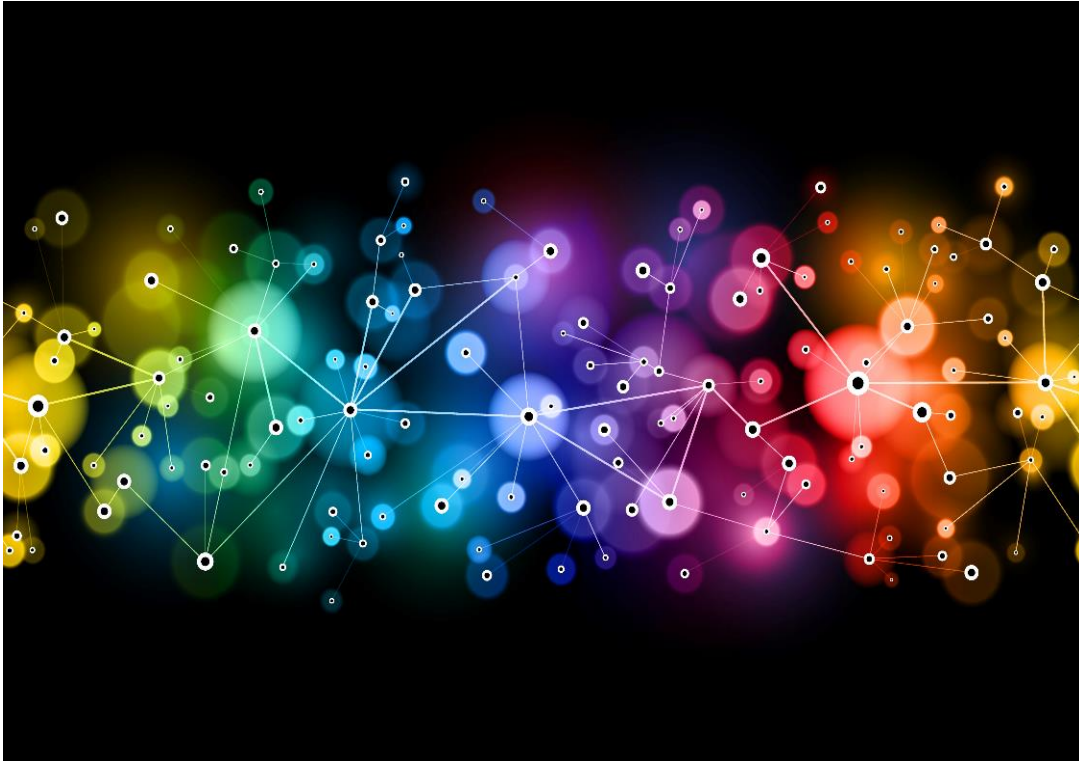
## Dear Colleague Letter: Growing Convergence Research

March 23, 2018





# What is NSF doing to support/enable convergence research?



- Big Ideas
- Dear Colleague Letters
- Opportunities in Core Programs
- Priorities:
  - Build capacity within community
  - Enable researchers to demonstrate ability to collaborate effectively
  - Ensure merit review process responds to new challenges

Questions?

