ACI Overview

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Research Cyberinfrastructure

Foundational Research

Advanced Cyberinfrastructure

- Networking & Security
- Advanced Computing
- Data
- Software
- Workforce Development

Computing and Communications Foundations

- Algorithmic Foundations
- Communication and Information
- Software and Hardware

Computer and Network Systems

- Computer Systems Research
- Networking Technology and Systems
- Education and Workforce

Information and Intelligent Systems

- Human-Centered Computing
- Information Integration and Informatics
- Robust Intelligence

ACI Mission: To explore, develop and support advanced cyberinfrastructure to enable and <u>accelerate</u> discovery and innovation <u>across all disciplines</u>
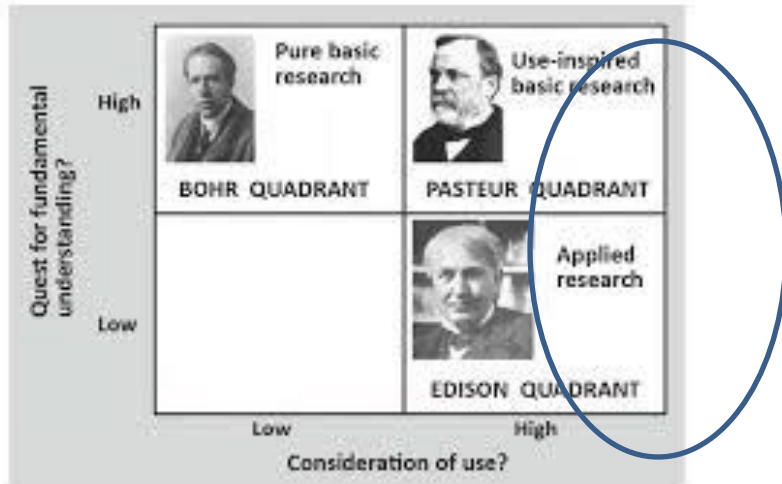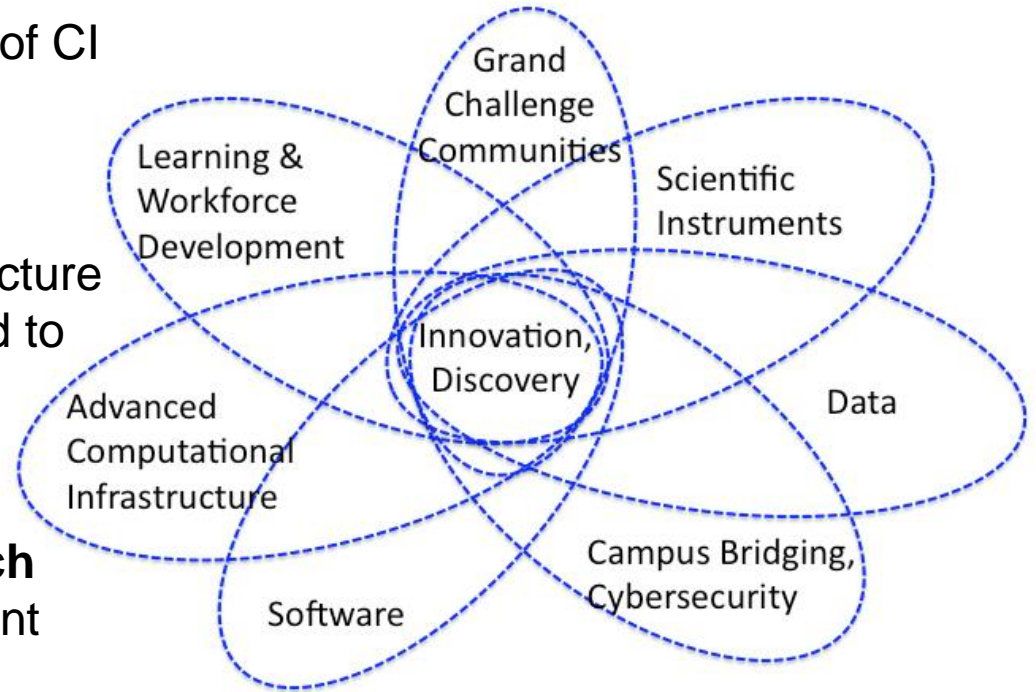

- **Use-inspired Cyberinfrastructure**
  - **Research and Education**
  - **Science and Engineering**
- **Inherently multidisciplinary with strong ties to all disciplines/directorates**

Biological Sciences Directorate	**Mathematical** & Physical Sciences Directorate
Computer and Information Science and Engineering Directorate	**Social, Behavioral** & Economic Sciences Directorate
Education & Human Resources Directorate	Geosciences Directorate
Engineering Directorate	
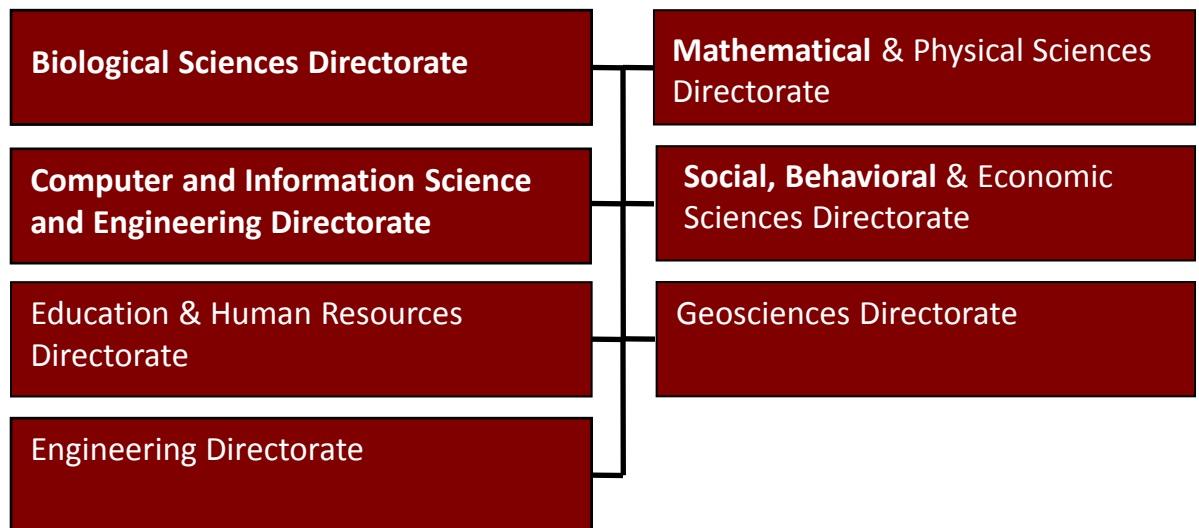
# ACI is pivotal to NSF's Vision for Research Cyberinfrastructure (CIF21)

CIF21: cyberinfrastructure as an ecological system

- **Community building** to foster use of CI in scientific discovery
- **Infrastructure collaboration** and coordination
- **Foundational research** in infrastructure components and science related to their use
- **Sustained development** through a diverse, trained workforce
- **Transform the conduct of research** through career path development for computational scientists

Grand Challenge Communities

Scientific Instruments

Learning & Workforce Development

Innovation, Discovery

Data

Advanced Computational Infrastructure

Campus Bridging, Cybersecurity

Software

http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf12051

Ubiquity in mobile devices, social networks, sensors and instruments have created a complex data-rich environment ripe for new scientific and engineering advances
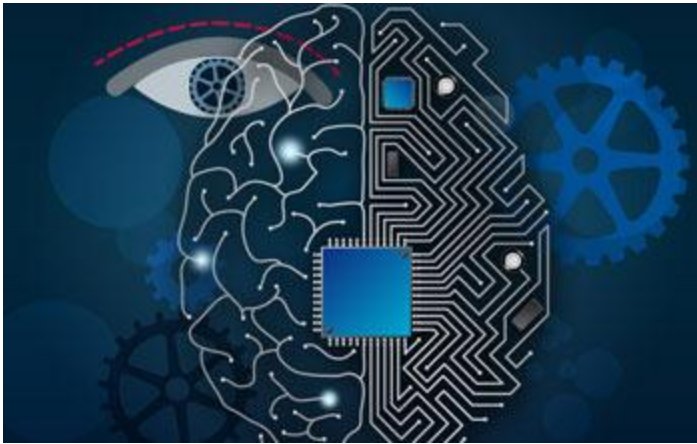
Credit: *Christine Daniloff/MIT*

An artist's conception of the National Ecological Observatory Network (NEON) depicting its distributed sensor networks, experiments and aerial and satellite remote sensing capabilities, all linked via cyberinfrastructure into a single, scalable, integrated research platform for conducting continental-scale ecological research. NEON is one of several National Science Foundation Earth-observing systems.

Credit: Nicolle Rager Fuller, National Science Foundation
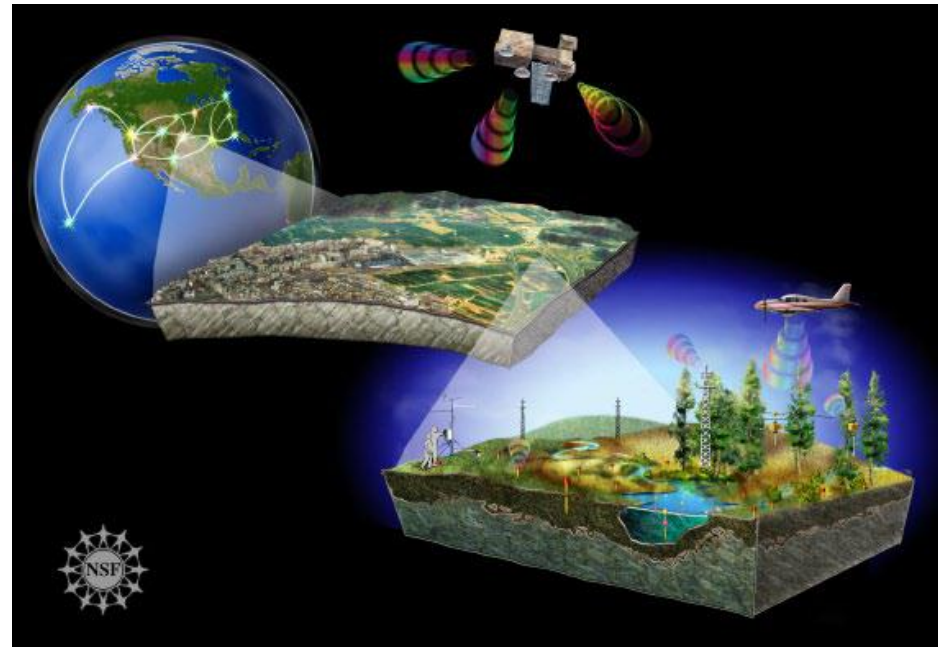
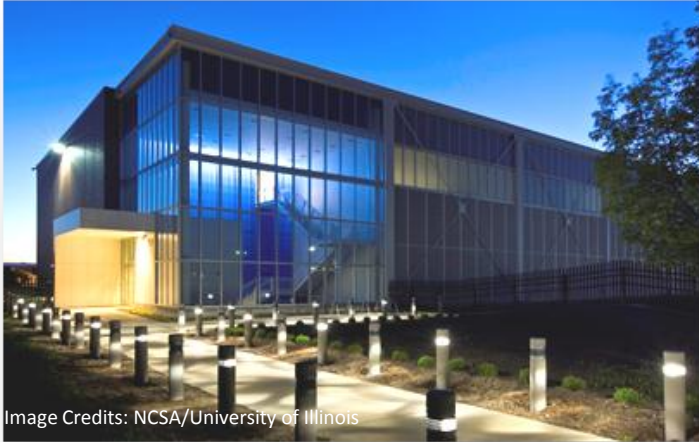# Within the overall cyberinfrastructure NSF supported major new deployments in 2013

Image Credits: NCSA/University of Illinois
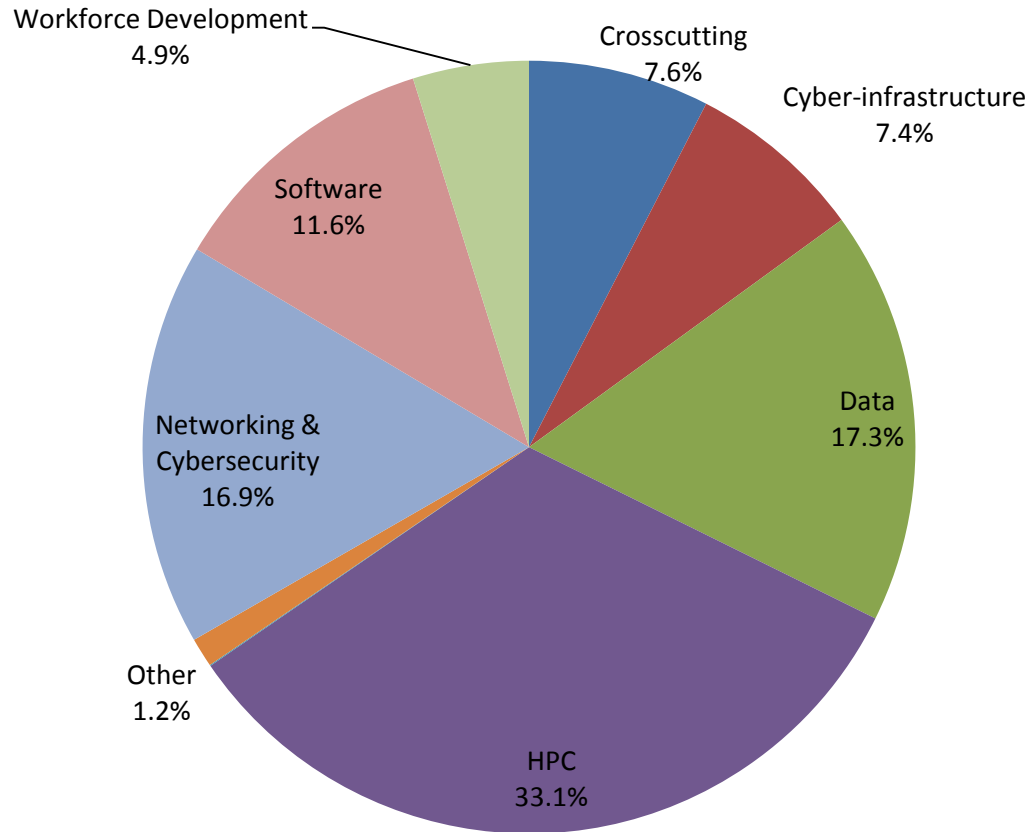
Blue Waters, UIUC

Image Credit: *TACC*

Stampede, UT Austin

NCAR/ Wyoming Supercomputing Center

FY2013 investment reflects increasingly diverse CI needs

Total ACI FY 2013 funding = $210,772,572

Core FY2014 Activities

- Data Infrastructure Building Blocks (DIBBs)
  - http://www.nsf.gov/pubs/2014/nsf14530/nsf14530.htm#toc
- Campus Cyberinfrastructure - Infrastructure, Innovation and Engineering Program (CC*IE)
  - http://www.nsf.gov/pubs/2014/nsf14521/nsf14521.htm
- High Performance Computing System Acquisition: Continuing the Building of a More Inclusive Computing Environment for Science and Engineering
  - http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503148
- Software Infrastructure for Sustained Innovation (SI**2)
  - http://www.nsf.gov/pubs/2014/nsf14520/nsf14520.htm?WT.mc_id=USNSF_25&WT.mc_ev=click
- Follow on to CIF21 IGERT

Thank you !

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