

# Cyberinfrastructure Days

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13 August 2010

# Why CI Days?

- Cyberinfrastructure (CI) is playing an increasingly important role in the academic community
- There are many groups involved in the use and providing of services of Cyberinfrastructure
- CI Days brings these groups together to start and ongoing communication about the CI needs and roles

# The Nature of Research Today

- Discipline groups working on a common project.
- The groups are made of researchers from multiple institutions.
- They use CI in support of these Virtual Organizations (VOs)

# New NSF Proposal Requirement

On or around October, 2010, NSF is planning to  
require that all proposals include a

## Data Management Plan

in the form of a two-page supplementary document

[http://www.nsf.gov/news/news\\_summ.jsp?cntn\\_id=116928](http://www.nsf.gov/news/news_summ.jsp?cntn_id=116928)

# Teaching is Changing Too

Network Based Multimedia Resources

Real-time Communications with Class

Multiple Location Classes

Online Classes

Team Teaching

# CI in Administration

- New CI tools and resources are being integrated into administrative Information Technology

# Example Researcher using CI

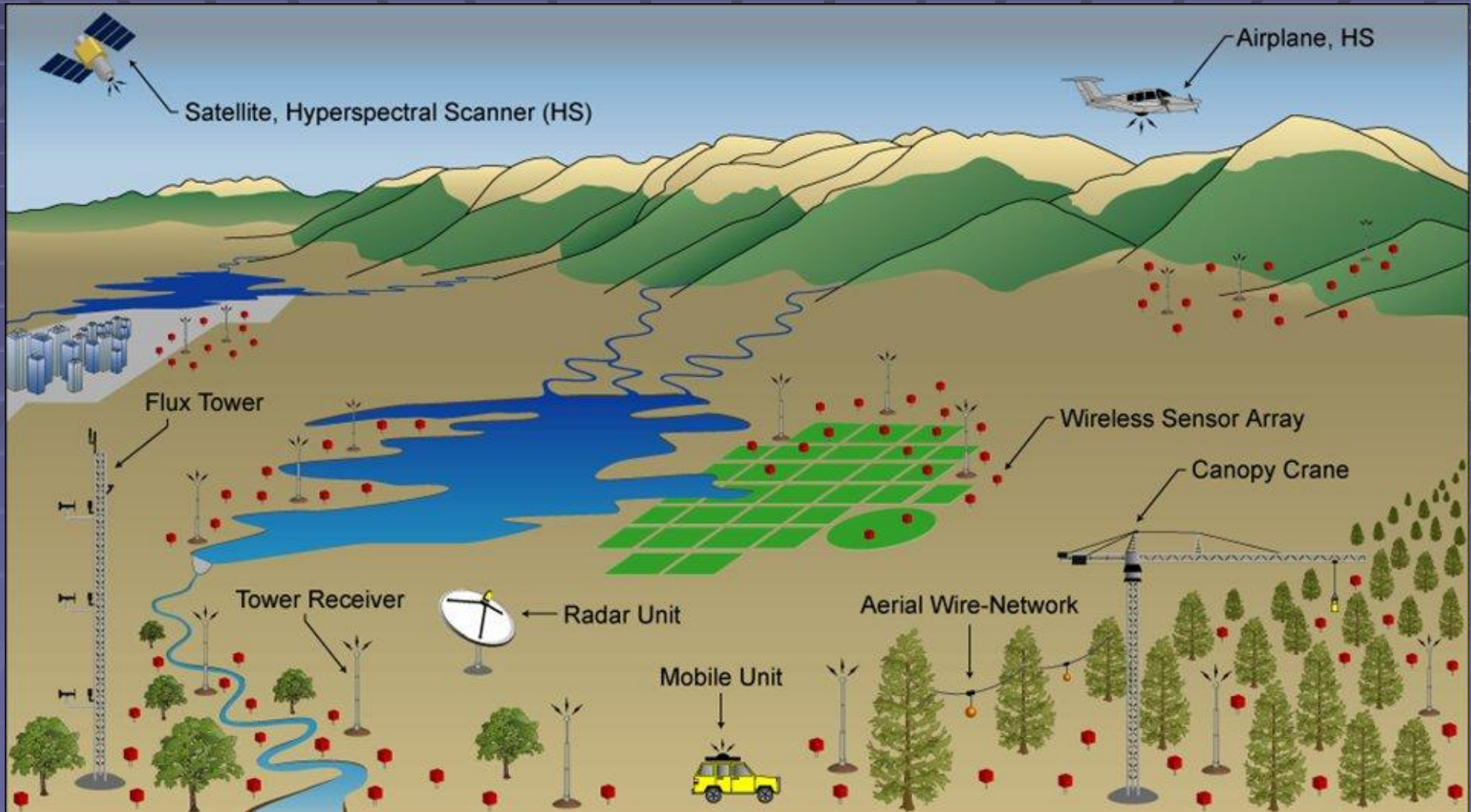
Jane is an environmental researcher and is going to find a solution to Global Warming. To do this she needs to collect and store data, do analysis of the data and run some simulation models to test her hypothesis. She will share ideas, data and results with her Discipline Group. Here are her steps in using CI

# Local Climate Data Collection



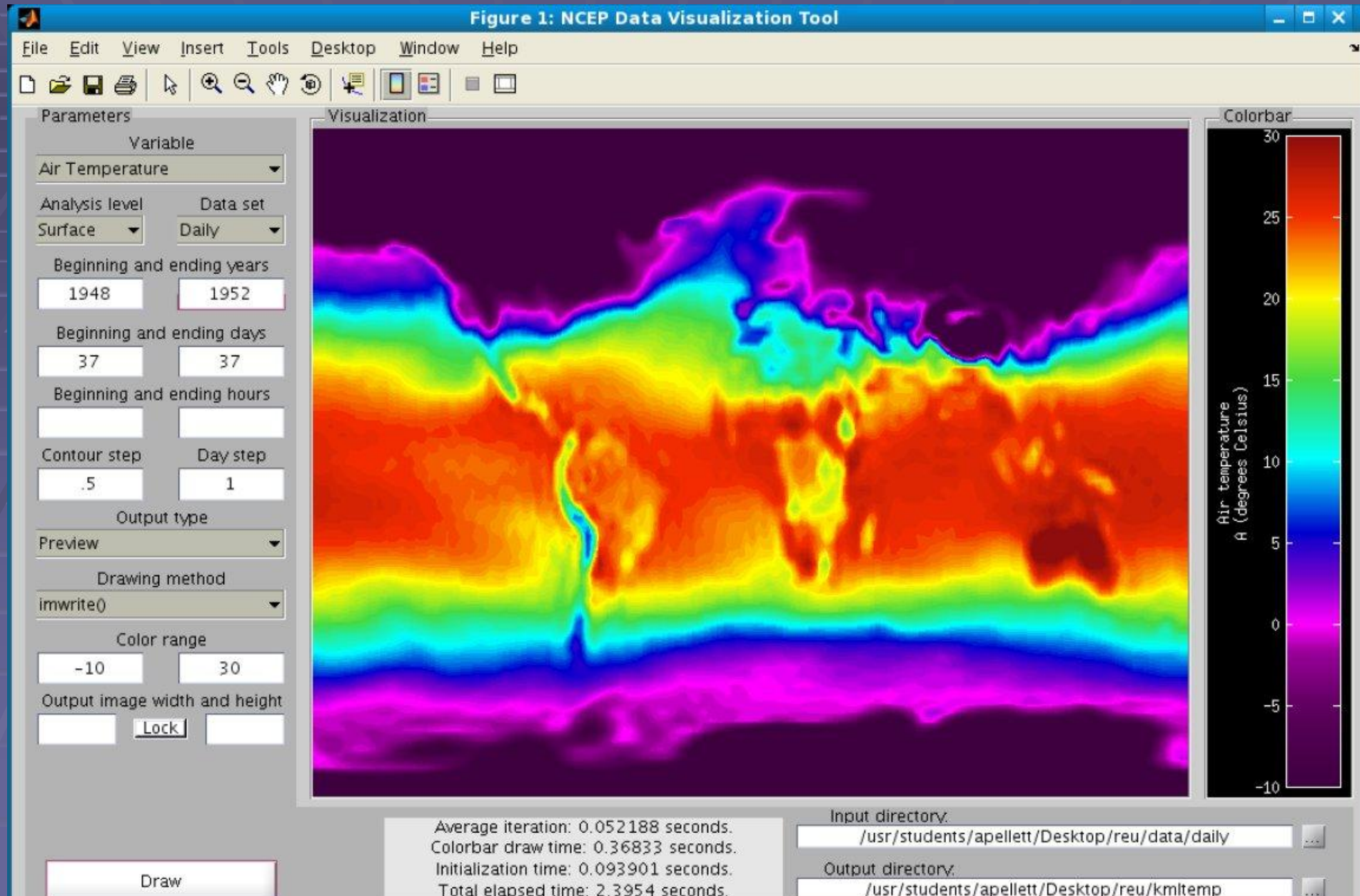


# Global Climate Data Collection



# Climate Data Visualization

Figure 1: NCEP Data Visualization Tool

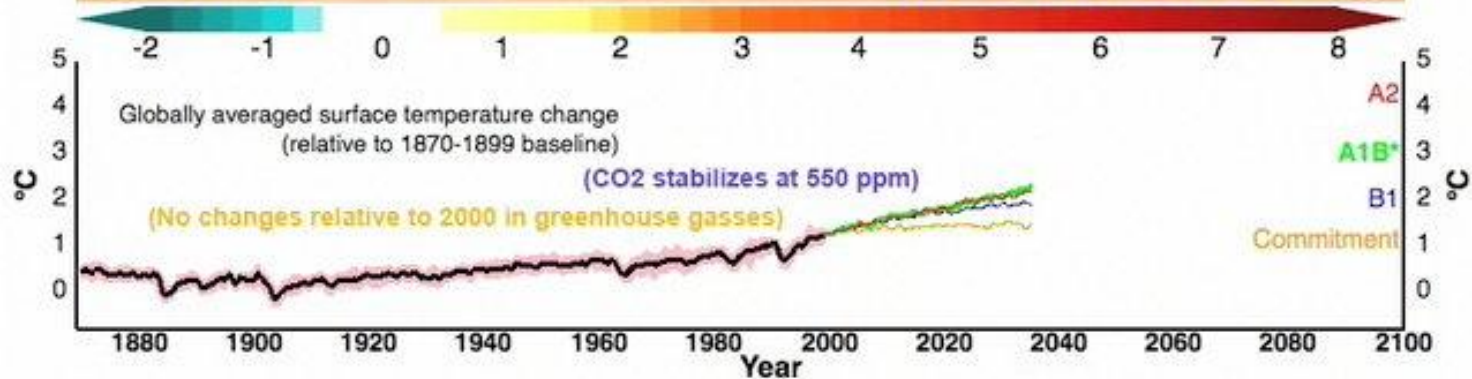
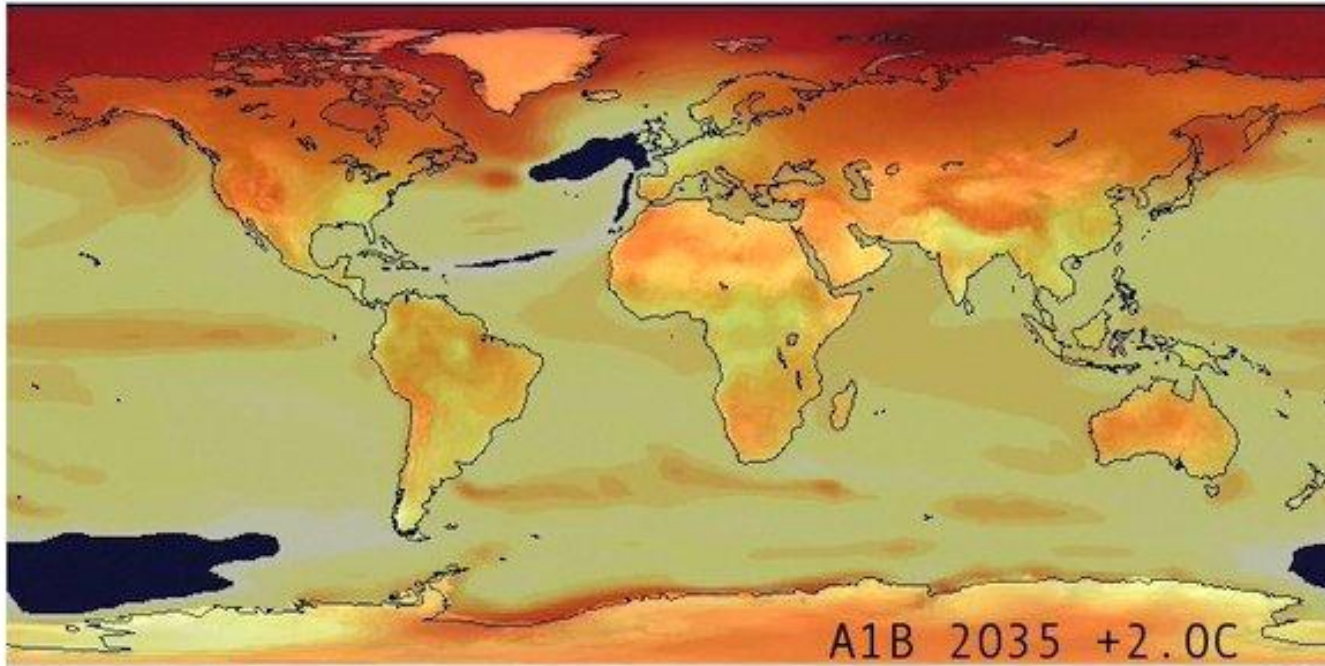


# Climate Modeling

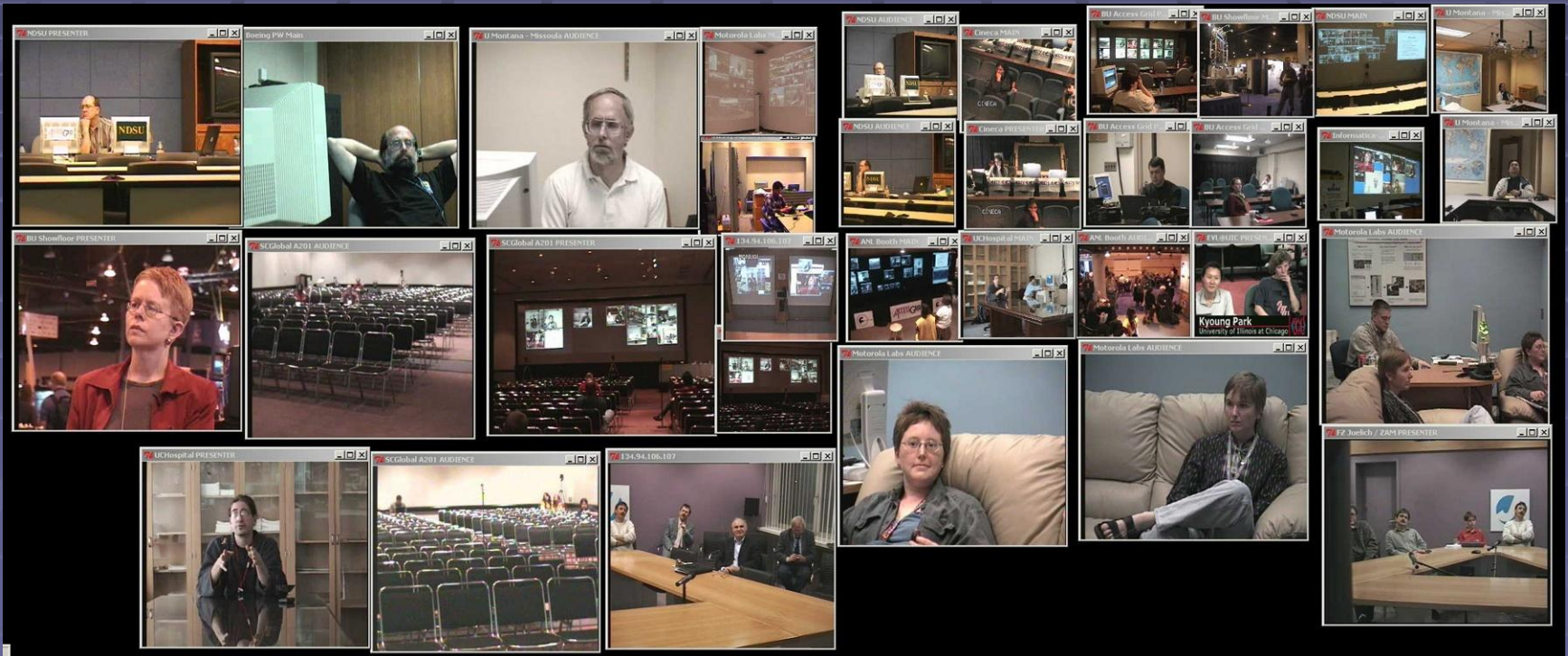


# Model Visualization

Surface temperature change relative to 1870-1899 baseline CCSM3 IPCC AR4



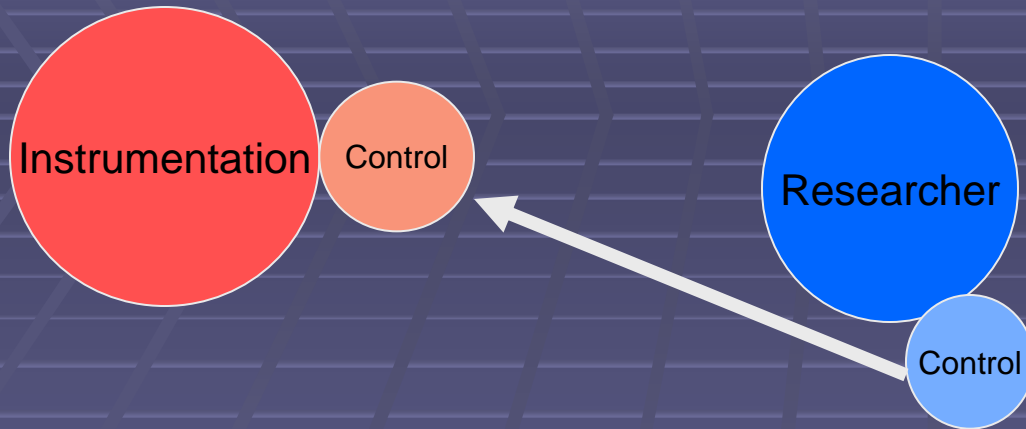
# Collaboration



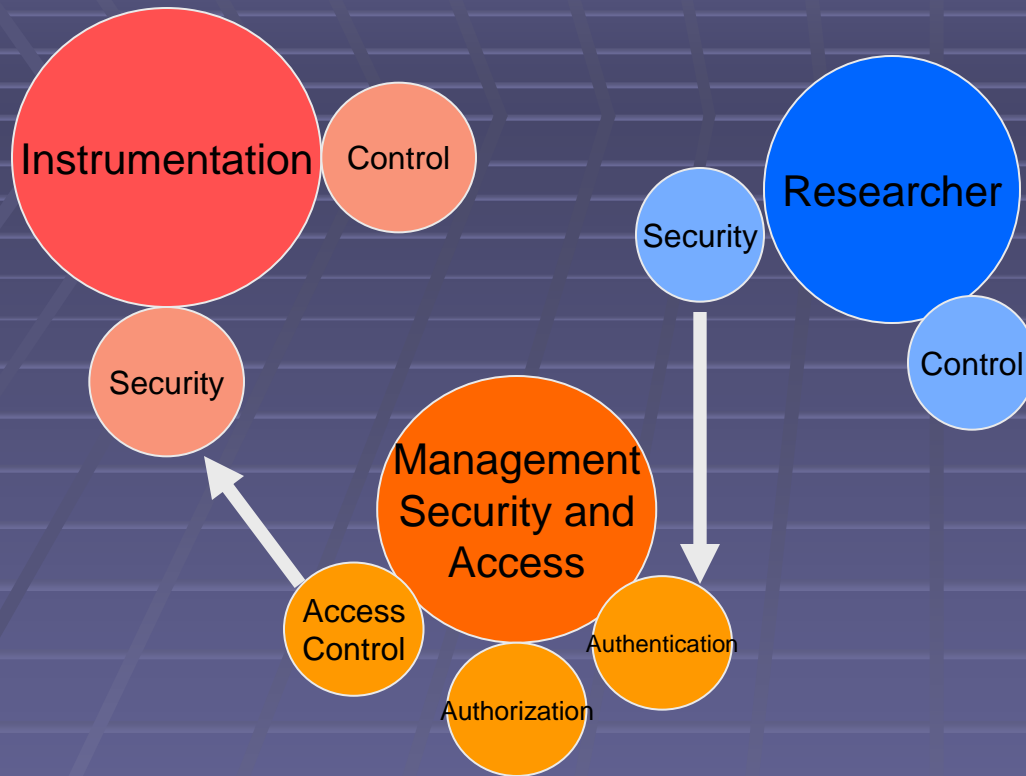
# What is Under the CI Hood?

- Someday you will tell a car where to go and it will take you there
- We aren't there yet
- You currently need to know that that a car has an engine, brakes, fuel system, etc
- Likewise with CI, you don't have to know all the details, but it is good to know about the parts
- Let's look at what Jane uses

# Control Instruments to Gather Data

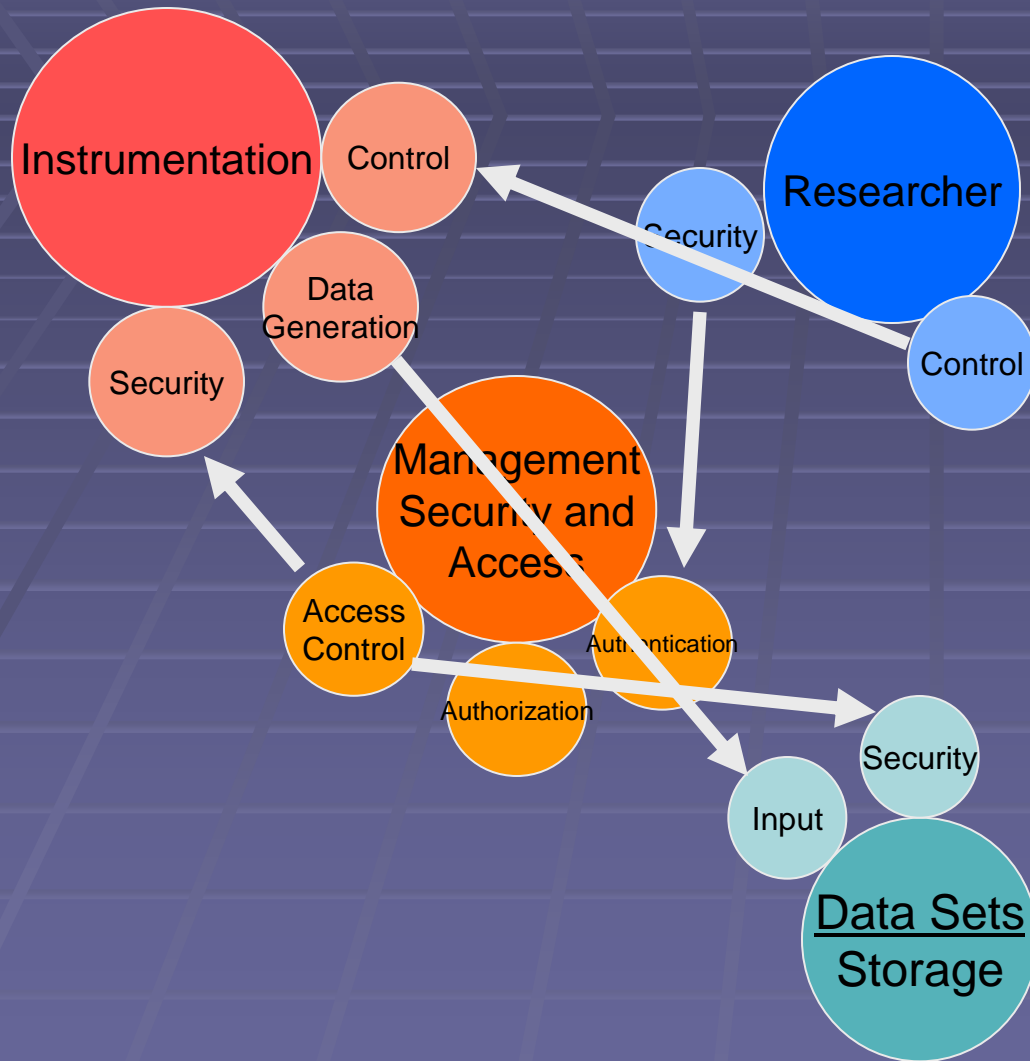


# Security and Access Control

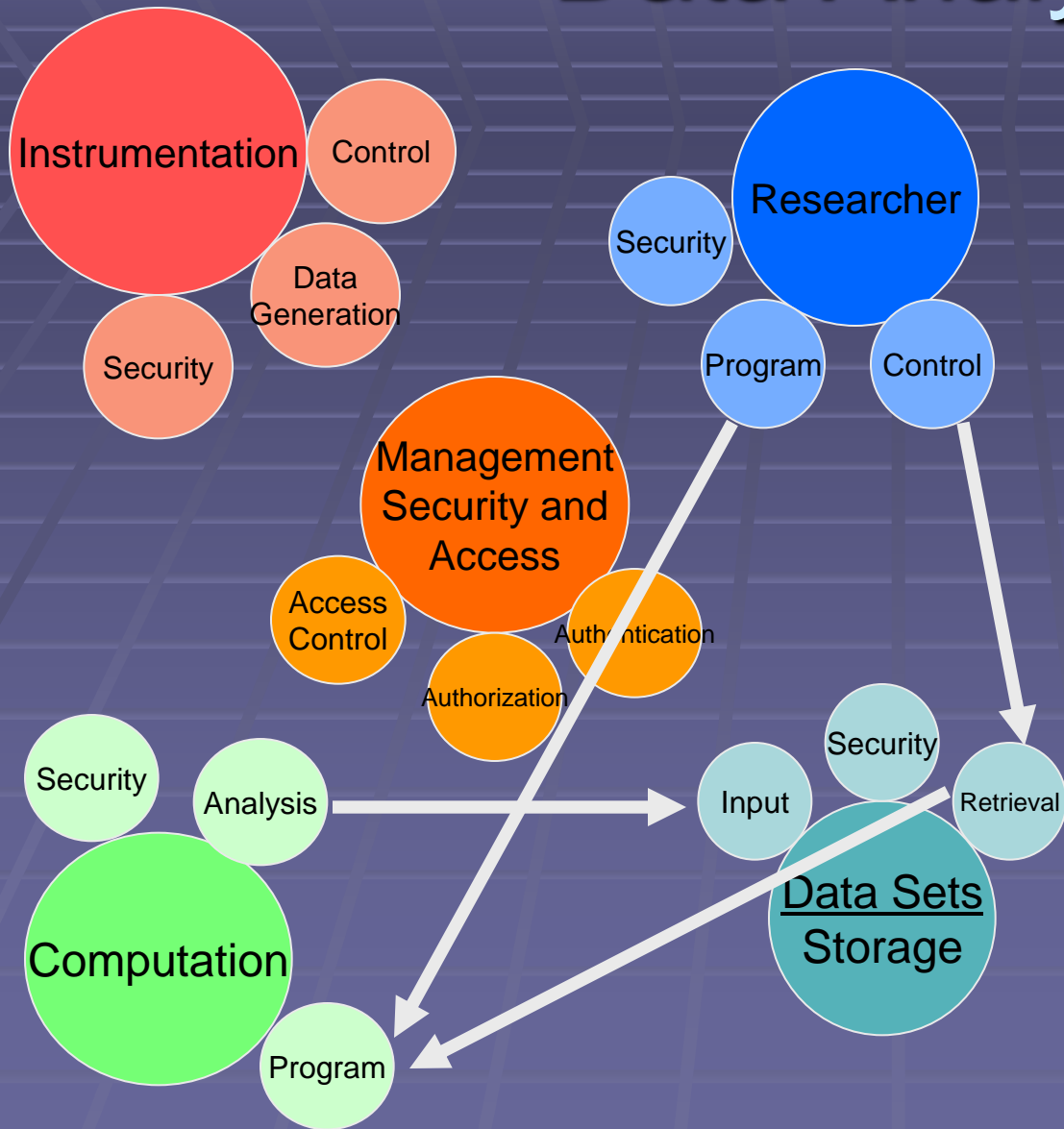




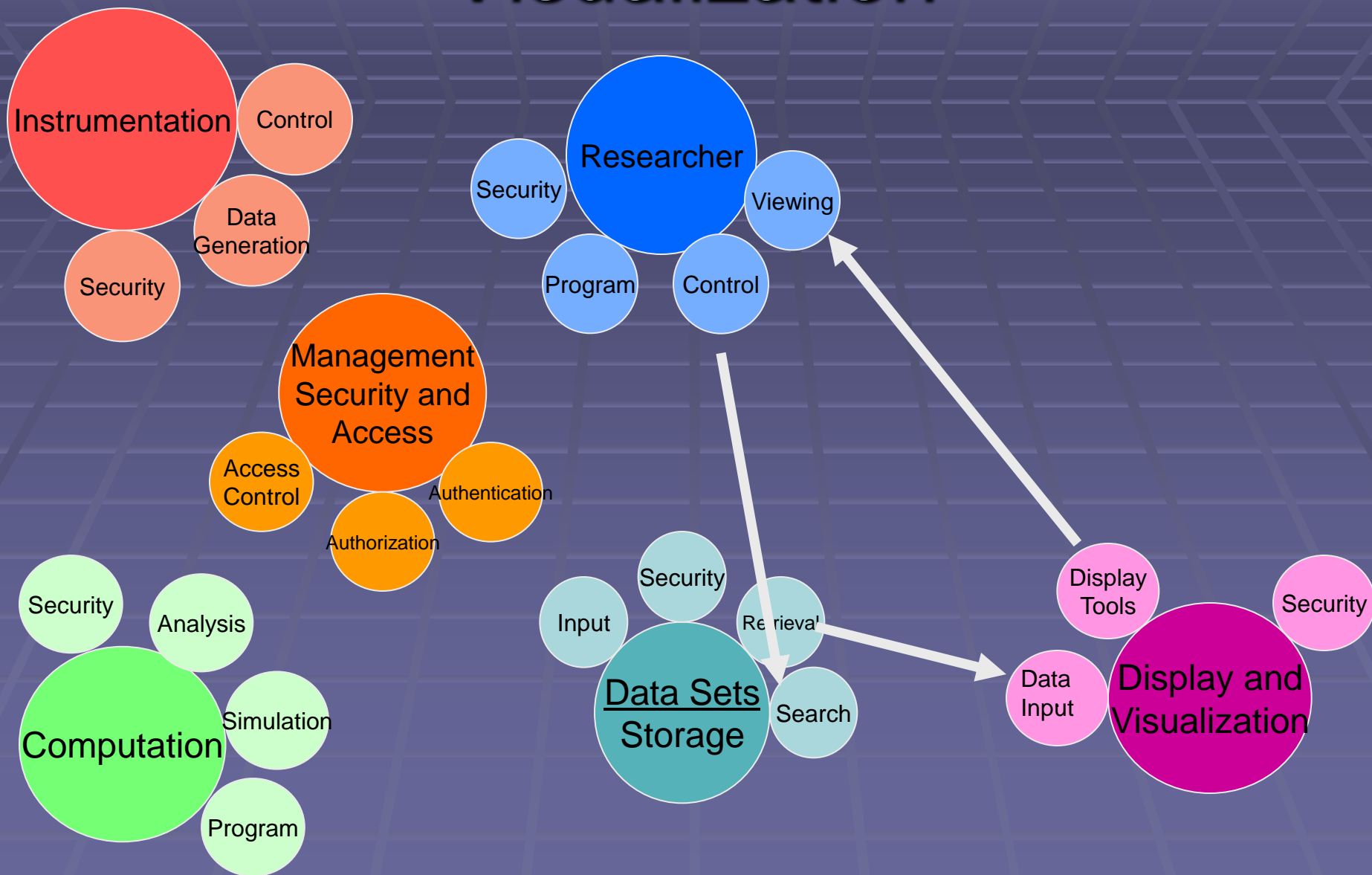
# Data Transfer and Storage



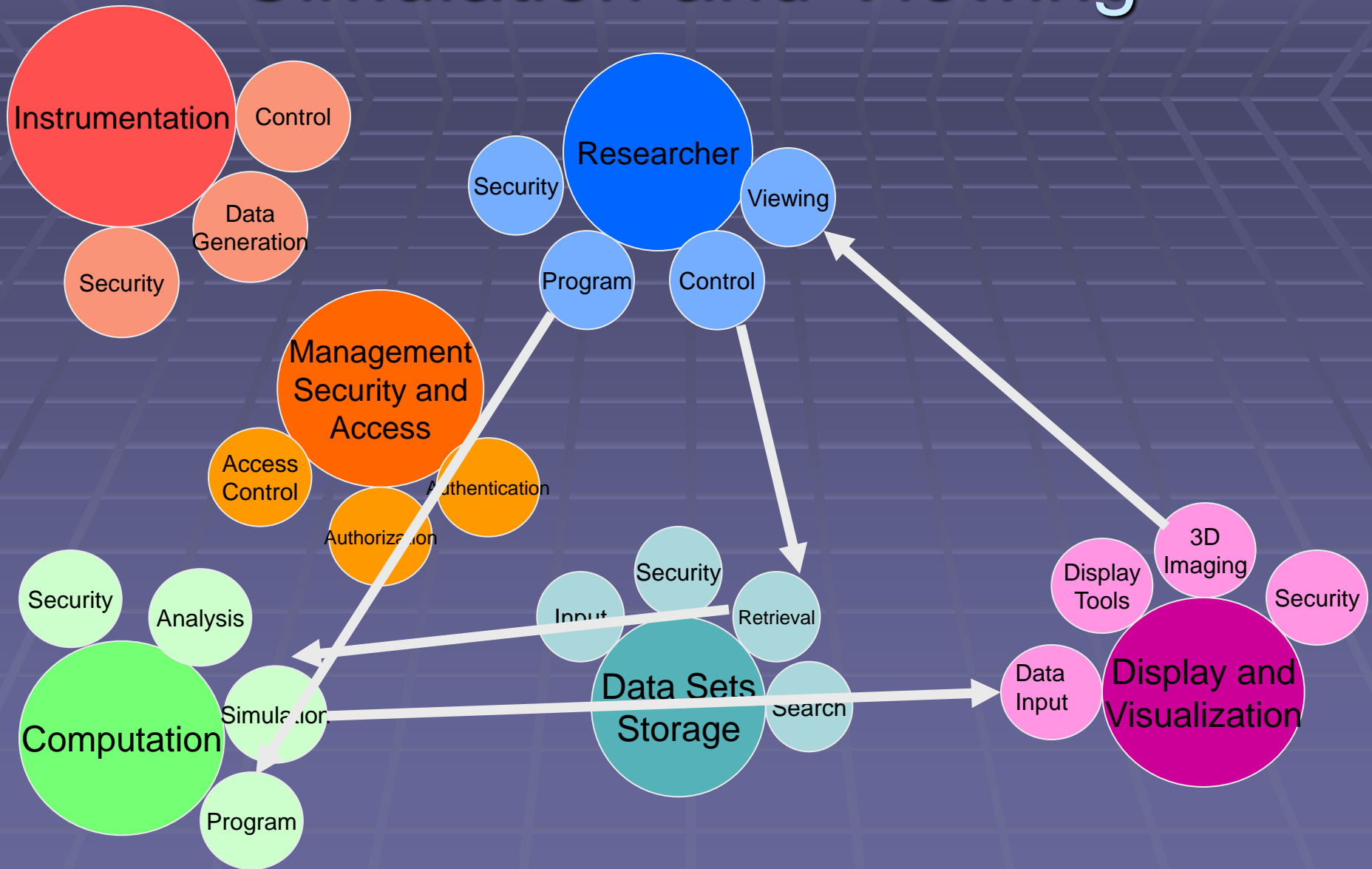
# Data Analysis



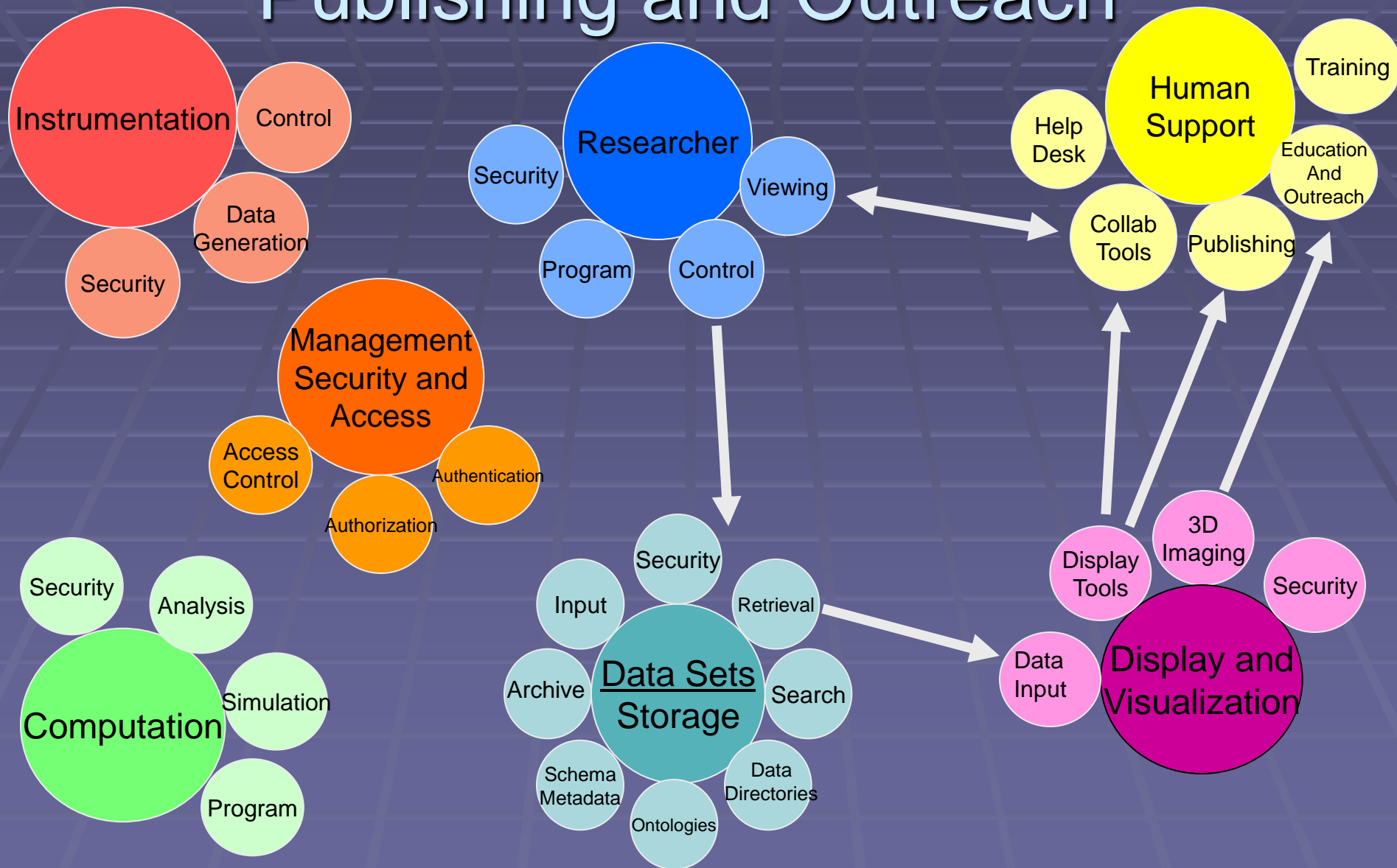
# Visualization



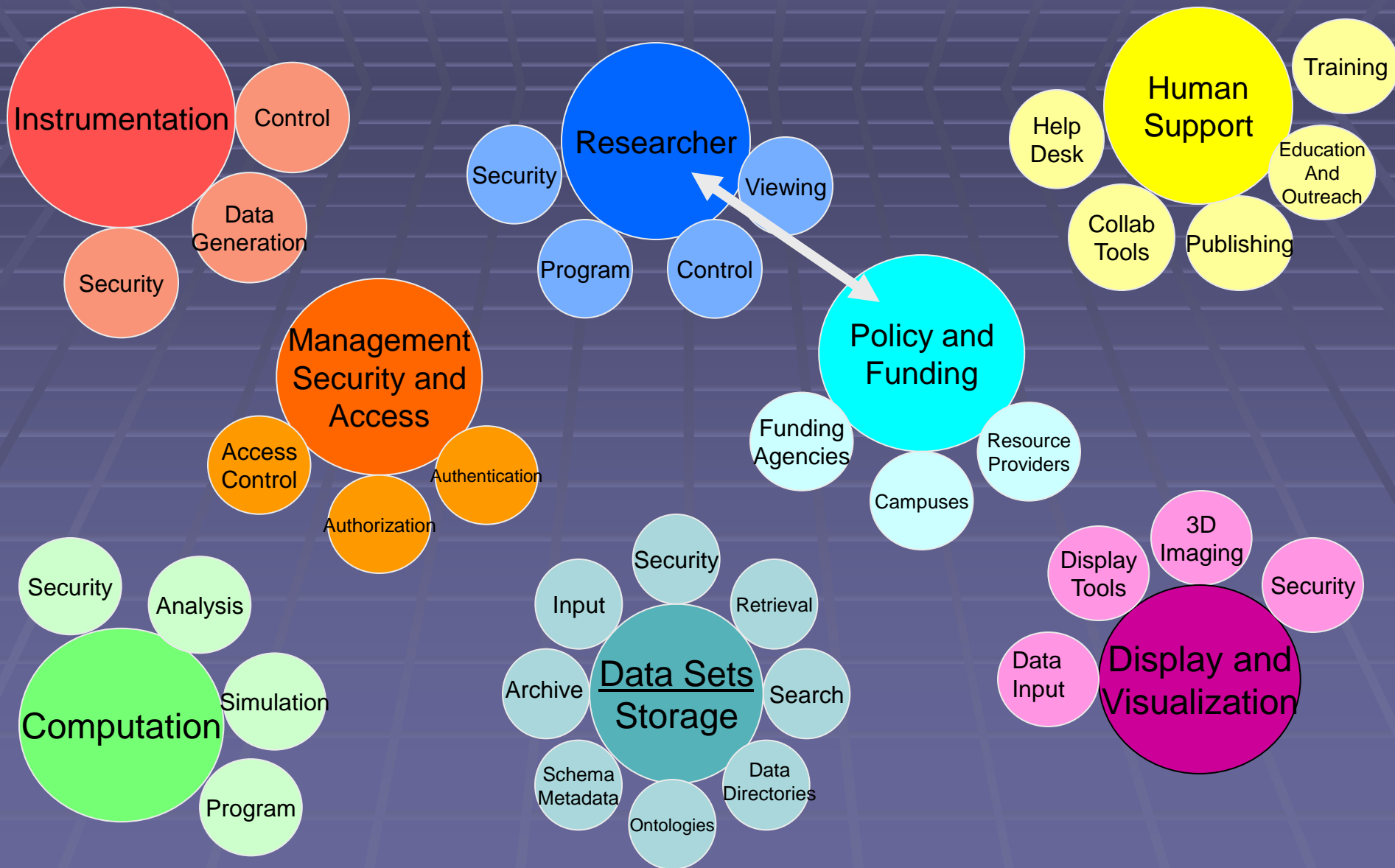
# Simulation and Viewing



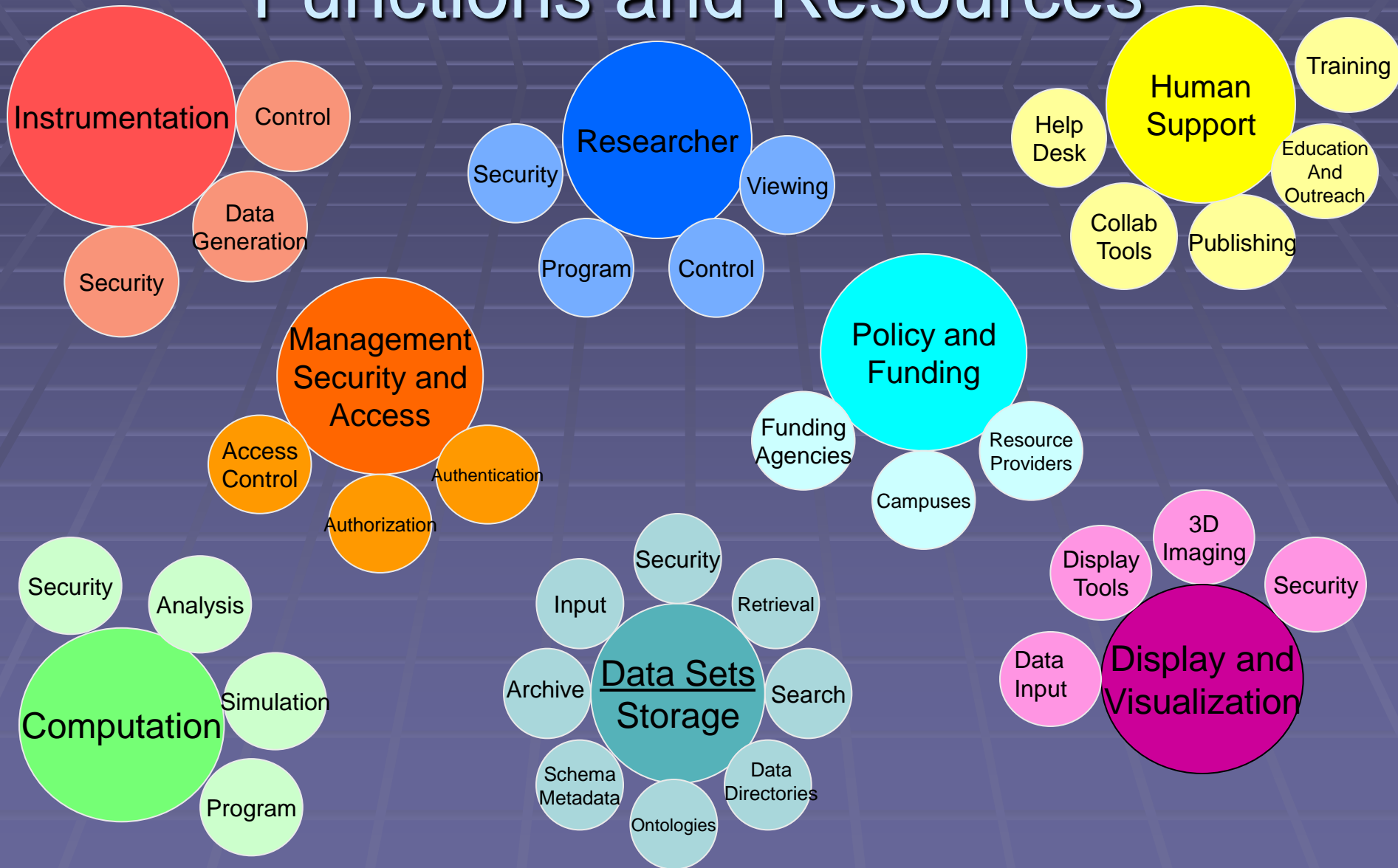
# Sharing, Collaboration, Publishing and Outreach



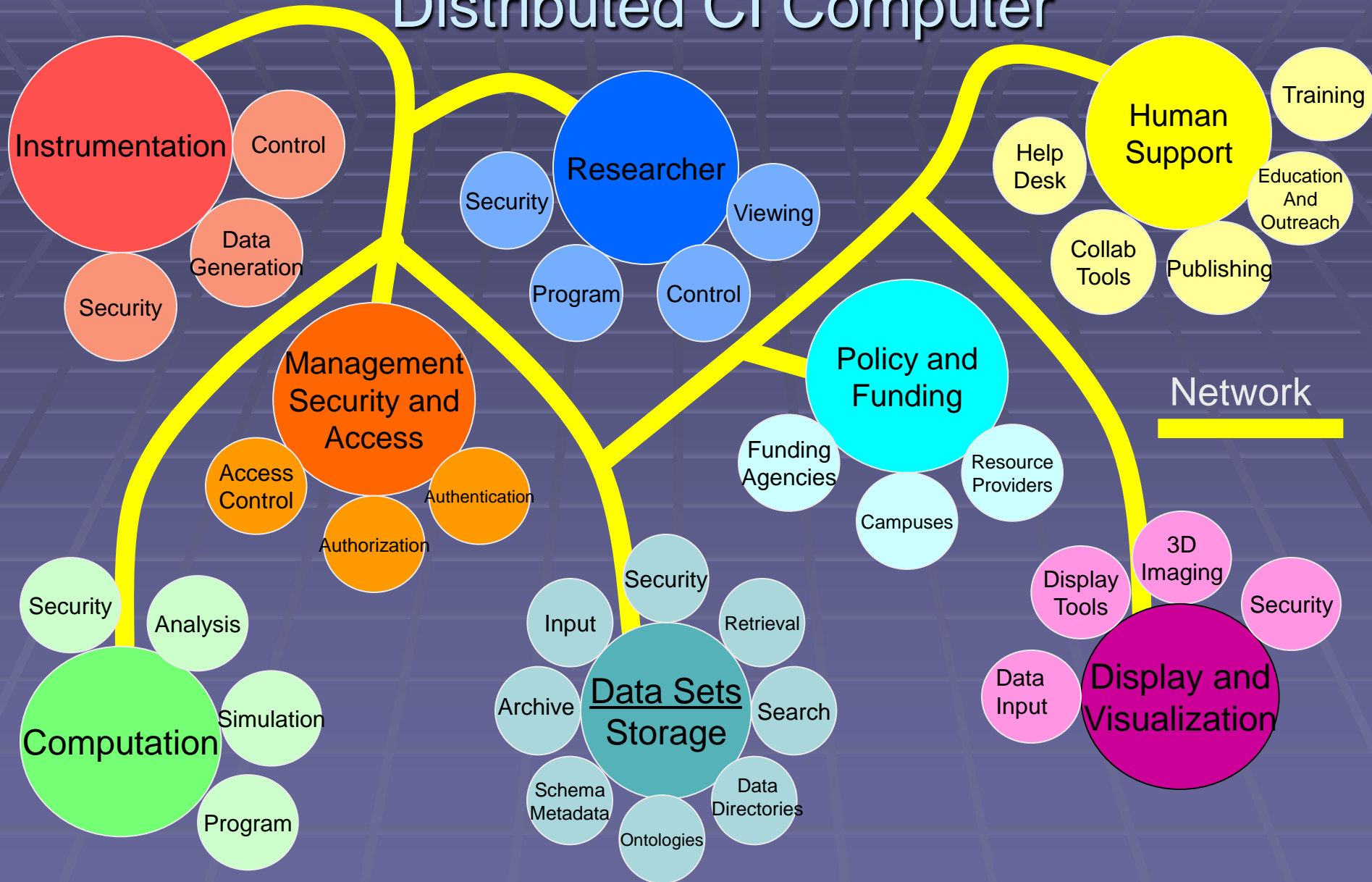
# Jane goes after new grant



# Cyberinfrastructure Functions and Resources

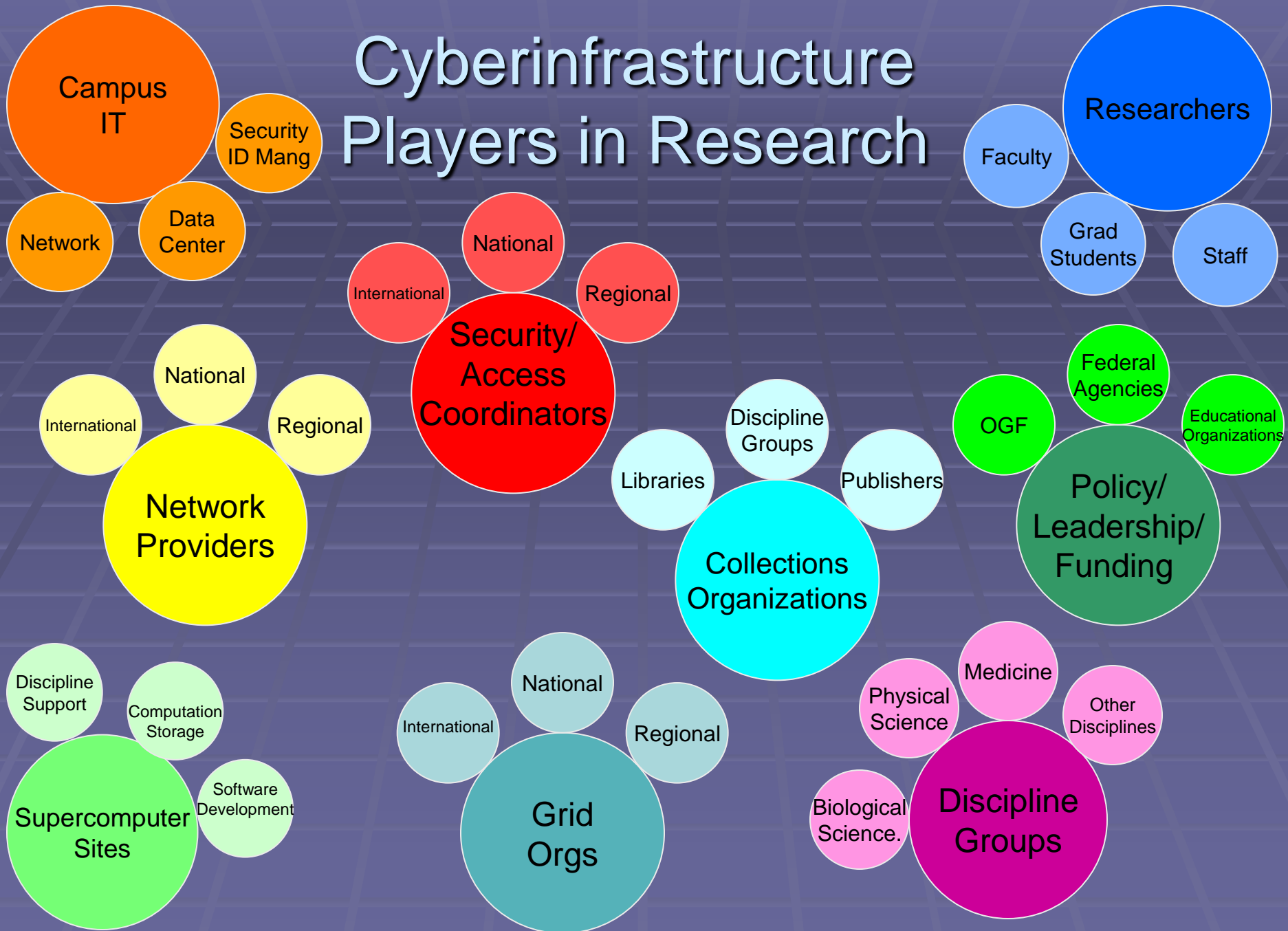


# The Network is the Backplane for the Distributed CI Computer

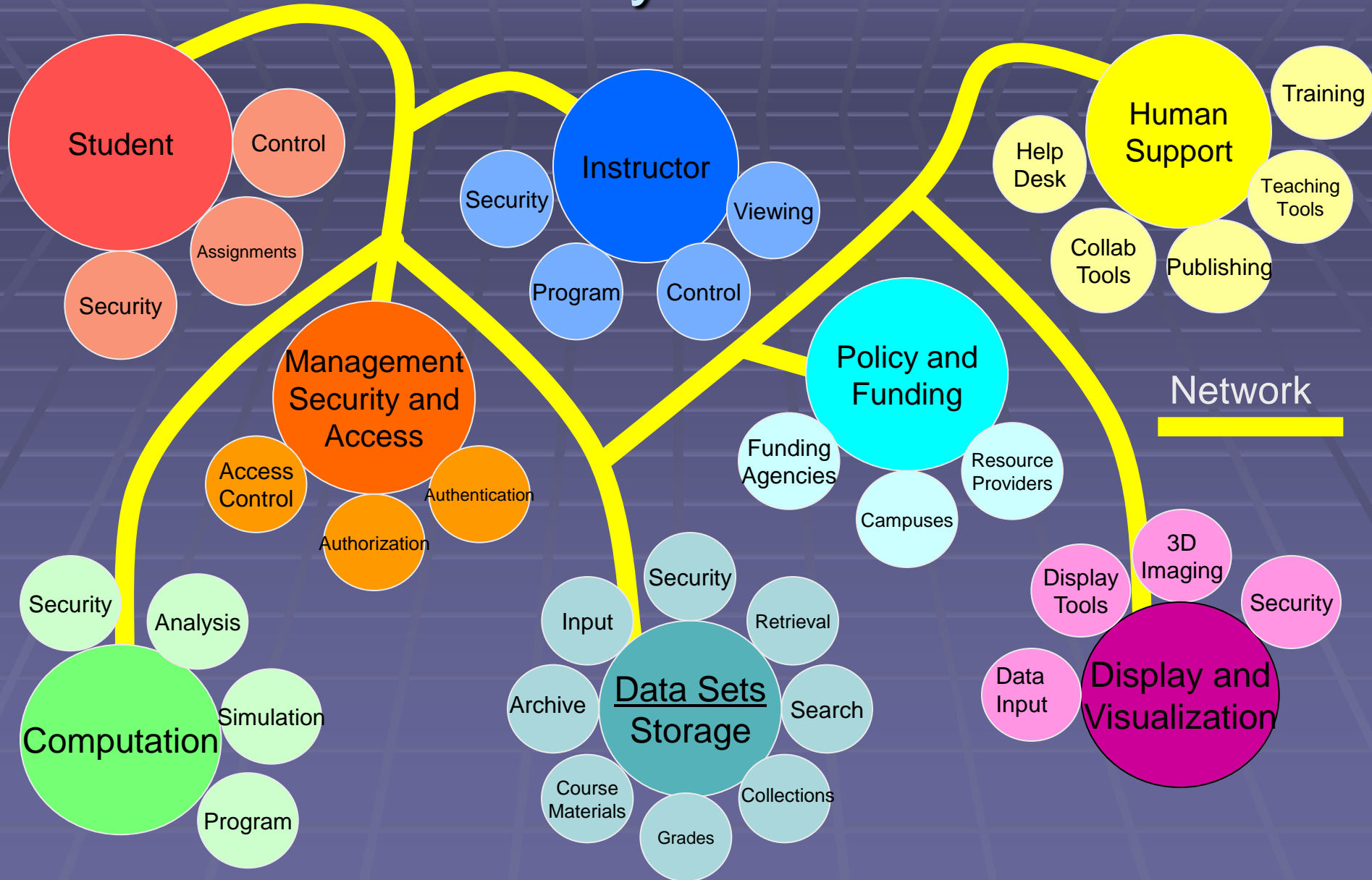




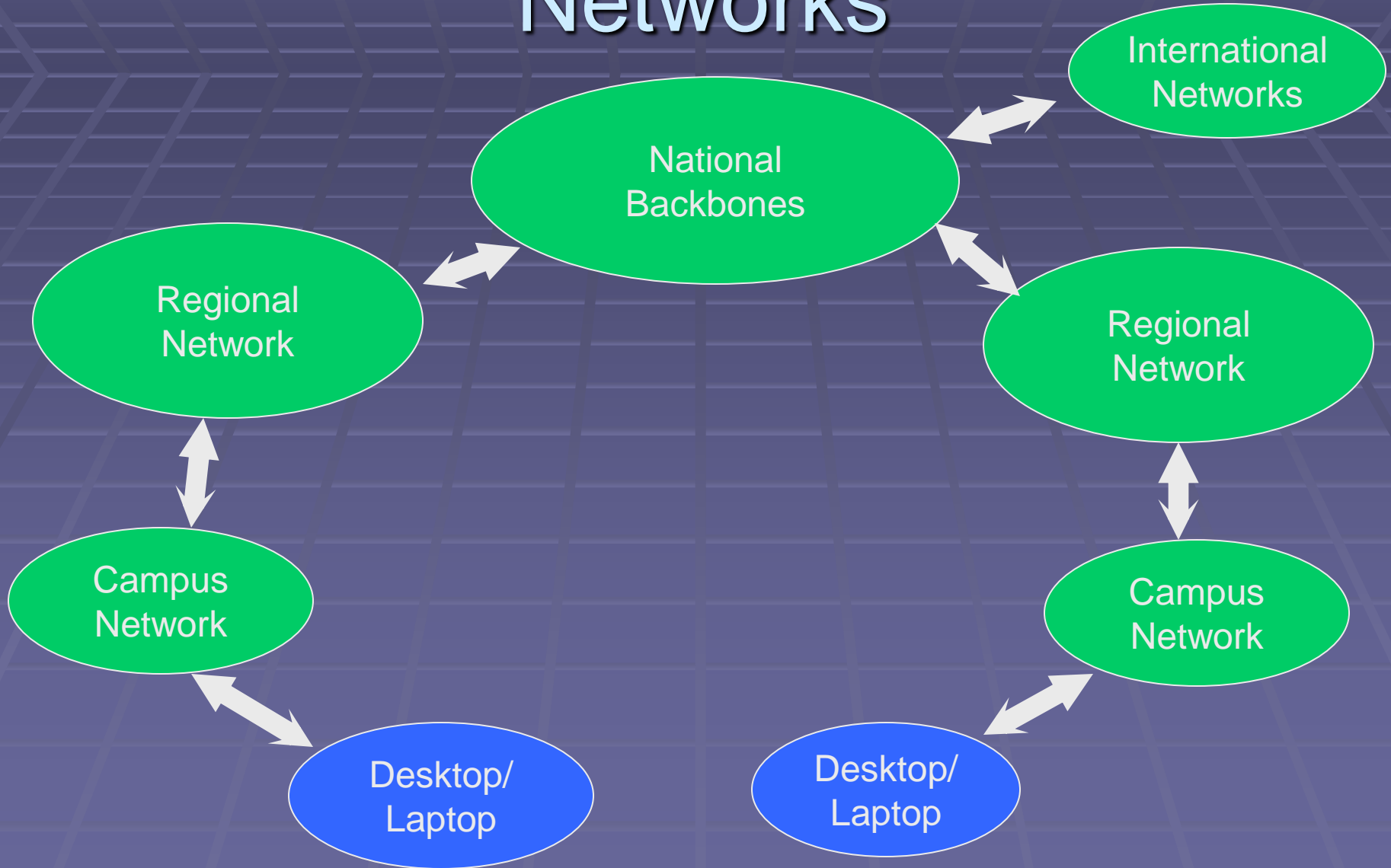
# Cyberinfrastructure Players in Research



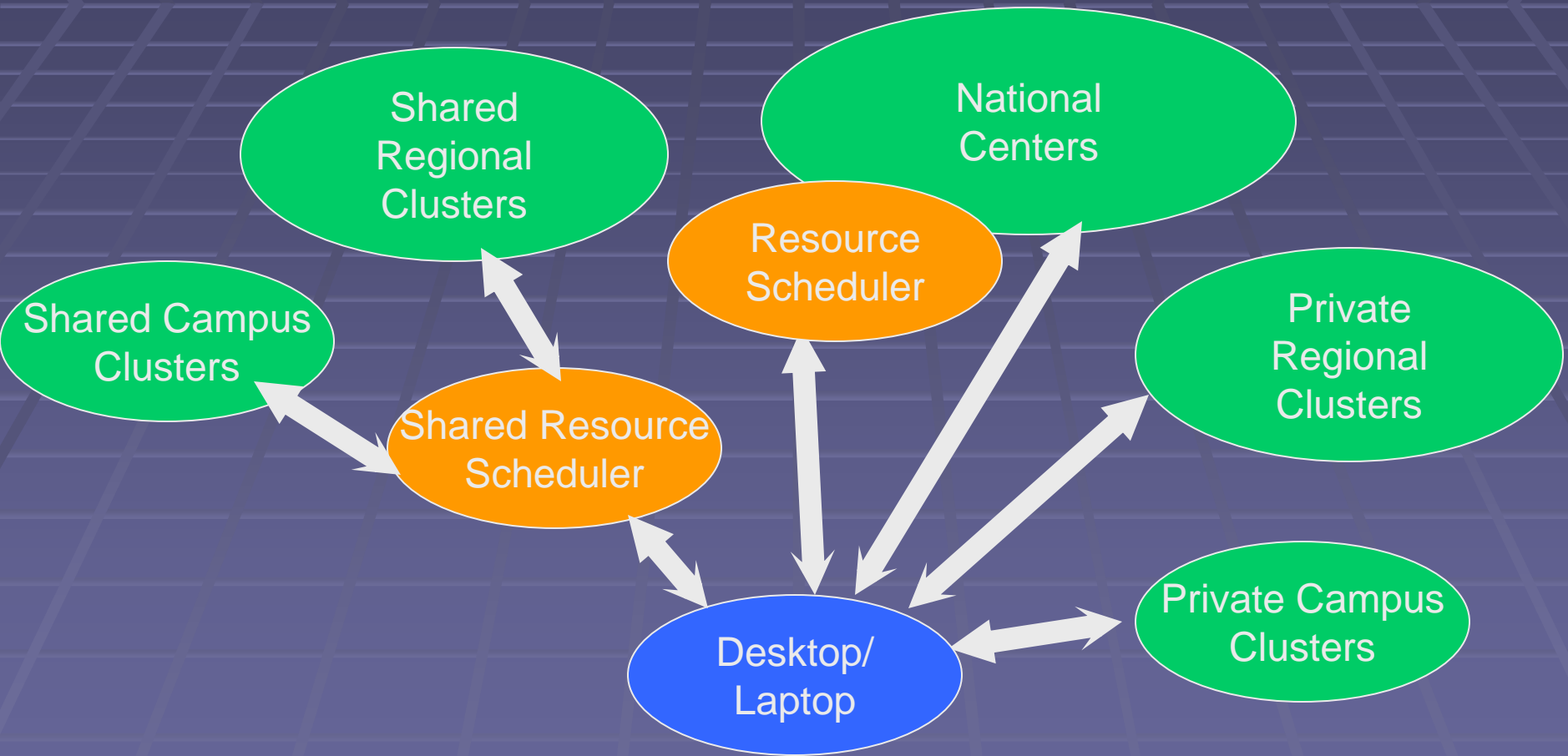
# Other Ways to Look at CI



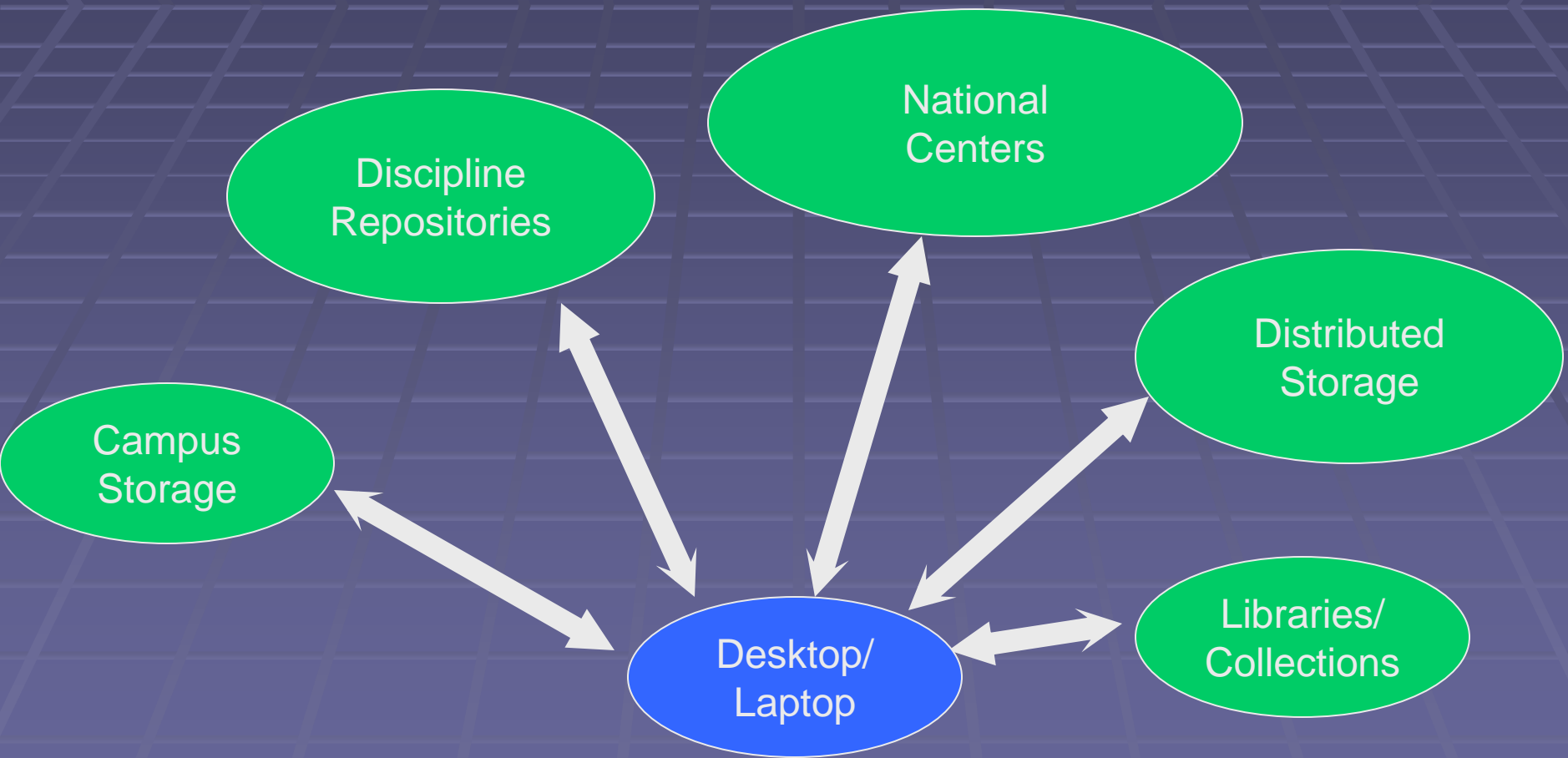
# The Research and Educational Networks



# Computational Resources



# Storage Resources



# Pulling it all together

- Gateways
  - Common Software
  - Common Data Formats and Schema
  - Performance and Monitoring Tools
- ... and a lot more!

# Russ' CI Vision

Set of tools and resources that allow:

- Computation and Storage to easily allow transition from the desktop, to the campus resource, to the regional center, to national super centers using the same software.
- Data repositories in formats and locations to allow ease of sharing among all interested disciplines (the real digital library!)
- Tools to allow people to easily construct systems to analyze, visualize and simulate their research subjects.
- Collaboration tools that allow people to work together like they are in the same room, even if they aren't.

# Discussion

What makes CI hard to use?

What could be done to make it easier?

What would make it more useful?



# More Info

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