Cyberinfrastructure Research, Learning and Workforce Development (LWD)

Office of Advanced Cyberinfrastructure Division (OAC)
Computer and Information Science & Engineering (CISE)
National Science Foundation

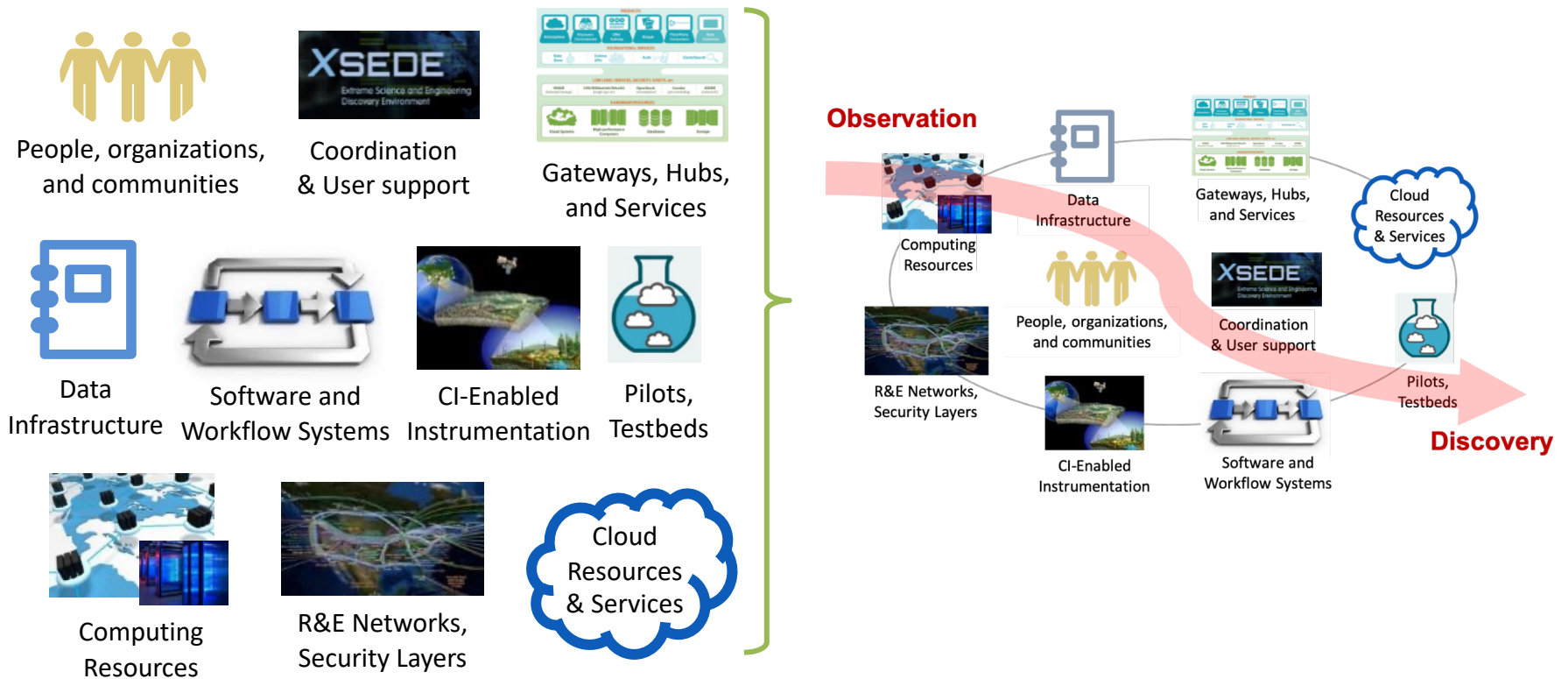Alan Sussman

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Virtual Residency Workshop, June 2021

National Science Foundation
WHERE DISCOVERIES BEGIN

NSF Office of Advanced Cyberinfrastructure (OAC)

Foster a cyberinfrastructure ecosystem to transform science and engineering research… through Research CI and CI research

People, organizations, and communities

Coordination & User support

Gateways, Hubs, and Services

Data Infrastructure

Software and Workflow Systems

CI-Enabled Instrumentation

Pilots, Testbeds

Computing Resources

R&E Networks, Security Layers

Cloud Resources & Services

Observation

Data Infrastructure

Computing Resources

People, organizations, and communities

R&E Networks, Security Layers

CI-Enabled Instrumentation

Gateways, Hubs, and Services

Cloud Resources & Services

Coordination & User support

Software and Workflow Systems

Pilots, Testbeds

Discovery

LWD: Communities of Concern

CI Contributors

Cyber Scientists
to develop
new capabilities

CI Professionals

Professional Staff
to deploy & support
new capabilities

CI Users

Area Scientists
to exploit
new capabilities

OAC

Learning and Workforce Development

Student Research Training

- REU SITES

Faculty Early Career Research

- CRII
- CAREER

Training/Workforce Development

- CyberTraining
  NSF 19-524

OAC Core Research Program

- Solicitation with other CISE divisions
- OAC is only division with deadline for Smalls (mid-Nov.)
  NSF 20-591

CyberTraining – Training-based Workforce Development for Advanced Cyberinfrastructure (NSF 19-524)

- Twin Goals for *research* workforce preparation
  1. Broad adoption of CI tools/methods, or
  2. Curriculum/Instructional Materials Development and Integration

- Three project classes:
  - *Pilot:* Exploratory activities, $300K, 2 yrs
  - *Implementation:* Broadly accessible to community
    - *Small:* $500K, 4 yrs
    - *Medium:* foster a community, $1M, 4 yrs
  - *Large-scale Project Conceptualization:*
    - Planning grants for potential future institute-like CyberTraining projects, $500k, 2 yrs

- 3 communities of concerns
  - CI Professionals, CI Contributors, and CI Users

- Participation:
  - ENG, GEO, SBE, MPS (AST, DMR, PHY), EHR/DGE, CISE/CCF
  - *OAC – lead*

- Excellent community response
  - ~10-12 awards per year last several years

- Deadline:
  - Jan. 19, 2022

OAC-Core Research Areas

- *Architecture & middleware for extreme-scale systems:*
  - Design, benchmarking, and analysis; storage, networks, and I/O; Resource management, monitoring, fault tolerance, and cybersecurity
- *Scalable Algorithms and Applications:*
  - Numerical and high-performance scientific computing methods; Data, software and visualization; and Modeling and simulation
- *Advanced Cyberinfrastructure Ecosystem:*
  - Programming languages, libraries, and environments; Tools; Sociotechnical aspects

CISE Research Initiation Initiative
(CRII - NSF 21-591)

- Independent research for faculty or *research scientists* in their first three years (Pre-CAREER)
  - May not have any federal grant as PI; 2 chances;
  - New: Chair letter (w/template) certifies lack of essential resources
  - Tenure-track or research science or education position
- OAC research focus:
  - Advanced CI research: Translational, Use-inspired, multidisciplinary, End-to-end
  - Computational and data-intensive scientists in addition to computer scientists
- Award ~$175K/ 2 yrs;
- Deadline: Sept. 20, 2021

Other Opportunities within OAC

- Software and Data programs include CSSI (NSF 20-592), PPoSS (NSF 21-513), …
- INTERN DCL (NSF 21-013)
  - Non-academic Graduate Student Research $55K/student
- Student Travel Grants
- *Discuss with me and other OAC Program Officers*
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