NCSA Faculty Fellows 2018 Kick off Presentation

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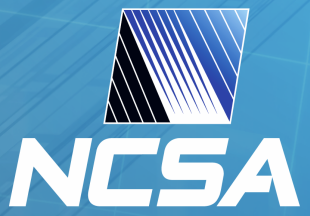

National Center for Supercomputing Applications
University of Illinois at Urbana–Champaign

NCSA

- Interdisciplinary institute at Illinois reporting to VCR
  - One of original five NSF supercomputing centers: Provide state-of-the-art computing capabilities (hardware, software, HPC expertise) to nation's scientists and engineers
- In total, > $1 Billion brought to U. Illinois since 1985
  - Approximately 220 staff (160+ technical/professional staff), two facilities
  - Operating NSF's most powerful computing system: Blue Waters ($345M)

- Managing NSF's national cyberinfrastructure: XSEDE ($145M)
- NCSA Industry: over 35 partners

NCSA

- 98 affiliate faculty
- 22 postdoctoral scholars with a postdoc program
- Graduate and undergraduate students

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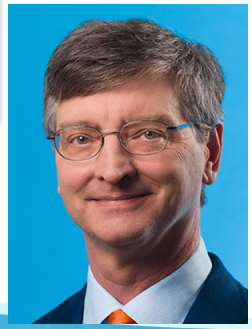


ILLINOIS

OFFICE OF THE VICE CHANCELLOR
FOR RESEARCH ORGANIZATIONAL STRUCTURE
October 2017

Research Institutes | VCR Administration | Compliance and Research Support Units

NCSA

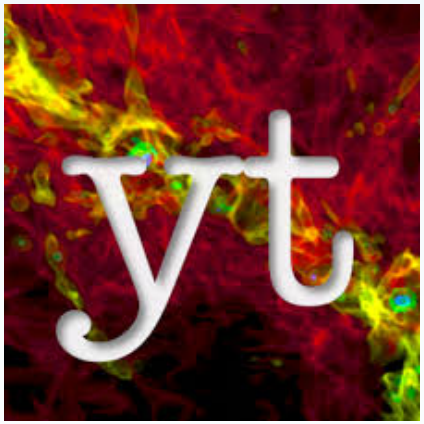
Petascale Computing Facility: Home to Blue Waters, Research Platform for Nation

- **Blue Waters**
  - 13PF, 1500TB, 300PB
  - >1PF On real apps
  - NAMD, MILC, WRF, PPM, NWChem, etc
  - Projected $1.08B direct economic impact on Illinois' economy
- **Modern Data Center**
  - 90,000+ ft^2 total
  - 30,000 ft^2 raised floor
    20,000 ft^2 machine room gallery
- **Networking**
  - 440 Gbits to outside world

NCSA

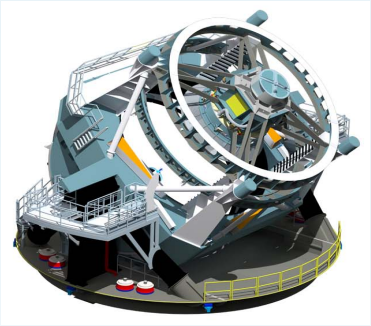
Example Projects, Centers, Facilities

XSEDE, national cyberinfrastructure



Data analysis for large scale simulation data

- Innovative Systems Laboratory
- Advanced Visualization Laboratory
- eDream - Emerging Digital Research & Education in Arts Media Institute
- Visual Intelligence
- NCSA Industry program



LSST Data pipeline

Browndog: Curation for “long tail” unstructured data

NCSA Strategic Plan

A deeper and integrative connection to the Illinois campus with faculty, postdocs and students.

NCSA Organization

http://www.ncsa.illinois.edu/about/directory

Bill Gropp
NCSA Director

Scott Wilkin
Deputy Director

Randy Butler
Senior Associate Director,
Integrated Cyberinfrastructure

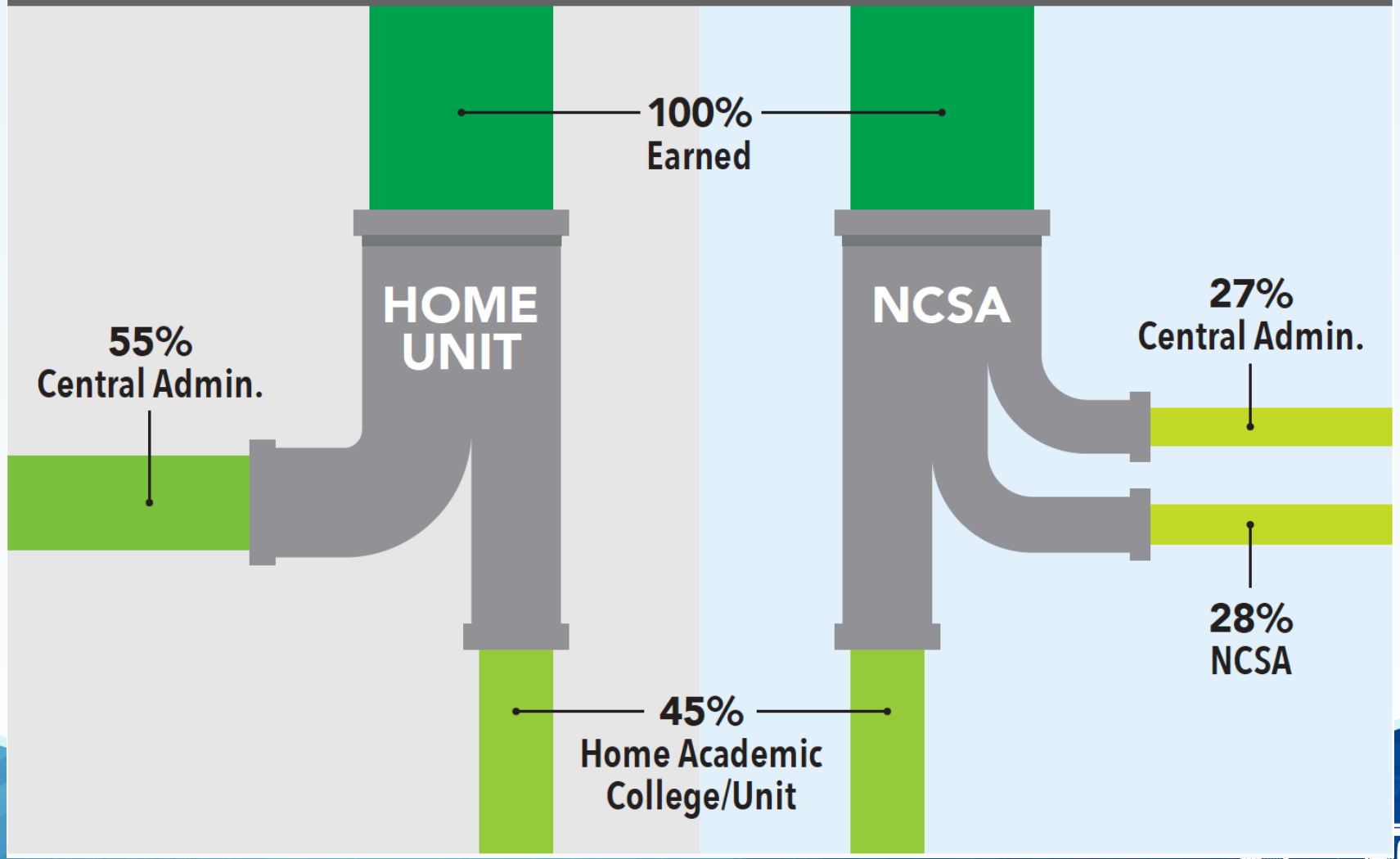
Donna Cox
Associate Director,
Research & Education

NCSA Mission

- Address challenges or opportunities that are complex, multifaceted, and interdisciplinary aligned with with potential to advance the Illinois Strategic Plan

- Pursue external funding opportunities through NCSA's Research Focus Areas
  - Astronomy and Astrophysics
  - Computational Biology and Health
  - Culture and Society
  - Food, Energy, and Water
  - Computational Engineering

Grants run through NCSA do not impact the F&A returned to your home unit.



NCSA Faculty Fellows Program (est. 1999)

- Competitive program provides seed funding (up to $25K/award) for demonstration, start-up projects, workshops, and/or other activities with the potential to lead to longer-term collaborations and externally funded activities around research and development.
- Will fund 6 fellows for the 2018-2019 cohort

Important Dates

- **Jan. 19, 2018:** NCSA Faculty Fellows kickoff: solicitation goals and focus, help potential applicants understand its scope, answer questions
- **Jan. 26, 2018: NCSA Fellowships Ideas Accelerator Workshop.**

  10 am-12 pm, NCSA Lobby. Speed match-making event between potential applicants and NCSA staff and researchers.
- **Feb. 18, 2018:** Deadline to submit to the NCSA Fellowships Program
- **April 2018:** Target date for decisions

Current Fellows

- **Patricia Gregg**, Geology
  - *A Data Assimilation Framework for Forecasting Volcanic Unrest*
- **Andre Schleife**, Materials Science and Engineering
  - *Computational Infrastructure for Collaborative Design of Semiconductor Nancrystals*
  - NCSA Staff: Michal Ondrejcek (ISDA)
- **Zhizhen Zhao**, Electrical and Computational Engineering
  - *Deep Learning to the Rescue: Enabling the Search and Characterization of New Classes of Gravitational Wave Sources with Novel Applications of Machine Learning*
  - NCSA Staff: Eliu Huerta (Gravity Group), Vlad Kindratenko (Innovative Systems Lab)
- **Dallas Trinkle**, Materials Science and Engineering
  - *Materials Modeling Optimization*
  - NCSA Staff: Michal Ondrejcek (ISDA), Dan Katz (Scientific Software Applications)

Current Fellows (cont'd)

- **J. Stephen Downie**
  - *Modeling the Massive HathiTrust Corpus: Creating Concept-Based Representations of 15 Million Volumes*
  - NCSA Staff: Craig Willis (ISDA), Donna Cox (R&E)
- **Anita Chan,** Media and Cinema Studies
  - *Transdisciplinary Convergence in Situated Research Environments: Mapping NCSA across the UI Campus*
  - NCSA Staff: Donna Cox (R&E)
- **Zeynep Madak-Erdogan**, Food Sciences and Human Nutrition
  - *Optimization of Agent-Based Models to Improve Infectious Disease Management*
  - NCSA Staff: Dora Cai (Advanced Application Support), Luda Mainzer (NCSA Genomics), Vlad Kindratenko (Innovative Systems Laboratory)
- **Ruby Mendenhall**, Sociology; African American Studies
  - *Using Wearable Sensors and Affective Diaries to Document How Violence Affects Public Life and Public Health*
  - NCSA Staff: Kiel Gilleade (Culture & Society), Luda Mainzer (NCSA Genomics)

Projects are encouraged that build on:

- NCSA focus research areas:
  - Astronomy and Astrophysics
  - Computational Biology and Health
  - Culture and Society
  - Food, Energy, and Water
  - Computational Engineering
- and NCSA major projects and programs:
  - Blue Waters (Contact: Greg Bauer)
  - XSEDE (Contact: Jay Alameda)
  - Innovative Systems Laboratory (Contact: Volodymyr Kindratenko)
  - Advanced Visualization Laboratory (Contact: Donna Cox)
  - Cybersecurity (Contact: Adam Slagell)
  - National Data Service (Contact: Kenton McHenry)
  - Midwest Big Data Hub (Contact: Melissa Cragin)
  - Innovative Software and Data Analysis (Contact: Kenton McHenry)
  - NCSA Industry (Contact: Seid Koric)
  - Visual Intelligence Group (Contact: Colleen Bushell)

NCSA

Fellows Responsibilities to NCSA

- Responsible for contributing to the NCSA academic core;
- Contribute to and take part in large collaborative funding efforts;
- Act as liaisons with their home departments.

NCSA Responsibilities to Fellows

- Provide a 0% NCSA appointment;
- Fellows are provided drop-in office space at NCSA;
- Have direct access to NCSA research scientists, staff, and services;
- Where possible, NCSA will provide access to compute, data, and other cyberinfrastructure, including software licenses, needed for fellowship projects.

Collaboration with NCSA Staff

- Strongly encouraged to maintain an active, close collaboration with NCSA staff for the duration of the fellowship, **discuss these collaborations in detail with the NCSA staff involved before submitting proposals**.
- Describe the nature of the collaboration, anticipated staff time commitment, source of support for staff involvement.
- Support for NCSA staff can come from existing project or grant funds or can be requested as part of the proposal from the NCSA Director's Office*.

***Requests of up to one month effort are the most likely to be supported. Staff should discuss their plans with their supervisor.**

Proposal Preparation and Submission

http://www.ncsa.illinois.edu/about/org/fellowships/submissions

- Competitive proposals will include:
  - Individual or multiple Illinois faculty
  - A well-defined activity that requires close collaboration with NCSA application and technical staff and possible use of NCSA computational resources or facilities.
  - A plan that will lead to new external funding

- Easychair used for proposal submission, beginning January 26th (see "Proposal Preparation and Submission" on Fellow Program website)

Review Criteria

- Significance
  - Does the project address an important problem or a critical barrier to progress in the field?
  - Is the project interdisciplinary and relevant to the Illinois campus and to NCSA strategic plan?
  - Is there a strong scientific promise for the project?
  - If the aims of the project are achieved, how will scientific knowledge, technical capability, and or clinical practice be improved?
- Investigators
- Innovation
- Approach
- Environment

Review Criteria (cont'd)

- Significance
- Investigators
  - Does the project include NCSA staff as integral contributor to the project?
  - Are the PI(s), collaborators, and other researchers well suited to the project?
  - Does the project include plan(s) to leverage NCSA scientific, technical, and management expertise, and/or leverage NCSA facilities and other major ongoing activities and programs?
  - Does the project include plan(s) for continued collaboration and pursue of external funding from Federal agencies, Foundations, or Industry?
- Innovation
- Approach
- Environment

Review Criteria (cont'd)

- Significance
- Investigators
- Innovation
  - Does the project challenge to seek to shift current research or clinical practice paradigms by utilizing novel theoretical concepts, approaches or methodologies, instrumentation, or interventions?
  - Are the concepts, approaches or methodologies, instrumentation, or interventions novel to one field of research or novel in a broad sense?
- Approach
- Environment

Review Criteria (cont'd)

- Significance
- Investigators
- Innovation
- Approach
  - Are the overall strategy, methodology, and analysis well-reasoned and appropriate to accomplish the scientific aims of the project?
  - Are potential problems, alternative strategies, and benchmarks for success presented?
  - If the project is in the early stages of development, will the strategy establish feasibility and will particularly risky aspects be managed?
- Environment

Review Criteria (cont'd)

- Significance
- Investigators
- Innovation
- Approach
- Environment
  - Will NCSA in which the work will be done contribute to the probability of success?
  - Does the project demonstrate a compelling need for the NCSA funding and involvement?
  - Are NCSA support, equipment and other physical resources available to the investigators adequate for the project proposed?

Proposal Preparation- Required Documents

Proposals should consist of:

A. Abstract ……(1/2 page)
B. Project Description ……(4 pages)
  B.1 Project Significance
  B.2 Investigators
  B.3 Innovation
  B.4 Approach
  B.5 Environment
C. References (avoid using et. al)
D. Bios – each PI/co-PI ……(2 pages)
E. Budget and Budget Justification
F. *Letter(s) of Commitment ……(1 page)

*Template may be found on the “Proposal Preparation and Submission” web page

Budgets

- Up to $25,000 over 12 months (appointments begin July 1, 2018).

- Fellowship funds can be used for the following purposes:
  - Research assistant support (GRA, postdoc, etc.)
  - Workshop support (to be held at NCSA)
  - Travel support—maximum of $1,500 for conference travel or travel to other sites
  - Faculty summer salary

- Project budgets do not need to include benefits, tuition remission, or overheads.

- Awards made are subject to the availability of funds, and review panel's recommendations.

Next Week: Idea Acceleration Workshop – Jan. 26, 10am-12pm, NCSA Atrium

- Potential applicants encouraged to present 1 slide on:
  - project ideas and/or skills/resources needed from NCSA
  - Picture of yourself
  - Contact information (e.g. email address)
  - Submit slide to Amanda Lombardo (alombar@illinois.edu) by 4pm on January 25th

- NCSA staff will be on hand to share information on major NCSA program areas

Questions/Comments??