Connecting people and resources to accelerate discovery by empowering the science gateway community

I SGCI I

Science Gateways Community Institute

Nancy Wilkins-Diehr, SDSC

Michael Zentner, Purdue

Marlon Pierce, Indiana U

Maytal Dahan, TACC

Katherine Lawrence, U of Michigan

Linda Hayden, ECSU

- You may ask yourself, how did I get here?
  - *David Byrne, Talking Heads*
- What are we doing now that we're here?
- How are we doing what we're doing?
- 1 XSEDE advertisement

SGCI

What is a science gateway?

science gateway /sī′ əns gāt′ wā′/ *n.*

1. an online community space for science and engineering research and education.

2. a Web-based resource for accessing data, software, computing services, and equipment specific to the needs of a science or engineering discipline.

GUI!

SGCI

10+ year road to the birth of an institute

> *Despite the technological progress of grid technology and deployment, **only a minority of the scientific, engineering, and education community use today's national computing infrastructure**. Our WIDE strategy addresses this situation by working directly with specific community leaders who are building **discipline-specific cyberinfrastructure capabilities** and resources for their communities.*
>
> TeraGrid proposal, 2003

- Hallmarks of the program
  - Worked with applications and technology "newlyweds"
    - NSF Information Technology Research program
    - Had to pay early customers while they helped us develop a program
  - **First example of community groups using supercomputers without individual identification**

EAGER grant
NSF Virtual Organizations program, 2009-2012

Award Abstract #0948476

Fundamental Cyberinfrastructure for Productive Science and Engineering: Identification of Barriers to and Enablers of Successful Projects

- Hallmarks of the program
  - $300k to 2 institutions, most funds to participant support
  - 5 focus groups
    - Characteristics of successful gateways
    - Fields ready for transformation by gateways
    - Research initiatives that have been successful and sustainable in multiple fields and through multiple funding sources
    - External perspectives on the evaluation criteria and compelling features of potentially successful and technology projects
    - Viability of preliminary findings (representatives from NSF and other federal agencies)

SGCI

S2I2 Conceptualization phase grant, 2012-2015

Award Abstract #1216870

Collaborative Research: The Science Gateway Institute (SGW-I) for the Democratization and Acceleration of Science

- Hallmarks of the program
  - $250k effort across 6 sites, most funds to participant support
  - Steering committee interviews
    - Identify participants and conferences
  - 3 more focus groups
    - 2 domain-focused events co-located with American Physical Society, American Society for Biochemistry and Molecular Biology
    - Tech-focused event
  - Large-scale survey of 5000 NSF PIs, academic CIOs, CTOs
  - 58-page strategic plan

SGCI

5-year S2I2 Implementation phase award begins Aug, 2016

Press Release 16-088

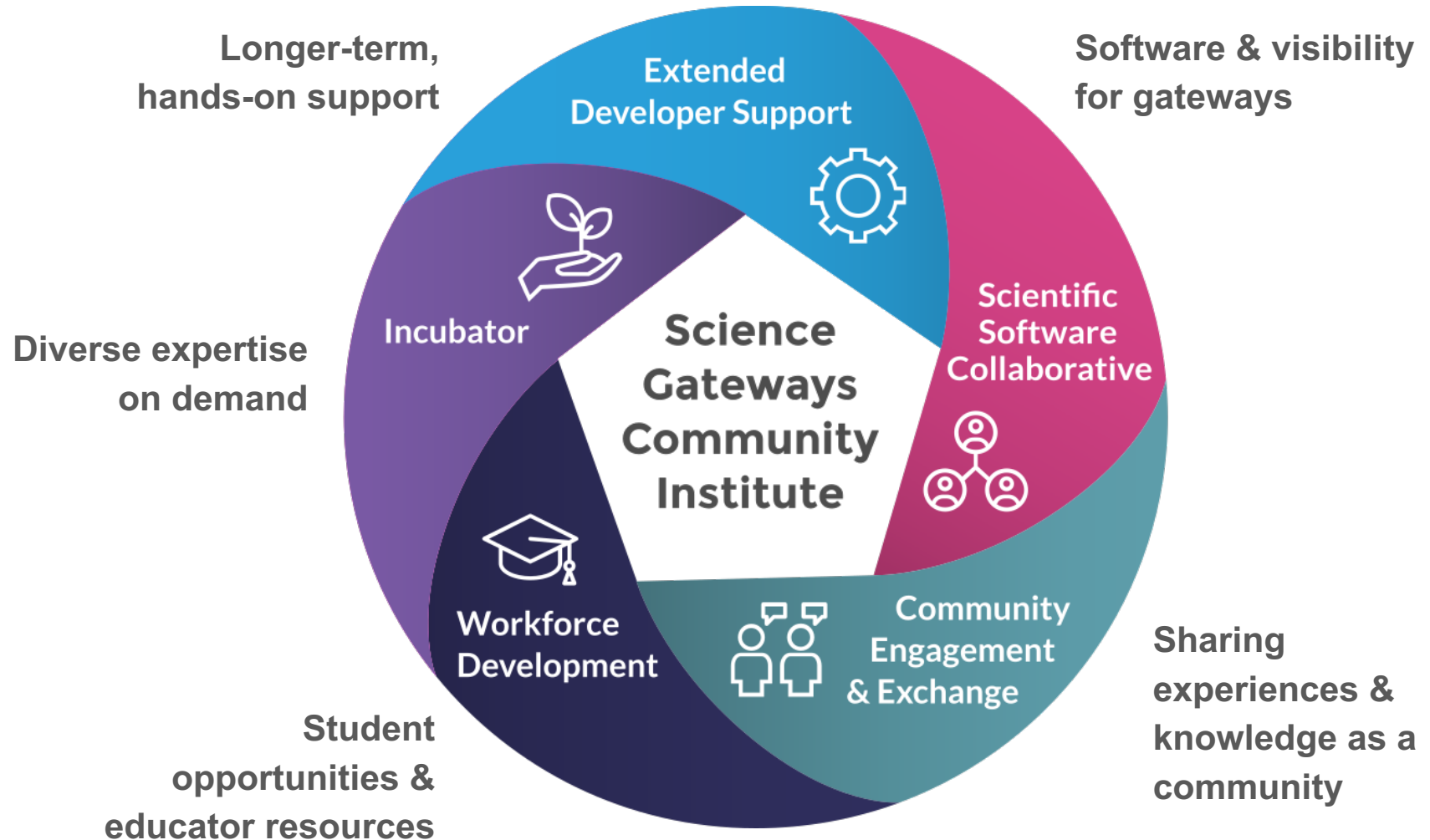## NSF commits $35 million to improve scientific software

Science Gateways Community Institute

The second award, led by the University of California, San Diego, establishes the Science Gateways Community Institute, a multi-institutional consortium that will increase the capabilities, number and sustainability of science gateways. Gateways are mobile or web-based applications that provide broad access to the nation's shared cyberinfrastructure to scientists and citizens alike.

"Gateways foster collaborations and the exchange of ideas among researchers and can democratize access, providing broad access to resources sometimes unavailable to those who are not at leading research institutions," said Nancy Wilkins-Diehr, associate director of the San Diego Supercomputer Center and principal investigator for the project. "Sharing expertise about basic infrastructure allows developers to concentrate on the novel, the challenging, and the cutting-edge development needed by their specific user community."

Science Gateways Community Institute

Designed to help the community build gateways more effectively

Longer-term, hands-on support

Software & visibility for gateways

Diverse expertise on demand

Sharing experiences & knowledge as a community

Student opportunities & educator resources

Extended Developer Support

Scientific Software Collaborative

Incubator

Science Gateways Community Institute

Workforce Development

Community Engagement & Exchange

SGCI

Incubator: Consulting expertise and in depth training

- Building a gateway can take may types of expertise
  - But projects cannot afford to hire this in
- Consulting services provide cost effective solution
  - Get expertise you need when you need it, release it when you're finished
- In depth cohorts for training, group interactions, mentoring
  - Customized structure, content and goals
- ACTION: Request services at http://sciencegateways.org/services/gateway-services-request-form/

Extended Developer Support

- Help building new gateways
  - Or portions of new gateways
- Dedicated support for months to a year
- Similar in structure to XSEDE ECSS program
- Different in that gateways can be built from the ground up
  - And can use any type of resource
- ACTION: Request services at http://sciencegateways.org/services/gateway-services-request-form/

Scientific Software Collaborative

- Find software used to build gateways
  - List your software
  - Work with us to support gateways as an affiliate

- Find existing gateways
  - Just use them
  - Learn what they're built with
  - Converse with developers
  - Find gateways used in curricula

- ACTION: Still in development, sign up for mailing list to keep apprised of status

- http://sciencegateways.org/connect-with-us/

Community Engagement and Exchange

- Goal is to be THE place for gateway-related information

- Building the community of gateway developers
  - Blogs, jobs, case studies, gateways in the news, webinars
  - ACTION: help@sciencegateways.org to present on the webinar, contribute a blog entry, etc

- Annual Gateways conference
  - Interact with other developers
  - Tutorials, presentations, posters, reception, open space discussions
  - Student opportunities, travel support
  - ACTION: Help organize, attend, participate
  - Gateways 2016
    - Nov 2-3, SDSC, 120 attendees
  - Gateways 2017
    - Oct 24-25, Ann Arbor

- Building gateway expertise on campuses
  - This area is developing, stay tuned

- ACTION: Follow us via mailing list or Twitter (@sciencegateways)

- http://sciencegateways.org/connect-with-us/

SGCI

Workforce Development

- Students
  - Fellowships and internships
  - Travel support
  - Training
  - Summer coding opportunities

- Young Professionals Network

- Year 1 work with
  - NOBBCHe (National Organization for the Professional Advancement of Black Chemists and Chemical Engineers)
  - ADMI (Association of Computer/Information Sciences and Engineering Departments at Minority Institutions)

- Faculty
  - Gateways in the curricula

- Career tracks for gateway developers

- ACTION: Watch for opportunities for faculty and students via the mailing list

- http://sciencegateways.org/connect-with-us/

Hot off the presses:
Gateway users are 77% of active XSEDE users in Q4 2016

This is largely due to the CIPRES and I-TASSER gateways, but others are gaining
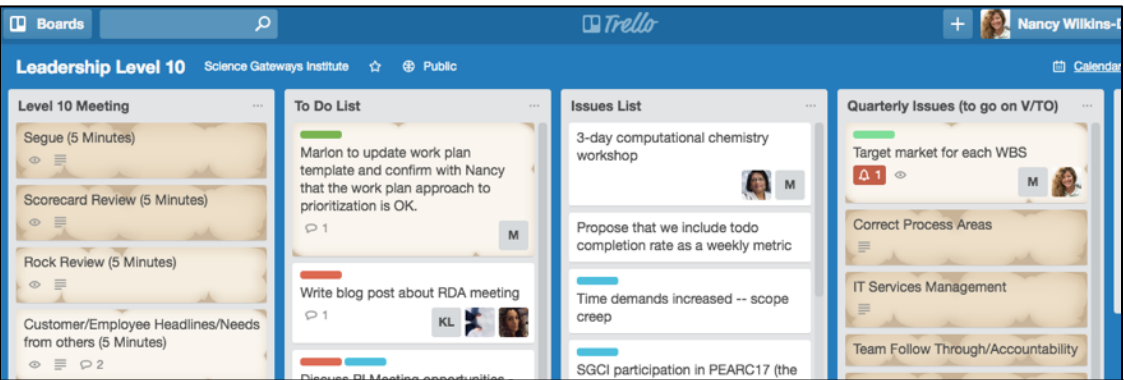
"Unique" management approach
Entrepreneurial Operating System™

Scorecard + 90-day "Rocks" to move forward

Trello, HubSpot, JIRA

Opportunities to Engage

- Request a Letter of Collaboration to leverage existing SGCI offerings

- Become an Affiliate to provide expertise to SGCI clients and attract users to your software

- Write SGCI experts into proposals for dedicated, continuing expertise

Email help@sciencegateways.org to discuss

XSEDE/SI2 opportunities

- XSEDE will
  - Incorporate **existing solutions** to identified needs of the XSEDE user community
  - provide input and support in the development of **new capabilities**--particularly those that might utilize XSEDE-allocated resources
  - support **integration of software** to be developed into the larger CI ecosystem via the XSEDE infrastructure

Community Software Repository (CSR) -- Vision

XSEDE Vision

XSEDE aims to be a Connector of Cyberinfrastructure (CI) Resources, Software, and Services.

Community Software Repository Vision

A **collaborative community** of software and services providers
that **engage with users** to document their **use cases**,
that **prioritize use case** gaps to **maximize ROI**,
who **integrate quality software and services** into a coherent Cyberinfrastructure,
who **share software** with others,
or **leverage** software from others,
to collectively enable the research community to use cyberinfrastructure.

Target audience is all research software providers and consumers

Not just software on XSEDE allocated resources, but also:
- campus un-allocated resources
- community services (like science gateways, 3rd party services)
- community software

A-la-cart CSR capabilities

What can **users** do with it?
- Discover ready-to-use software already integrated into clusters, in gateways/portals, and community software areas

What can **software providers** do with it?
- Share their packaged software (for operators or developers to install)
- In VM/container or traditional package format

What can **operators or developers** do with it?
- Advertise ready-to-use software they operate for the community
- Advertise packaged software they offer operators/developers
- Discover ready-to-use or packaged software from others that they can leverage

What can **everyone** do with it?
- Prepare and discover motivating use cases
- Discuss and review priorities, plans, designs, defects/features, and how to use

Temporarily hosted at https://software.xsede.org/

SI2 developers can also install software on XSEDE resources
Community Software Areas

- Developer allocations
  - XSEDE Extended Collaborative Support Service (ECSS) staff can help with code porting and optimization
- Software advertised to XSEDE users through the software catalog
- Training advertised to XSEDE users
  - Education and outreach opportunities
- Usage statistics
- https://www.xsede.org/software

Thank you!

- SGCI follow-up

    - Mailing list for news and updates: http://sciencegateways.org/connect-with-us/

    - Ready to request our services? http://sciencegateways.org/services/ gateway-services-request-form/

    - Have a question? help@sciencegateways.org

    - @sciencegateways on Twitter

    - http://sciencegateways.org/linkedin