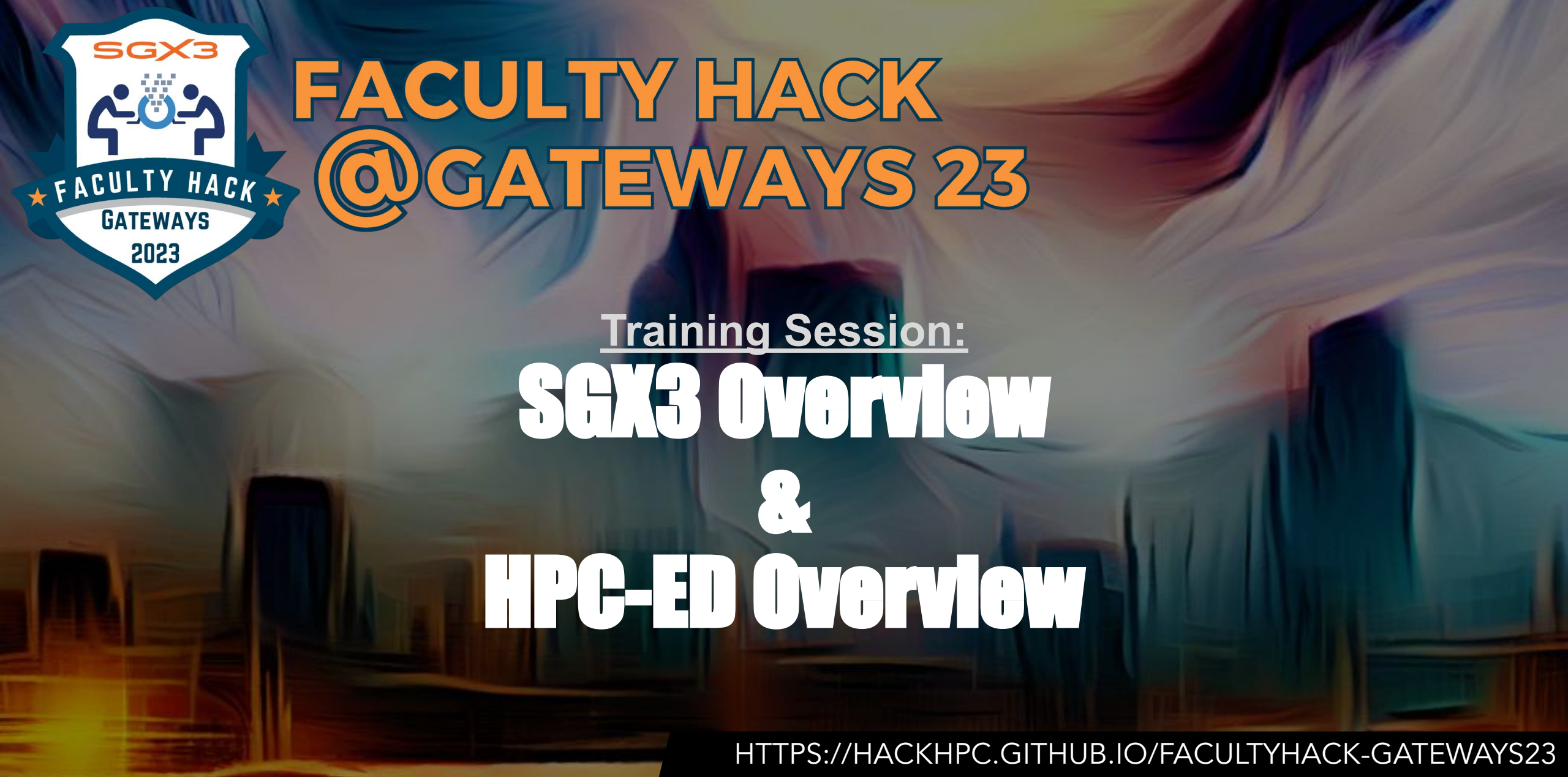

FACULTY HACK @GATEWAYS 23

Training Session:

SGX3 Overview & HPC-ED Overview

HTTPS://HACKHPC.GITHUB.IO/FACULTYHACK-GATEWAYS23

SGX3 Extend. Expand. Exemplify.

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Schedule

https://hackhpc.github.io/facultyhack-gateways23/schedule.html

Prehack Training

- 10/16
  - Poster Template - Dr. Muneve Kanampiu, WSSU
  - GitHub Overview - Je'aime Powell, TACC
- 10/17
  - HPC Overview - Fernanda Foertter, Voltron Data
- 10/18
  - SGX3 Overview - tbd
  - HPC-ED Overview + MiniHack- Charlie Dey, TACC

Hackathon Schedule

- 10/19, 5pm ET - Kickoff
  - Project Eureka! - Boyd Wilson, CEO, Omnibond
- 10/20, 5pm ET - First Check-In
  - Team Introductions and Goals
- 10/21, 5pm ET - Second Check-In
- 10/22, 5pm ET - Final Check-In
  - Faculty Programs - Elijah Macarthy, ORNL

Poster Presentation

- 10/30, 6:40pm ET - Science Gateways 23
  - Exit Interview, Alex Nolte

FACULTY HACK @GATEWAYS 23

SGX3 Overview

Presented by: THE Dr. Linda Hayden, ECSU

HTTPS://HACKHPC.GITHUB.IO/FACULTYHACK-GATEWAYS23

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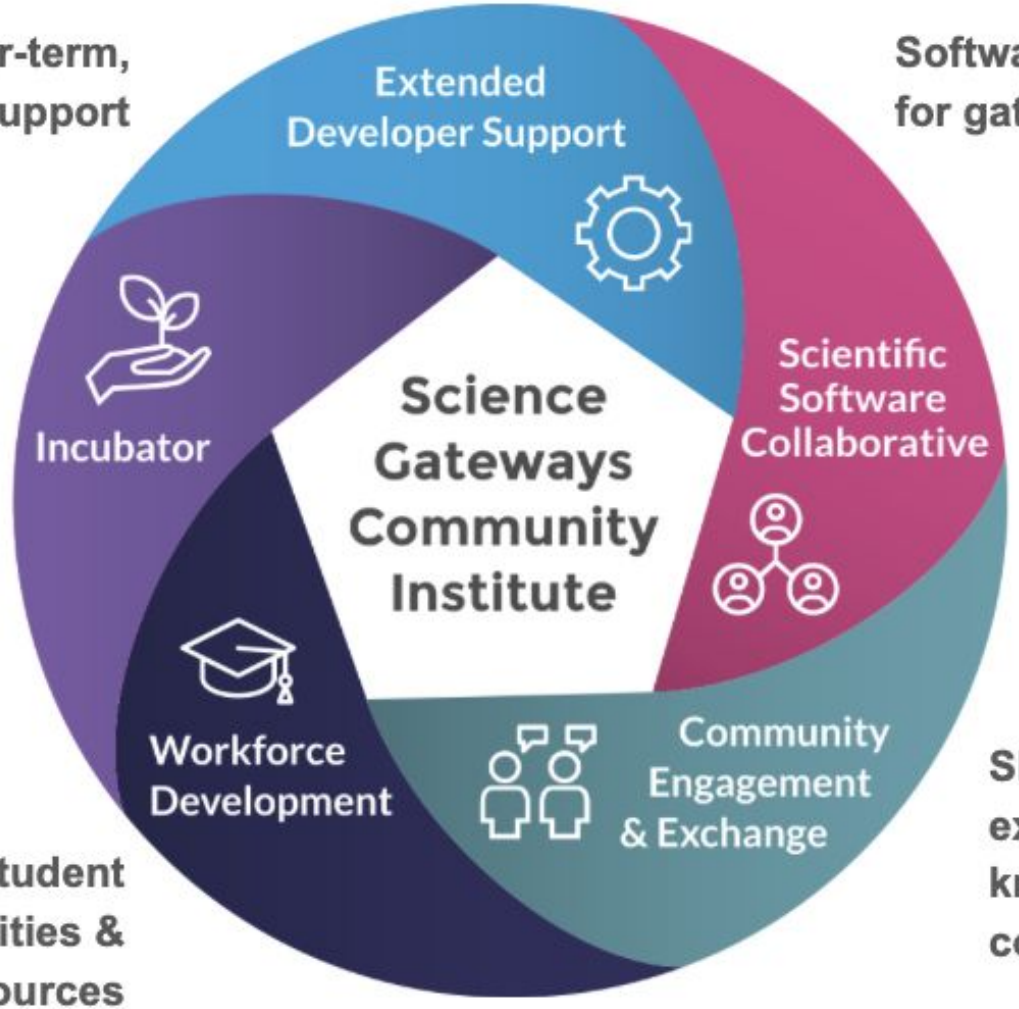
Science Gateways Community Institute



Longer-term, hands-on support

Software & visibility for gateways

Diverse expertise on demand

Student opportunities & educator resources

Sharing experiences & knowledge as a community

SGX3 | SGCI

Leadership Team

Michael Zentner

Director

Claire Stirm

Project Manager
Incubator Lead

Maytal Dahan

Scientific Software Collaborative Lead

Sandra Gesing

Community Engagement Lead

Linda Hayden

Workforce Development Lead

Nancy Maron

Sustainability Blueprint Factory Lead

Paul Parsons

User Experience Consulting Lead

939 webinar attendees

2056 participants in SGCI's events

504 student & **41** faculty participants

154 letters of collaboration

240 Focus Week Attendees

13 Affiliates

32 success stories

63 Consultations

14 partners

48 Extended Developer Support projects

$1,384,325 additional funding to SGCI by external projects

600 Gateway Catalog entries

SGX3 | SGCI

R.I.P.
SGCI
Science Gateways
Community Institute

SGX3

Extend. Expand. Exemplify.

A Center of Excellence to Extend Access, Expand the Community, and Exemplify Good Practices for CI through Science Gateways.

Award #2231406

SGX3
SGCI
A Center of Excellence and a Software Institute to serve the Science Gateways Community
Helping…
• Community Focused
• Workforce Focused
• Future Focused
• Working Toward Preparing for the Future
Building…
• Development Service Focused
• Operations Service Focused
• Heavy Touch Consulting
• Working Toward Self-

SGX3

A new Cyberinfrastructure Center of Excellence for Science Gateways

SGX3 – NSF Funded

- ✓ Community building activities
- ✓ Workforce development activities
- ✓ Light-touch consulting / advisory services
- ✓ Envisioning the future through Blueprint Factories
  - ✓ ACCESS
  - ✓ PATh
  - ✓ Materials Genome Initiative
  - ✓ Sustainability practices
  - ✓ more to come…

SGCI – Client Funded

- ✓ Heavy-touch consulting / other services
- ✓ Software team augmentation / outsourcing
- ✓ Professional science gateway operations

SGX3 is $7.5 million over 5 years beginning September 2022

Workforce Development Overview

https://sciencegateways.org/faculty-focused

SGX3's workforce development activities contribute to broader impact by enriching existing and forming new relationships with minority serving institutions and organizations to bring gateway development into curricula, bring domain-specific gateways to relevant classrooms and research settings, and train faculty to scale these efforts to grow and live beyond SGX3.

The SGX3 Faculty Program builds a supportive HPC/Gateways community for the faculty while providing them the training and support needed to succeed. SGX3 staff assist faculty in establishing HPC accounts for their classes and consult with them through the implementation phase of their curriculum changes.

- HPC/SG Curriculum Enhancement Efforts
- Faculty workshops at ADMIUSA.ORG Symposiums
- Faculty Hackathons
- Faculty Poster Session at Gateways conference
- Gateway Community mentors assigned to faculty

SGX3 | SGCI

Partnership with ADMIUSA.org has been a key ingredients to being successful.

2023 ADMI Symposium

SGCI /SGX3 involvement included:

Faculty Session:
Hackathon HPC Education
Charlie Dey, *Director, Training and Professional Development*
Je'aime Powell, *Sr. Systems Admin.* TACC

Student Workshop
HPC and Science Gateway Opportunities
Charlie Dey, *Director, Training and Professional Development*
Je'aime Powell, *Sr. Systems Admin.* TACC

Faculty Session:
Initiative for HBCUs/MSIs
Dr. Elijah Maccarthy, HPC Engineer
Systems Acceptance and User Environment
Oak Ridge National Laboratory

Student and Faculty Session: *The ACCESS Program: Research Computing Resources for All* **Ms. Virginia Do**, *Outreach Manager & SIParCS Internship Director,* NCAR

Faculty Session:
Hackathon HPC Education
Charlie Dey, *Director, Training and Professional Development*
Je'aime Powell, *Sr. Systems Admin.*
TACC

SGX3 SGCI

2023 Coding Institute & Hackathon

- Sixteen students participated in the virtual 2023 Coding Institute. All were computer science majors. Weeks one and two of the Coding Institute focused on building non-technical and basic technical skills. Week three was devoted to specific gateway technology led by TACC. Finally, week four involved team projects via the hackathon.

- The Hackathon was co-sponsored by SGCI/SGX3, Omnibond Systems, Texas Advanced Computing Center and Amazon Web Services June 26th - 29th. All team projects focused on using UX Design techniques to revamp ADMIUSA.org and the HACKHPC.org sites. SGCI staffer Ali Baigelenov abaigele@purdue.edu served as a consultant and judge for the event.

Ali Baigelenov

Professional development seminar speakers:

Dan Dietz, Suzanne Prentice and Jacqueline Jackson.

SGX3 SGCI

SGX3 Internships
https://sciencegateways.org/internships

Each year, our Workforce Development team offers summer internships for students interested in developing their gateway development skills. Interns are placed at the Texas Advanced Computing Center (TACC).

Eligible applicants include graduate students majoring in computer science or computer engineering (or related fields). The student will be funded by SGX3 to join the TACC science gateway team for the summer, working on live, impactful gateways.

Stipend

Participants will receive a $5,400 stipend (scholarship), housing (if not local to Austin), and meal card at The University of Texas at Austin, and travel arranged by TACC.

Additionally, travel grants to present research at an annual conference will be available to selected participants.

SGX3 | SGCI

Student Programs. Hackathons, professional development seminars, and coding institutes that have a focus on participants from traditionally underrepresented populations will be continued from SGCI.

- Coding Institute June 5-29, 2023
- ADMI Symposium April 13-15 , 2023
- ADMI Hackathon June 26 -30, 2023
- Gateways Conference Mentors
- Rising Stars Award
- HPC in the City Hackathon@ SC
- Internships at TACC

SGX3 SGCI

Intern Presenters: (L to R) Jackson, Dhanny, Swathi, Prithul, Steven

- **Dhanny Indrakusuma** - working on Tapis with the Cloud and Interactive Computing team on creating a machine learning hub application that aims to enhance the experience of non-technical individuals involved in machine learning research. **Dhanny will continue his work at TACC funded by TAPIS.**
- **Jackson Thetford and Steven Oh** - working on the SCOPED (Seismic COmputational Platform for Empowering Discovery) project, an organization that advances research for seismic analysis to create custom Tapis applications using the Tapis UI infrastructure.
- **Prithul Sarker** - working with the web mobile applications team and the project primarily focuses on the backend operations of applications in high-performance computing.
- **Swathi Vallabhajosyula** - working with the Tapis team on extending the platform to include microservices to profile applications for resource consumption and recommend walltime.
- Jackson and Steven (undergraduates) will be funded by an NSF Scoped project and will be working with Ian Wang at UT Austin and TACC staff to continue the project they have been working on.

SGX3 | SGCI

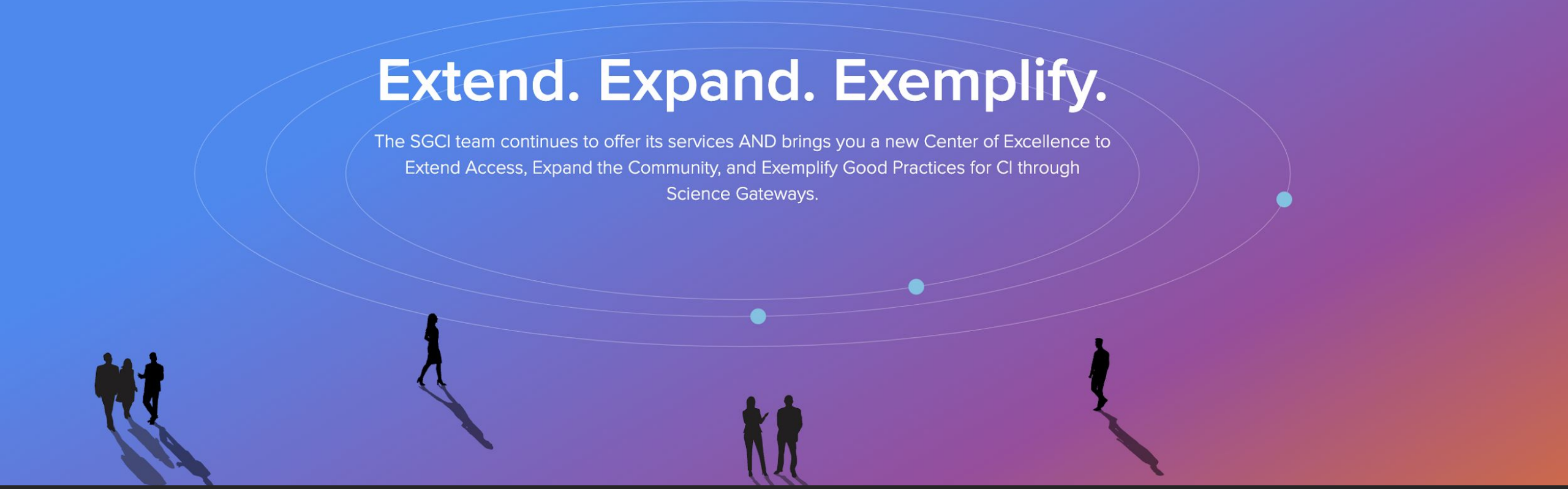
SGX3

SGX3 Funded Services

UX evaluation and design engagements lasting up to 3 calendar months
Technology evaluation and gap analysis
Science Gateway architecture design
Summer faculty and student internships
Once annually Science Gateways Focus Week sustainability sessions
Focus Week follow-on sustainability coaching
Summer Coding Institutes
Science Gateway Hackathons
Young Professionals program

In addition, SGX3 also conducts the following community catalyzing services:

- Gateways Central site for gateway listing, software listing, and partnership formation
- SGX3 “On the Road” outreach to scientific communities where they meet
- Gateways conference series
- Blueprint Factory sessions to develop the future roadmap for Science Gateways serving new domain science needs



2023 Faculty Hackathon – SGCI/SGX3 Update

Linda Bailey Hayden, Co-PI
LBHAYDEN@ECSU.EDU

NSF awards
1547611
2231406

SGX3 SGCI

FACULTY HACK @GATEWAYS 23

HPC ED
HPC-ED.GITHUB.IO

HPC-ED Overview + MiniHack

Presented by: Charlie Dey, TACC

HTTPS://HACKHPC.GITHUB.IO/FACULTYHACK-GATEWAYS23

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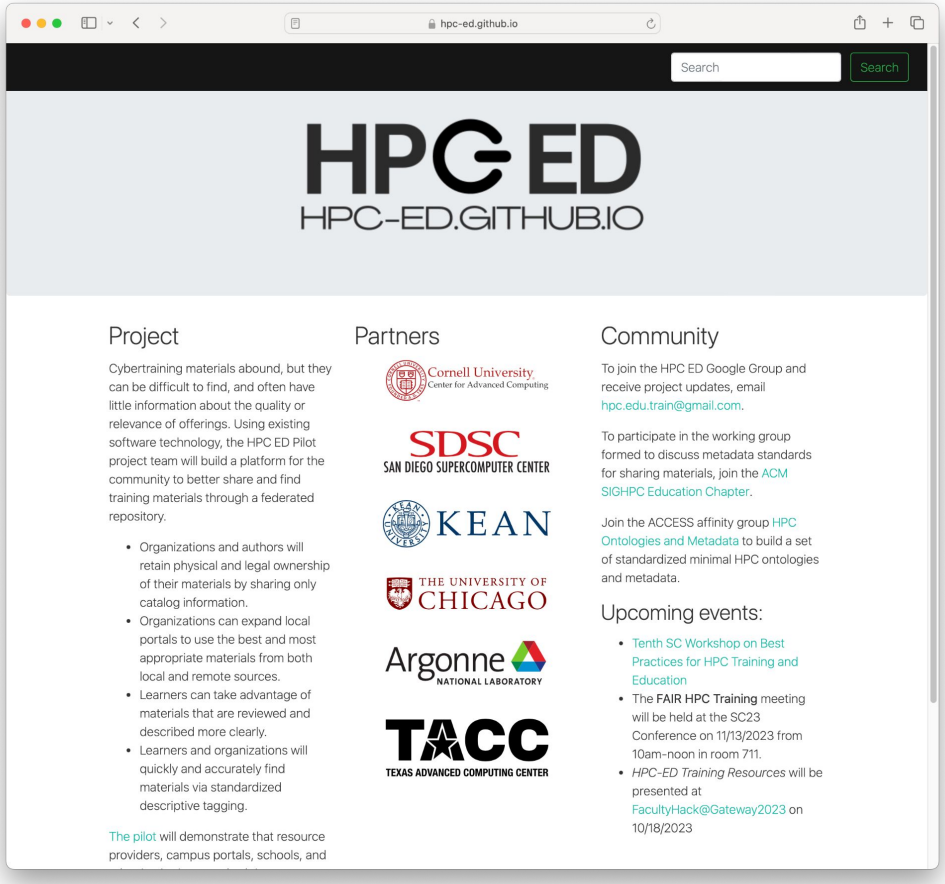
[*Pilot*] HPC-ED: Building a Federated Repository and Increasing Access through Cybertraining

HPC ED
HPC-ED.GITHUB.IO

The Problem at Hand

- Computing technologies are rapidly expanding in many sectors
- There is a need for access to high-quality education and training materials to facilitate research computing
- The demand is high for instructional materials encompassing a wide range of topics in advanced computing
- Meeting this demand is crucial



CyberTraining: Pilot: HPC ED: Building a Federated Repository and Increasing Access through Cybertraining is supported by NSF grant OAC-2320977

The Challenge

To meet this need and keep up with the ever-evolving landscape of HPC educational and training material development is to improve how the community shares and finds materials.

The Needs of the Many

- To gauge the needs of the HPC Education and Training community with regard to sharing training materials we sought input from stakeholders.
- We conducted a survey to explore ***interest*** and ***key factors*** related to ***sharing*** and ***discovering*** training and education materials.
- The results of this survey highlighted the barriers to finding relevant materials and the barriers to sharing materials developed.

Survey Methodology

- The survey questions were reviewed by a focus group from the HPC education and training community.
- Invitations to participate were sent out through well-known mailing lists in the HPC support community, such as CaRCC People Network, Campus Champions, Virtual Residents, Coalition for Academic Scientific Computation, and the EDU Special Interest Group on High Performance Computing.
- This effort resulted in a total of up to 112 responses received for each question.
- We were targeting professionals in the HPC support community at research computing centers.

We shared interim results at the Ninth SC Workshop on Best Practices for HPC Training and Education (BPHTE22) at SC22.

About the Respondents

The survey begins with two questions pertaining to the respondent's role and the communities they support. Both questions allowed multiple selections and were answered by all 112 respondents.

Tabulated results show that:

- 84% are, or support, academics
- 71% for both the Grad/Postdoc and Undergrad communities
- 37% of the respondents specifically selected these three options only
- 84% are content authors
- 61% curate appropriate materials for their community
- 25% see themselves as filling all four roles.

About the Respondents

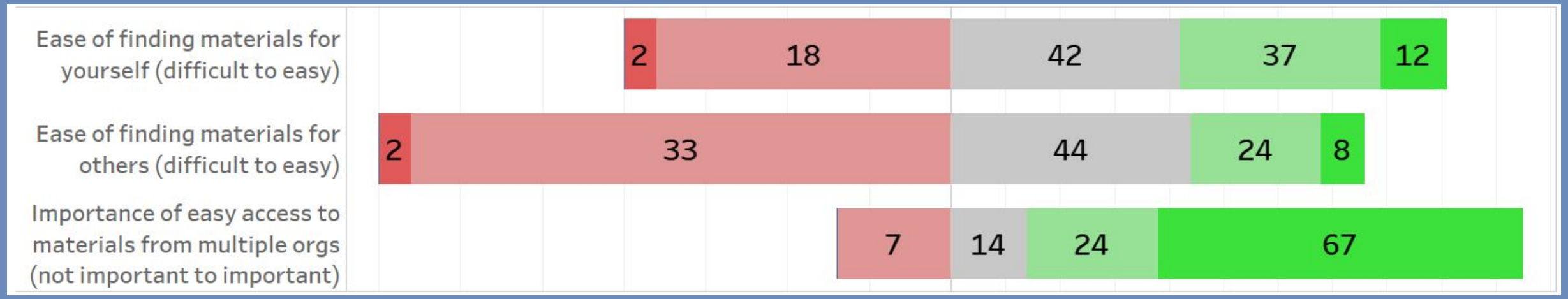
Which communities do you support?

Community	Responses
Academia	94
Grad/Post doc	80
Undergrad	80
Government	25
Pre-college	18
Industry	16
Other	4
Total	**112**

Which communities do you support?

Respondent's role	Responses
Content author	94
Curator collecting appropriate materials for my community	68
Consumer of materials hosted by other organizations	57
Consumer of materials hosted by my organization	35
Other	6
Total	**112**

Survey Results



Finding Materials - Barriers and Roadblocks

What barriers have you encountered when searching for materials?

Barriers encountered	Responses
I can't find materials on the topic I need	35
I can find materials on the topic, but not at the depth or level I need	72
I find too many materials, and I can't effectively sort through them all	44
I am aware of specific appropriate materials, but search engines don't list them in the top results	26
Other	28
Total	**93**

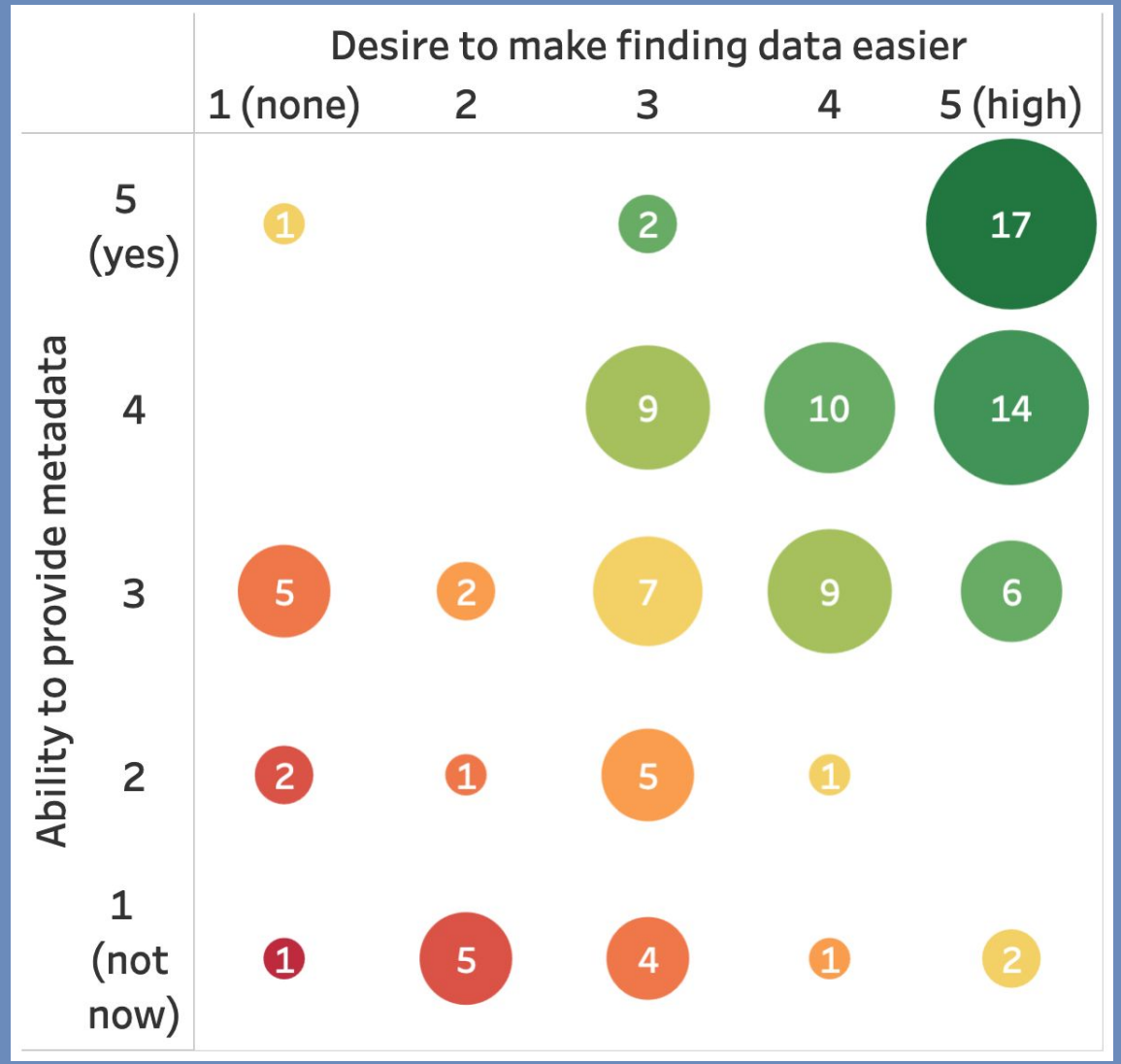
Which barrier, if removed would be most helpful for finding appropriate materials

Barrier to remove	Responses
I can't find materials on the topic I need	12
I can find materials on the topic, but not at the depth or level I need	46
I find too many materials, and I can't effectively sort through them all	29
I am aware of specific appropriate materials, but search engines don't list them in the top results	10
Other	11
Total	**109**

If your organization is not willing and able to provide metadata about your materials in a standard format, what are your roadblocks?

Roadblocks to providing metadata	Responses
Lack of staff time	65
Lack of funding	38
Inadequate staff expertise	28
Our materials aren't in a catalog	37
Other	12
Total	**87**

Survey Analysis



Where do we go from here

Community Engagement / Community Building

- Collaborate with HPC Education and Training Communities
- Build an HPC Professional Trainer Community
- Organize Birds-of-a-Feather Meetings
- Organize Community Hosted Training Material Services

HPC-ED

NSF Award Abstract # 2320977

Allows for the **discovery, identification, and sharing** of **High Performance Computing (HPC) training materials** across a multitude of providers and users. While there are considerable resources for learning about HPC topics online, **the overall environment is highly fragmented and challenging to navigate**. The project aims to **create a federated repository of training materials** with **metadata**, **quality assurance**, and **roadmaps** that can be accessed by both computational resource providers and computational scientists to discover and use these materials. Training providers can list their resources through the repository (HPC ED) and make them accessible to a multitude of portals across the United States and beyond.

Acknowledgements

We want to acknowledge the use of several NSF funded resources and services including: the SDSC Expanse project (#1928224); TACC Stampede System (# 1663578); the NSF Track 3 Award: COre National Ecosystem for CyberinfrasTructure (CONECT) (#2138307); and the Extreme Science and Engineering Discovery Environment (XSEDE) (NSF award #ACI-1548562). We also want to acknowledge Ben Trumbore for creating the two figures.

Assessing Shared Material Usage in the High Performance Computing (HPC) Education and Training Community

Susan Mehringer
Center for Advanced Computing
Cornell University
Ithaca, New York
shm7@cornell.edu

Kate Cahill
Ohio Supercomputer Center
Columbus, Ohio
kcahill@osc.edu

John-Paul Navarro
University of Chicago
Argonne National Lab
Naperville, Illinois
navarro@anl.gov

Scott Lathrop
University of Illinois
Shodor Education Foundation, Inc.
Urbana-Champaign, Illinois
lathrop@illinois.edu

Charlie Dey
Texas Advanced Computing Center
Austin, Texas
charlie@tacc.utexas.edu

Mary Thomas
San Diego Supercomputing Center
University of California San Diego
La Jolla, California
mpthomas@ucsd.edu

Jeaime H. Powell
Texas Advanced Computing Center
Austin, Texas
jpowell@tacc.utexas.edu

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HACKHPC.ORG

We need *your* help!
Let's have *"Jam"* session :)

https://tinyurl.com/hpc-ed-kg42

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SGX3 FACULTY HACK GATEWAYS 2023

Next Sessions:

- Thursday[10/19] @ 5pmET
  - *Hackathon Kick-Off!*
  - *Project Eureka Overview - Omnibond*
- Friday[10/20] @ 5pmET
  - **Team Introductions**
    - *2 Slides Max.*
    - *Team Name*
    - *Member and Mentor Names*
    - *Institutions*
    - *Pictures*
    - *Target Course*
    - *Goals*
    - *Tasking*