



Meet the Student Cluster Competitions

7 April 2025

Le Mai Weakley, PhD | SC25 Student Cluster Competition Chair
Layla Freeborn, PhD | SC25 IndySCC Chair

Agenda

Today:

- What is the Student Cluster Competition (SCC) and IndySCC?
- What's new this year?
- How do you prepare and write a team application?
- Q&A

We're recording this session. The recording and slides will be posted on the SCC and IndySCC pages.

SCC25 Committee Members 🖐️

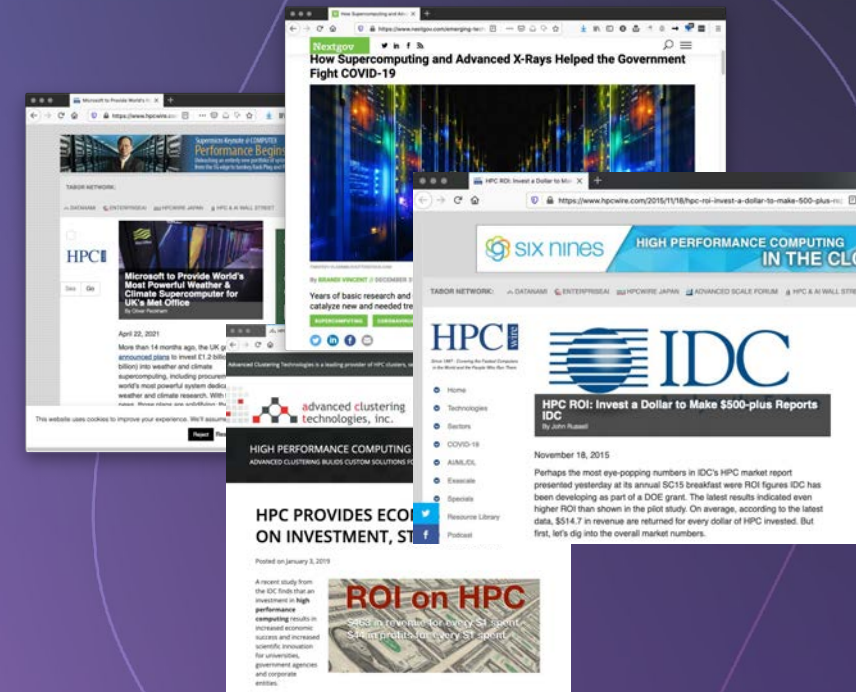


- SCC Chair: **Le Mai Weakley** Indiana University (IU)
- SCC Vice Chair: **Abhinav Thota** Indiana University (IU)
- IndySCC Chair: **Layla Freeborn** University of Colorado Boulder (CU Boulder)
- IndySCC Vice Chair: **Dan Dietz** Oak Ridge National Laboratory (ORNL)
- SCC Infrastructure Chair: **Steve Bird** Notre Dame University
- Apps Lead: **Steve Leak** NERSC
- Benchmark Leads: **Amiya K. Maji** | **Ryan DeRue** Purdue University
- Communication Leads: **Darshan Sarojini** Virginia Tech | **Mohal Khandewal** CU Boulder
- Team Liaisons: **Megha Moncy** OmniSOC | **Ryan Scherbarth** Tesla | **Wajdi Halabi** Microsoft | **Doug Smith** CU Boulder LASP | **Laura Huber** IU
- **A whole bunch of other amazing volunteers!**

What are the Student Cluster Competitions?

HPC is one of the **best tools in existence** for science and engineering

The student cluster competitions (SCC and IndySCC) fosters skill development and social connections to bring new people into HPC



Screenshots from <https://www.advancedclustering.com/hpc-provides-economic-return-investment-study-finds/>, <https://www.nextgov.com/emerging-tech/2020/12/how-supercomputing-and-advanced-x-rays-helped-government-fight-covid-19/171070/>, <https://www.hpcwire.com/2015/11/18/hpc-roi-invest-a-dollar-to-make-500-plus-reports-idc/> and <https://www.hpcwire.com/2021/04/22/microsoft-to-provide-worlds-most-powerful-weather-climate-supercomputer-for-uks-met-office/>

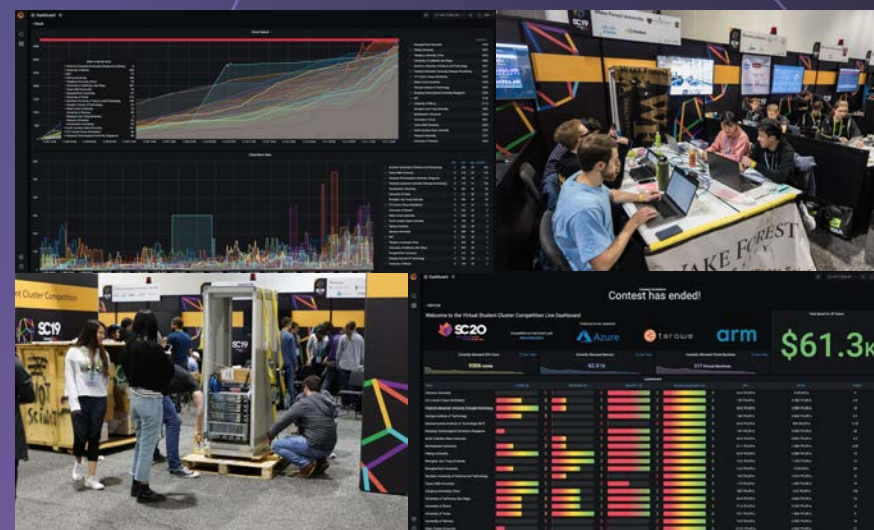
What is the Student Cluster Competition?

A 48-hour, non-stop contest to build and run a (small) supercomputer

Teams of 6 undergraduate¹ students:

- Design and build a HPC Cluster
- Measure and tune its performance
- Run real science workloads on your cluster
- Handle real-world events like power outages
- Report on your results

All within a power budget



1. Student Team Members must:













- Be enrolled in a university or high school
- Be at least 18 years old by the beginning of the SCC
- Not have received a bachelor's degree or equivalent before the beginning of the competition

How is the IndySCC different from the SCC?

- A cloud-based competition held simultaneously with SCC
 - Teams will be provided allocations on Jetstream2, an NSF-funded cloud resource hosted at Indiana University
- Practice running the applications is built into the schedule
- Teams can apply to compete on-site but the majority of teams are 100% virtual
- No reproducibility challenge
- Teams run benchmarks prior to the competition
- No team interviews






SCC Schedule (week of SC)



- Friday/ Saturday
 - Teams arrive 
- Saturday
 - Afternoon: **Safety** briefings , **Students@SC** Orientation  & Mixer 
 - After the briefings: **building begins!** 
- Monday morning:
 - **Benchmarking** begins! 
 - At the end of benchmarking, **final configuration is locked in**  - no more hardware changes
- Monday evening:
 - **Mystery app, datasets announced** 
 - **Main contest starts** 
- Monday -> Wednesday
 - Teams **run applications** , interact with conference goers, other events
- Wednesday evening:
 - **Competition ends!** 
- Thursday
 - Results announced at **Awards Ceremony!** 

IndySCC Schedule










- **August** - Orientation webinar, IndySCC teams get access to hardware
- **September to mid-October** - Application webinars + exercises
- **mid-October to November** - Benchmark webinar + “hero” runs
- **November 17-19**- Final 48-hour competition, takes place at the same time as the SCC
 - Monday evening:
 - **Mystery app, datasets announced** 
 - **Main contest starts** 
 - Monday -> Wednesday
 - Teams run applications , interact with conference goers, other events
 - Wednesday evening:
 - **Competition ends!** 
 - Thursday
 - **Results announced at Awards Ceremony!** 

What's the SCC like?



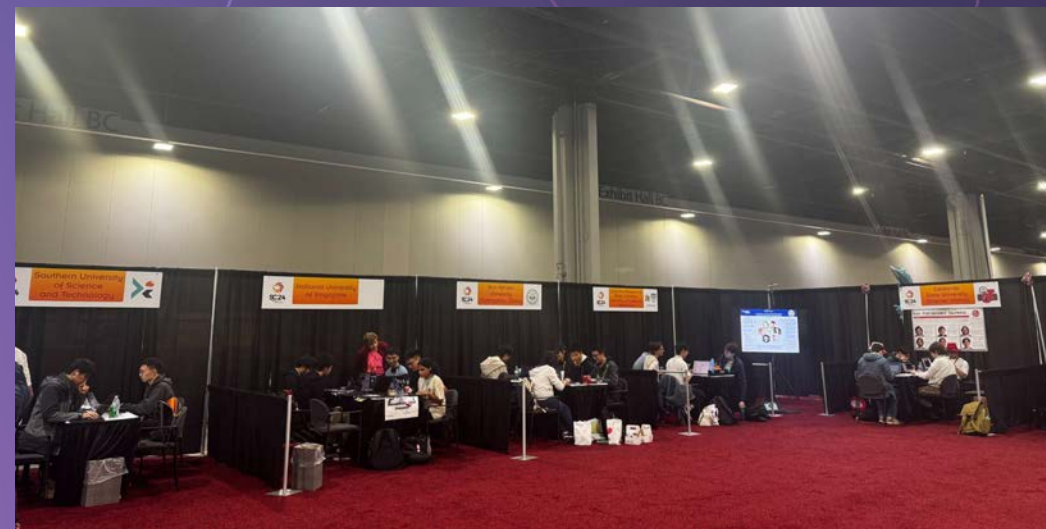
SCC components

- **Benchmarks**  - get the highest score on the selected benchmark suite of HPL, HPL-MxP, MLPerf
 - No mystery benchmark or benchmark interviews this year
- **Applications**  - complete tasks and report results and performance
- **Reproducibility challenge**  - reproduce the results of an SC24 paper, and write your findings in a journal-quality report
- **Applications will be announced soon** , watch this space
- **Mystery Application**  - announced at the beginning of the competition
- **Team Poster** 
- **Guided Interest Group** 
- <https://sc25.supercomputing.org/students/student-cluster-competition/>






What's the IndySCC like?

It's primarily virtual!

- Zoom
- Google Groups



IndySCC components

- **Setup and Practice** - attend webinars, set up VMs, ask questions, complete exercises
- **Benchmarks**  - get the highest score on the selected set of benchmarks
- **Team Poster** 
- **Competition**
 - **Two known applications**  - complete tasks and report results and performance
 - **Applications will be announced soon** , watch [this space](#)
 - **Mystery Application**  - announced at the beginning of the competition

<https://sc25.supercomputing.org/students/indyscc/>

What's new this year for the SCC? ✨

- **New Power Rules** 💡
 - The power cap has been raised to 10000W¹
 - No per-node power cap
 - No extra budget for networking
 - We've lifted the three-node minimum
- **No benchmark interviews or mystery benchmark** 🚫
- **No Top HPL Award** 🚫
- **Booths are smaller than last year (same as prior years)** 📏
- **New event: Guided Interest Group** 🖐️

1. It's Over 9000!

What's new this year for the IndySCC? ✨

- Team liaisons for in-person and virtual teams
- Each team will have **their own** Jetstream2 allocation so they can
 - access the user portal (Exosphere) for self-management of VMs
 - select from a variety of images and OS
 - manage their own snapshots
 - easily monitor SUs
 - customize storage
- A set-up period prior to the application webinars
- More opportunities to interact with application experts (Office Hours, review sessions)

What's new this year for the IndySCC? ✨

- **New award!** The IndySCC winner will be announced on stage at the awards ceremony.
- **Travel funding** for up to three IndySCC teams including an international team.
- Hard-sided booths

How Do You Prepare for the SCC? 🐱



Preparation before the event:

- Teams form **partnerships** with institutions and vendors 🤝
- Design a cluster, **practice building** and **running the applications** 🏋️
- **Plan logistics** of getting to the competition 📝
- **SCC provides** for the 6 team members and 1 advisor:
 - Conference registrations 📋
 - Single Occupancy Hotel Rooms 🛏
 - Conference provided hotel rooms cannot be shared with other attendees 🙅
- We encourage **institution and vendor partners to cover other expenses**
 - For example, travel ✈️ and shipping 📦

How Do You Prepare for the IndySCC? 🐱

- Set aside time for practice with your team
- Plan to attend webinars, office hours, review sessions
- Leave plenty of time for troubleshooting issues
- **Plan logistics** of getting to the competition (on-site teams)

Tips for the application

- Be sure to address all of the questions!
- SCC or IndySCC -
 - Can select SCC or IndySCC (SCC applicants have the option to indicate that they're interested in participating in the IndySCC if not selected for the SCC)
- Strength of Team
 - How will you work together as a team to win?
- Strength of Diversity
 - Not academic diversity, but diversity in areas such as underrepresented groups in your home region and institution
 - What does diversity mean to you?
 - Efforts taken to recruit diverse team

Tips for the application

- Strength of Hardware and Software (SCC only)
 - Detail your hardware and software
 - Go beyond technical specs and let us know how the specs will allow you to win
 - Why did you make the choices you did?
- Strength of Vendor/Institution Relationship
 - Describe support you are receiving
- Team Preparation
 - What is your plan to prepare?
 - Don't list course catalog
- Team Education Goals
 - Be as specific as possible!

Important dates



March 1, 2025	SCC/IndySCC Applications Open
May 16, 2025	SCC/IndySCC Applications Close
June 16, 2025	Notifications sent to all teams

Need more information?

SC25 SCC Website & Rules

- <https://sc25.supercomputing.org/students/student-cluster-competition/>
- <https://sc25.supercomputing.org/students/indyscc/>

Questions? 🤔

Email Us

- student-cluster-competition@info.supercomputing.org
- indyscc@info.supercomputing.org