Oregon State University
College of Earth, Ocean, and Atmospheric Sciences

RACS Newsletter

CEOAS - Oregon State University

Spring Quarter 2024-2025

Spring Update

Figure 1: The front of the San Jose Convention Center setup for GTC 2025.

NVIDA GTC was amazing and there were many groups attending from around the world leveraging GPU technologies for research and business applications.

This was a huge conference with over 25,000 attendees in person and over 300k watching online including over 500 exhibitors. OSU computing staff from across campus were in attendance and had several meetings with NVIDIA about new technologies including new Blackwell Ultra and Vera Rubin GPUs which are still on track for 2025 and 2026. This is great news as there was a delay on the Blackwell B100 and B200 GPUs do to a design flaw that was resolved late last year. The B100 and B200 designs had a mismatch in the thermal expansion properties between the GPU chiplets, LSI bridges, RDL interposer, and motherboard

substrate caused the system to warp and fail. At the same time many groups including our group needed to incorporate liquid-based cooling technologies into the datacenters that will be used to support this new GPU hardware. Because of this the RACS group has been looking at many different liquid-cooling based technologies to enable this new GPU hardware as well extend the capabilities around the ECC datacenter. To this end we have been testing the Zutacore 2-phase direct to chip liquid cooling-based technology for the past several months. This will be discussed more in the ECC datacenter section of this newsletter. There was a ton of robots and Virtual Reality (VR) and Augmented Reality (AR). These technologies created a huge impact, and we are starting to see more and more groups leverage edge devices including robots and sensors.

Figure 2: Looking from the second floor of the Oracle Booth at GTC25.


Figure 2: The Da Vinci 5 Surgery Robot.

Figure 4: The Llamda Walking Robot.

There was some other exciting new hardware announced by Jensen Huang at his Keynote talk. There were two pieces of hardware our groups may be able to take advantage called the DGX Spark and DGX Station machines which are based on the Grace Blackwell superchip. These two machines are desktop-based supercomputers placing accelerated hardware directly into the hands of developers and researchers. DGX Spark and DGX Station bring the power of the Grace Blackwell architecture, previously only available in the datacenter, to the desktop. Global system builders who plan to develop DGX Spark and DGX Station include ASUS, Dell, HP Inc. and Lenovo. We have several requests already into NVIDIA to get access to this hardware as it becomes available to the world.

Figure 5: The new Grace Blackwell based DGX Spark and DGX Station.

ECC Datacenter

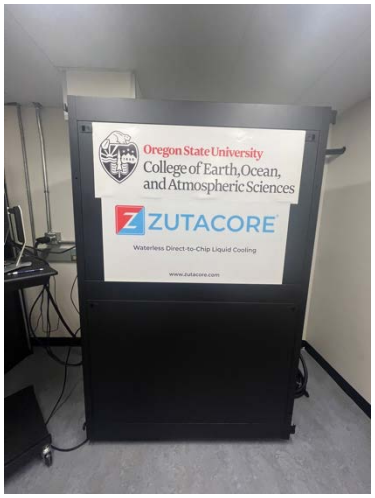


Figure 6: A rack of Zutacore test hardware in the basement of Burt Hall.

The campus facilities group worked with RACS to deploy the Zutacore a 2-phase direct to chip non-water based liquid cooling that can be retro fitted onto machines we already own at no or low risk. These tests were done so the CEOAS ECC datacenter could find more cost-effective ways to leverage the District Utility Plant (DUP) chilled water loop next to Cordley Hall while enabling the recapture of energy for sustainability. The Zutacore system essentially enables the ECC to have server racks of liquid cooling at low cost without impacting the current (or new) standard air

cooling in the datacenter. For example, a rack in our datacenter will support about 8KVA currently (15KVA after the upgraded cooling) from the support of 4x 30-ton Computer Room Air Conditioning (CRAC) units. One rack of Zutacore can support ~70KVA each and leverages minimal chilled water to exchange the heat from the 2-phase system. The rebuild of the Burt datacenter will have double the chilled water capacity from what it will be using allowing our researchers to leverage the extra chilled water support for racks like Zutacore. The CQLS worked closely with RACS on this project and have machines in the test as they see it a pathway to reduce power as they need to change datacenters by moving out of Kerr and ALS.

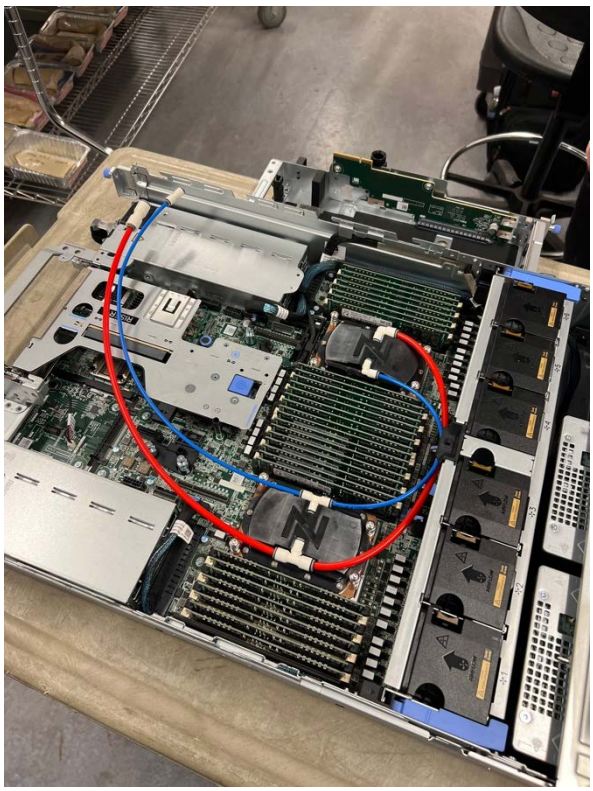


Figure 7: A Zutacore setup on a server.

The ECC datacenter is being rebuild starting here in April 2025. Durning this rebuild we will replace the 4 aged or dead CRAC units and upgrade the cooling from the current 70-tons to a total of 120-tons. The new CRAC units will have redundant cooling pathways that include using the DUP and liquid based cooling as a primary source and use standard condensers if that system goes down. We should see the first of the units coming online by late June early July to help us make it through summer. This rebuild will be a crazy time and will require some moving of racks to align with new hot-cold isle isolation. We will be working with labs to ensure we keep services online through the process.

Research Computing

by **Thomas Olson and Chris Sullivan**

High Performance Computing (HPC)

The RACS group continues to work with the Center for Quantitative Life Science (CQLS) and the Advanced Research Computing Services (ARCS) on combining the HPC infrastructures across campus. The migration will take some time but should have no effect on the CEOAS HPC access as we will continue to use the same infrastructure we are currently using. The RACS group continues to work with labs on compiling and installing software tools for specific research processing. If your lab needs help accessing or are interested in using the HPC systems please contact the RACS groups through email support@ceoas.oregonstate.edu or submit a help ticket at https://ceoas.oregonstate.edu/computing-support.

We are encouraging groups to work with RACS to ensure their codes and tools will work on the Arm64 based architecture since we can see a large movement by NVIDIA to have that processor on new technologies like Grace Hopper, Grace Blackwell, Vera Rubin, DGX Spark and DGX Station. To fully embrace the NVIDIA supercomputer that comes online after the new HCIC building is finished we may need to have our pipelines, codes and tools working on the Grace processors. We can provide access to Grace Hopper machines and help test your codes.

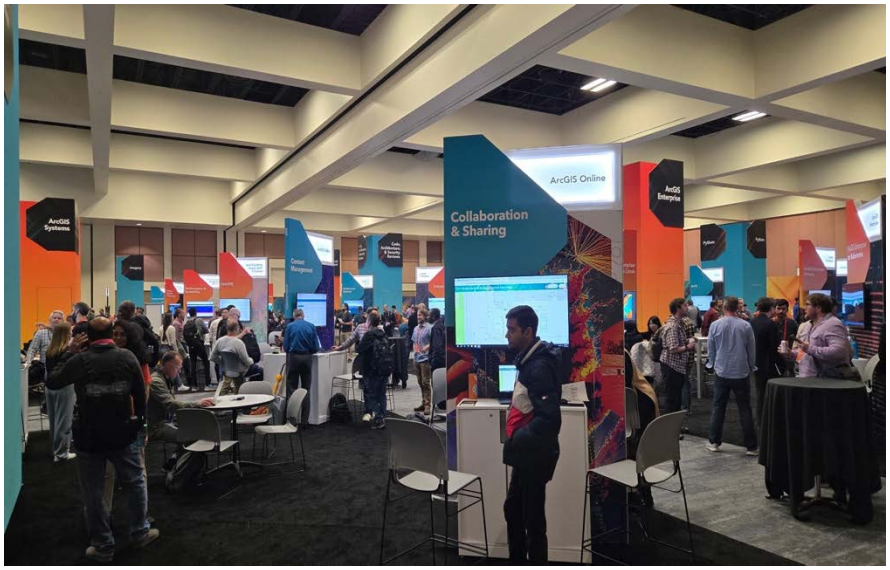
Figure 8: Vera Rubin pictured with the GPU that carries her name.

Academic Computing

by Cory Langhoff and Wayne Wood

ESRI Conference

Cory Langhoff attended the ESRI Developer and Technology conference again this year during the week of March 11-14. This year's conference was equally rewarding as last year, and the addition of the Technology piece to the title was reflected in the many new technologies being shown. There have been considerable improvements in the use of AI in GIS. This comes in the form of AI assistants and AI geospatial algorithms as they are taking the GIS world by storm and offer great insight on how to perform tasks in the ESRI ecosystem. Users can ask questions about how to perform tasks and the AI assistant can provide guidance. This is especially useful when creating Python code. While users still need to have a good understanding of how things work and what they want to do, AI can help bring new insights into solving problems and improving workflows and this will only improve in the future. AI also brings a rich set of tools to use in things like feature extraction from images, automation, and predictive models using real time data are also transforming industries. Part of his attendance at the conference is dedicated to interacting with the Education Innovation Program group (EIP). This is comprised of ArcGIS Administrators, scientists and practitioners from universities around the world. Managing users and data in a higher education setting is fundamentally different from many other industries. The college has a very large user bases with a high rate of turnover. Students who take GIS courses



often use our ESRI geospatial resources for a few terms and then leave. Some of these students also create data and workflows that are part of a larger effort, with the need to retain this data or capability into the future. The discussion on how to handle this turnover and how to retain pertinent data, while simultaneously purging our ArcGIS Online system of unnecessary data, is ongoing and is handled differently by almost every institution. ESRI has indicated that major changes to the university site license will be coming in the next 18 months. While they have not yet delivered the expected messaging, it should be coming along this summer. Preliminary indications are that the number of users available and the amount of feature data storage and credits will be reduced. This should not impact OSU's ArcGIS online usage immediately. However, best practices and policies will need to be discussed and implemented to reduce our usage of the systems in the long term. This group also meets virtually once a quarter to discuss what they are working on and the issues they face. A document has been curated annually to bring forward a list of issues and ideas to be passed on to ESRI development teams. This conference really provides a great way to directly interact with the development teams for ArcGIS Pro, Enterprise and Online. They are a great bunch of people who are very eager for feedback, as they often do not get as much feedback as they like. We were able to make quite a bit of progress with the teams this year and are confident that many of our suggestions will be taken seriously and implemented in future releases.

Printing Services

There were a bunch of poster prints last quarter for the different conferences. Please remember to provide as much time as possible for the posters to be printed. We generally look for 2-3 days of time before they are needed. If you are having problems with one of the shared printers, please contact printers@ceoas.oregonstate.edu for help.

3D Printing Services

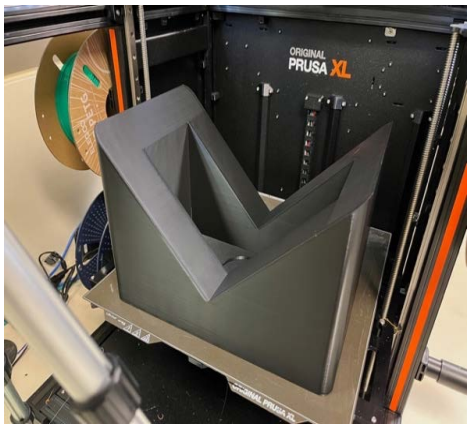


Figure 9: 3D printed block for sensitive equipment.

Our 3D printing services have been heavily utilized this term. Some of the best examples are custom made water collection devices, large blocks to hold sensitive equipment and several different models of Mt. Saint Helens for use in the classroom. Next month Wayne Wood will be attending the RAPID + TCT 3D printing and design conference in Detroit Michigan. This will be a great opportunity to learn about new technologies and build on the connections made when attended last year's conference.

Wayne Wood also had the opportunity to share what RACS has been doing with the NVIDIA Omniverse at the Winter OSU IT Plenary. This was a chance to talk about the work RACS has done modeling both the ECC datacenter in Burt as well as the new datacenter in the HCIC. Overall, it seemed to be something many people were interested in so hopeful more people will follow in our footsteps and start developing content for the Omniverse.

Figure 9: Large 3D printed Fin for water sampling.

Security Information and Updates

by Office of Information Security (OIS)

January 16, 2025

Dear OSU Community,

As part of our ongoing commitment to cybersecurity, we are updating email requirements to better protect the OSU community from spam and phishing. This change may affect you if you send or receive emails from non-OSU mailing lists or email marketing platforms.

Starting Friday, January 31, University Information and Technology will begin implementing a change to our email security requirements. This change will help ensure that the emails you send and receive from OSU can be trusted.

What does this mean for you?
If you send or receive emails from non-OSU mailing lists (such as Listserv) or third-party email marketing platforms (e.g., MailChimp, Constant Contact, and HubSpot), your email may be impacted. Messages that do not meet the new security requirements will be sent to quarantine for review.

What do I need to do?
Keep your OSU emails flowing smoothly and securely by periodically reviewing quarantined messages and contacting your IT support if you send emails from mailing lists or marketing platforms to ensure they are configured correctly.

- Review Quarantined Messages: Messages that don't meet the new security requirements will be flagged and sent to quarantine. You'll receive an email from Microsoft when this happens, and you can view these messages securely. If legitimate messages are quarantined, you can release the message and add the sender to your safe senders list.
- Email Lists or Marketing Platforms: If you use non-OSU mailing lists or third-party email marketing services to send emails from an OSU email address, contact

your OSU IT support. OSU IT will verify your services are configured correctly to ensure recipients continue to receive your messages.

The new email security requirement will be implemented slowly over the next several months to help reduce the impact. We understand that changes like these can be challenging, but they are essential for maintaining the security and integrity of our OSU email.

If you have any questions or concerns, please contact the Service Desk at beav.es/help or by calling 541-737-8787.