



## The Technology Infrastructure for Data Exploration (TIDE) and the Regional Optical Network as an Enabling Infrastructure for Digital Equity

Jerry Sheehan, Adjunct Faculty, College of Sciences, San Diego State University,  
Principal Investigator for TIDE,  
Chief Information Officer for the Salk Institute for Biological Sciences

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# What is the The Technology Infrastructure for Data Exploration (TIDE)

- **TIDE is a recently received NSF Campus Cyberinfrastructure award for regional computing**
  - The lead campus is San Diego State University, which has partnered with CSU San Bernardino, Cal Poly Humboldt, CSU Stanislaus, and the San Diego Supercomputer Center.
- **The TIDE Ecosystem**
  - **New Funded Compute:** \$800K for new hardware, a computational core for California State University.
  - **New Funded People:** \$200K for student hiring at four partner CSU Campuses to help onboard and support new users.
  - **Existing Networks:** Science DMZ at SDSU, CENIC HPR, and CENIC.
  - **Existing Partnerships:** National Research Platform.



616 CPU Cores



73 GPUs



14.592 TB RAM



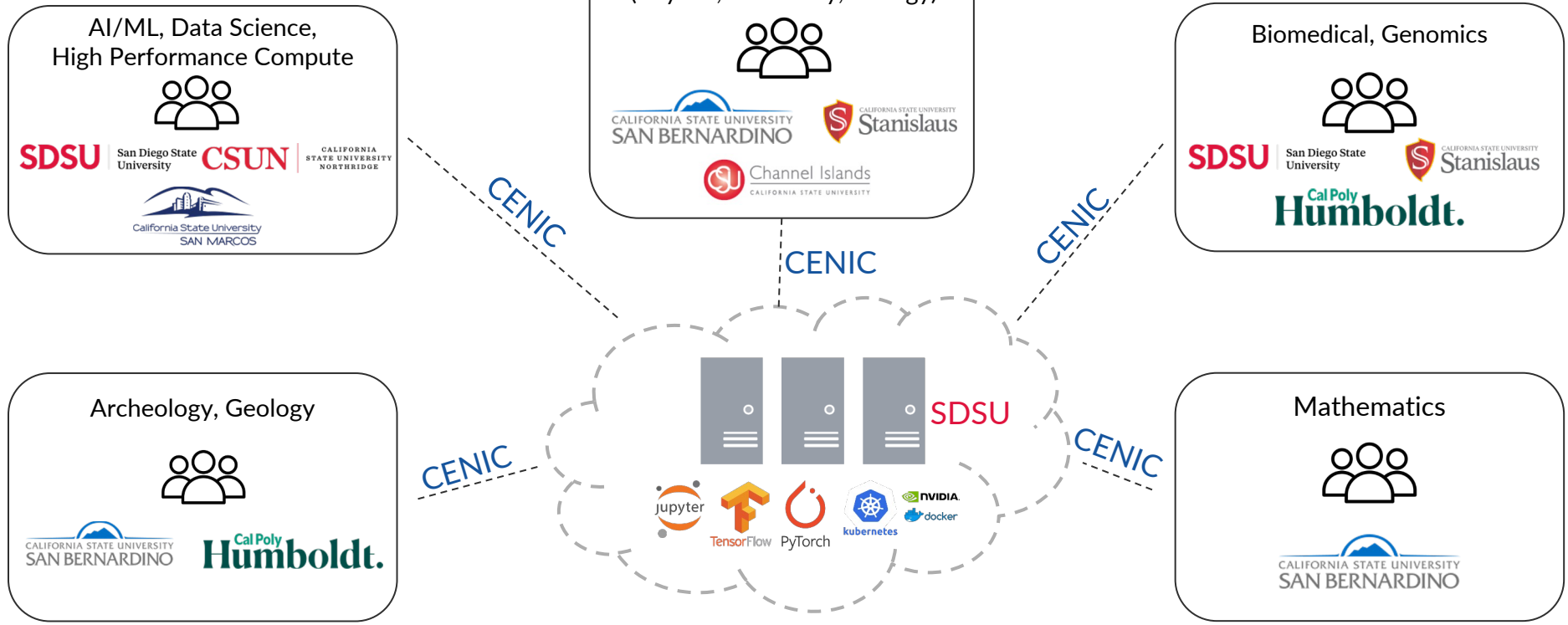
U.S. National  
Science  
Foundation

National Science Foundation, Campus  
Cyberinfrastructure: Regional  
Computing, Award 2346701

<https://tide.sdsu.edu/>



# What Role does the Regional Optical Network Play in TIDE?



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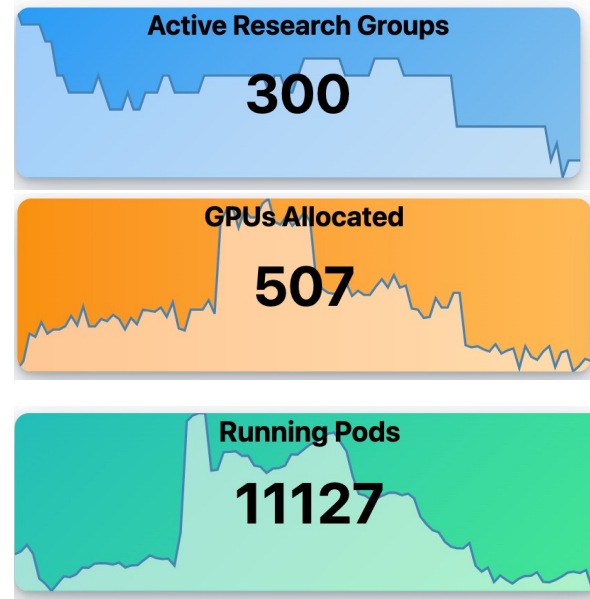
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# Using the NRP and CENIC-AIR to Allow Science Focus and Scale

- **TIDE will be integrated into the National Research Platform (NRP) Nautilus Hyper-Cluster**
- **NRP Provides a Platform for Synergy for Science**
  - System Administration: NRP provides system administration to TIDE-managed nodes, allowing resources to be focused on user support and facilitation with CSU Science Drivers.
  - Burstable Resources: Integrated resources into NRP also have access to their computational resources, allowing bursting into an academic cloud.
  - Community of Practice: Over 50 institutions as collaborators, robust resources including JupyterHubs and pre-existing docker and Kubernetes solutions.

**NRP 10am  
March 15, 2024**



21,869 CPUs



1,237 GPUs



113.25 TB RAM

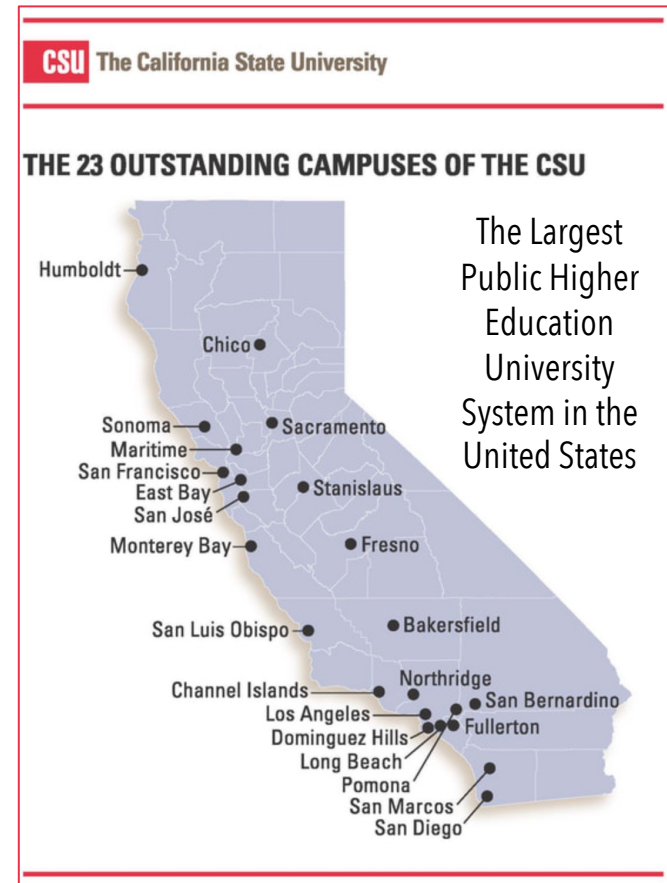
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U.S. National Science Foundation, Campus Cyberinfrastructure: Regional Computing, Award 2346701

# Observations on Research Networking Challenges for the CSU

- **Limited Science Networking deployment on the 23 CSU Campuses**
  - The system primarily focuses on enterprise networks and hardware funding is exclusively provided.
  - Limited experience and staff for “research only” payloads
- **Science Networks are “Bursty” in Their Use**
  - Most science networks are “bursty” in their traffic. Those bursts are required for discovery and collaboration.
  - But, when prioritizing investments (wifi, for example, vs. research network), ROIs are tough, and security concerns are persistent.
- **Hardware-Only Science Networks are So 2010**
  - Developed before commoditization for Software Defined Networks, even the dreaded Firewall has gotten better at allowing traffic to be flagged to get around the “safety tax.”
  - NSF CC\* has funded great exploration of different ways ranging from the Great Plains Regional CyberTeam, Oklahoma Friction Free Network (OFFN) and Kent State with OARNET as examples

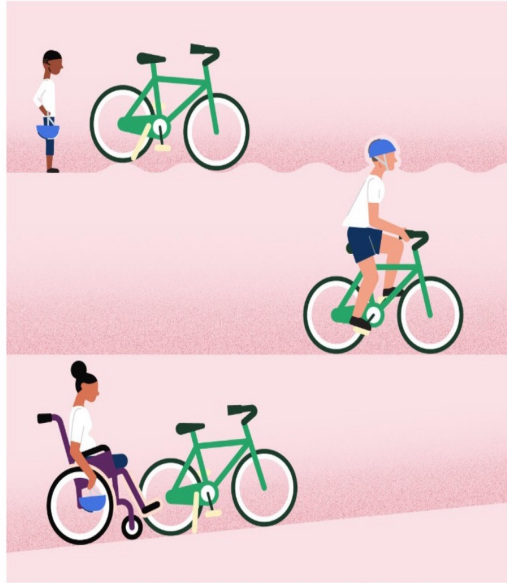




# NRP-A Infrastructure for Equity

## EQUALITY:

Everyone gets the same—regardless if it's needed or right for them.



## EQUITY:

Everyone gets what they need—understanding the barriers, circumstances, and conditions.



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