# TEAM CARPINCHOS @ SC25
St. Louis, MO | hpc ignites.

## UNIVERSIDAD NACIONAL DE CÓRDOBA

With more than four centuries of history, the National University of Córdoba (UNC), founded in 1613, is the oldest university in Argentina and one of the pioneers in Latin America. UNC plays a key role in the intellectual, scientific, and social development of the country. As the birthplace of the 1918 University Reform, it remains a beacon of knowledge, innovation, and commitment to society.

**Alejandro Ismael Silva**
Team Advisor

From student team member to advisor, now working as a SysAdmin at UNC Supercómputo. Obviously, he loves HPC... If not, something went terribly wrong.

Visit our website!

## RESOURCES

We had access to our university's computing clusters and the "Gordito" node, equipped with the same dual EPYC Milan 7713 processors we will be using during the competition, where we carried out several compilations and benchmarking tests.

These resources allowed us to parallelize our learning, as some team members focused on applications and dependencies, while the infrastructure team optimized the Jetstream nodes to achieve a reproducible and optimal configuration.

## STACK

slurm workload manager

- **Terraform** and **Ansible** to deploy and configure our clusters, ensuring a reproducible and flexible infrastructure setup.
- Latest stock **Rocky Linux (10)** for a lighweight setup on CPU nodes.
- Jetstream's featured **Rocky Linux (9)** for GPU nodes, to take advantage of pre-installed NVIDIA drivers.
- **Manilla Shares** for our network file system.
- **Slurm** for workload management, for efficient and organized cluster usage.
- **Spack** and **Environment modules** for organized and reproducible builds.
- GCC (14-15) and AOCC (4.1) as our **compilers**.

## STRATEGY

- Attend IndySCC webinars to learn directly from the app experts and understand the tools we will be using for the competition.
- Experiment with multiple builds, testing different combinations of compilers and libraries to spot performance trends.
- Benchmark our infrastructure to guide deployment and optimization decisions.
- Organize into **specialized subteams** that pair experienced and new members, each focusing on different areas of the main competition and coming together for the Hero Run.

## PREPARATION

- **Competition drills**

To bring the team together and prepare newcomers, we organized a **mini Hero Run** where experienced members led small groups through practical HPL exercises. These activities helped new members develop essential HPC skills such as compiling and benchmarking.
We also practiced under simulated competition conditions, even rebuilding our cluster from scratch to assess coordination and problem-solving efficiency.

- **Weekly Meetings**

We hold two regular meetings, one in person and one online. These sessions help us coordinate tasks, discuss challenges, and track our progress.

- **Always Connected**

We use Discord and Telegram to stay in touch, troubleshoot together, and share results from application exercises and benchmarks.

## SST
### Structural Simulation Toolkit

**Lara Kurtz**
Computer Science

Curious about the hidden mechanics of Linux systems, she enjoys automating workflows and optimizing performance to get the most out of every core.

Trades the terminal for the mosh pit every now and then.

**Ignacio Facello**
Computer Science

Fascinated by how complex systems can arise from simple elements. Likes to play with code, electronics and mechanisms.

Practices archery and enjoys making coffee and tea.

## ECE
### Exascale Climate Emulator

**Javier Mercado Alcoba**
Physics

Project-driven student, curious about how simulations allow us to explore complex phenomena that are difficult to measure in conventional laboratories.

Obsessed with HPC, neutron stars, and palm trees.

**Tomás Hubmann**
Computer Science

Experienced in back-end web development and competitive programming. He aims to apply his software engineering skills to build efficient and impactful solutions.

He is a black belt in taekwondo.

## INFRA
### Infrastructure Management

**Milagros Carabelos**
Computer Science

She's passionate about creating reproducible workflows and exploring performance through plots and data visualization.

A big dog lover and amateur dog trainer

**Tomás Bazán**
Computer Science

Like to learn about anything. Once a low level hater, now in love — thanks to Carpinchos.

Also, he plays the drums

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