

Who are we?

- Six **second-year** undergraduates.



- **Name:** Laura Kraft
- **Department:** Mathematics + Computer Science
- **SCC strengths:** Scientific applications, numerical modelling
- **Cultural background:** German



- **Name:** Ethan Burkinshaw
- **Department:** Computer Science
- **SCC strengths:** Sysadmin
- **Cultural background:** UK



- **Name:** Avesta Afshari-Mehr
- **Department:** Physics + Computer Science
- **SCC strengths:** Commercial applications, machine learning
- **Cultural background:** German-Iranian (UK-born)



- **Name:** Erik Tallinn
- **Department:** Computer Science
- **SCC strengths:** Performance benchmarking, programming
- **Cultural background:** Estonian



- **Name:** Jaden Yuen
- **Department:** Computer Science
- **SCC strengths:** C++, HPL tuning
- **Cultural background:** Malaysian



- **Name:** Wilfred Fung
- **Department:** Computer Science
- **SCC strengths:** Programming
- **Cultural background:** Hongkonger

What makes us unique?

- All members **first time** competing in IndySCC + **new to HPC**.
- Though new to competitions, we bring research and industry experience.

Diversity in the Team

Our team brings together individuals from **underrepresented groups** in tech:

- Avesta is part of the **LGBTQ+** community.
- **Gender diversity** with a female team captain.
- **Multicultural** composition with team members from Germany, Iran, Estonia, Malaysia and Hong Kong.

Supervisors

- **Prof. Tobias Weinzierl** - Expert in multiscale algorithms, adaptive mesh refinement + hyperbolic equation solvers.
- **Dr. Karl Southern** - Supports student-led research + initiatives like DurHack.
- **Dr. Karen Bower** - Senior Research Officer, expert in HPC systems.

Supporters

- Our team benefits from **strong institutional** and **external support** that extends well beyond its core team of six members.



Team Preparation and Strategy

- Entails **parallel programming** with OpenMP, MPI, CUDA and oneAPI; shell scripting, git, **system administration**, and HPC environment skills.
- **Students-teach-students** approach.
- **Intra-team mini challenges** - practice for competitions based on pre-announced applications.
- Use software carpentry workshops and DIRAC's collection of teaching materials for self-paced learning.
- Everyone specializes in what they have a **keen interest** in and **share their knowledge** with the rest of the team.



Training Infrastructure

- **Hamilton 8:** 15,616 core HPC system.
- **NCC:** Departmental NVIDIA CUDA cluster.
- **DINE:** Smart NIC cluster.
- **COSMA8:** Particle physics, astronomy and cosmology cluster.

Resource Management Strategies

Our team uses:

- **Github Projects** to track and delegate tasks between team members.
- **Rocky9 Linux**, due to its **stability** in enterprise applications + being **FOSS**.
- **SLURM** and **Ansible**, for configuration management.
- Compiling modules, to improve performance on the specific system.
- **Jetstream2 exosphere**, for resource management and tracking resource usage on nodes.
- **NFS**, to mount the data volume for access on all nodes.
- **NVIDIA-smi**, for tracking GPU usage.