

3-DAY HACKATHON · NANO@STANFORD

Live 4D-STEM Hackathon

Stream electron diffraction data from the DECTRIS ARINA detector straight into GPU memory and **run 4D-STEM imaging and quantitative algorithms in real time**. No disk writes, no HDF5 staging.

When Oct 26–28, 2026 **Where** Huang B007 · Spectra 300, Spilker 008K **Open** to all

THREE DAYS, THREE MILESTONES

Oct 26

DAY 1 · MONDAY

Streaming & live imaging

- ARINA → multiple GPUs
- Live virtual BF/DF, DPC
- SSB ptychography & tilt estimation
- Parallax imaging, defocus estimation
- Align and merge repeated scans live

Oct 27–28

DAYS 2–3 · TUE–WED

Live quantitative microscopy

- Live strain mapping
- Live orientation mapping
- Live pair distribution function (PDF)

Oct 28

DAY 3 · STRETCH GOAL

Multi-GPU iterative ptychography

- Automatic iterative multislice ptychography
- One scan per GPU

WHO SHOULD JOIN

Open to all microscope users and anyone interested in learning.

4D-STEM

STEM imaging

Ptychography

GPU / CUDA programming

Nanobeam diffraction

Python & web apps

WHY IT MATTERS

Today every 4D-STEM scan is written to disk before analysis can start. Streaming directly to GPUs removes that step, so acquisition can run continuously and images and quantitative results arrive in real time, within seconds.

LOCATION

Hackathon room: Huang B007

Jen-Hsun Huang Engineering Center, 475 Via Ortega

Stanford | nano@stanford**Microscope: Spectra 300, Spilker 008K**

Spilker Engineering & Applied Sciences Building, 348 Via Pueblo

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