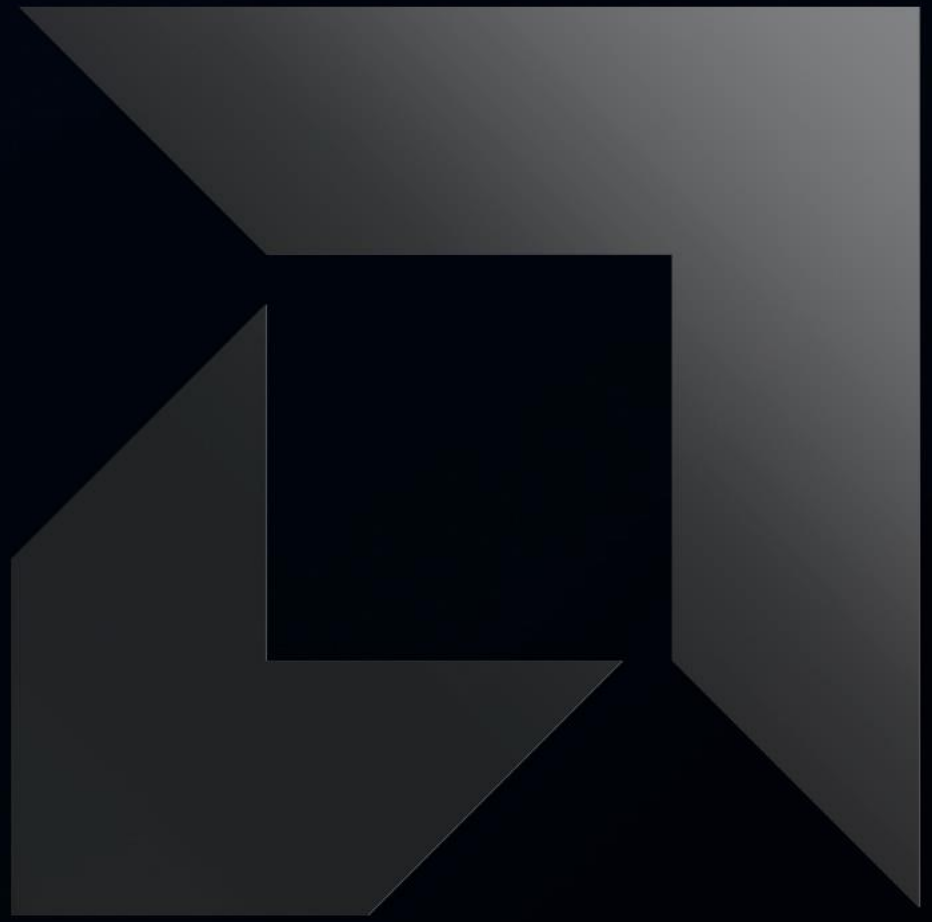


AMD University Program

Research & Advanced Development

Andrew Schmidt
AMD University Program – North America
Andrew.Schmidt@amd.com

AMD
together we advance_

Agenda

1. AMD University Program Overview
2. Heterogenous Accelerated Compute Clusters (HACC)
3. AMD AI & HPC Cluster Program
4. Questions

AMD University Program Vision

Empower academics with AMD technology to enhance teaching and learning experiences and advance state-of-the-art research.

www.amd.com/AUP

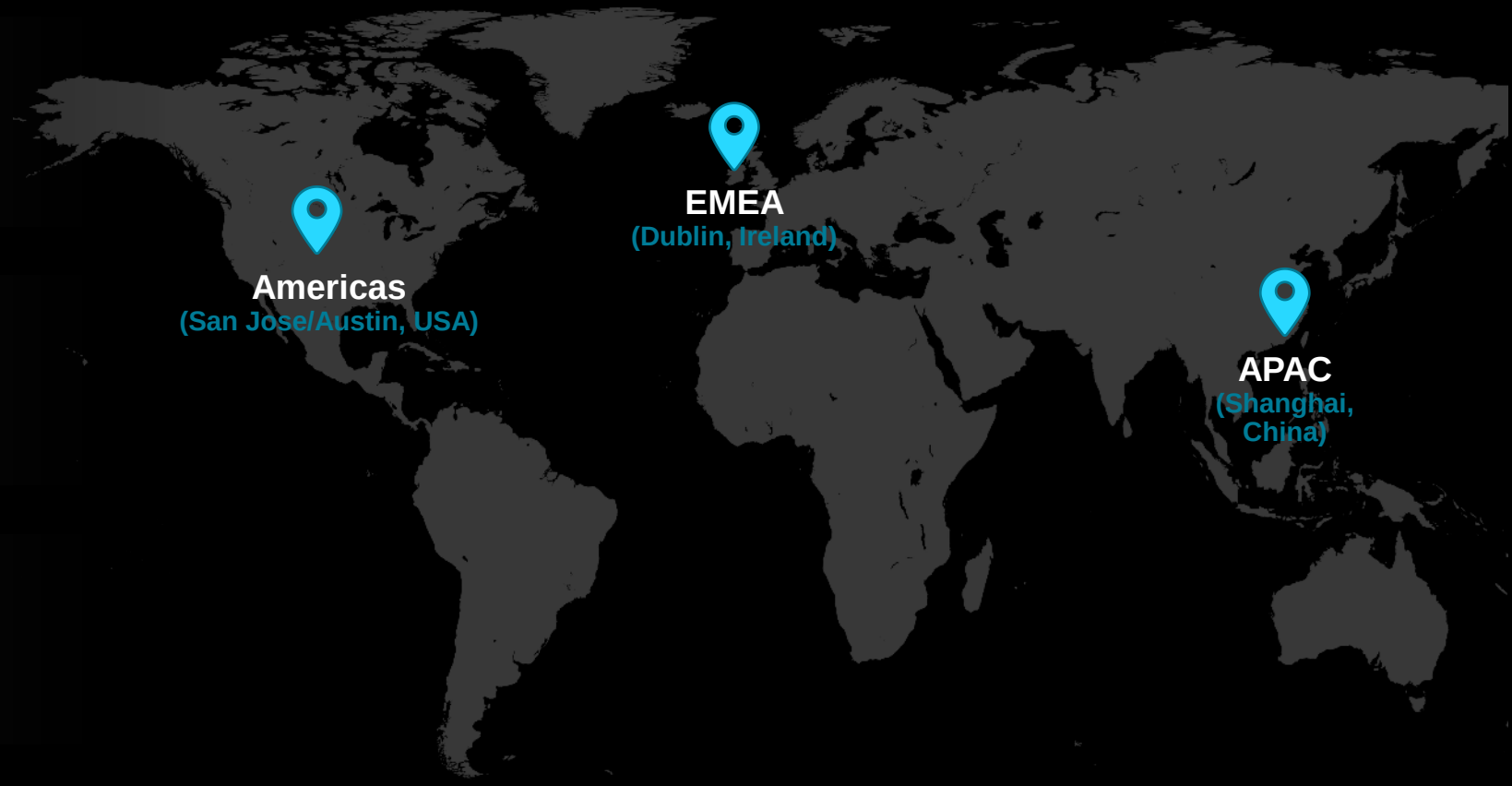
AMD
together we advance_

AMD University Program Team

Dedicated world-wide technical team

Supporting High Performance and Adaptive Compute

25+ years experience working with academia



Academic and Research Community

Students

Affordable access to AMD products

Build industry relevant skills and knowledge with AMD products

Educators

University resources and support

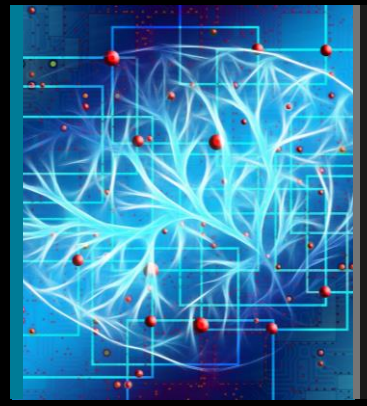
Deliver exceptional teaching with AMD educational resources and support

Researchers

Leading-edge AMD technologies

Advance state-of-the-art research

AMD University Team Offerings

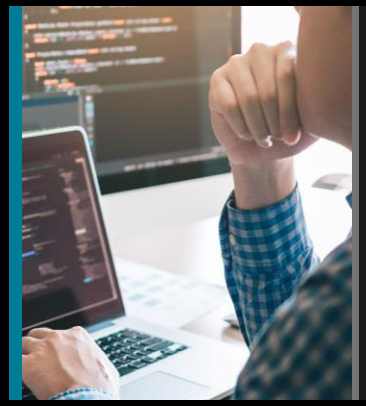


Research Programs

Donation Program

Teaching Resources

Training



Academic Solutions

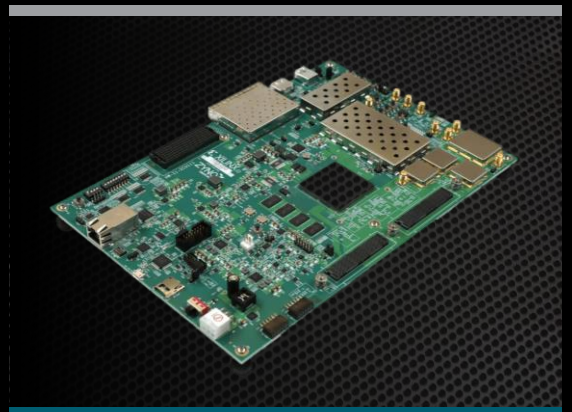
Support

Donation Program

Request academic and AMD boards for teaching and research

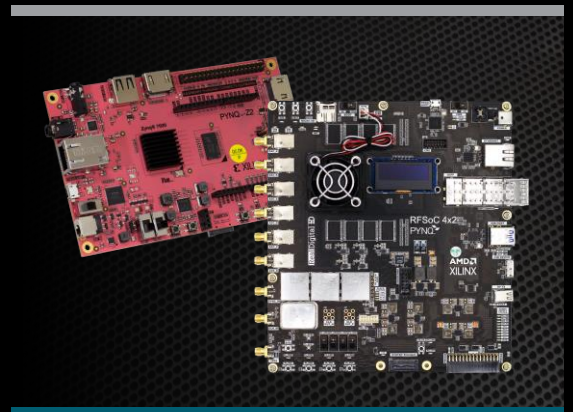
Apply now for academic licenses for AMD Software & IP

Request silicon devices for custom projects



Development boards

Production boards



Academic boards

Silicon devices

www.amd.com/AUP

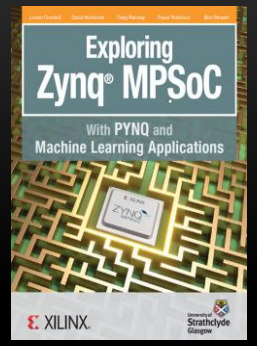
Teaching Resources

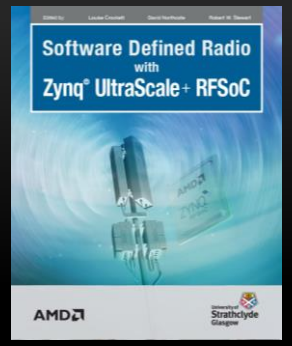
- Open-source teaching material
- Video presentations
- Tech Talks
- Tutorial Labs
- *Academic Experts* program for access to advance training

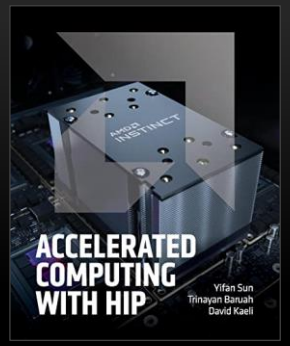
www.amd.com/AUP

Enabling Hands-on Learning and Exploration

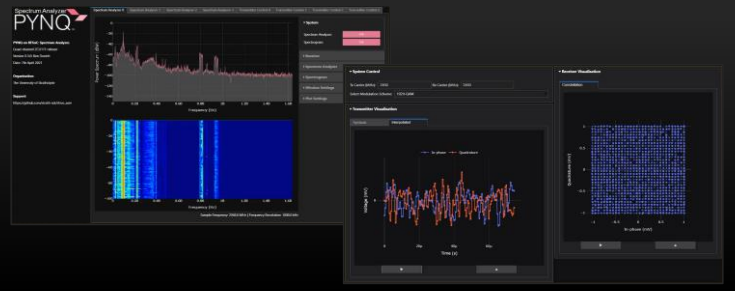
AMD Text Books







Jupyter Notebooks

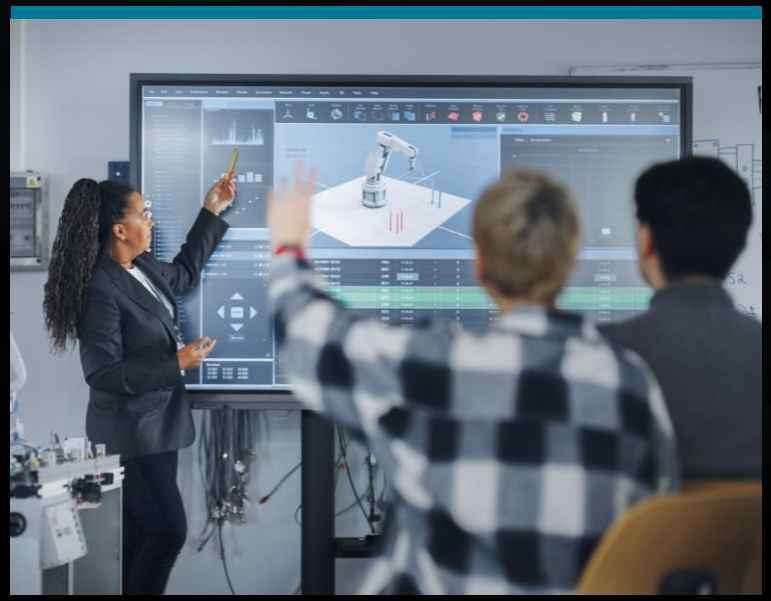


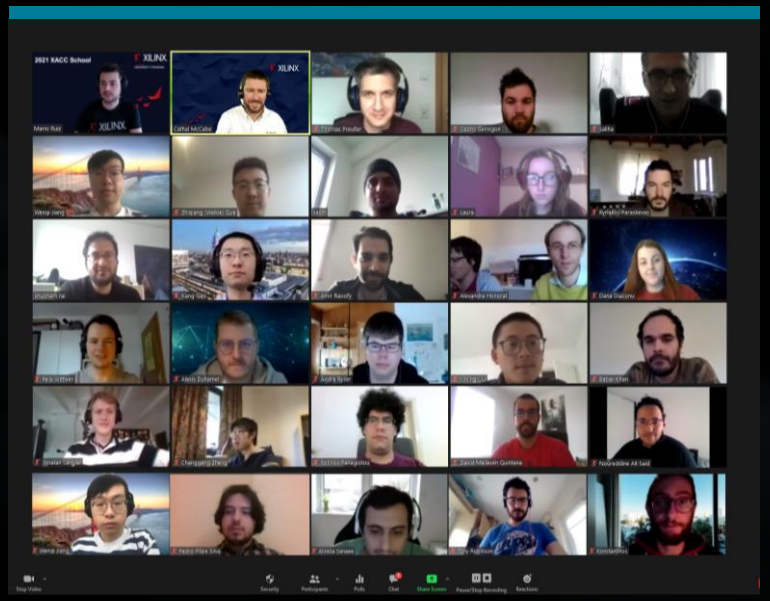
ZCU111 and RFSoC 4x2

Open-source framework

AMD
PYNQ

University Training





Live and remote instructor-led training

PhD schools

Free to attend for academics

Hands-on lab exercises

Supported on University Program hardware and cloud resources

www.amd.com/AUP

AMD Partners

University Program

- Leads interaction with university community
- Coordinates collaborations across AMD partners
- Facilitates research opportunities

RESEARCH PROGRAMS
Accelerating AI and Science

AMD
AI & HPC Fund

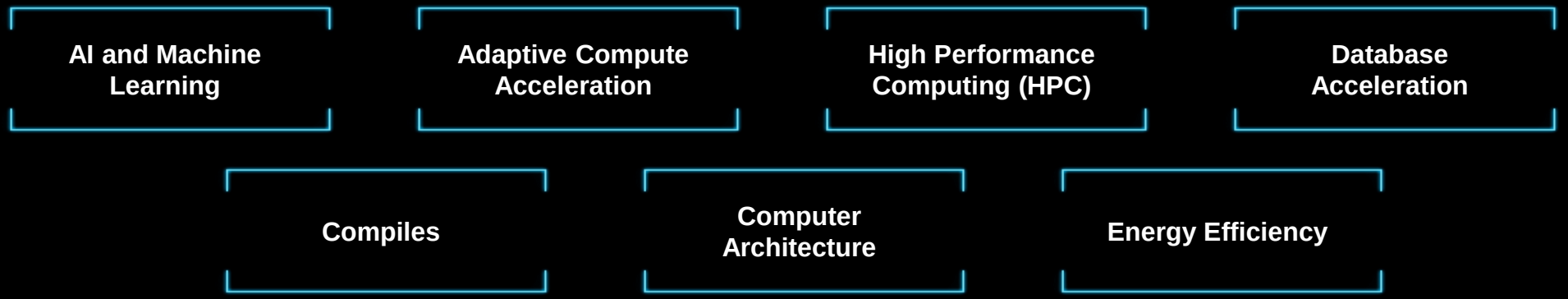
Heterogeneous Accelerated Compute Clusters

Enabling Novel Research in Heterogeneous Compute Acceleration for HPC

Heterogenous Accelerated Compute Clusters (HACCs)

- Supports novel research in heterogenous compute acceleration for AI and HPC to foster a community of leading academic teams to conduct state-of-the-art research
- Encompasses systems, architecture, tools and applications
- Established at six of world's most prestigious universities
- Equipped with the latest AMD hardware and software technologies

RESEARCH AREAS



HACCs: Heterogeneous Accelerated Compute Clusters

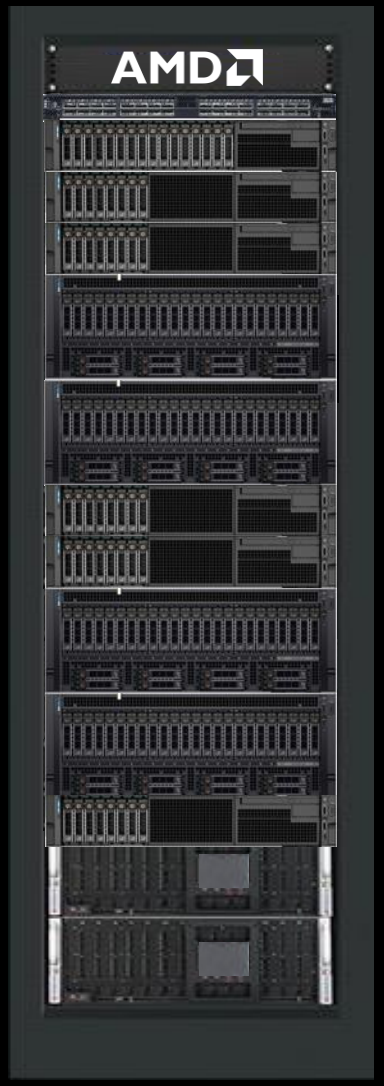
- Remote access to Adaptive Compute hardware
- HACC user group meetings
- Access to AMD researchers
- Collaboration opportunities

AMD EPYC | AMD INSTINCT | AMD ALVEO | AMD VERSAL

www.amd-haccs.io

★ Newest HACC at IISc, Bangalore

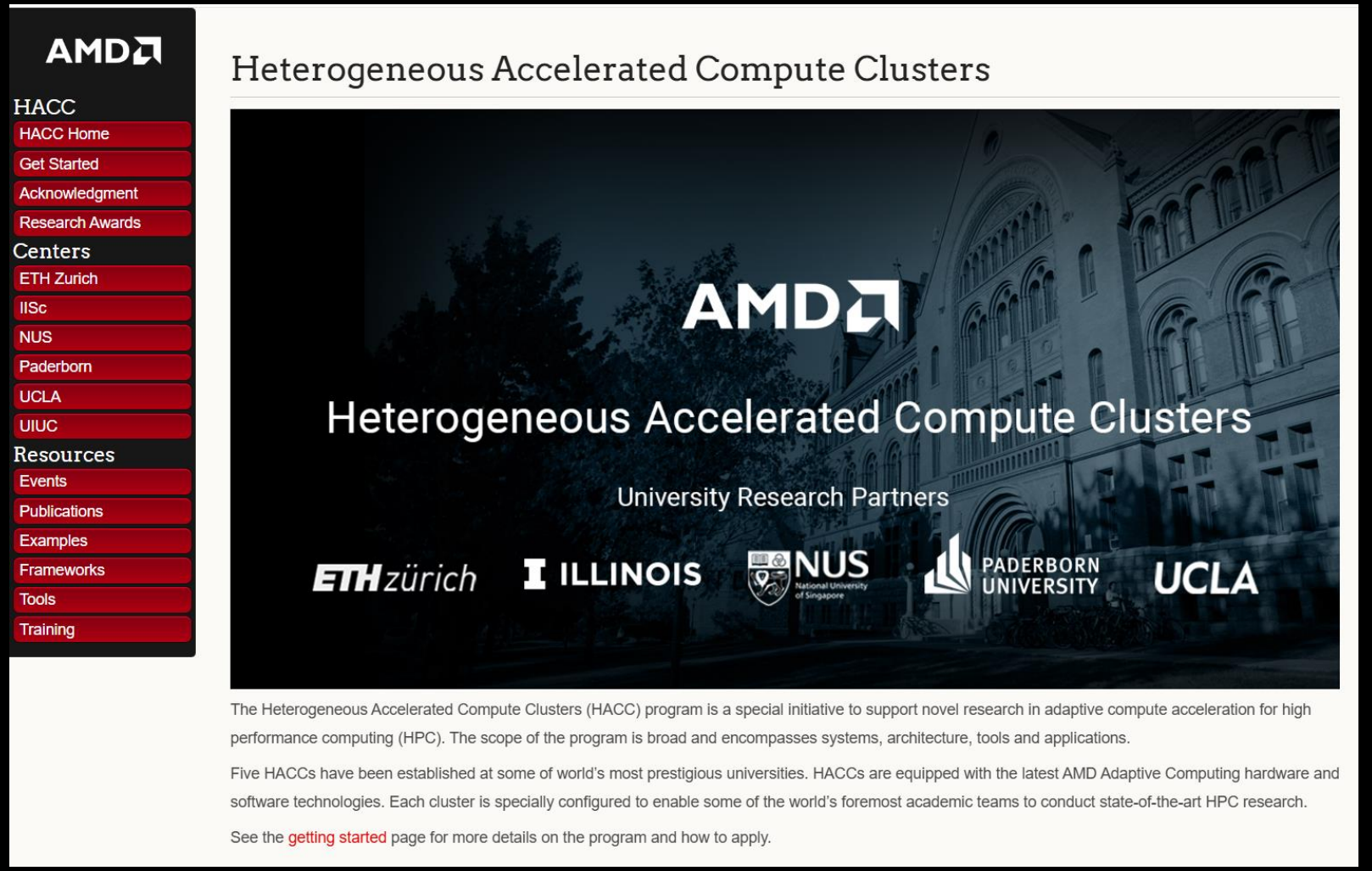
HACC Adaptive Computing Hardware



- HACC hardware consists of:
  - Compute and Alveo™ nodes (initially U250 and U280 with HBM)
  - Latest heterogeneous nodes (SMC 4124GS) include:
    - 2 EPYC™ 3rd generation CPUs
    - 4 AMD Instinct™ MI210 GPUs
    - 2 Alveo U55C FPGA with HBM
    - 2 VCK-5000 ACAP/Versal with AIEs
    - Run-time via AMD ROCm™, XRT
    - SW development via HIP, Vitis, frameworks
  - 100G network

- Community hub for researchers
  - Support from in-house AMD research groups
  - Reproducible results & experiments

HACC Resources



https://www.amd-haccs.io/

HACC Tech Talk Series

HACC Tech Talk series

The talks will be hosted as Zoom webinars and are free to attend. The format for each session will be two 30-minute talks on topics related to Adaptive Compute.

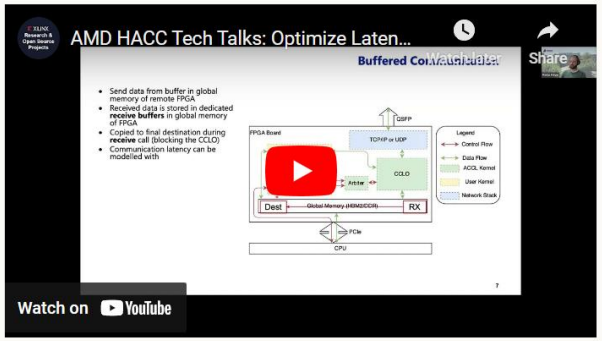
If you would like to present your work at an HACC Tech Talk, please contact aup@amd.com with an outline of your proposal.

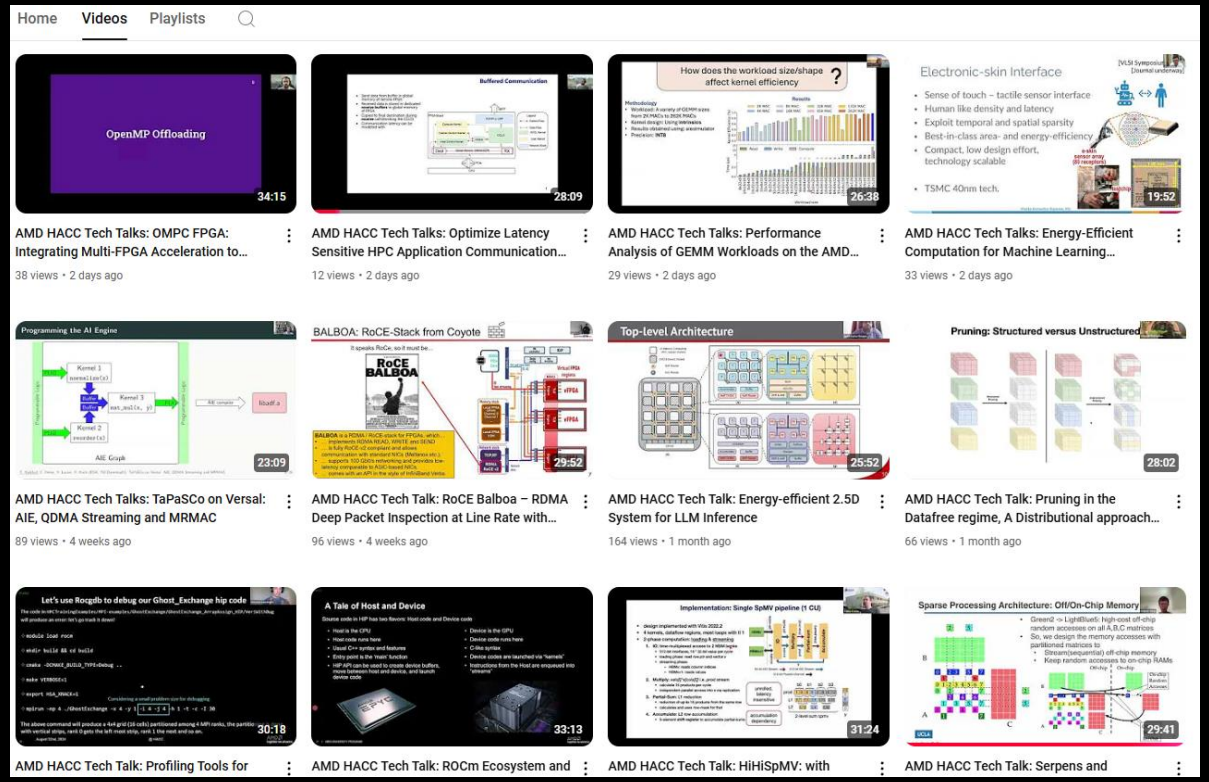
Past talks

HACC Tech Talk 15

14th November 2024

Optimizing Communication for Latency Sensitive HPC Applications on up to 48 FPGAs Using ACCL





www.amd-haccs.io/hacc_tech_talks.html

Next Talk December 9th!

Join the HACC Program

- Researchers working in relevant areas are invited to apply to join the HACC.
- Partner research teams can remotely access the clusters' computing resources to carry out research
- HACCs are a community hub for researchers to come together to collaborate with other experts in the field, including AMD in-house research groups.

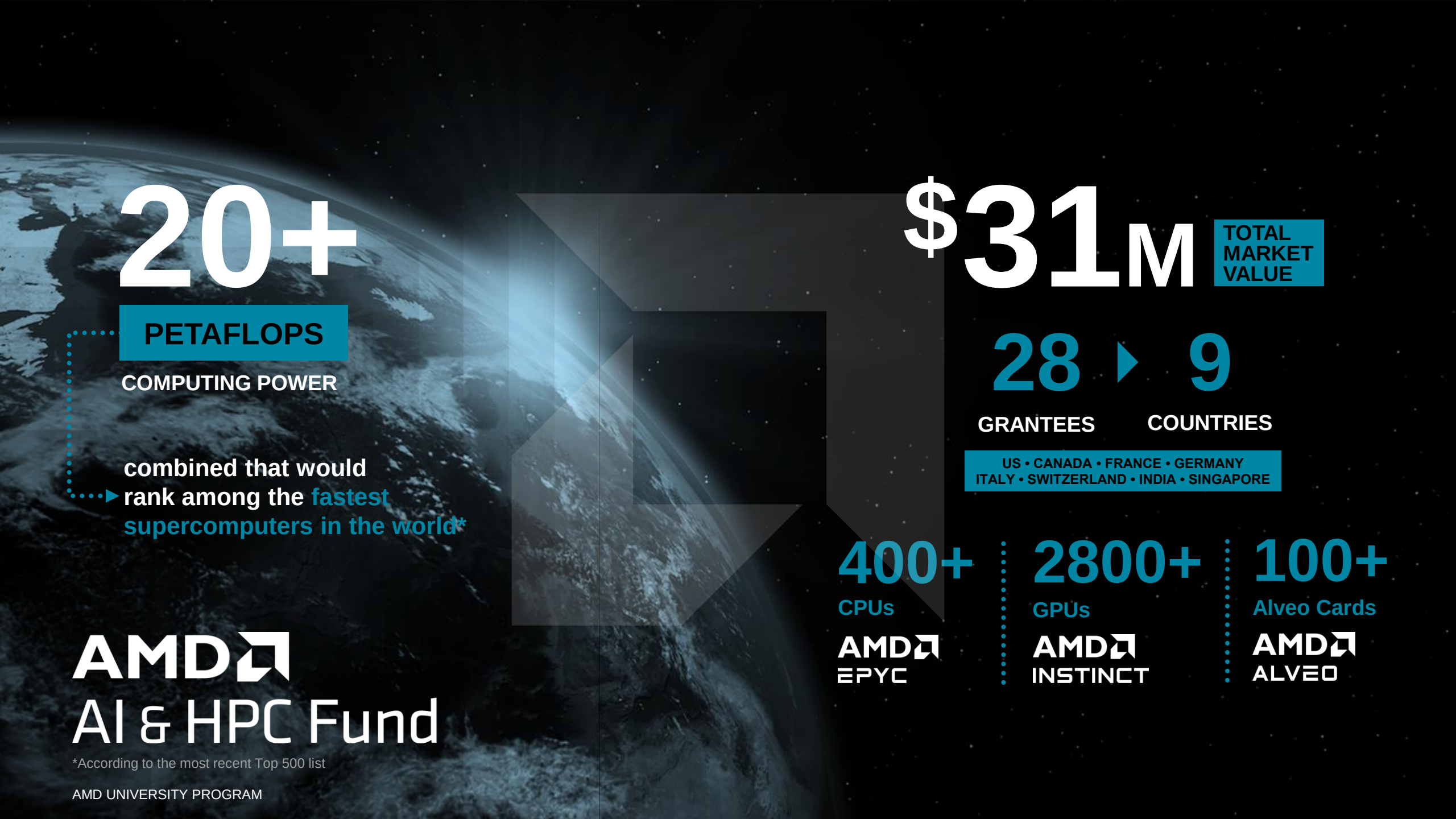
- Visit the HACC resources pages to find out more about the centers, how to get started, events as well as related publications, examples, frameworks, tools and training material.

- Please contact research_clusters@amd.com with any questions related to this program.

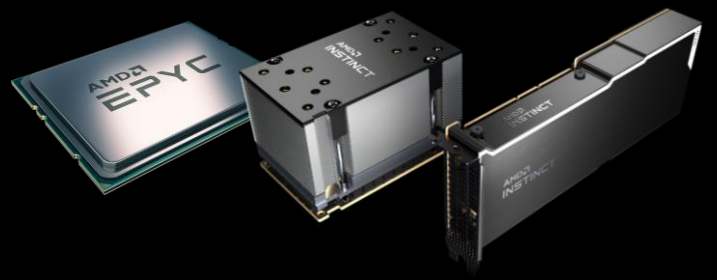
https://www.amd-haccs.io/get-started.html

AMD AI & HPC Cluster Program

Accelerating research and education in AI and HPC


20+
PETAFLOPS
COMPUTING POWER
combined that would
rank among the fastest
supercomputers in the world*
$31M
TOTAL MARKET VALUE
28
GRANTEES
9
COUNTRIES
US • CANADA • FRANCE • GERMANY
ITALY • SWITZERLAND • INDIA • SINGAPORE
400+
CPUs
AMD EPYC
2800+
GPUs
AMD INSTINCT
100+
Alveo Cards
AMD ALVEO
AMD
AI & HPC Fund
*According to the most recent Top 500 list
AMD UNIVERSITY PROGRAM

AMD AI & HPC Cluster



40-node cluster consisting of AMD EPYC CPUs and AMD Instinct GPUs (MI100, MI210, MI250, MI300X) connected with a high-speed GPU-aware interconnect

- ROCm platform w/ HIP for explicit GPU programming
- ROCm-enabled PyTorch and TensorFlow for AI workloads
- Slurm for job management
- Singularity for container solutions
- Persistent file storage on parallel file system(s)

Allocations available to academic researchers and educators through our external user program

AMD ROCm PyTorch TensorFlow

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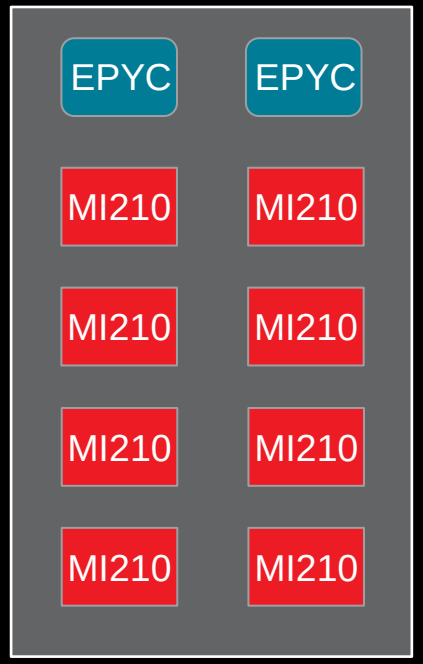
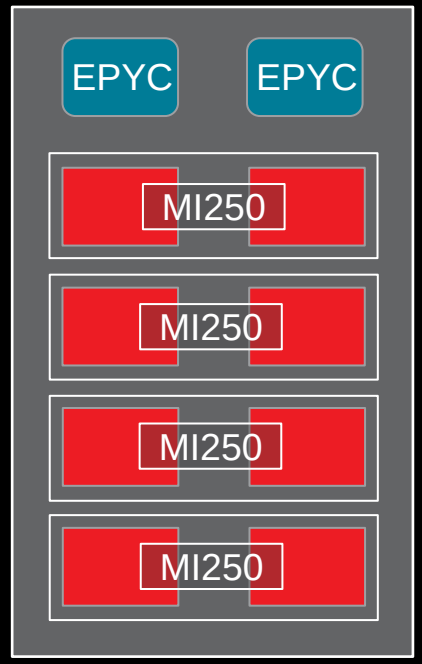
AMD AI & HPC Cluster Program

Perform Your Academic Research on Our 40-Node AMD EPYC + Instinct (MI210, MI250, MI300X) Cluster

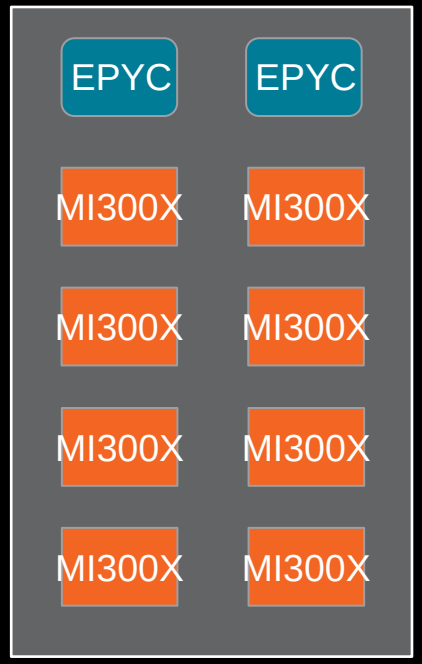
MI210 Node



MI250 Node



MI300X Node



Proposal Form

AMD AI & HPC Cluster User Program – Proposal Requirements

Project PIs

- Must be researchers or educators from academic organizations (e.g., universities, national labs, technical institutes)
- Must be postdoc or higher

Project Proposals

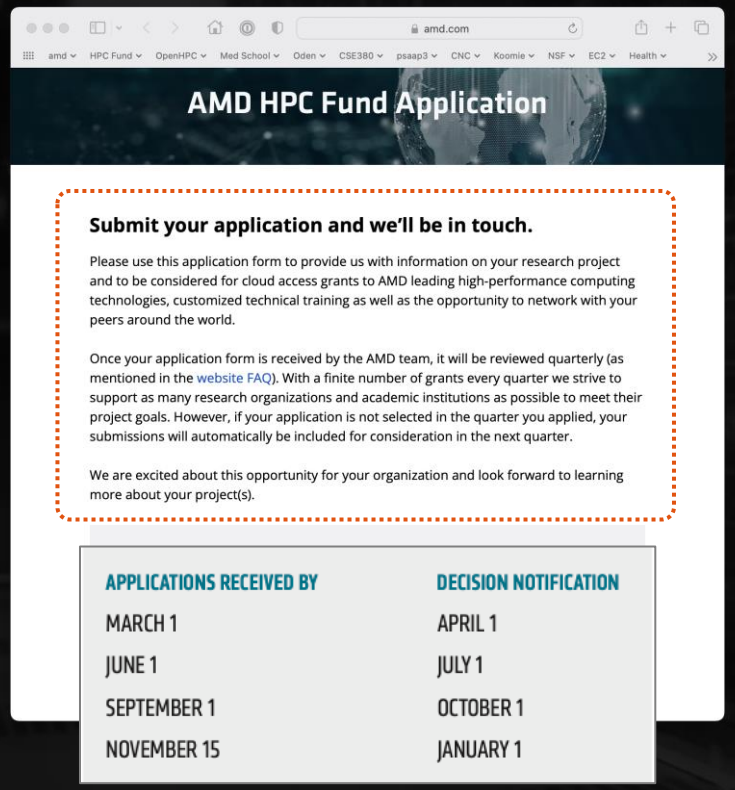
- Proposed work must be non-commercial
- Proposed work must be for 1 year or less (follow on allocations require new proposal)
- Node-hour requests must be appropriate size for cluster (typical allocations are between 5K – 15K node-hours)
  - Total node-hours per year = (39 compute nodes) * (365 days) * (24 hours / day) = 341,640 node-hours
- Project outcome should be highly impactful (e.g., publications, open-source libraries, educational content)

AMD AI & HPC Cluster User Program – How to Request Access

Proposal Form

https://www.amd.com/en/forms/registration/amd-hpc-fund-research-accelerator.html

Research applications in AI/ML are particularly encouraged!



FUNDING TRANSFORMATIONAL TECHNOLOGY AND ENGINEERING

AMD
Institutional Research

Funding Academic Research Program Overview

“Accelerate the world’s transformative technology and engineering”

Enables groundbreaking and innovative research projects through grants

Proposals for grants are submitted through AMD University Program and will be evaluated and selected by a cross-functional team

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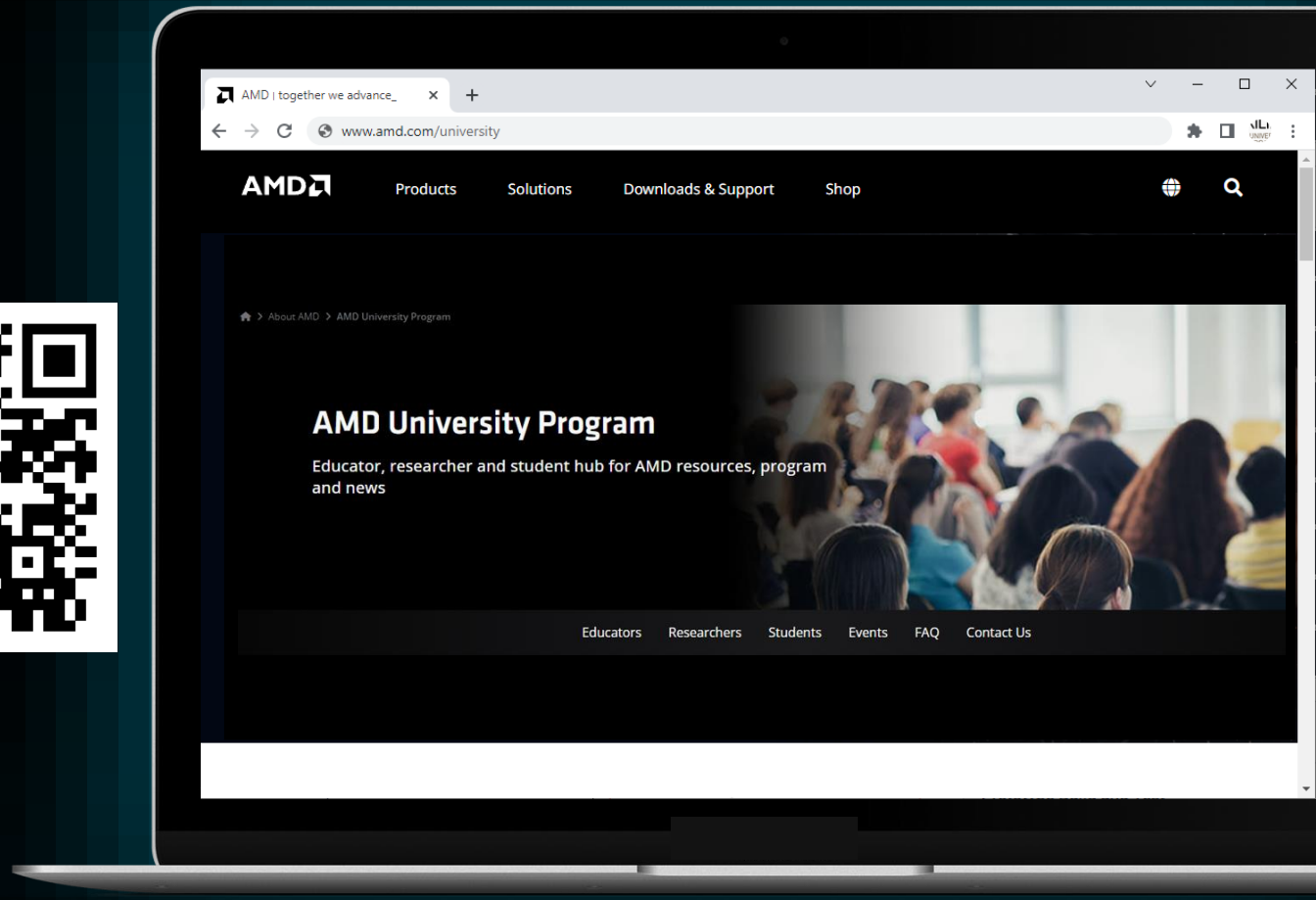
Contact Us

Visit our website to:

- Discover our research programs
- Access educational resources
- Submit a donation request
- Find training & other events



Email us:

aup@amd.com

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