



# ACES Phase I

## Next Generation Composability

Aug 21, 2022



High Performance  
Research Computing  
DIVISION OF RESEARCH



# ACES - Accelerating Computing for Emerging Sciences (Phase I)



Component	Quantity	Description
<a href="#">Graphcore IPU</a>	16	16 Colossus GC200 IPUs and dual AMD Rome CPU server on a 100 GbE RoCE fabric
<a href="#">Intel FPGA PAC D5005</a>	2	FPGA SOC with Intel Stratix 10 SX FPGAs, 64 bit quad-core Arm Cortex-A53 processors, and 32GB DDR4
<a href="#">Intel Optane SSDs</a>	8	3 TB of Intel Optane SSDs addressable as memory using MemVerge Memory Machine.

Available through [FASTER](#) (NSF Award #[2019129](#) )

# ACES - Accelerating Computing for Emerging Sciences (Phase II)



Component	Quantity*	Description
<a href="#">Graphcore IPU</a>	32	16 Colossus GC200 IPUs, 16 Bow IPUs, and a dual AMD Rome CPU server on a 100 GbE RoCE fabric
<a href="#">Intel FPGA PAC D5005</a>	2	FPGA SOC with Intel Stratix 10 SX FPGAs, 64 bit quad core Arm Cortex-A53 processors, and 32GB DDR4
<a href="#">Bittware IA-840F FPGA</a>	2	Accelerator based on Intel Agilex FPGA
<a href="#">NextSilicon</a> coprocessor	20	Reconfigurable accelerator with an optimizer continuously evaluating application behavior.
<a href="#">NEC Vector Engine</a>	24	Vector computing card (8 cores and HBM2 memory)
Intel Ponte Vecchio GPU	100	Intel GPUs for HPC, DL Training, AI Inference
<a href="#">Intel Optane SSDs</a>	48	18 TB of Intel Optane SSDs addressable as memory w/ MemVerge Memory Machine. <i>*Estimated quantities</i>

# ACES

## Accelerating Computing for Emerging Sciences

### Our Mission:

- Offer an accelerator testbed for numerical simulations and **AI/ML workloads**
- Provide consulting, technical guidance, and training to researchers
- Collaborate on computational and data-enabled research.

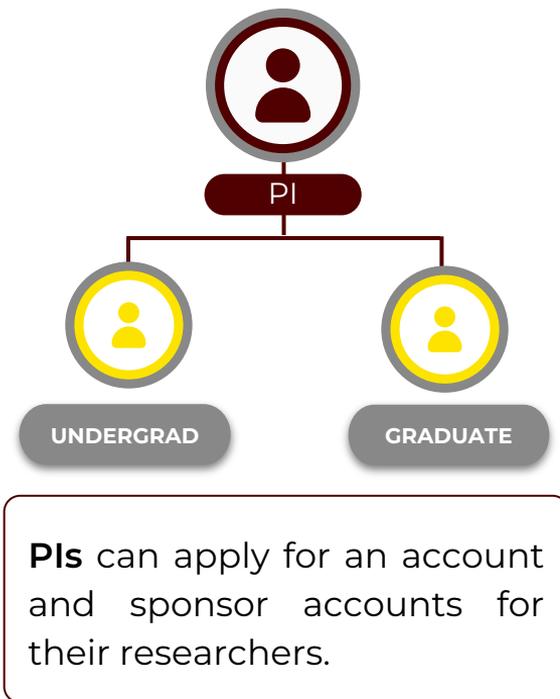


# Research Workflows - Accelerators (Phases I and II)

Hardware Profile	Applications Supported	
NEC Vector Engines	<ul style="list-style-type: none"> <li>AI/ML (Statistical Machine Learning, Data Frame)</li> <li>Chemistry (VASP, Quantum ESPRESSO)</li> <li>Earth Sciences</li> <li>NumPy Acceleration</li> </ul>	<ul style="list-style-type: none"> <li>Oil &amp; Gas (Seismic Imaging, Reservoir Simulation)</li> <li>Plasma Simulation</li> <li>Weather/Climate Simulation</li> </ul>
Graphcore IPUs	<ul style="list-style-type: none"> <li>Graph Data</li> <li>LSTM Neural Networks</li> </ul>	<ul style="list-style-type: none"> <li>Markov Chain Monte Carlo</li> <li>Natural Language Processing (Deep Learning)</li> </ul>
Intel/Bittware FPGA	<ul style="list-style-type: none"> <li>AI Models for Embedded Use Cases</li> <li>Big Data</li> <li>CXL Memory Interface</li> <li>Deep Learning Inference</li> <li>Genomics</li> </ul>	<ul style="list-style-type: none"> <li>MD Codes</li> <li>Microcontroller Emulation for Autonomy Simulations</li> <li>Streaming Data Analysis</li> </ul>
Intel Optane SSDs	<ul style="list-style-type: none"> <li>Bioinformatics</li> <li>Computational Fluid Dynamics (OpenFOAM)</li> </ul>	<ul style="list-style-type: none"> <li>MD Codes</li> <li>R</li> <li>WRF</li> </ul>
NextSilicon	<ul style="list-style-type: none"> <li>Biosciences (BLAST)</li> <li>Computational Fluid Dynamics (OpenFOAM)</li> <li>Cosmology (HACC)</li> <li>Graph Search (Pathfinder)</li> </ul>	<ul style="list-style-type: none"> <li>Molecular Dynamics (NAMD, AMBER, LAMMPS)</li> <li>Quantum ChromoDynamics (MILC)</li> <li>Weather/Environment modeling (WRF)</li> </ul>

# Getting on ACES Phase I

- Allocation is upon special request during this phase of deployment.
- You must have an XSEDE account!
- Applications are available at [hprc.tamu.edu/aces/](https://hprc.tamu.edu/aces/)
- Email us at [help@hprc.tamu.edu](mailto:help@hprc.tamu.edu) for questions, comments, and concerns





[hprc.tamu.edu](http://hprc.tamu.edu)

HPRC Helpdesk:

[help@hprc.tamu.edu](mailto:help@hprc.tamu.edu)

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