



# The Arm HPC User Group

An Open Community for Arm-based  
Research and Engagement

# What is the Arm HPC User Group (AHUG)?

The Arm HPC User Group (AHUG) is a community-led user group with members from around the globe who are focused on ***next-generation high-performance computing built around the Arm ecosystem, including hardware, software, tools, and education.***



Read more about our mission at <https://a-hug.org/about>

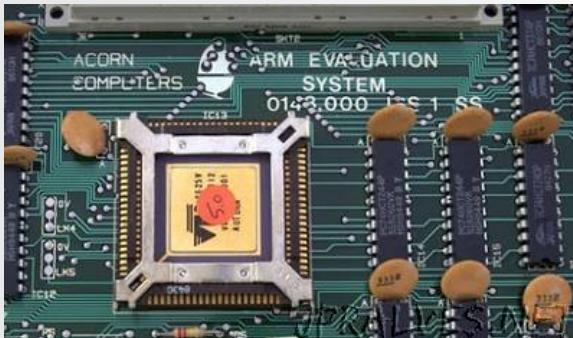


ISC18 and ISC19 Photos from Roxana Rusitoru and Jeff Young



# From Acorn(s) to Supercomputers

The first Acorn RISC Machine processor, the 6 MHz ARM1 was released in 1985. In 1990, the company Advanced RISC Machines (ARM) was incorporated.



Peter Howkins, <https://commons.wikimedia.org/w/index.php?curid=17401171>

Throughout the 90s, Arm processors were adopted for mobile devices as a low-power, high-performance computing platform

As of 2020, we have seen the arrival of the Arm-based Fugaku supercomputer at #1 on the Top500!

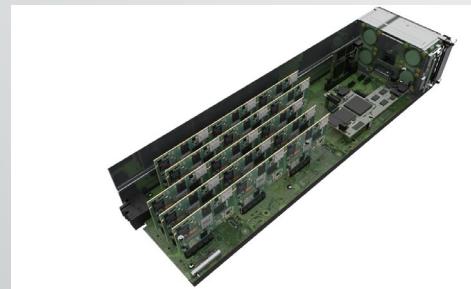
*Learn more:*

- See Ben Walshe's "A Brief History of Arm: Parts 1 and 2" for more details or early ARM hardware!



Fugaku photo courtesy of RIKEN

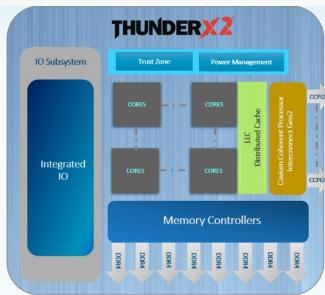
# A Retrospective



2011 2012 2013



2014 2015



2016

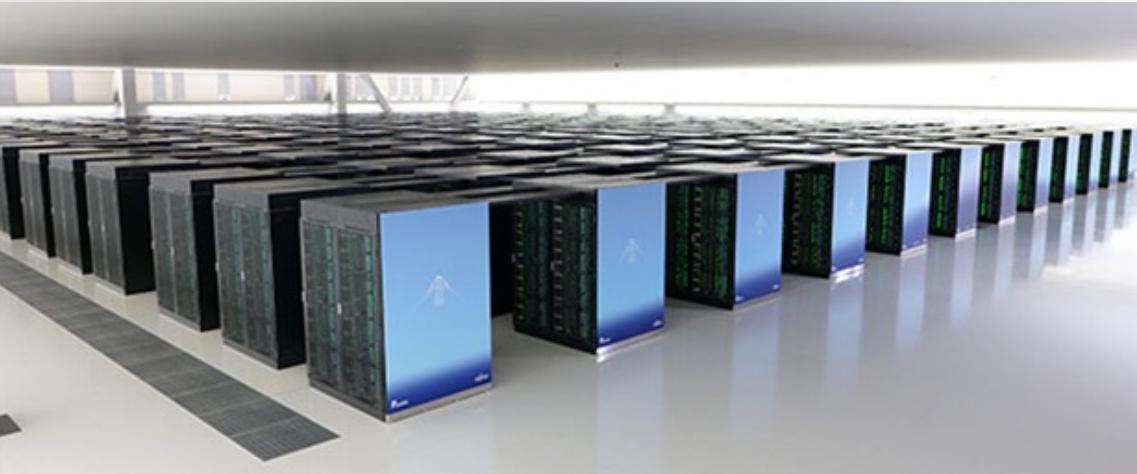


2017

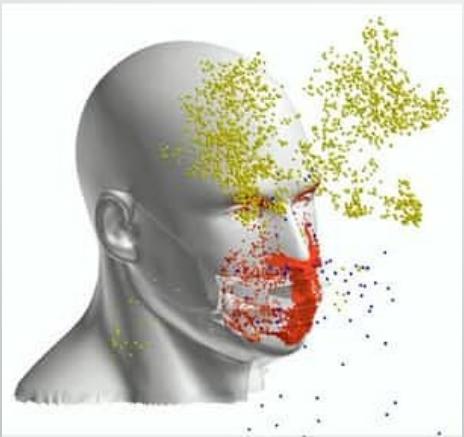


2018

# Fugaku: The Fastest Supercomputer in the World!



Fugaku photo courtesy of RIKEN

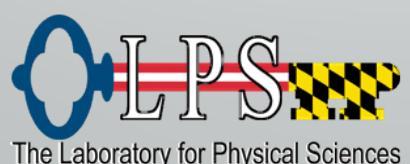


Fugaku photo courtesy of RIKEN

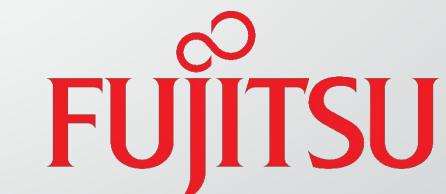
Fugaku is the first Arm supercomputer to be #1 on the Top500 (2020), #1 on the Green500 (2019), and #1 on the Graph500 and HPL-AI (2020).

Scientific contributions include simulations on the effectiveness of masks, particulate flows, tsunami modeling, and much more.

Codesign efforts, industry-academic partnerships and open exchange of ideas all contributed to the novel design of the A64FX chip and the Fugaku supercomputer.



# Ongoing Collaborations



# A Collaborative Journey

Mainstream Arm HPC deployments have resulted from a series of individual and collaborative accomplishments by vendors, scientists, and HPC facility users including:

- MontBlanc 1, 2, 3 and 2020
- FastForward-2 and other efforts in the US
- Long-term co-design around the development of simulators and tools for Fugaku
- Industry, government, and academic partnerships like the Catalyst UK programme and the European Processor Initiative (EPI)
- Earlier Arm HPC User Group and GoingArm workshops
- Countless BoFs and tutorials...

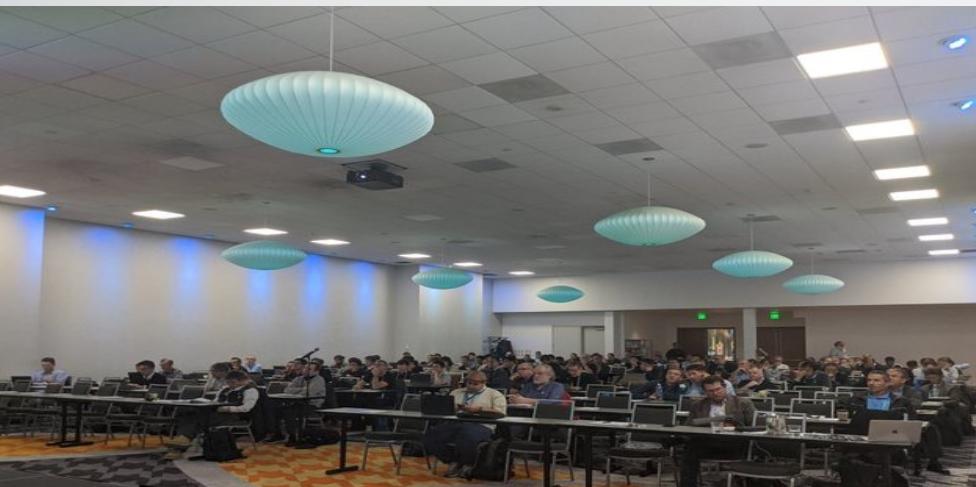


SC18 BoF Photo from Roxana Rusitoru

# How Does AHUG Fit In?

The Arm HPC User Group provides a place for the Arm HPC community to come together in an open fashion to **exchange ideas and share knowledge** related to issues related to using Arm devices and tools for HPC.

Most importantly, AHUG continues the tradition of user-led and focused events and outreach that has enabled the rapid growth of Arm HPC over the past 10 years!



SC2019 Photos from Roxana Rusitoru and Jeff Young



# The Arm HPC Experience

While the first Arm HPC event was in 2015, public “Arm User Experiences with HPC” events started in earnest in late 2017 with most of these events being run by the growing Arm HPC community of users



Since 2017, there have been upwards of 40 Birds of a Feather, workshops, and training events related to Arm HPC!



ISC18 and ISC19 Photos from Roxana Rusitoru and Jeff Young

*Learn more:*

- <https://developer.arm.com/solutions/hpc/events/arm-bof-sc17> (first public BoF)
- <https://developer.arm.com/solutions/hpc/events> (list of previous Arm events)

# AHUG Cloud Hackathon for Arm-based HPC



A massive competitive event organized by AWS, Arm, and AHUG (July 2021)

## Objective

- Jumpstart HPC applications on Arm-based cloud platforms
- Port, tune, optimize, compete!



## Participation

- 140 participants in 35 teams
- 55 mentors
- 17 time zones



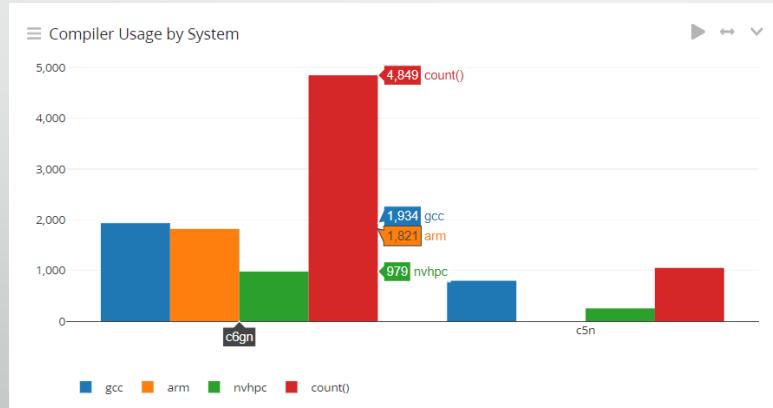
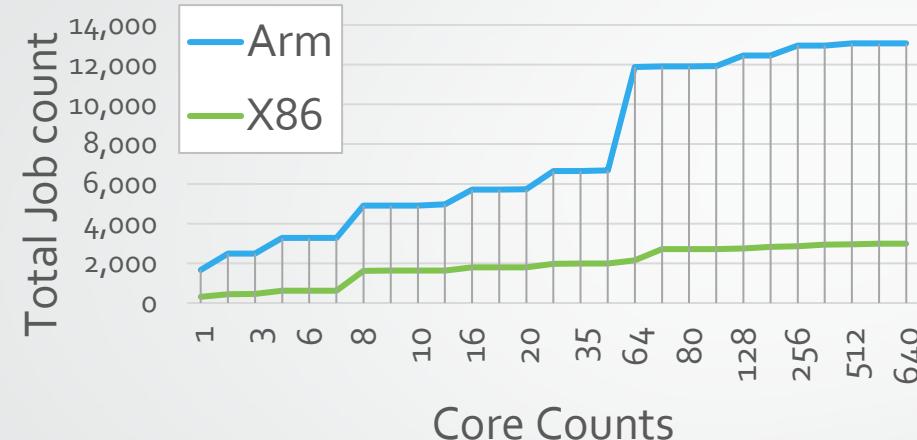
## Stats

- 5 Days
- 19,000 AWS Graviton 2 cores
- 478 commits



## Results

- Dozens of applications ported
- Hundreds of test cases finished
- Thousands of jobs submitted
- Patches are still going upstream



# How can you get involved with AHUG?

Talk with any of the AHUG directors about opportunities and upcoming events

- Christelle Piechurski, Steve Poole, Mitsuhsia Sato, Valerio Schiavioni, Michèle Weiland, Jeff Young

Check out our YouTube channel for “Arm HPC User Group”!

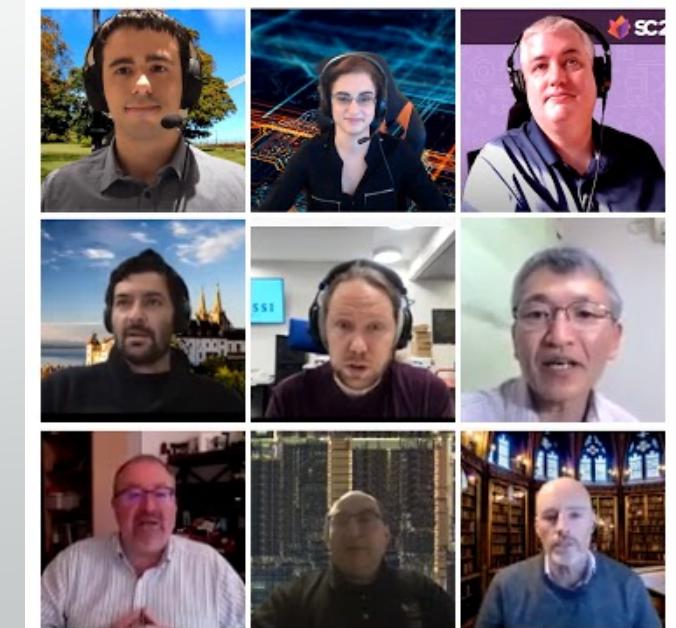
- SC20 and ISC21 playlists from Arm HPC users and vendors

Workshops and Birds of Feather Sessions

- Events at ISC, SC, and HPC-Asia – please check a-hug.org for more information

Website, Mailing list, LinkedIn, and Slack

- a-hug.org – general information and details on AHUG membership
- ahug@arm-hpc.groups.io
- <https://www.linkedin.com/groups/13911056/>
- a-hug.slack.com



SC2020 Virtual AHUG Panelists