

# Salishan, 27-30 April 2026

**Web:** <https://salishan.ahsc-nm.org/program.html>

**Theme:** “*We’re all mad here*”. **Applications of the Future:** Describing key scientific challenges on the horizon and how those challenges are driving innovation in supercomputing systems.

**Schedule:** Tuesday, April 28, 9:30-10:00 am

**Duration:** 25min +5min

## Title:

A balancing act: Energy, Performance, and Resource Efficiency in HPC

## Abstract:

Progress in science, engineering, and artificial intelligence would be impossible without HPC. This is the main justification why one continues deploying more and ever larger HPC systems, despite their huge energy consumption. In the race to Exascale the mental upper limit was set at 20MW for a system capable of performing 1 Eflop/s. Today, however, industry, politics and press announce huge deployments (aka “*Gigafactories*”) as if the target would be reaching the GW limit, instead of avoiding it. Still, a part of the HPC community (sometimes regarded as slightly mad) is dedicating their effort to making HPC infrastructures more energy efficient, attacking the problem from the hardware design, the software environment, and the applications.

Under the spirit of “*We’re all mad here*,” this talk argues that the real madness may be continuing to scale computing without fundamentally rethinking how efficiently we use the resources we already have. We present some ideas to increase resource utilization and energy efficiency of HPC systems without scarifying performance, by combining monitoring infrastructures, AI-enhanced monitoring data analysis, co-scheduling strategies, and dynamic resource allocation. We hope these ideas will trigger some interesting discussions.

## Bio:

Estela Suarez is Joint Lead of the department Novel System Architecture Design at the Jülich Supercomputing Centre, and Associate Professor for High Performance Computing at the University of Bonn. Her expertise is in HPC system architecture and codesign. As leader of the DEEP project series, she has driven the development of the Modular Supercomputing Architecture, including the implementation and validation of hardware, software and applications. In addition, she leads the energy efficiency project SEANERGYs and has led the codesign efforts within the European Processor Initiative in 2018-2024. From 2024 to 2025 she has been Senior Principal Solution Architect at SiPEARL, during a sabbatical. She holds a Master's degree in Astrophysics from the University Complutense of Madrid (Spain) and a PhD in Physics from the University of Geneva (Switzerland).