



## CASUS Hands on Software Seminar



### **Pedal to the Metal: Designing a Scalable Particle-in-Cell Code PIConGPU**

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**Date:** Thursday, 01 October 2020

**Time:** 10:00 – 12:00 CET

**Location:** CASUS Lecture Room, Görlitz

#### **Abstract:**

PIConGPU is an open-source Particle-in-Cell simulation code for the Exascale era. It implements a wide range of core Particle-in-Cell numerical schemes and extensions, in-situ diagnostics, and high-performance I/O. With a single source code base, PIConGPU runs on a variety of modern hardware, including both CPUs and GPUs, and scales from a single workstation up to the largest supercomputers. Following up the two recent talks concerning physical and numerical features of PIConGPU, this talk will focus on the computer science and software design aspects of the code and the underlying software stack.

The talk concerns PIConGPU core data structures, typical patterns of parallel processing, and software design approach to enable efficient and scalable single-source implementation. It also presents performance and scaling results on the Summit supercomputer.