

# Programming paradigms for HPC

An introduction to parallel and distributed programming

**Instructor:** Daniela Loreti, PhD (email: [daniela.loreti@unibo.it](mailto:daniela.loreti@unibo.it))

**Schedule:**

- December 9, 2020 – 14:00-16:30
- December 10, 2020 – 14:00-16:30
- December 15, 2020 – 14:00-16:30
- December 16, 2020 – 14:00-16:30

**Duration:** 10 hours

**Location:** Online, using Teams. Register to the following team:

<https://teams.microsoft.com/l/team/19%3a4322628b6a4142b5bef0395dee7c3f9a%40thread.tacv2/conversations?groupId=0adff39a-6cac-4e50-bc47-61e693e9a1d1&tenantId=e99647dc-1b08-454a-bf8c-699181b389ab>

## Overview

The course will provide an introduction to the main techniques to manage the complexity of High-Performance Computing infrastructures while taking advantage of their great computing power.

**Topics:**

- Introduction to HPC computing: architectural principals and classical programming paradigms: message passing and shared memory
- Introduction to GPU: architectures and programming principles
- Introduction to distributed data processing frameworks and stream processing
- Current challenges and research directions

**Course material:** the instructor will provide the slides and bibliographical references. All course material is in English.

**Learning and assessment**

The course will be taught in either Italian or English at the preference of the attendees.

The final assessment can consist of a technical report on a paper related to the course topics.