

# Joint ICTP-IAEA School on Systems-on-Chip based on FPGA for Scientific Instrumentation and Reconfigurable Computing



**20 November - 1 December 2023**  
**An ICTP - IAEA Meeting**  
**Trieste, Italy**

Further information:  
<http://indico.ictp.it/event/10225/>  
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The school will cover key aspects of FPGA-based Systems-on-Chip (SoC-FPGA) and their applications to scientific instrumentation and reconfigurable computing, with emphasis in nuclear and particle physics experiments.

## Directors:

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## Description:

Modern nuclear and particle physics experiments require online data acquisition (DAQ) systems that process multiple and parallel signals coming from detectors and reduce both the data rate and the amount of data to be storage in disk for further offline analysis.

These systems usually rely on the reconfigurable computing paradigm that combines software's flexibility and hardware's high performance using programmable computing fabrics such as SoC-FPGA.

Participants will be familiarized with professional software design tools and hardware platforms through tutorials and hands-on activities. They will do projects and build embedded instruments for nuclear applications and particle physics experiments.

They will be also introduced to an open-source SoC-FPGA firmware framework, providing a well-tested interface with the control computer.

## Topics:

- Systems-on-Chip: Architecture and Design Methodology
- Hardware/Software Interface
- VHDL for FPGA Design, Modeling, and Logic Synthesis
- Embedded C and High Level Synthesis
- Good Practices in Firmware and Software Development
- FPGA for Acceleration of AI Algorithms
- Digital Electronics for Standard and Modern Sensors
- Real-Time Data Acquisition
- Detector Signal Processing and Event Reconstruction
- SoC-FPGA Architectures for High Performance Computing

## Local Organiser:

M.L. CRESPO, ICTP, Italy

## How to apply:

Online application:  
<http://indico.ictp.it/event/10225/>

Female scientists are encouraged to apply.

## Grants:

A limited number of grants are available to support the attendance of selected participants, with priority given to participants from developing countries. There is no registration fee.

## Deadline:

**6 August 2023**

