

# 2023 EDIT School

## Program Overview

### **Silicon Sensors: Design, Fabrication, and Testing**

- Learn about the principles and applications of silicon sensors
- Explore the methods and tools for creating silicon sensors
- Perform bench tests and beam tests to evaluate the performance of silicon sensors

### **Integrated Electronics for Detector Readouts**

- Learn about the role and functions of integrated electronics in detector readouts
- Explore the methods and tools for developing ASICs for various sensors
- Perform signal processing and data acquisition using integrated electronics
- Verify the functionality and reliability of integrated electronics using simulation tools

### **Data Acquisition Systems for Quick Prototyping of Detectors Readout and an Experiment**

- Learn about data acquisition devices and their efficient use in software at different abstraction levels
- Explore the tools and methods for fast prototyping of an embedded DAQ systems based on OEM devices
- Perform Digital Signal Processing in FPGA synchronized to a Real-Time OS microcontroller

### **Liquid Argon Detectors: Physics, Design, and Operation**

- Learn about the advantages and challenges of liquid argon detectors
- Explore the physics principles and phenomena involved in liquid argon detectors
- Design and construct liquid argon detectors and testbeds
- Operate and measure the performance of liquid argon detectors and testbeds

### **Liquid Scintillators: Properties, Fabrication, and Analysis**

- Learn about the applications and characteristics of liquid scintillators
- Explore the properties and behaviors of liquid scintillators
- Design and fabricate liquid scintillator detectors from benchtop to scale-up deployment
- Calibrate and analyze the data from liquid scintillator detectors

### **RF Cosmology: Techniques, Instrumentation, and Data**

- Learn about the goals and challenges of RF cosmology
- Explore the techniques and methods for observing the 21cm absorption/emission line of neutral hydrogen
- Learn about designing and constructing RF telescopes and related instrumentation
- Process and interpret the data from RF cosmology observations

### **Quantum Network: Concepts, Components, and Capabilities**

- Learn about the potential applications and benefits of quantum networks
- Explore the fundamentals and concepts of quantum network
- Design and implement quantum network components and protocols
- Demonstrate and evaluate quantum network capabilities