



The Abdus Salam
**International Centre
for Theoretical Physics**



Secretaría
**Nacional de
Ciencia y
Tecnología**



1st Mesoamerican Workshop on Reconfigurable X-ray Scientific Instrumentation for Cultural Heritage

27 - 31 June, 2025
Antigua Guatemala

Workshop Directors

Maria Liz Crespo (ICTP, Italy)

Melissa Maria Cruz Torres (UNAH, Honduras)

Juan Adolfo Ponciano (USAC, Guatemala)

Rodrigo Sacahui Reyes (USAC, Guatemala)

Workshop Programme

- Workshop website: <https://indico.ictp.it/event/10843>
(detailed schedule & list of participants)
- **Daily timetable (9:00 – 17:30)**

Timetable	
9:00 - 11:00	lectures
11:00 - 11:15	coffee-break
11:15 - 13:00	lectures
13:00 - 14:00	lunch
14:00 - 16:00	lectures / lab activities
16:00 - 16:15	coffee-break
16:15 - 17:30	lab activities

Participants

- Requests for participation: 137 applicants from 31 different nationalities
- **Selected: 36 participants from 8 different countries**

Colombia

Costa Rica

Dominican Republic

El Salvador

Guatemala

Honduras

Mexico

Peru

Lecturers & Lab Tutors

BALLINA ESCOBAR Maynor (Italy/Guatemala)

BALSELLS Jorge (Guatemala)

BERNARDINI Federico (Italy) - *Online*

CASTAÑO USUGA Fabián (Colombia)

CICUTTIN Andres (Italy) - *Online*

GARCIA ORDOÑEZ Luis (Italy/Guatemala)

MOLINA Romina (Italy/Argentina)

MORALES ARGUETA Ivan (Austria/Guatemala) - *Online*

PEREZ Héctor (Guatemala)

RUVALCABA SIL José Luis (México)

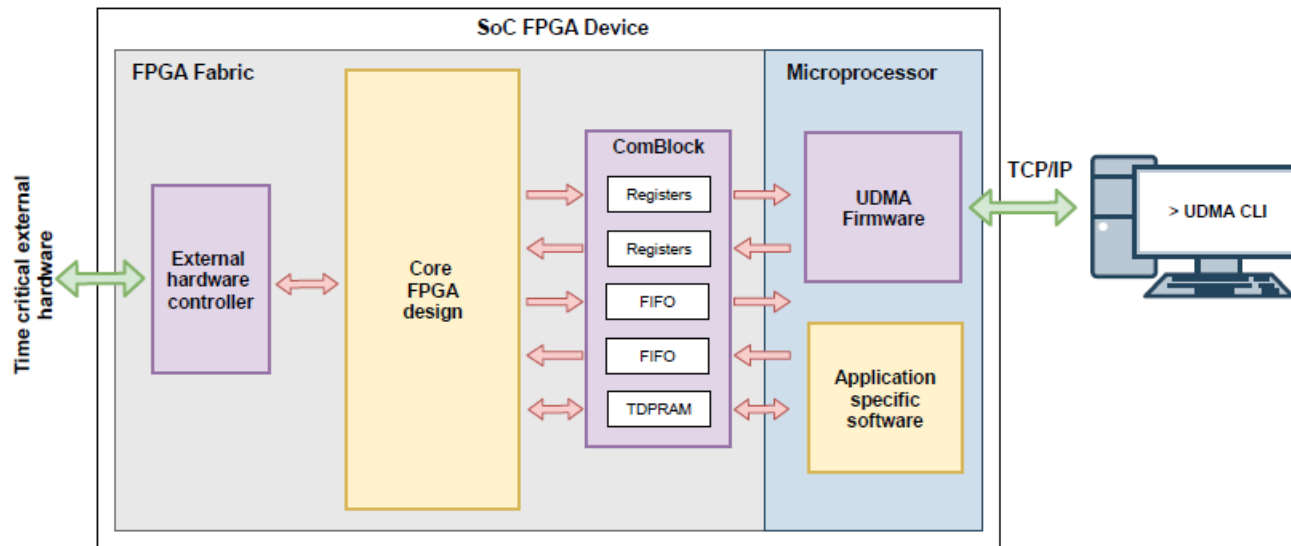
SISTERNA Cristian (Argentina)

Main Topics

- X-ray Analytical Methods: Fluorescence (XRF), Diffraction (XRD), Micro-computed Tomography (μ CT) for Cultural Heritage
- FPGA-based Systems-on-Chip (SoC-FPGA): Architecture and Design Methodology
- Reconfigurable Virtual Instrumentation
- Digital Pulse Processing for X-ray Photon Detection and Energy Measurement
- FPGA Acceleration for Machine Learning Algorithms
- Applications on Cultural Heritage, Nuclear Instrumentation, High-Energy Physics Experiments, and Heterogeneous Computing

Lab Activities

- Lab 1: **Getting Started with SoC-FPGA**
- Lab 2: **Reconfigurable Instrumentation**
- Lab 3: **SoC-FPGA Development Framework**
- Lab 4: **Digital Pulse Processing**
- Lab 5: **Machine Learning**



Lab Activities

- Virtual Machines (VM)
- Vivado IDE 2022.2 (Xilinx)
- ZedBoard: Xilinx Zynq-7000 All-Programmable SoC
- GitLab (guides for lab activities)
<https://gitlab.com/ictp-mlab/smr-4078/-/wikis/home>
- Lab Tutors will assist you during the lab activities

Recommendations:

- 1) Be on time
- 2) Attend all the lectures + labs to receive the Diploma
- 3) Feel free to ask questions!

WHAT ABOUT YOU?

NAME

COUNTRY

UNIVERSITY / INSTITUTE

AREA OF RESEARCH

INTEREST IN THE SCHOOL