



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



IAEA
International Atomic Energy Agency

WELCOME to the

Joint ICTP-IAEA School on FPGA-based SoC and its Applications to Nuclear and Scientific Instrumentation

14 November – 02 December, 2022

ICTP Organizers

Maria Liz CRESPO

Andres CICUTTIN

IAEA Organizers

Kalliopi KANAKI

Mladen BOGOBAC

SCHOOL PROGRAMME

- The School will be held in the Kastler Lecture Hall (lectures) and Infolab (lab sessions) at the Adriatico Guest House (AGH)
- **School website:** <https://indico.ictp.it/event/9933/overview>
- Detailed schedule can be consulted at the school website:
<https://indico.ictp.it/event/9933/other-view?view=ictp timetable>
- **AGH Bar and Cafeteria:**
Bar: Monday to Friday 7.45 - 11.00, Saturday and Sunday 8.00 - 9.00
Cafeteria: Lunch: Monday to Saturday 12.00 - 14.00
Dinner: Monday to Friday 19.00 - 20.00, Sunday 19.00 - 20.00
- School's email (secretariat): smr3765@ictp.it



SCHOOL PROGRAMME

- Typical daily timetable (9:00 – 18:00):

Timetable	
9:00 - 10:00	lectures
10:00 - 10:30	coffee-break
10:30 - 12:30	lectures
12:30 - 14:00	lunch
14:00 - 16:00	lectures / lab activities
16:00 - 16:30	coffee-break
16:30 - 18:00	lab activities

- Wednesday, 16 November 2022, 19:00: *Welcome Reception (AGH)*



PARTICIPANTS

- Requests for participation: 167 applicants from 41 different countries
- **Selected**: 33 participants from 25 different countries

Albania

Algeria

Argentina

Bangladesh

Benin

Brazil

Cameroon

Colombia

Ecuador

Ghana

Guatemala

India

Indonesia

Iran

Jordan

Luxembourg

Malaysia

Mexico

Nigeria

Pakistan

Sri Lanka

Syria

Tanzania

Togo

Ukraine

FACULTY

Lecturers

BAZARGAN SABET Pirouz (France)

- Digital Logic Design and Digital Arithmetic

SISTERNA Cristian (Argentina)

- FPGA and System on Chip (SoC) Technology

RINCON CALLE Fernando (Spain)

- High Level Synthesis (HLS)

RONGEN Heinz (Germany)

- Real-time Operating System (FreeRTOS)

CICUTTIN Andres (Italy)

- Reconfigurable Virtual Instrumentation (RVI) based on SoC-FPGA

FACULTY

Lecturers:

VALCARENGHI Luca (Italy)

- Programmable Hardware Acceleration in Communication Networks

SUTTER Gustavo (Spain)

- New SoC platforms for AI and Algorithm Acceleration

DUPONT DE DINECHIN Florent (France)

- FPGAs computing just right thanks to application-specific arithmetic (FloPoCo)

MARIOTTI Mirko (Italy)

- BondMachine, a mouldable computer architecture

REAZ Mamun Bin Ibne (Malaysia)

- Academic Writing Strategy for Impacted Journal

FACULTY

Speakers:

MOLINA Romina (Argentina)

- FPGA for Accelerating Machine Learning Algorithms

PAOLINI Emilio (Italy)

- Quantization in Neural Networks: Advantages and Limitations

SILVA Agustin (Argentina)

- Reinforcement Learning and Quantum Computing

HAMID BIN ALI Sawal (Malaysia)

- Computer Vision on FPGA

MANNATUNGA Kasun (Sri Lanka)

- High Channel Count for Electrophysiology (HiCCE)



FACULTY

Speakers and Lab Tutors:

BALLINA ESCOBAR Maynor (Guatemala)

FLORIAN SAMAYOA Werner (Guatemala)

GARCIA ORDOÑEZ Luis (Guatemala)

JOVALEKIC Nikola (Netherlands)

MORALES ARGUETA Ivan (Guatemala)

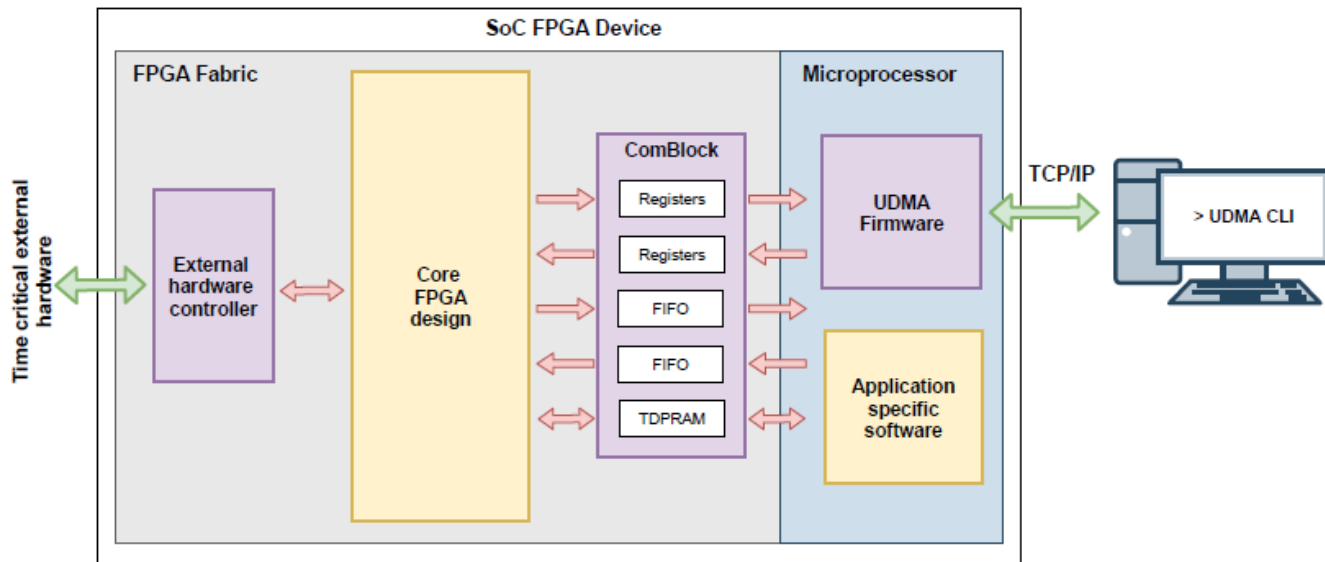
VALINOTI Bruno (Argentina)

Lab Activities

- Vivado IDE 2022.1
- ZedBoard: Xilinx Zynq-7000 All-Programmable SoC
- GitLab link (guides for lab activities):

<https://gitlab.com/ictp-mlab/smr3765/-/wikis/home>

- SoC-FPGA Development Framework:



Project Activities

- Data Acquisition and Processing Systems for Radiation Detectors
- Advanced Digital Pulse Processing Methods on FPGA



Photon Detection and Energy Measurement (SoC-FPGA)

M.L. Crespo, A. Cicuttin, L. Garcia,
B. Valinoti, W. Florian

Ionization Radiation Measurement (FPGA-uC)

K. Kanaki, M. Bogovac, N. Jovalekic,
I. Morales

Recommendations:

- 1) Be on time
- 2) Attend at least 90% of 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