



The Abdus Salam

**International Centre
for Theoretical Physics**

Advanced School on Programmable System-on-Chip for Scientific Instrumentation

20 Nov 2017 - 01 Dec 2017

ICTP

**Venue: Giambiagi Lecture Hall (AGH)
Informatics Laboratory (AGH)**

**School Organizers: Andres Cicutin (ICTP)
Maria Liz Crespo (ICTP)**



Typical Daily Program

Timetable	
9:00 - 10:30	lecture
10:30 - 11:00	coffee-break
11:00 - 12:30	lecture
12:30 - 14:00	lunch
14:00 - 16:00	lecture/hands-on
16:00 - 16:30	coffee-break
16:30 - 18:00	hands-on



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Faculty

Lecturers:

Sisterna Cristian, Argentina

Bazargan Sabet Pirouz, France

Abdallah Nizar, USA

Santambrogio Marco, Italy

Dondo Gazzano Julio, Spain

Rincon Calle Fernando, Spain

Lab Tutors:

Mannatunga Kasun, Sri Lanka

Baly Amador Marie, Cuba

De La Torre Las Heras José Antonio, Spain

Garcia Ordonez Luis, Guatemala



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First week:

- Selected topics in Digital and Arithmetic Design for FPGA

Bazargan Sabet Pirouz

- FPGA and SoC Technology

- Design Verification and Timing Concepts

- SoC Design Trends

Abdallah Nizar

- Reconfigurable Computing based on FPGA

Santambrogio Marco



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Lessons and hands-on activities:

- Fully Programmable SoC Technology: Hardware and Software

Sisterna Cristian

- Lab activities:

- Vivado IDE 2016.4

- Zynq-7 family SoC

- ZedBoad development kit

- PyQt for Graphical User Interface (GUI) Development

De La Torre José Antonio



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Second week:

Hands-on activities:

- from an external hardware connected to the ZedBoard to a GUI on the PC**
- High Level Synthesis**
- Embedded Real Time Operating System (FreeRTOS)**
- FreeRTOS and TCP/IP communication: The LwIP library**
- Dynamic Reconfiguration of FPGAs**

Dondo Gazzano Julio

Rincon Calle Fernando



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Second week:

Advanced hands-on activities

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

Cicuttin Andres

- **Demo: RVI communication block**

Mannatunga Kasun

- FMC ADC board (ADC 8-bits 500 MS/s) for
 - high speed data acquisition
 - high time resolution measurements

