Mauro Focardi

Curriculum Vitae

Education

- **Ph.D. in Electronics Engineering** - *"Devices and Electronics Circuits"* carried out at the Dept. of Electronics and Telecommunication of the University of Florence - ITALY. Ph.D. Dissertation Thesis title: *"Study of the analog and digital electronics chain for video signal processing aimed at the development of an ASIC-based CCD camera"*; IT tr.: *"Studio dell'elettronica analogica e digitale di trattamento del segnale video per lo sviluppo di una camera CCD basata su circuito integrato"*.
- **Physics Degree** carried out at the Dept. of Astronomy and Space Science of the University of Florence - ITALY. Degree Thesis title: *"A hybrid CMOS detector assessment study for the Solar Orbiter Space Mission"; IT tr.: "Studio di fattibilita' di un rivelatore ibrido in tecnologia CMOS per la missione spaziale Solar Orbiter"*.
- **Technical Diploma** carried out at the ITG G. Vasari of Figline V.no (FI) - ITALY.

University and Research fellowships

- 2012-08/2016-08: **INAF-National Institute for Astrophysics** (Arcetri Astrophysical Observatory)
- 2012-03/2012-06: **INAF-National Institute for Astrophysics** (Arcetri Astrophysical Observatory)
- 2010-01/2012-02: **Dept. of Physics and Astronomy** - University of Florence
- 2008-2009: **CNR - INOA** (National Applied Optics Institute)
- 2007: **Dept. of Astronomy and Space Science** - University of Florence
- 2003-2006: **Dept. of Electronics and Telecommunication** - University of Florence

Research activities and training

- Technology and instrumentation for Astrophysics, CCD cameras, CMOS detectors and readout electronics. Front-end electronics for solid state detectors and data acquisition systems for telescopes and focal plane instrumentation
- On-board data handling electronics and communication systems for satellite scientific payloads
- EGSE (Electrical Ground Support Equipment), OGSE (Optical Ground Support Equipment)
- Diamond-based detectors and fast read-out electronics
- Solar Physics
- Exoplanets
- Polarimetry/Spectropolarimetry
- Control systems for solar concentrators

Space and sub-orbital projects experiences

- ESA/NASA **Solar Orbiter** Mission - METIS Coronagraph (METIS Processing and Power Unit - MPPU, front-end electronics and detectors, EGSE) - Co-Investigator
- ESA **PROBA3** Mission - ASPIICS Coronagraph, Shadow Position Sensor (SPS) subsystem
- ESA **PLATO 2.0** Mission - ICU (Instrument Control Unit) System Engineer
- ESA **EChO/ARIEL** Mission - ICU (Instrument Control Unit) and VNIR channel detector and front-end electronics
- ASI/NRL **Herschel/SCORE I/II** sub-orbital mission (CCD cameras, on-board electronics and communication system)
- ESA/Roscosmos **WSO/UV** - World Space Observatory satellite - FCU (Field Camera Unit) EGSE and calibrations
- ESA **EUSO** satellite - Extreme Universe Space Observatory (actual Riken/JAXA **JEM-EUSO** mission) - filter lenses for the MAPMT R8900 photomultipliers, electronics calibrations

International field experiences

- U.S. NAVAL RESEARCH LABORATORY, Washington DC - USA
- WHITE SANDS MISSILE RANGE, New Mexico - USA

Main skills

- Payloads on-board data processing electronics
- Rad-hard processors and FPGAs
- CCD cameras and detectors
- CMOS and hybrid detectors
- Diamond detectors
- Front-end electronics, readout electronics
- FPGA, CPLD, VHDL hardware description language
- Microcontrollers and C/C++ languages
- Memories (FIFOs, RAMs, PROMs) and converters (ADC, DAC)
- Mechanical design (AutoCAD)
- SpaceWire communication protocol for satellites
- Polarimetry/Spectropolarimetry
- Knowledge of HW and SW laboratory main equipments

Teaching experiences

- Lectures for the course of *Space Technologies* for Physics students of the University of Florence
- Mathematic and Physics courses for the primary school students

Astronomy and Science divulgation activities and outreaches

- OAA - Arcetry Astrophysical Observatory
- OPC - Chianti Polyfunctional Observatory

Past working experiences

- 12 years as Technician @ Enel Distribuzione S.p.a. - (Florence)