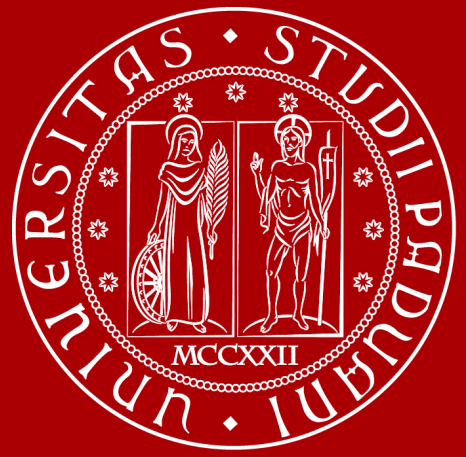

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TECH-FPA PhD Retreat 2025

17th – 21st February 2025

PhD student: Alessandra Zingaretti

Supervisor: Serena Mattiazzo

Background

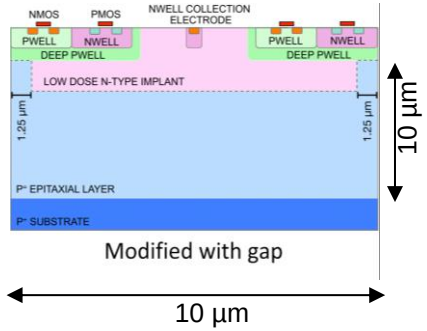
Master Thesis
test neutron irradiated silicon pixel sensors
designed for the **ITS3 upgrade**

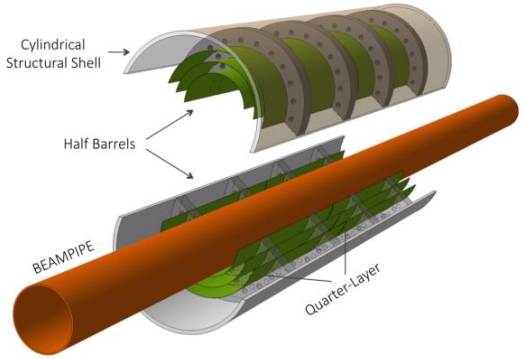
→ **Inner Tracking System upgrade:**
replace 3 innermost layers with curved wafer-scale monolithic active pixel sensors, or **MAPS** (sensor size: ≈ 28 x 9 cm^2)

→ **Analogue Pixel Test Structures (APTS)**

The **APTS** is the tool used to study the basic properties of the sensor

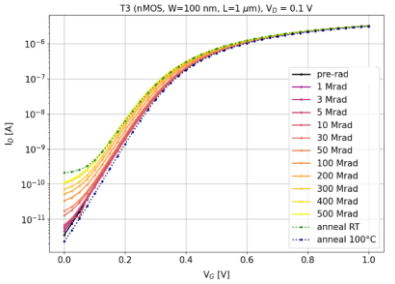
- Matrix: 4x4 active pixels, with analogue output
- Pixel pitches: **10**, **15** µm



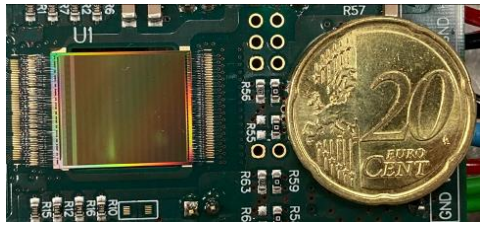


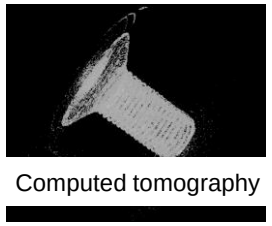
Post graduation activities:
IGNITE project and **ARCADIA** collaboration

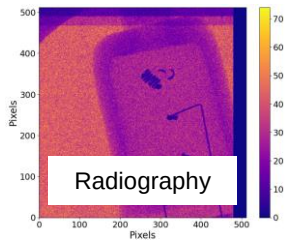
→ **IGNITE:** "Radiation hardness studies on CMOS technologies for vertex detectors in future collider experiments" → TID effects on NMOS-PMOS using X-ray machine



→ **ARCADIA:** characterization of **FD-MAPS** (Fully Depleted MAPS) 3 plane telescope at FNAL test beam facility, with 120 GeV protons




Computed tomography

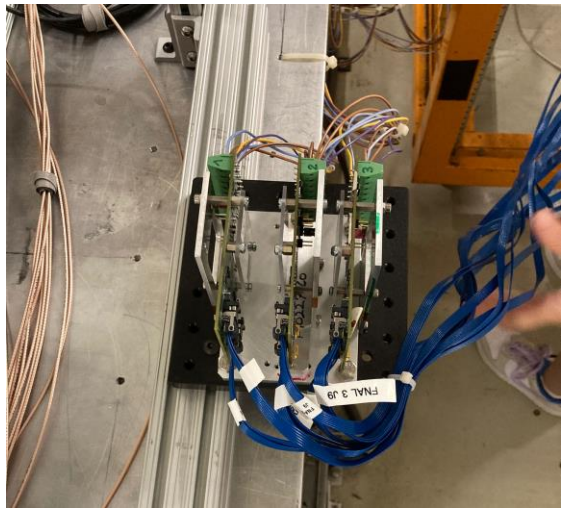


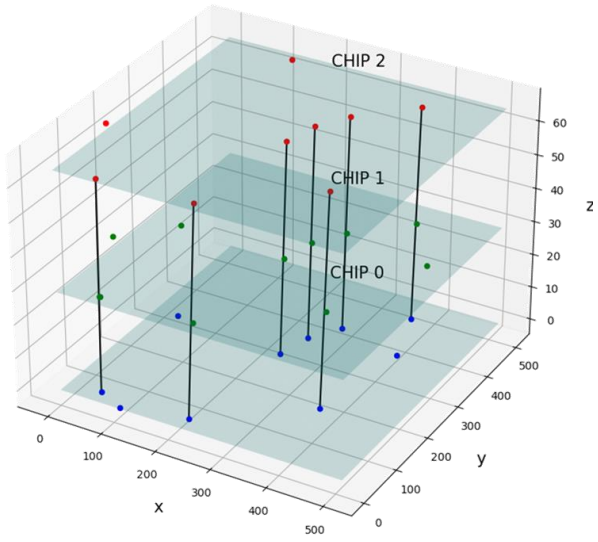
PhD project: “CMOS pixel sensor development for future colliders”

→ **CURRICULUM:** Detectors, Lasers and Optics

→ **ALICE:**
- testing **babyMOSS** (small pixel array designed for the ITS3 upgrade, it is a smaller version of the MOSS, *MOnolithic Stitched Sensor*)

→ **ARCADIA:**
- build a telescope setup with more tracking planes
- characterization of other chips with different thicknesses, …





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Thank you for your attention!

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