

SPOKE 5

Micro-Accelerator and DEtectors for Innovation and Sustainability

Salvo Tudisco



Finanziato
dall'Unione europea
NextGenerationEU

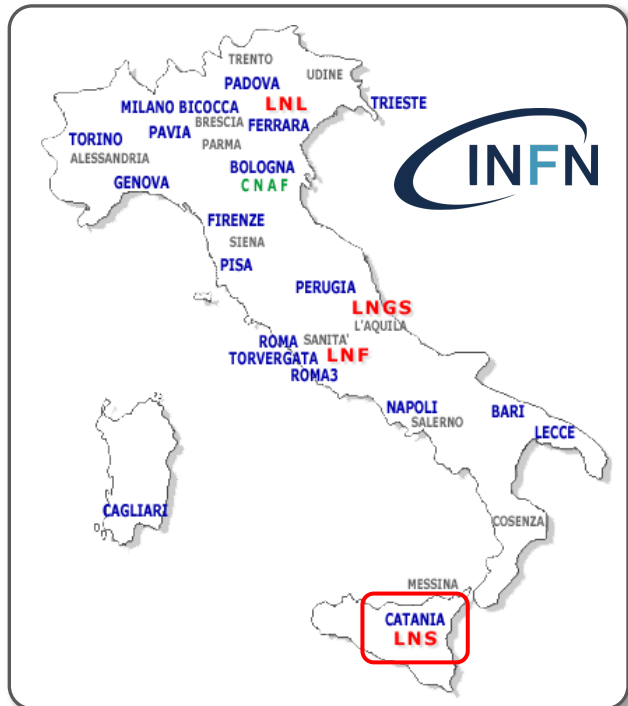


Ministero
dell'Università
e della Ricerca

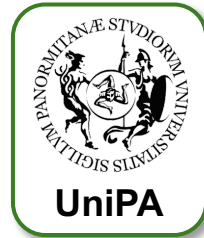


Italiadomani
PIANO NAZIONALE
DI RIPRESA E RESILIENZA

Spoke 5 organization



Partners



Transversal collaborations

SPOKE5

IMM-CNR STM LPE

Work package

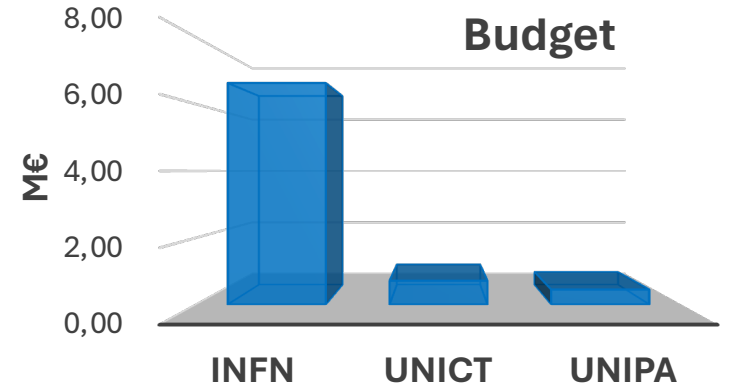
WP1. Micro accelerators for **Health** and Energy

WP2. Micro e Nano beams for **Health** and Energy

WP3. Photodetectors and digital ACQ for **Environment**, Agritech, Health

WP4. Detectors for particle therapy, **Health**

WP5. Diagnostics and technologies for Fusion Power, **Energy**



Work Package

Micro Accelerators

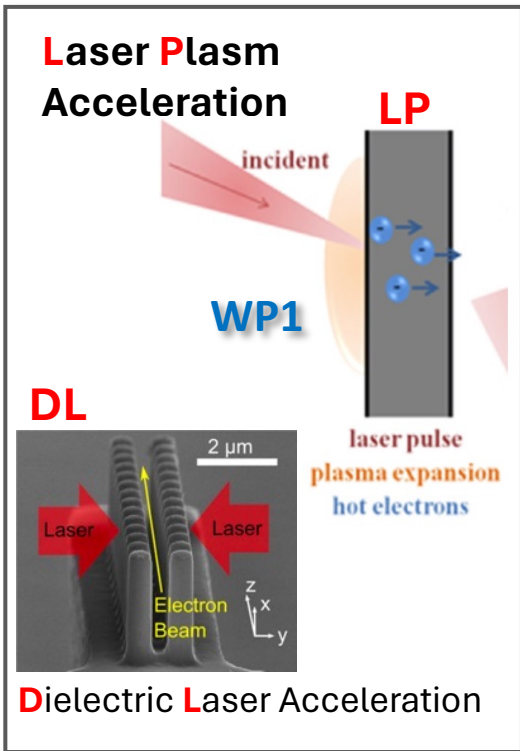
Micro/Nano Beam Lines

Photodetectors

Particle Detectors

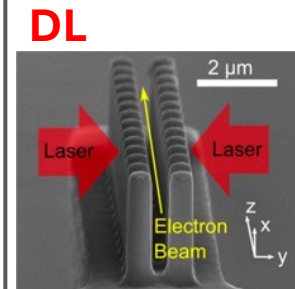
Diagnostics for Fusion

Laser Plasm Acceleration



WP1

DL

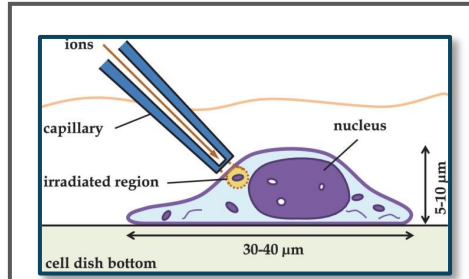


2 μm

Laser

Electron Beam

Dielectric Laser Acceleration



ions

capillary

irradiated region

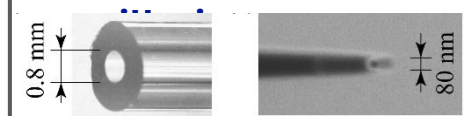
nucleus

5-10 μm

30-40 μm

cell dish bottom

Micro-Nano



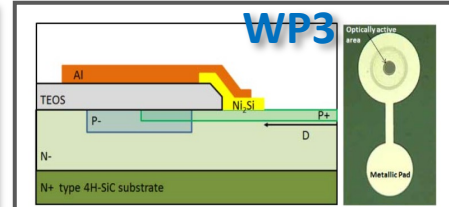
0.8 mm

80 nm

Micro and nanobeams, protons/light ions in the keV/MeV range

WP2

WP3



Al

TEOS

Ni₃Si

P+

D

N-

N+ type 4H-SiC substrate

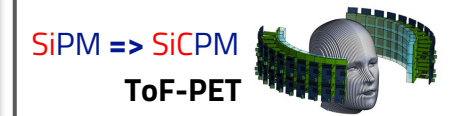
Optically active area

Metallic Pad

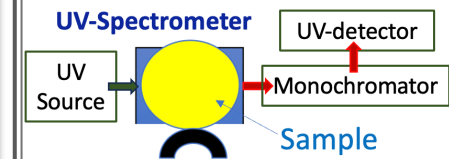
SiC-APD UV sensors

SiPM => SiCPM

ToF-PET



UV-Spectrometer



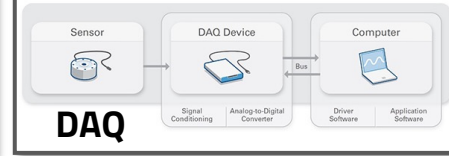
UV Source

Monochromator

Sample

UV-detector

DAQ



Sensor

DAQ Device

Computer

Signal Conditioning

Analog-to-Digital Converter

Bus

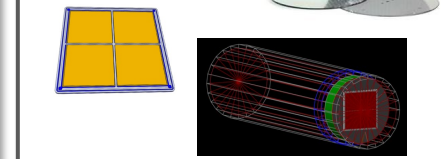
Driver Software

Application Software

WP4

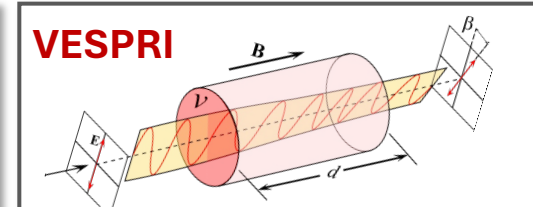
- ✓ Dosimeters
- ✓ Micro-dosimeters
- ✓ ...
- ✓ beam-monitors
- ✓ Imaging devices

SiC devices



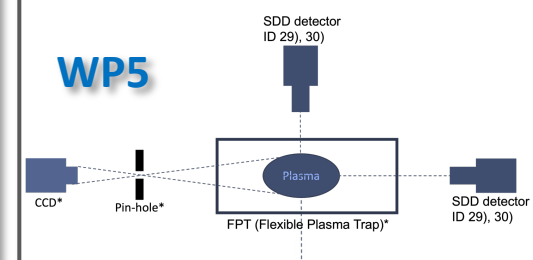

p-therapy

VESPRI



mm-wave polarimeter

WP5



SDD detector ID 29, 30

CCD*


Pin-hole*

Plasma

FPT (Flexible Plasma Trap)*

SDD detector ID 29, 30

PYN-HO



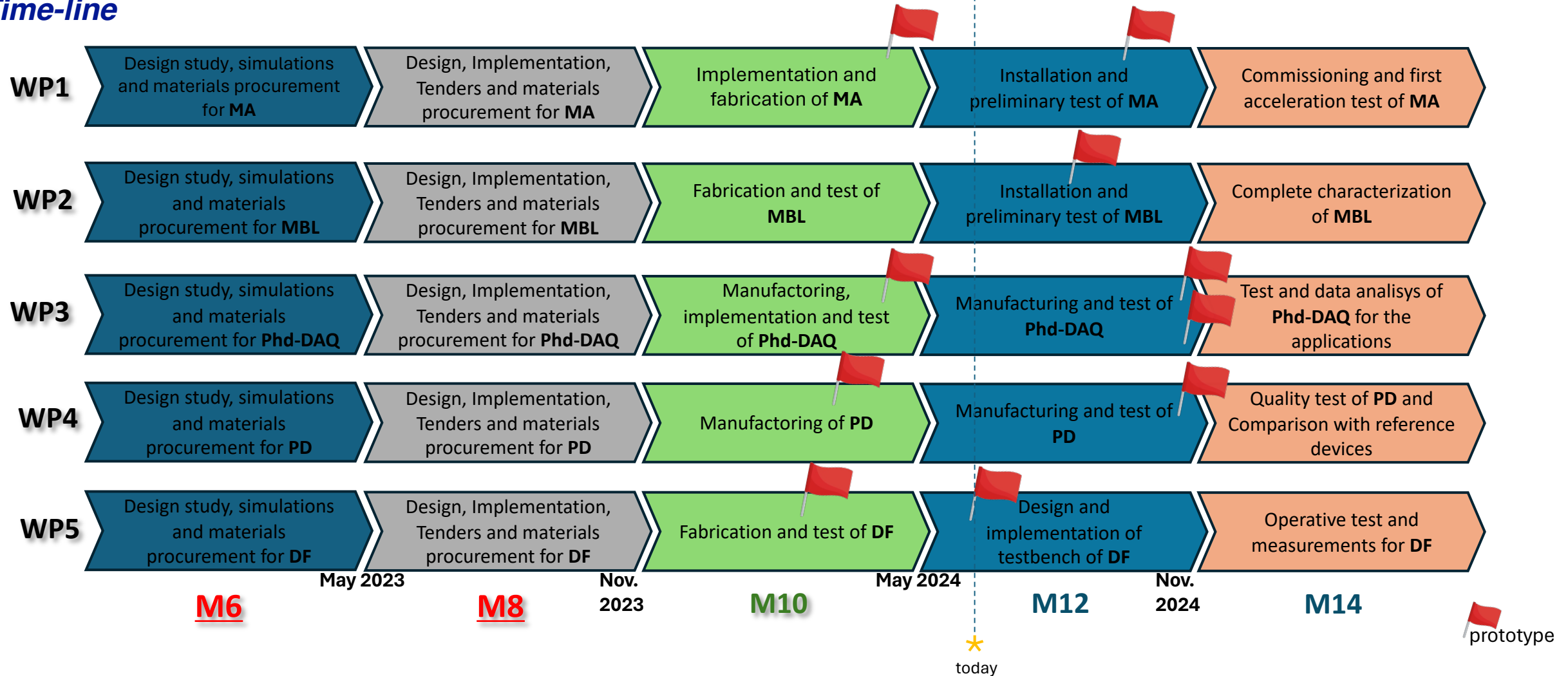
Grating*

SDD detector ID 29, 30

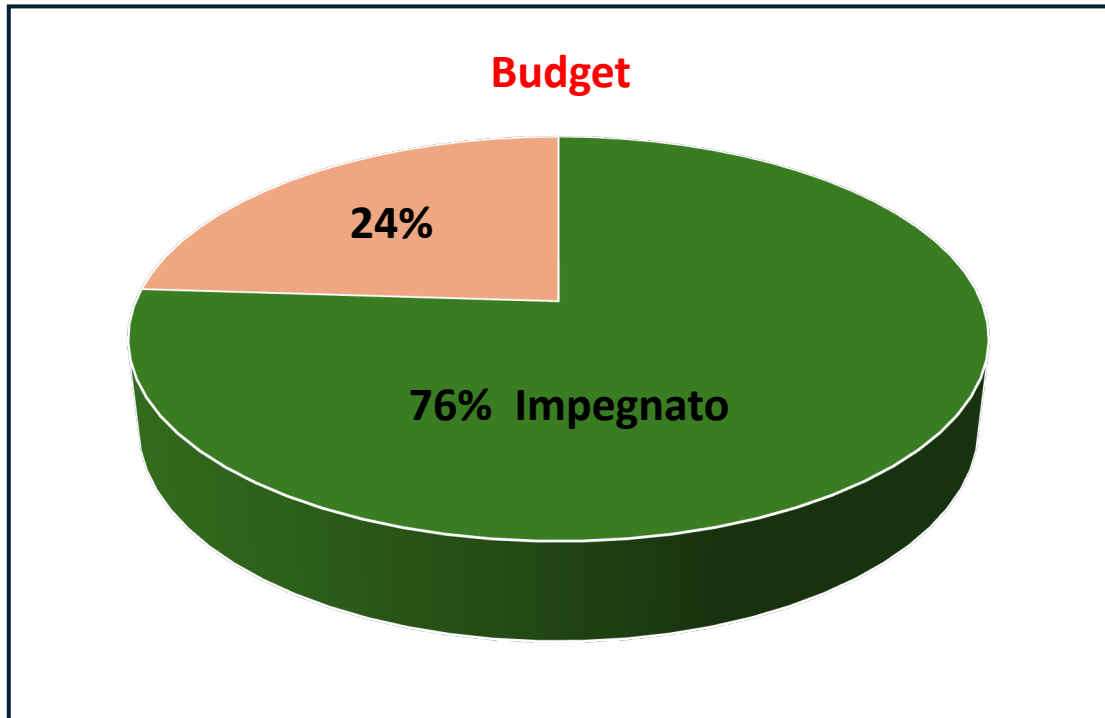
CCD*

X-ray Imaging and pin-hole Spectrometer

Time-line



Status Luglio 2024



CASCADE CALL

“Advanced solution for energy production and environmental pollution”;

topic 1: “Data acquisition, data processing and remote handling of innovative radiation sensors”;

topic 2: “Fast optical analysis for environment water-quality monitoring”.

Status: *under approval*