

Enrico Sangiorgi

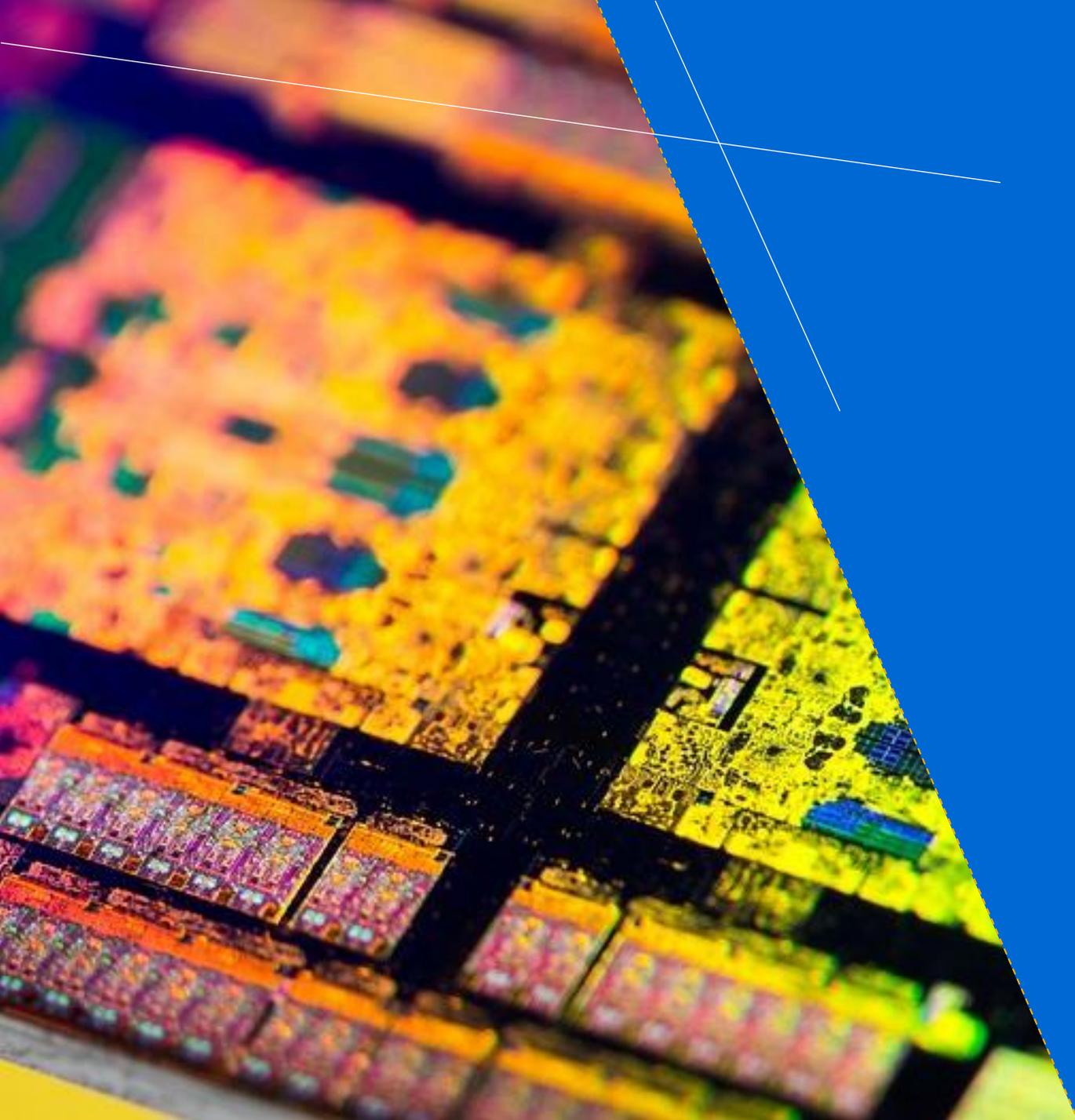
Member of the Supervisory Board

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Chips JU Information Day – Rome, April 1st, 2025

Chips-IT
FONDAZIONE





RESHAPING
THE ITALIAN
SEMICONDUCTOR
ECOSYSTEM

WHY CHIPS-IT?

- Italy was the only G7 country without a research institution vertically focused on semiconductors and microelectronics
- All major EU Member States own one or multiple infrastructure specialized in the field
- Given the level of national and EU commitment, a centralized structure to handle the EU Chips Act was needed



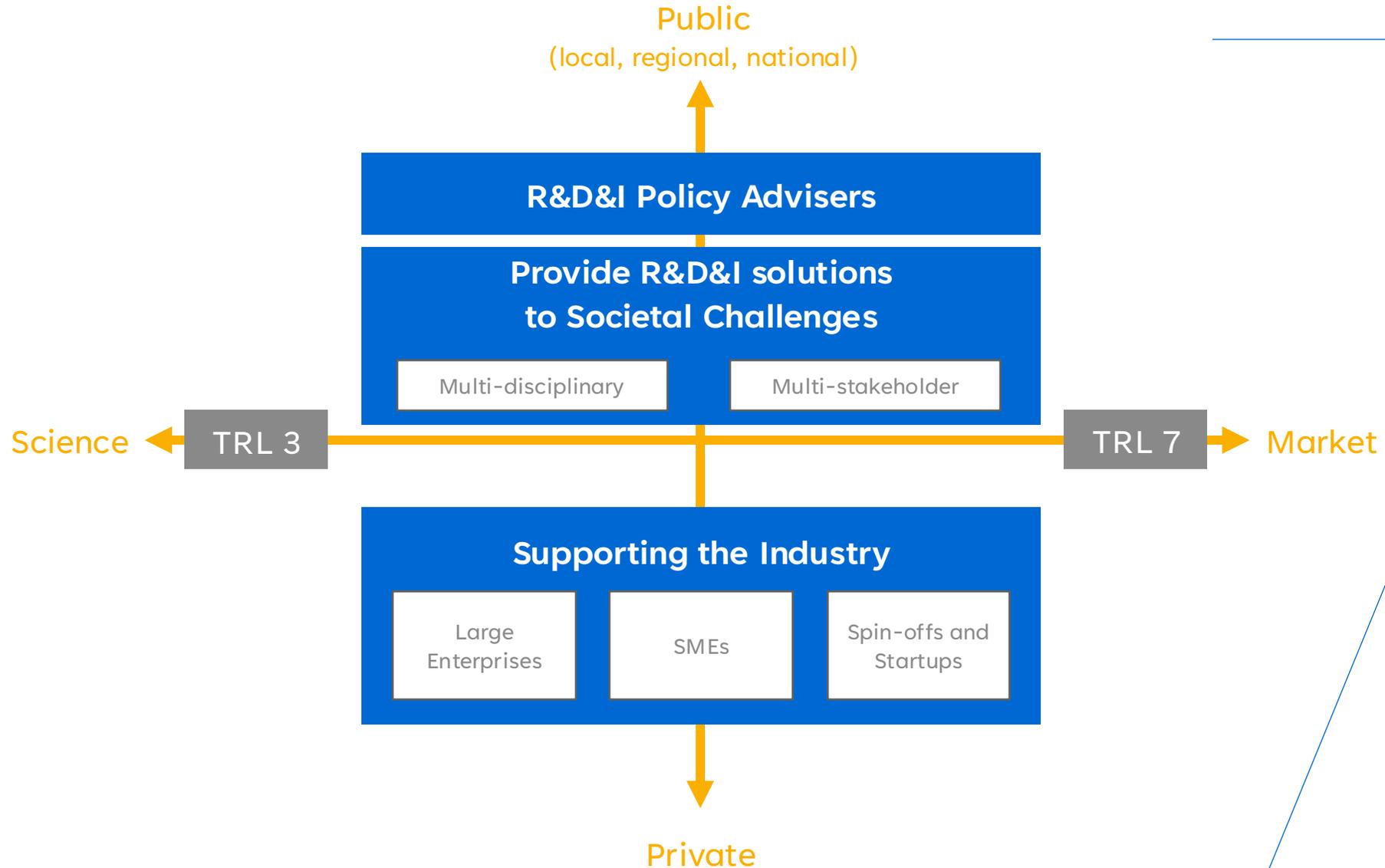
A NEW FOUNDATION

- Created by the Law n.197 – December 29th, 2022
- The foundation is named “Centro Italiano per il design dei circuiti integrati a semiconduttore”
- It might be referred to as “Fondazione Chips-IT”
- An overall € 225M budget for the period 2023-2030
- Based in Pavia (Lombardy) – 20km from Milan
- Ownership is shared by three ministries (MEF – Ministero dell’Economia e Finanze / MIMIT - Ministero dell’Industria e Made in Italy / MIUR – Ministero Università e Ricerca) and is supervised by MIMIT

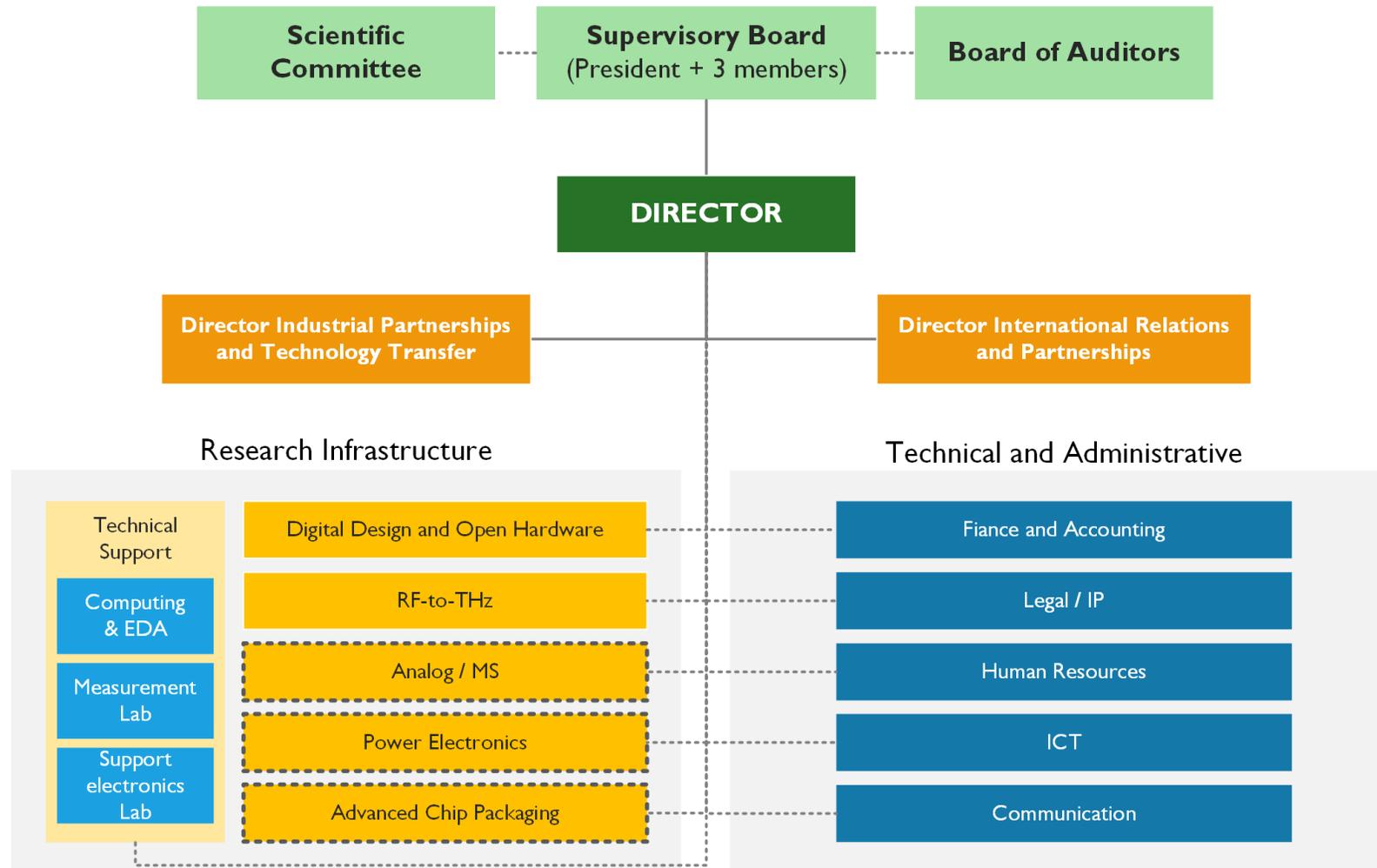
OUR STATUTORY MISSIONS

- 1 PROMOTE THE **DESIGN AND DEVELOPMENT OF INTEGRATED CIRCUITS** THROUGH ITS RESEARCH ACTIVITIES
- 2 STRENGTHEN THE **PROFESSIONAL TRAINING SYSTEM** IN THE FIELD OF MICROELECTRONICS
- 3 BUILD A NETWORK OF UNIVERSITIES, RESEARCH CENTERS AND ENTERPRISES TO FOSTER INNOVATION AND **TECHNOLOGY TRANSFER**
- 4 NETWORK WITH **NATIONAL AND INTERNATIONAL LABORATORIES AND GROUPS OF EXCELLENCE**
- 5 PARTICIPATE IN **EUROPEAN UNION INITIATIVES AND PROGRAMS**

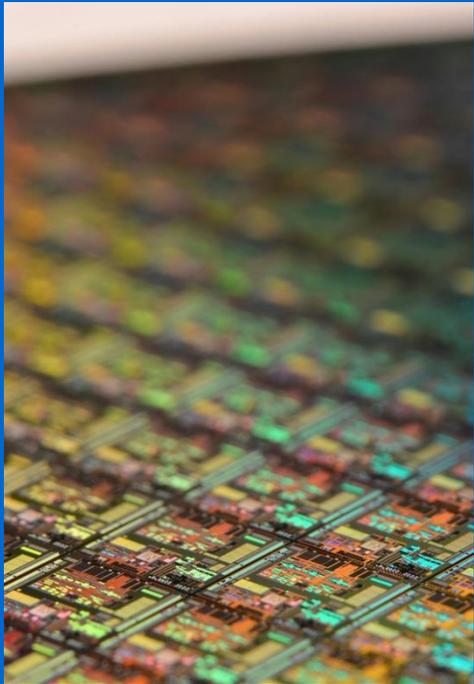
CHIPS-IT AS A VERTICALLY INTEGRATED RTO



ORGANIZATION CHART



RESEARCH LINES



DIGITAL DESIGN AND
OPEN HARDWARE



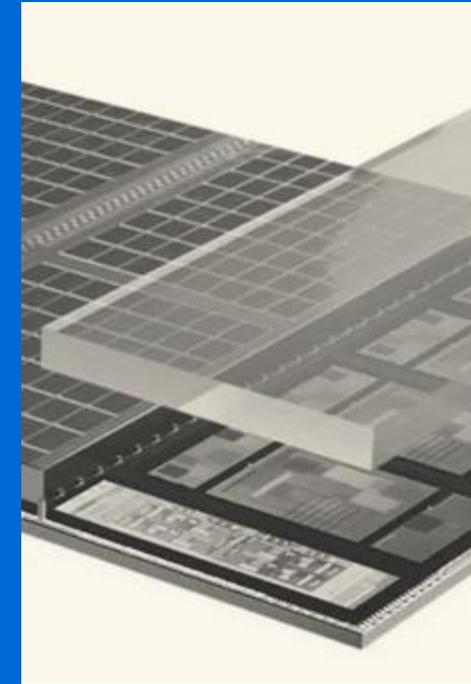
RF-to-THz



ANALOG &
MIXED SIGNAL



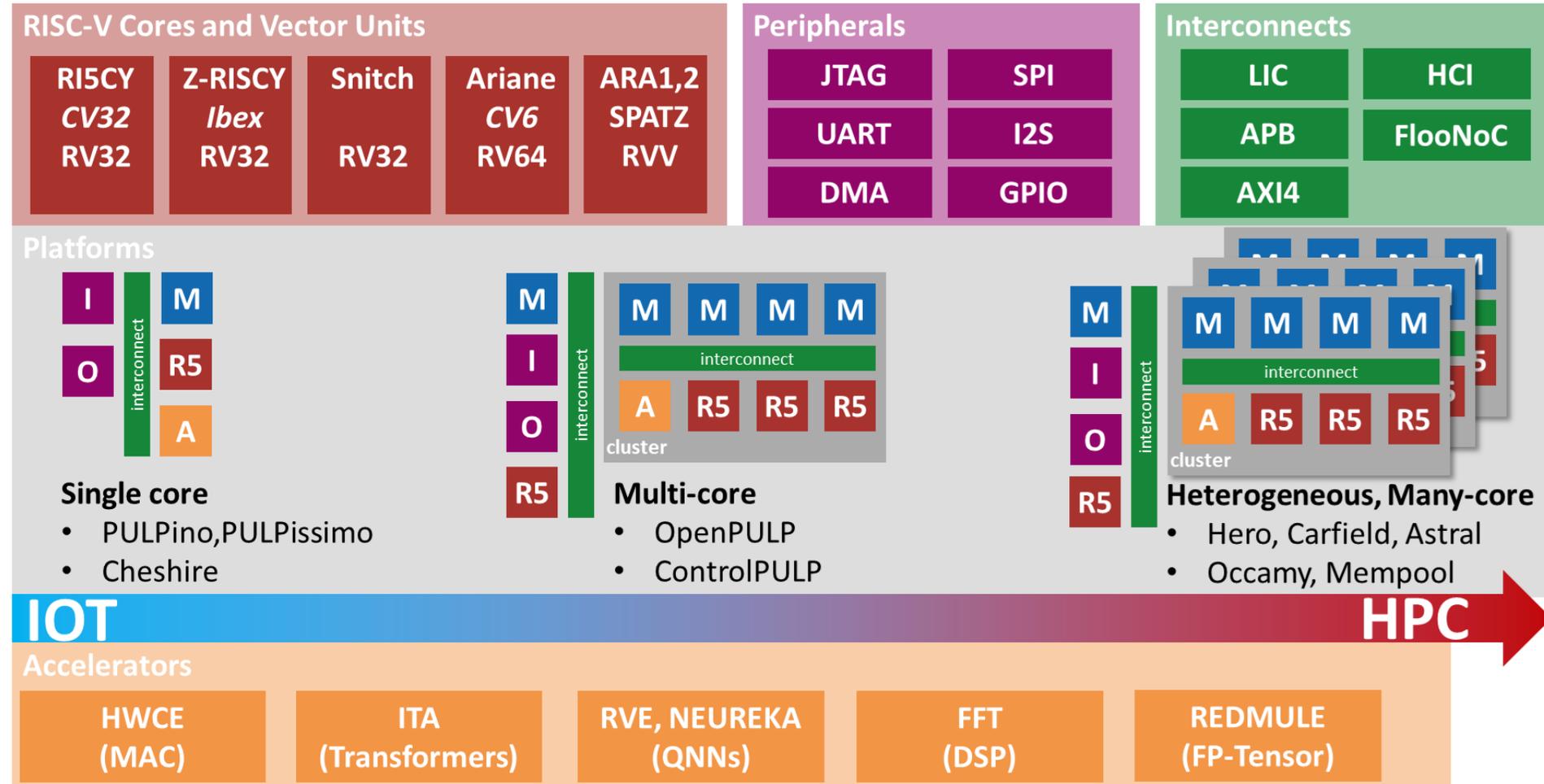
POWER
ELECTRONICS



ADVANCED IC
PACKAGING

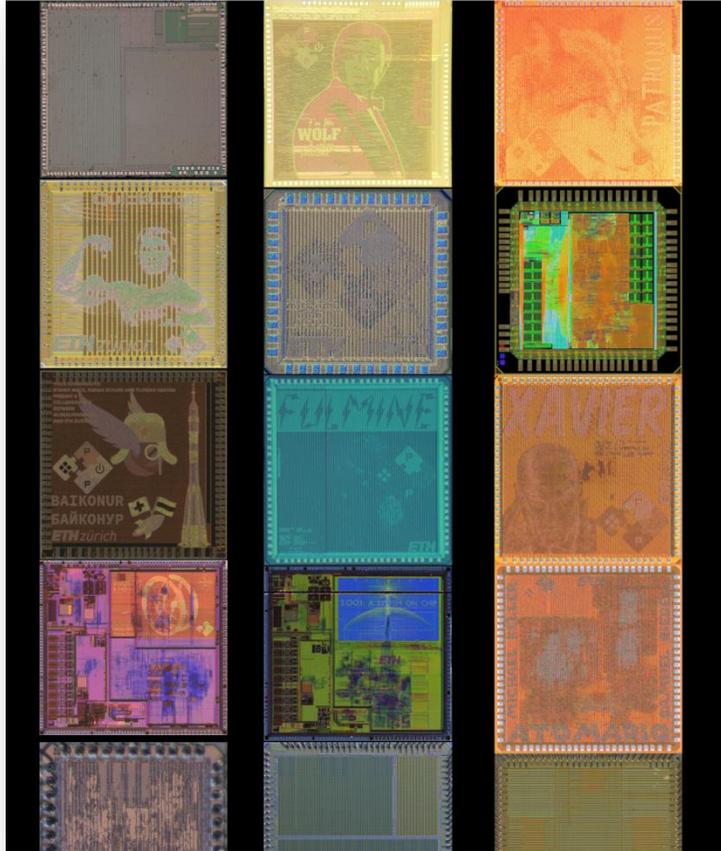
DIGITAL DESIGN AND OPEN HARDWARE

PULP: Pushing on energy efficiency of open-hardware based computing architectures



DIGITAL DESIGN AND OPEN HARDWARE

PULP: Pushing on energy efficiency of open-hardware based computing architectures



Aiming at being **independent from any commercial IP**, the PULP project, started from a collaboration between ETH Zurich and University of Bologna (L.Benini), and taped-out more than 30 SoCs in 10 years. IP cores and accelerators are based on the RISC-V ISA. The group is based in Bologna, infrastructure in Pavia including a state-of-the-art **2.88 Ggates IC emulator** available to the Chips-IT network.

IoT SoCs

- Near Sensor Processing
- Human Machine Interfaces
- Wearable Devices
- TinyML

High-End Heterogeneous and Reliable SoCs

- Automotive
- Embedded Machine Learning
- Space
- Autonomous Drone Navigation

High-Performance SoCs

- High-Performance Computing
- LLM Training and Inference
- Data analysis and ML
- Life science

DIGITAL DESIGN AND OPEN HARDWARE

PULP: Pushing on energy efficiency of open-hardware based computing architectures

Link to RISC-V EU Initiatives



EuroHPC
Joint Undertaking



RF-TO-THz RESEARCH LINE

Pushing silicon ICs to unlock the capabilities of mmWave and THz spectrum



Innovating in **highly-integrated MIMO and phased-array transceivers** [spectrum utilization, beamforming/tracking, energy efficiency for next-gen wireless communication and radar sensing]. Enabling Tbps interconnects with unprecedented efficiency through multi-level SerDes, coherent optics and photonics integration.

WIRELESS

- 6G and Beyond
- Vehicle-to-X
- SAT-COM
- Wifi-Evolution

WIREFINE AND OPTICAL

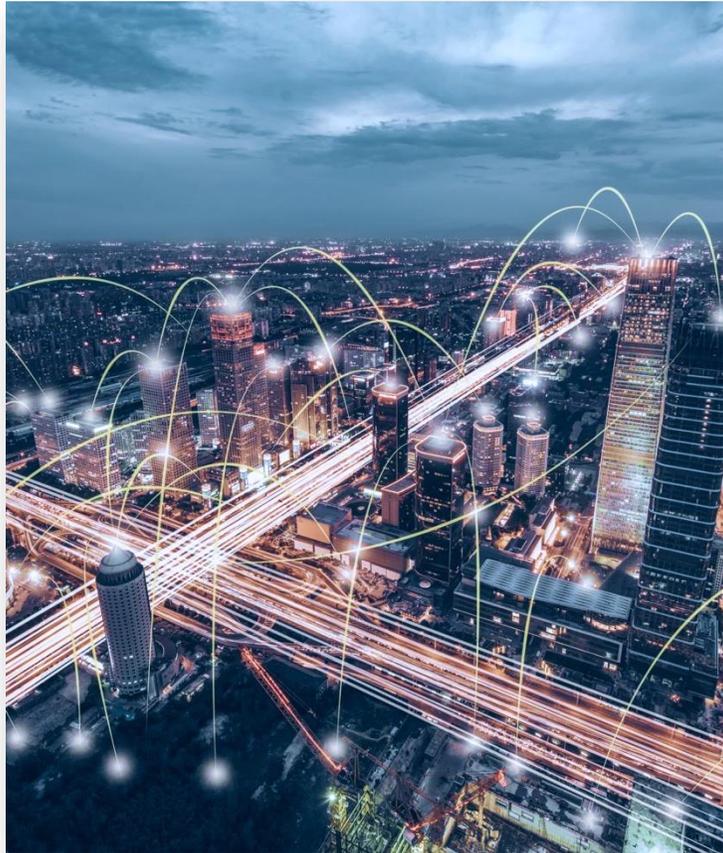
- Data Centers
- HPC
- AI Infrastructure
- Global Internet Connection

REMOTE SENSING

- Autonomous Vehicles
- HMI
- Healthcare Imaging
- Industrial and robotics
- Life sign monitoring
- Security and Defense

RF-TO-THz RESEARCH LINE

Pushing silicon ICs to unlock the capabilities of mmWave and THz spectrum



TECH EXPLORATION

- benchmarking of silicon and compound semiconductor technologies for mmWave & SubTHz ICs
- solutions for hybrid integration, including chip-package co-design, silicon photonics, and 3D integration.

VALIDATION OF KEY IP

- development of critical components addressing the demanding performance and efficiency of future applications:
- amplifiers and drivers
 - synthesizers
 - frequency up/dn-converters
 - equalizers

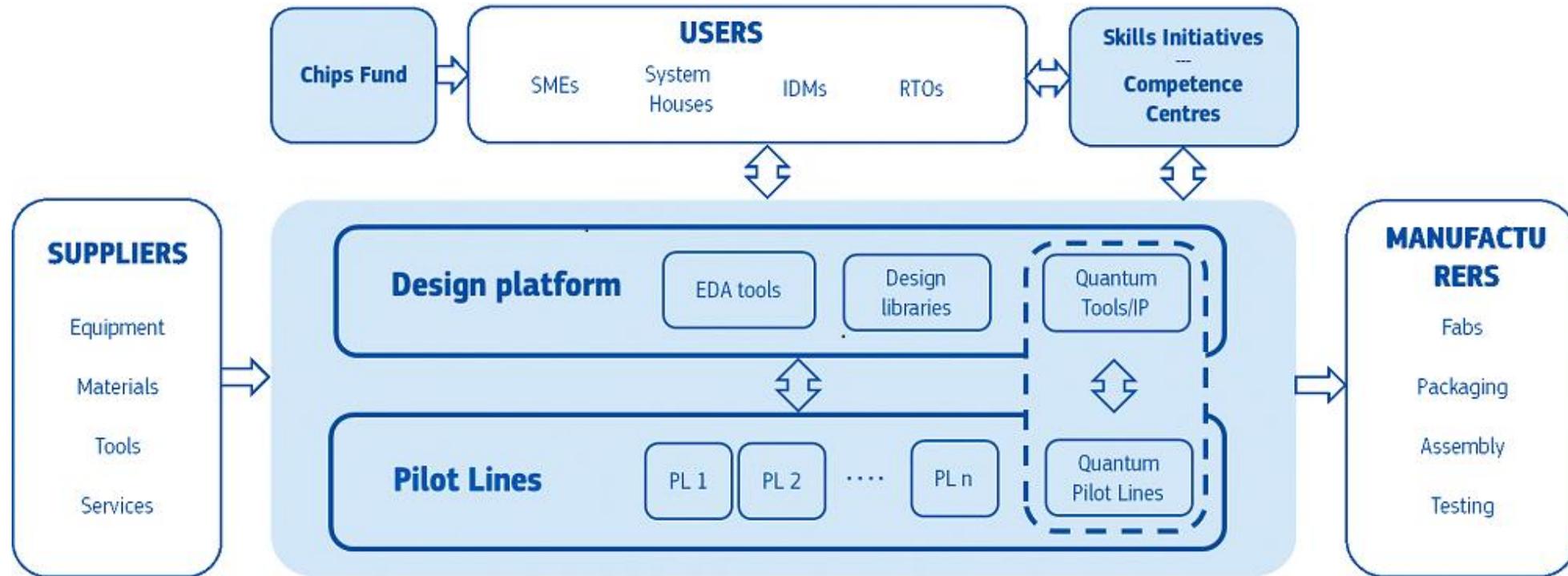
TRANSCEIVER DEMO

- Conception and design of transceivers to push the state-of-the-art
- digitally-intensive solutions
 - dense phased-array/MIMO architectures
 - ultra-wideband up to the sub-THz spectrum

TEST EQUIPMENT

Instrumentation for the assembly and characterization of fundamental components and transceivers, including performance evaluation of wireless and wireline links up to the sub-THz band.

THE “CHIPS FOR EUROPE” INITIATIVE



ACTIVE PROJECTS

In less than one year Chips-IT gained a relevant position in all the three main initiatives of the Chips -JU



WIDE BAND-GAP PILOT LINE [WBG Pilot Line]

Four Pilot Lines to provide SMEs and other industries access to advanced technologies

Large Italian consortium: Chips-IT / FBK / CNR / IU.NET

Chips-IT tasks: Creation of a SiC and GaN PDK / 2M€ in 4 years



CHIPS JU - DESIGN PLATFORM - "DECIDE" PROJECT

To provide European SMEs and Startups affordable access to IC design

Coordinator of the Training and Support activities

Participant in the Open-Hardware / RISC-V activities

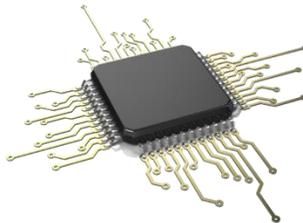
Available budget: 2.5M€ in 4 years

SEMICONDUCTOR COMPETENCE CENTER

Candidate to the role of national competence center for semiconductor industry.

National Gateway to Chips Act initiatives (e.g. Pilot Lines, Design Platform)

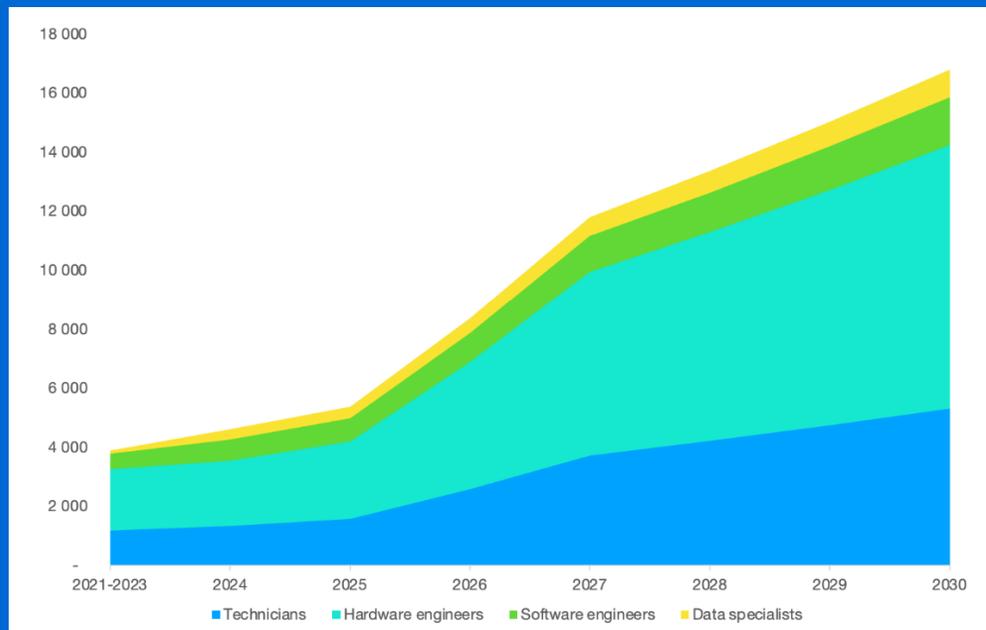
Estimated budget: 4M€ in 4 years



TACKLING THE SKILLS GAP

A top priority for the Italian and international semiconductor ecosystem

Annual Projected Semiconductor Workforce Gap

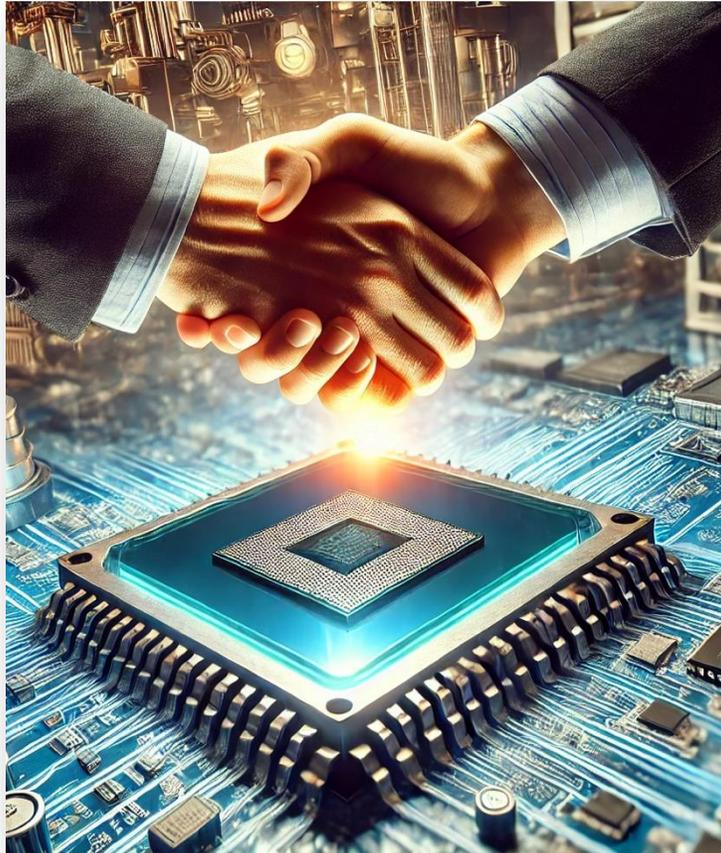


Source: DECISION Etudes & Conseil

- The semiconductor industry is facing a significant labour shortage, driven by a surge in job openings that outpaces the growth in graduates.
- Between 2017 and 2023, job openings in the semiconductor industry expanded at an average annual growth rate of 11 % supported by a robust employment growth
- Graduates in semiconductor-related fields of study remained relatively stable

APPROXIMATELY 3.830 JOBS REMAINING UNFILLED ON
AVERAGE OVER THE PERIOD 2021-2023

PROMOTING AN ACTIVE ECOSYSTEM PARTICIPATION



PARTICIPATING MEMBERS (“Membri Partecipanti”)

- Can undertake co-development activities with the Foundation
- Can propose the appointment of members of the Scientific Committee
- Can submit proposals for new projects within the scope of the Foundation
- Minimum 3 years commitment
- Economical or **in-kind** contribution for 0.5% of yearly ministerial budget [€ 100.000 for Y2025]

ADVOCATES (“Sostenitori”)

- Can actively participate to the Foundation activities
- Yearly contribution of € 50.000 either economical or in-kind



Chips-IT

FONDAZIONE