



SIPEARL

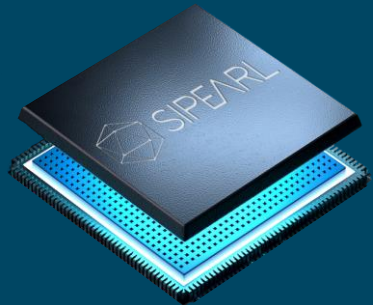
Company update, HPC User Forum

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06-07 Sept 2023

— SiPearl in a nutshell

Building the European energy-efficient HPC microprocessor



Incorporated in June 2019



Key personnel from
Atos MEDiatek ST MARVELL
NXP Infineon intel NOKIA




Funded by the European Union



Financing
Initial closing of the Series A: €90m

arm European Innovation Council Fund European Union Banque européenne d'investissement EVIDEN FRANCE 2030




ARM architecture
Energy-efficiency, quick time to market, proven ecosystem



Fabless
Manufactured by TSMC, WW leader for advanced manufacturing nodes

6 locations in Europe



+130 employees

Maisons-Laffitte HQ
Massy
Barcelona
Sophia Antipolis
Grenoble
Duisburg



Identified customers
Server manufacturers for targeted end users (governments, supercomputing centres, academics, industries, etc.)

SiPearl Origin

September 2018



EuroHPC
Joint Undertaking

Launch of the EuroHPC Joint Undertaking backed by a €8bn budget to deploy in Europe a world class exascale supercomputing infrastructure

December 2018



Launch of a call for proposals in 2017 for developing a new generation of high-end European microprocessors

- Budget: €150m
- Target: high-performance and energy-efficiency

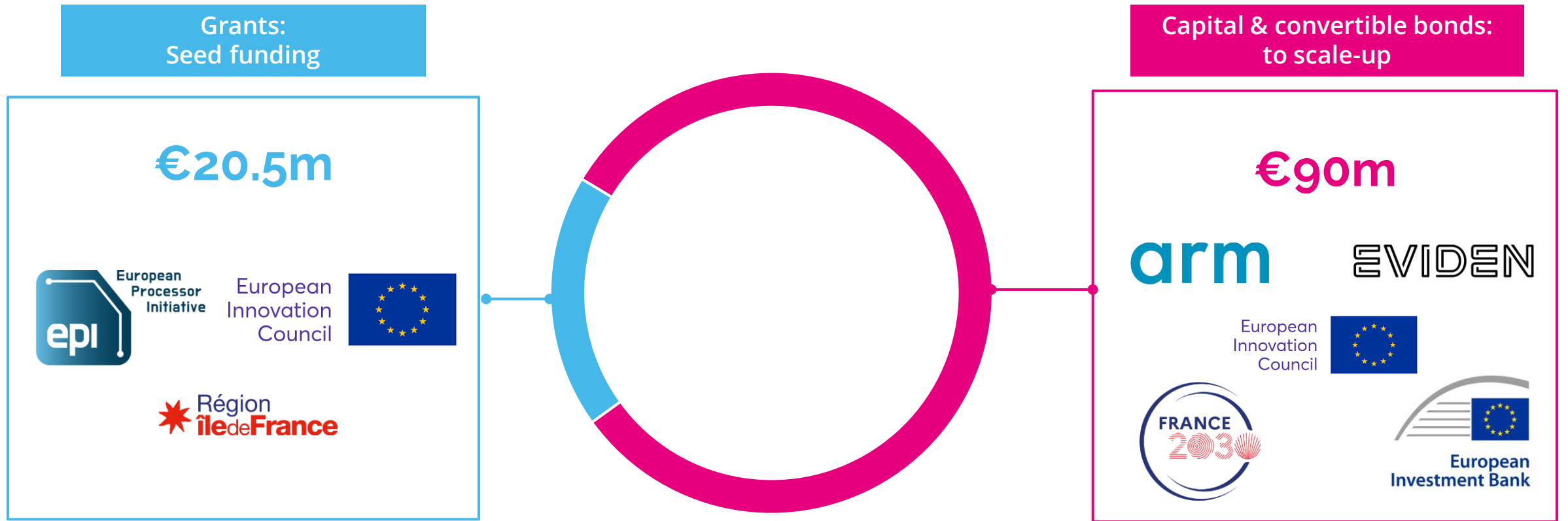
Coordinated by Bull (Atos Group), the European Processor Initiative (EPI) consortium won this call for proposals. It has currently 28 members:

- Scientists: research institutes, universities and supercomputing centres
- Industry: European leaders, IT, electronics and automotive specialists

June 2019

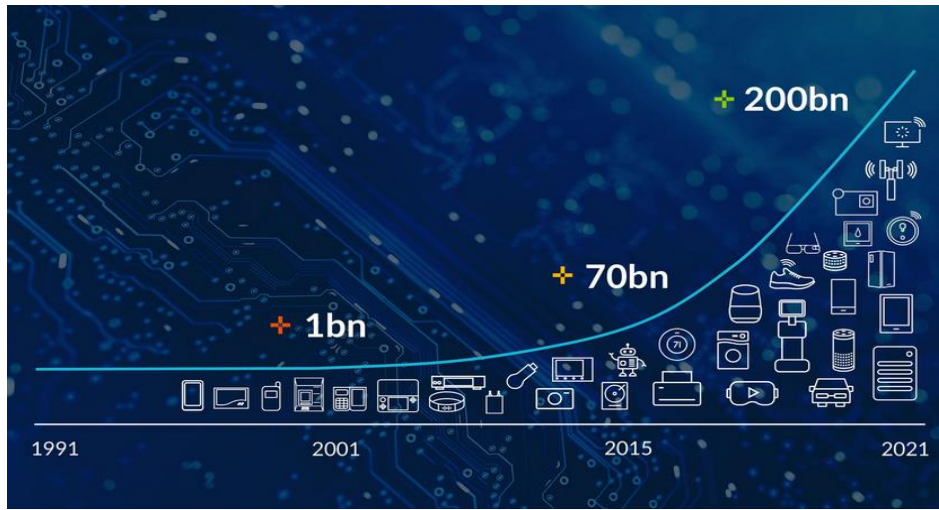
SiPearl is the private company created within the EPI to launch a strategic industry for Europe.

SiPearl's financing since its launch: €110.5m



Additional investors to join the round by end of 2023.

SiPearl Key Partnerships



arm

- Most widely used ISA on the planet, over 200bn Arm devices WW
- Low power high performance alternative to x86
- Arm design and modelling tools → time to market
- Arm toolchain and libraries
- Fully fleshed ecosystem is growing organically across HPC, Cloud; Edge, IOT, Automotive



- Consortium funded by EU Government to foster a Sovereign EU based Server Processor & Ecosystem
- 27 funded partners across HPC Labs, System Integrators and OEMs, HW and SW companies

SiPearl Corporate Vision and Strategy

HPC Supercomputing

SiPearl entry business: European HPC

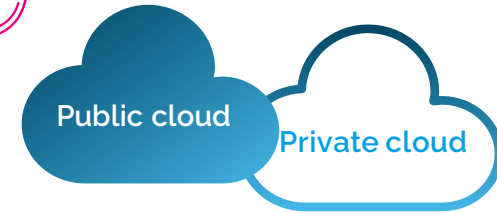


Data center-Central

Data centers, private and public cloud



DATA CENTER



Embedded Security channel



Data center-Edge

Smaller Data centers, including around 6G infrastructure



6G infrastructure

World leading industrial partnerships

Our ecosystem to accelerate Europe's adoption of exascale supercomputers

Leading manufacturers

EVIDEN

Europe No1



**Hewlett Packard
Enterprise**

Global leader

Developing joint solutions for HPC applications

Acceleration specialists

AMD

Instinct™ accelerators
with ROCm™ open software

GRAPHCORE

Intelligence Processing Unit (IPU), designed
to support artificial intelligence workloads

intel

GPU Ponte Vecchio
with the open unified software stack oneAPI

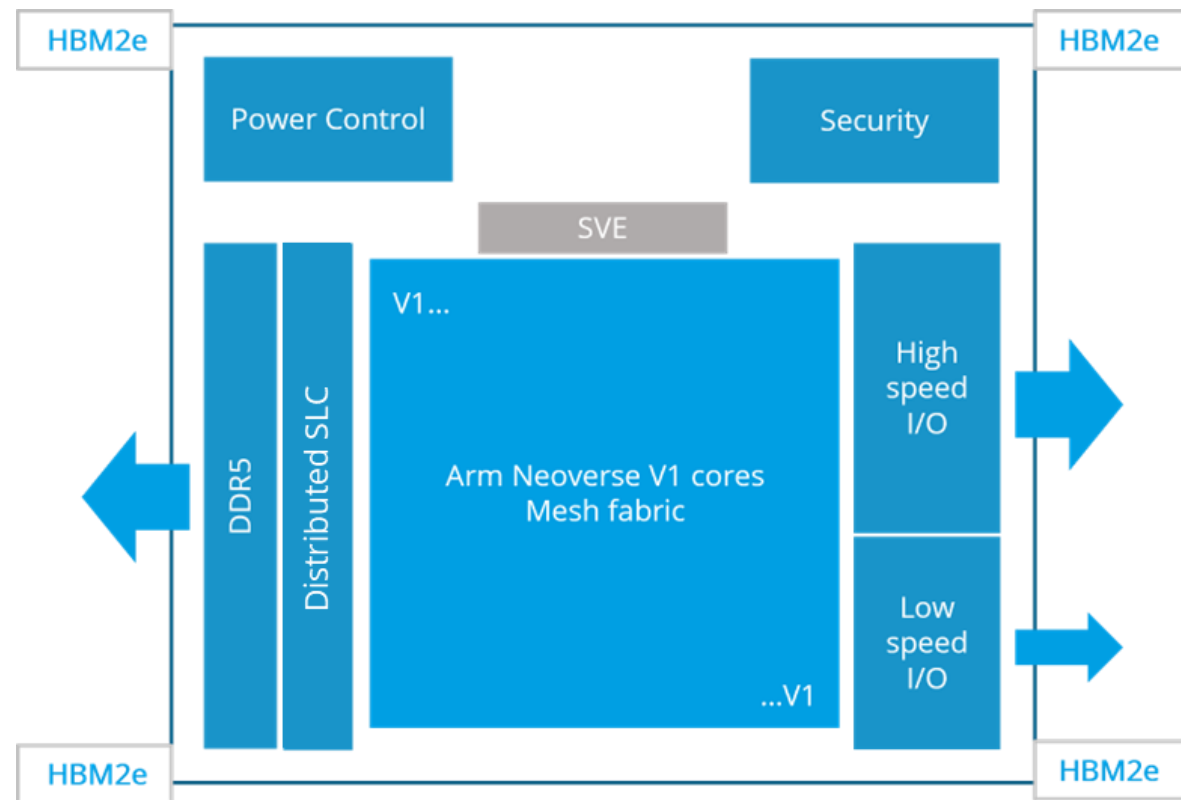

NVIDIA

Portfolio of world-leading accelerated
computing and networking solutions

Rhea, our 1st generation microprocessor

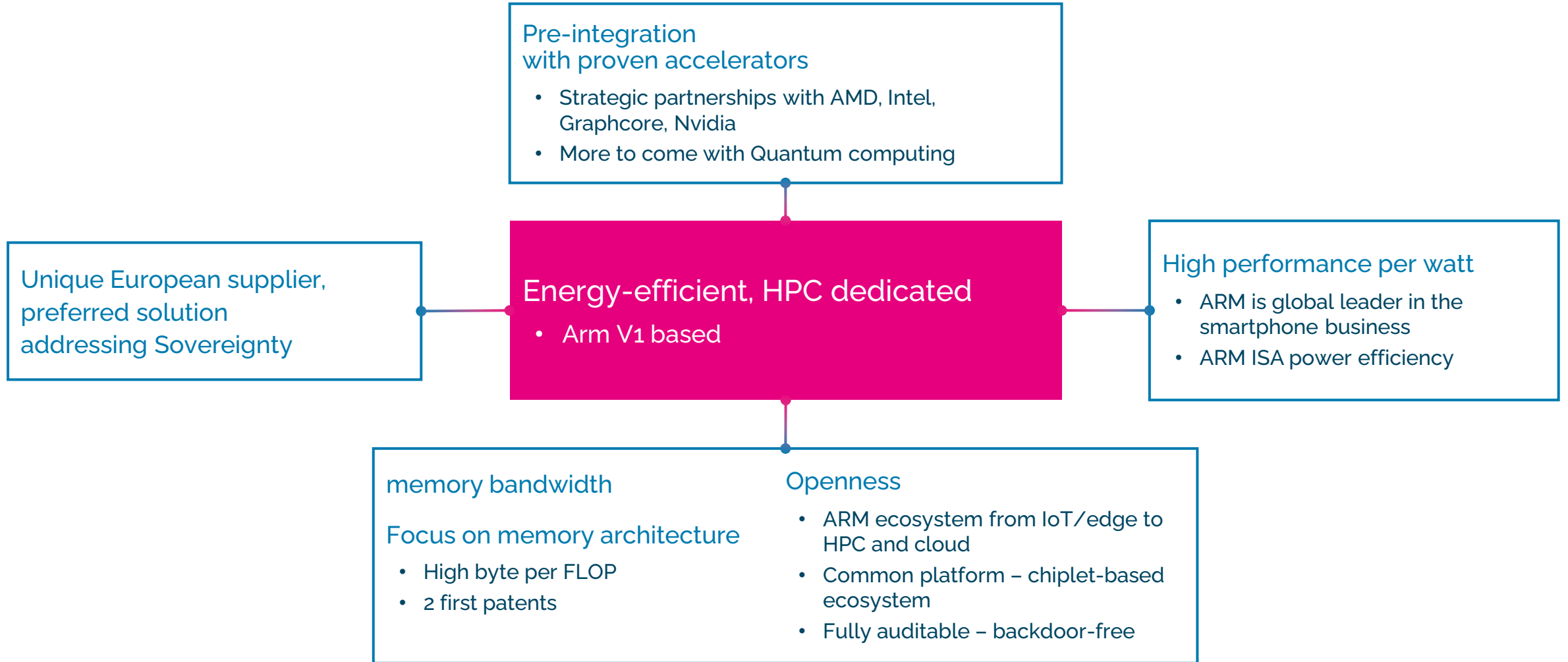
With its high-performance energy-efficient Arm Neoverse V1 architecture, Rhea will meet the needs of all supercomputing workloads.

Core	<ul style="list-style-type: none"> - Arm Architecture Neoverse V1 cores - SVE 256 per core supporting 64/32/BF16 and int8 - Arm Virtualization Extensions
SoC	<ul style="list-style-type: none"> - Arm Mesh fabric - Advanced RAS support including Arm RAS extensions <ul style="list-style-type: none"> - Link protection for NOC and high-speed IO - ECC support for selected memory
Cache	- RAS supported for all Cache levels
Memory	ECC for memory and link protection for controllers <ul style="list-style-type: none"> - HBM2e - DDR-5
High Speed I/O	PCIe or CCIX/CXL: root and endpoint support
Other I/O	USB, GPIO, SPI, I ² C...
Power Management	Power management block to optimize perf/watt across use cases and workloads.
Security Block Support	<ul style="list-style-type: none"> - Secure boot and secure upgrade - Crypto - True Random Number Generation



Rhea will deliver extraordinary compute performance and efficiency with a superior Byte/Flop ratio.

Rhea: differentiating factors



Rhea in a nutshell

The world's first energy-efficient HPC-dedicated microprocessor designed to work with any third-party accelerator: GPU, artificial intelligence, quantum



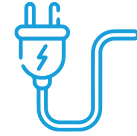
Sovereignty

To further Europe's technological leadership and independence.



High Performance

To surpass the performance of 2,000,000 laptop computers.



Energy-efficiency

To halve power consumption for equivalent computing power.



Flexibility

Designed to work with any third-party accelerator (GPU, artificial intelligence, quantum).



Backdoor-free security

To protect data with secure end-to-end network transmission.

— EU SW preparation and porting

COE FOR HPC APPLICATIONS

Advancing Lighthouse Applications addressing scientific grand challenge(s) where exascale performance is needed.

Project	Topic	Organisation
MAX	Material science SW prep for exascale class systems	CONSIGLIO NAZIONALE DELLE RICERCHE (IT)
EXCELLERAT	Engineering and Manufacturing SW prep for exascale class systems	UNIVERSITY OF STUTTGART (DE)
PLASMA-PEPSC	High-energy physics SW prep for exascale class systems	KTH (SE)

OPEN CLOUD

Advance SW and HW interfaces between the processing architectures and cloud applications focusing on industry standards and Open-source stacks.

Project	Topic	Organisation
RISER	OS SW port to EU Risc-V cloud server infrastructure	IDRYMA TECHNOLOGIAS KAI EREVNAS (GR)
OPENCUBE	develop a full-stack European Cloud computing blueprint deployed on European hardware infrastructure.	KTH (SE)
AERO	open-source software including OS, compilers, runtimes, system software and auxiliary software deployment services for cloud computing.	INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS (GR)

About... SiPearl

SiPearl is building the first energy-efficient HPC-dedicated microprocessor designed to work with any third-party accelerator (GPU, artificial intelligence, quantum). This new generation of microprocessors will first target EuroHPC Joint Undertaking ecosystem, which is deploying world-class supercomputing infrastructures in Europe for solving major challenges in medical research, artificial intelligence, security, energy management and climate while reducing its environmental footprint.

SiPearl is working in close collaboration with its 27 partners from the European Processor Initiative (EPI) consortium - leading names from the scientific community, supercomputing centres and industry - which are its stakeholders, future clients and end-users.

SiPearl employs 130 people in France (Maisons-Laffitte, Grenoble, Massy, Sophia Antipolis), Germany (Duisburg) and Spain (Barcelona).

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