SIPEARL

No European digital sovereignty without sovereign hardware

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Riser Workshop #3

December 9,2025

SiPearl, a startup funded by Europe & France

To provide sovereign high-performance energy-efficient processors for Europe's supercomputers, AI companies and data centres

Incorporated
In France in June 2019, deployed in Spain, Italy

Fabless IC design house
Manufacturing entrusted to TSMC with N6P

tsmc

200 employees
from AtoS MEDIATEK ST MARVELL
NXP Hewlett Packard Enterprise intel. NOKIA

Seed funded
By the European Union

Funded by
the European Union

Sovereign design
Data centre in France

317 servers / **55** networks
48 storage / **5** backup server

2 design wins
JUPITER & Alice Recoque, 2 European exascale supercomputers funded by EuroHPC and EU Member States

Financing
Series-A: €130m

arm 國泰創投 Cathay Venture European Innovation Council Fund
European Investment Bank EVIDEN FRANCE 2030

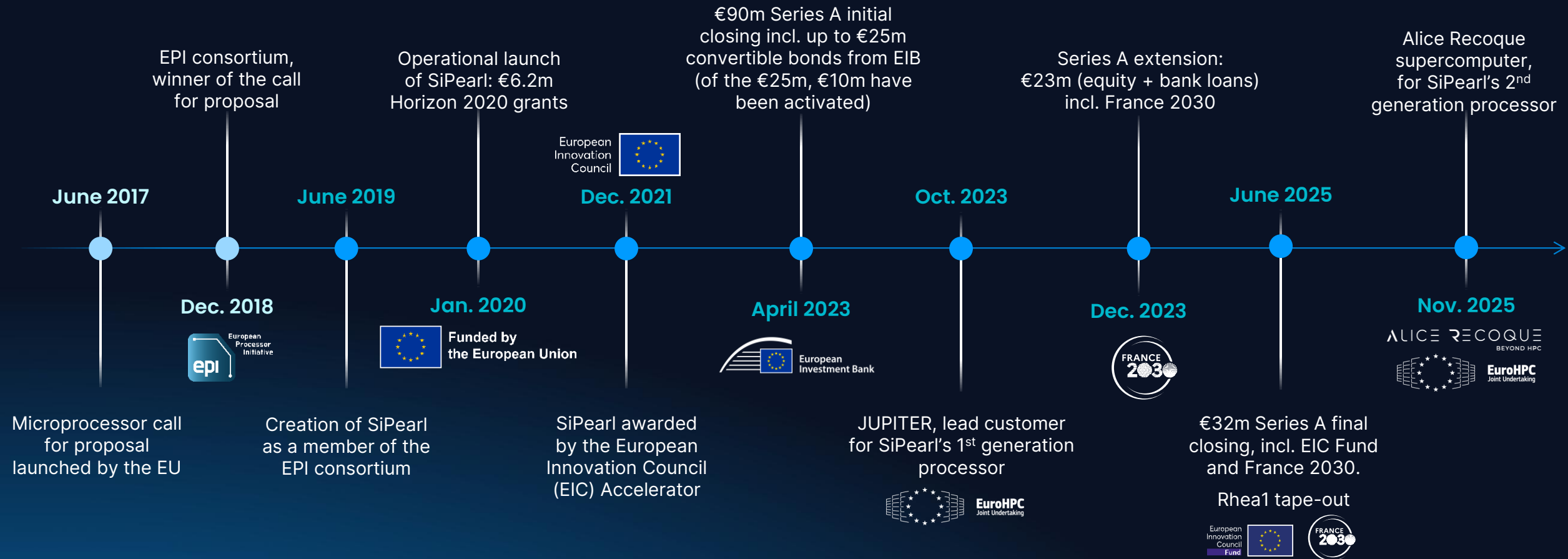**Technological partnership**
Intellectual property

arm

1st tape-out
June 2025

From a European Union concern to SiPearl's ramp-up

Our common goal: fostering the return of high-performance, energy-efficient processor technologies in Europe.

June 2017 — Microprocessor call for proposal launched by the EU

Dec. 2018 — EPI consortium, winner of the call for proposal

June 2019 — Creation of SiPearl as a member of the EPI consortium

Jan. 2020 — Operational launch of SiPearl: €6.2m Horizon 2020 grants
Funded by the European Union

Dec. 2021 — SiPearl awarded by the European Innovation Council (EIC) Accelerator

April 2023 — €90m Series A initial closing incl. up to €25m convertible bonds from EIB (of the €25m, €10m have been activated)
European Investment Bank

Oct. 2023 — JUPITER, lead customer for SiPearl's 1st generation processor
EuroHPC Joint Undertaking

Dec. 2023 — €32m Series A final closing, incl. EIC Fund and France 2030. Rhea1 tape-out
FRANCE 2030

June 2025 — Series A extension: €23m (equity + bank loans) incl. France 2030

Nov. 2025 — Alice Recoque supercomputer, for SiPearl's 2nd generation processor
ALICE RECOQUE BEYOND HPC / EuroHPC Joint Undertaking

SiPearl's role within the Riser project

Hardware Platform Prototyping (WP3)

→ Hardware and low-level software integration of the PCIe acceleration board in Arm-based servers

Firmware & System Software (WP4) and use cases (WP5)

→ Based on our server development experience, contribution to the development and validation of boot support on accelerator and microserver boards

→ Contribution to the development of host-side drivers for Arm-based servers to enable interaction with accelerator board compute resources

→ Contribution to the definition of the outcome of the three use cases as defined in WP5

Equipment

→ 2 Rhea1 servers (Seine servers) for the acceleration use case, when combined with Risc-V PCIe acceleration boards

For memo

SiPearl is leader on:

- T2.1: Requirements & use cases refinement
- T6.2: Dissemination & communication
- D2.1: Requirements & use cases deliverable
- D6.2 + D6.3: Initial + Final report on Dissemination & Communication deliverables

SIPEARL

No European digital sovereignty without sovereign hardware

Europe: Digital sovereignty has become a neccessity

Exponential growth in demand for computing power

AI

Health

Defence

Complex global geopolitical context

US AI chips export control tightened :
a push for homegrown hardware

→ Jan. 25, restrictions for 17 EU countries

→ Sept. 25, GAIN AI Act initiative

US rules on access to strategic European data:
Sovereign cloud and giga data centres initiatives

→ Eurostack Initiative

→ 1 GW data centres

Europe of defence
strategic independence is a must

→ Dramatical increase of EU defence spending targets: from 2% to 5% of GDP

→ Canada's deal strengthening European defence & security partnership

AI, a global fierce race that Europe can't afford to lose:
major public funding announcements

→ Invest AI (EU): €200bn / France: €109bn

→ EuroHPC JU AI factories program: AION Consortium

Hardware security:
Suspicions regarding kill switch & backdoor

Europe hosts 148 of the Global Top 500 supercomputers[1]

5 machines in the TOP10, *including 3 EuroHPC ones*

No4: JUPITER Booster - Germany
(1 exaflop) — EuroHPC Joint Undertaking

No6: HPC6 – Italy
(478 petaflops)

No8: Alps - Switzerland
(435 petaflops)

No9: LUMI - Finland — EuroHPC Joint Undertaking
(380 petaflops)

No10: LEONARDO - Italy — EuroHPC Joint Undertaking
(241 petaflops)
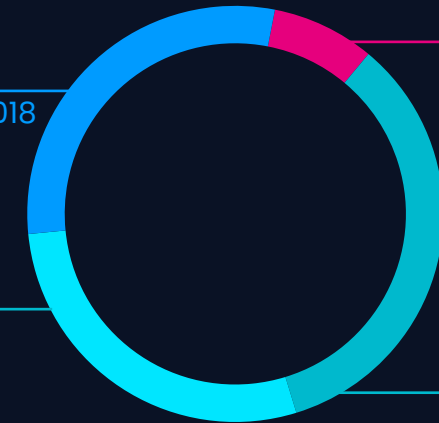
A great demand for supercomputers in Europe

Since the launch of EuroHPC in 2018
+ 54 European supercomputers in the TOP500[1]

China 40

Europe 148
vs 94 in November 2018
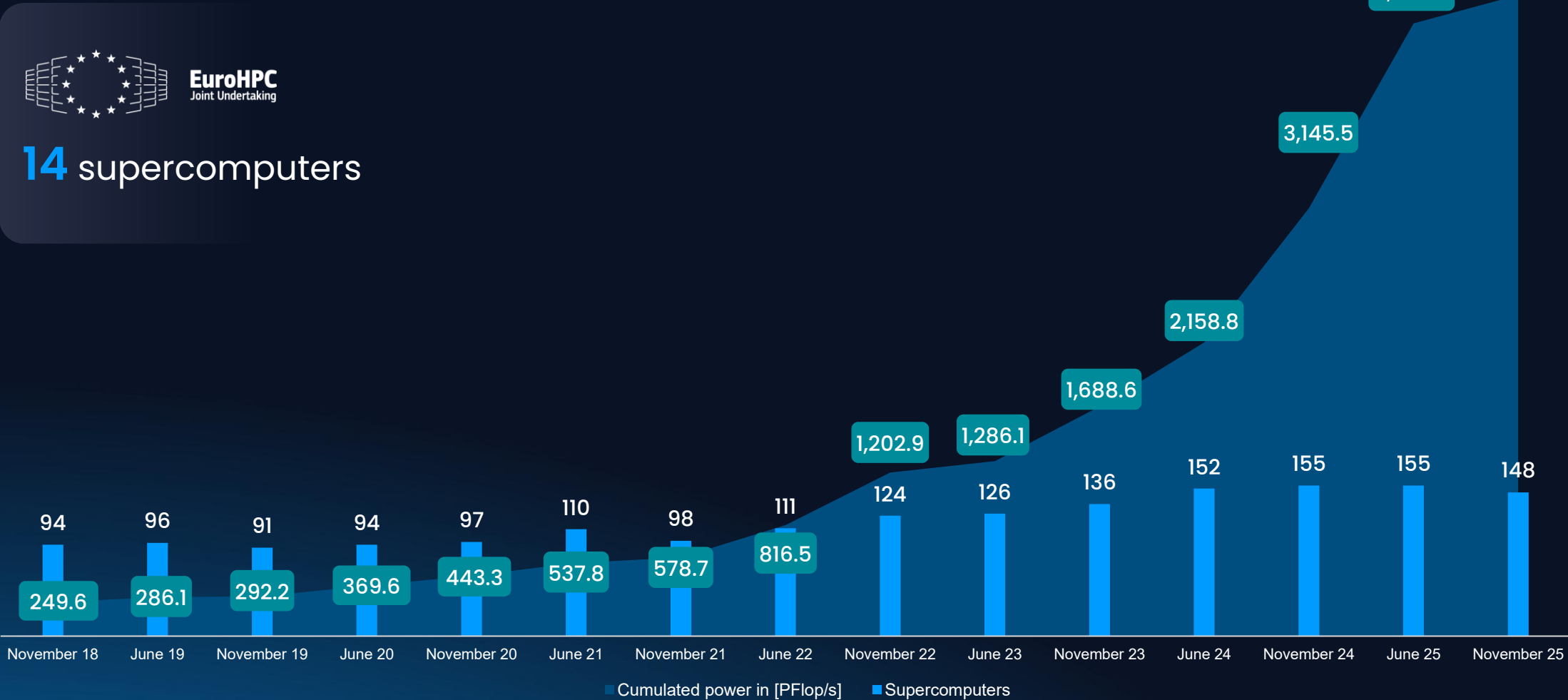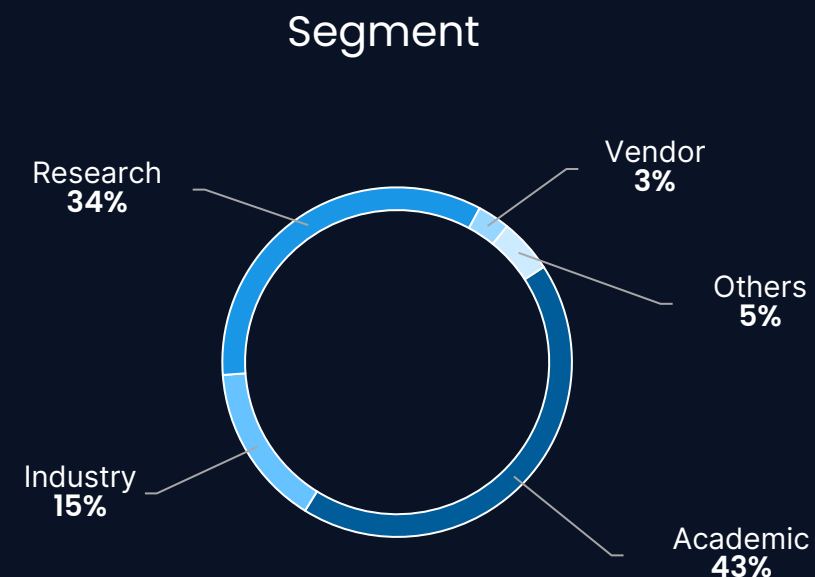
Rest of the world 141
incl. 43 in Japan

USA 171

(1) Sources: 66th edition of the global Top 500 most powerful supercomputers - November 2025 – Europe's supercomputers without Russia's: 148
52nd edition of the global Top 500 most powerful supercomputers - November 2018 - Europe's supercomputers without Russia's: 94

Europe supercomputers: a strong growth since EuroHPC launch[1]

EuroHPC
Joint Undertaking

14 supercomputers

	November 18	June 19	November 19	June 20	November 20	June 21	November 21	June 22	November 22	June 23	November 23	June 24	November 24	June 25	November 25
Supercomputers	94	96	91	94	97	110	98	111	124	126	136	152	155	155	148
Cumulated power [PFlop/s]	249.6	286.1	292.2	369.6	443.3	537.8	578.7	816.5	1,202.9	1,286.1	1,688.6	2,158.8	3,145.5	4,505.6	4,713.0

■ Cumulated power in [PFlop/s]   ■ Supercomputers

Germany, France & Italy lead the race[1]

148

Iceland
1

Sweden
8

Norway
9

Finland
3

Denmark
1

Germany
40

Netherlands
7

Poland
8

Czechia
3

Belgium
1

Slovakia
2

UK
9

Ireland
2

Hungary
1

France
22

Portugal
1

Bulgaria
1

Spain
3

Slovenia
2

Luxembourg
1

Italy
18

Switzerland
3

Austria
2

Segment

Research
34%

Vendor
3%

Others
5%

Industry
15%

Academic
43%

(1) Sources: 66th edition of the global Top 500 most powerful supercomputers - November 2025 – Europe's supercomputers without Russia's: 148

But Europe is lagging behind in terms of hardware

1/3
of global supercomputing ressources are consumed by Europe[1].

Europe

1/20
of global supercomputing equipment are supplied by Europe[1].

Europe

0%
of the processors powering Europe supercomputers are European[2].

Intel 40%

Others[3] 3%

NVIDIA 7%

AMD 50%

(1)   Hyperion Research - HPC server and supercomputer market – 2024
(2)   Sources: 66th edition of the global Top 500 most powerful supercomputers - November 2025 – Europe's supercomputers without Russia's: 148 / 52nd edition of the global Top 500
        most powerful supercomputers - November 2018 - Europe's supercomputers without Russia's: 94
(3)   Others: NEC (1.4%) / IBM (0.7%) / Fujitsu (0.7%)
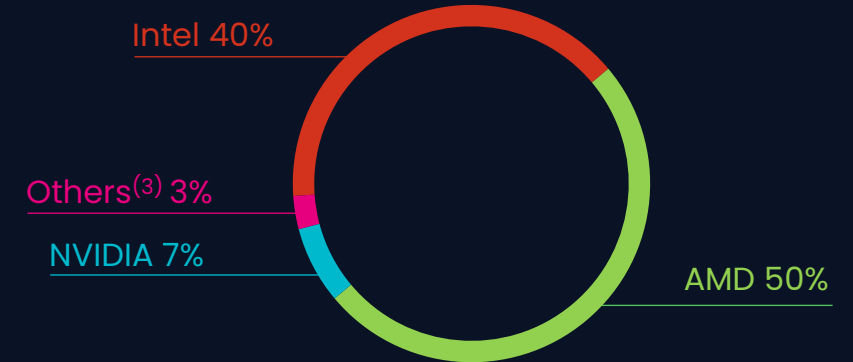
Our answer: Strenghtening Europe sovereignty (1/2)
with our processors

TODAY A dramatic situation for Europe

TOMORROW
SiPearl's processors will fuel:

A complex
geopolitical context

Europe's strategic data
are processed by
non-European processors.

Huge impact on:
→ Security
→ Safety
→ Competitiveness
→ Sovereignty

Europe's supercomputers

EuroHPC
Joint Undertaking

Europe's data centres, AI, cloud & defence

Our answer: strenghtening Europe sovereignty (2/2)
with a fabless strategy

THE QUESTION
An advanced semiconductor factory in Europe?

- Area of an airport ✅
- Cost: 20 to $40Bn ❓
- Energy demand ✅
- Pure water use ❌
- Highly skilled workforce ❌
- Investments in new equipment every 1.5 year: ASML machine = +$300m ❌
- Full-capacity operation ❌

OUR SOLUTION
We follow the American example!

0 factory

100% subcontracted manufacturing

RHEA 1

The most complex processor ever designed in Europe

SILICON PROCESS 6 nm TSMC N6
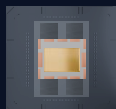
LOGIC DIE IN ADVANCED SILICON PROCESS

80	arm® Neoverse V1 cores[1]
+61	billion transistors
7.8	billion equ. gates
16	metal layers
6	PCIe x16 Gen5
2	PCIe x4 Gen5
4	DDR5 interfaces
80	MB distributed SLC

SILICON INTERPOSER
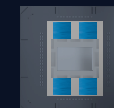
2.5D advanced packaging

4 HBM 4x16=64GB

PACKAGE

5,430 pins

69 mm

1.99 mm

75 mm

(1) with 2x SVE256 engines each

14
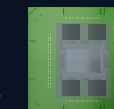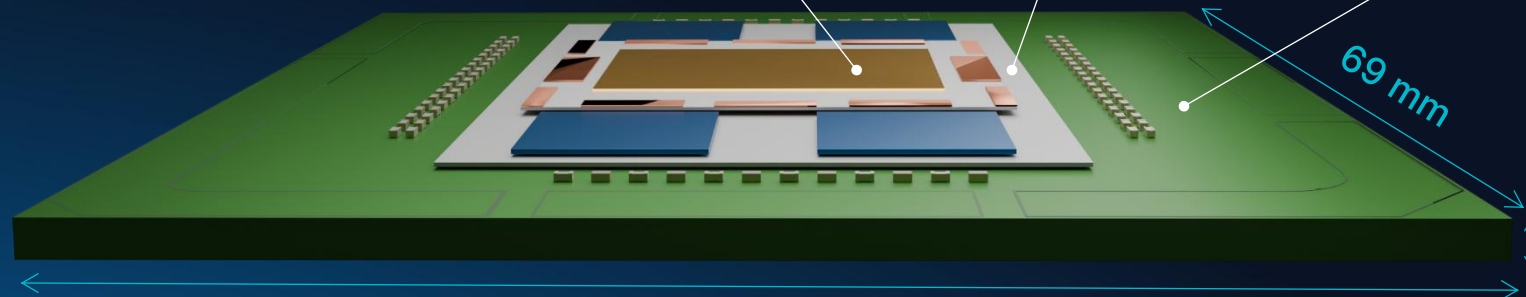
Our 2 first processors

Athena1 capitalises on the work done for Rhea1

RHEA 1
HPC & AI processor

In production / Sampling early 26

Silicon Process	**6** nm TSMC N6		

+61 billion transistors
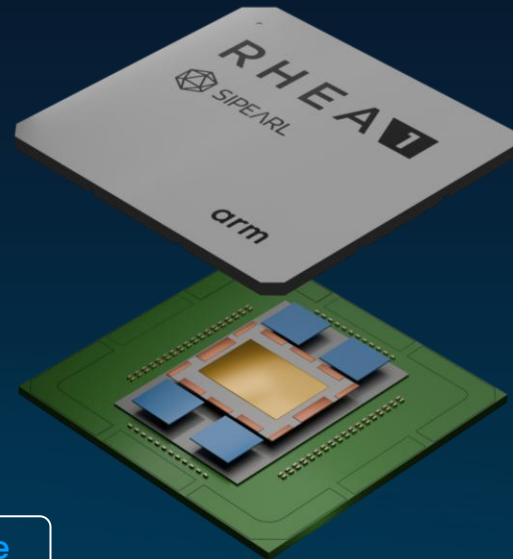
4 HBM 4x16=64GB

80 arm® Neoverse V1 cores[1]

4 DDR5 interfaces

Health | Energy | AI inference

(1) with 2x SVE256 engines each

ATHENA 1
Dual-use processor

Under design / Release H2 27

A bespoke version of Rhea1

European technology
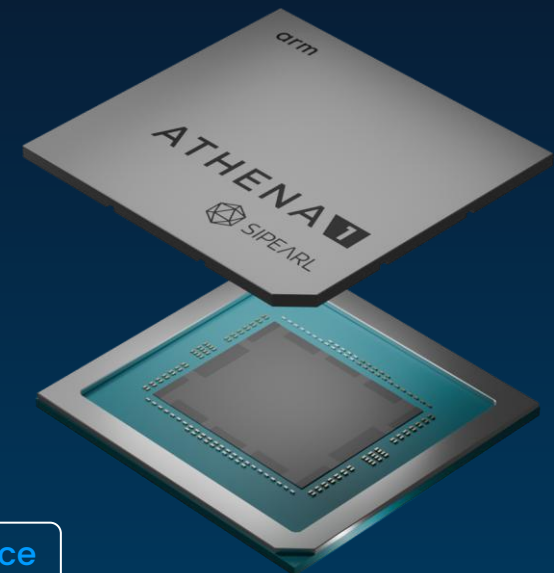
SKUs of 16, 32, 48, 64 or 80
Arm Neoverse V1 cores

New packaging | No HBM

Government | Defence | Aerospace

About… SiPearl

SiPearl is the European fabless designer of sovereign high-performance energy-efficient processors for HPC, AI and data centres. These processors will help address strategic dual-use challenges in the fields of security, defence, medical research, energy, climate and engineering with a reduced environmental footprint.

SiPearl completed the design of the most complex processor ever designed in Europe, Rhea1. Featuring 80 Arm Neoverse V1 cores, with 61 billion transistors, it is currently in production at TSMC and will be available for sampling in early 2026. Sipearl processors will equip both European exascale supercomputers owned by EuroHPC JU: Rhea1 will be integrated into the JUPITER machine based in Germany and Rhea2 will be part of Alice Recoque which will be located in France.

Incubated within the European Processor Initiative (EPI) consortium and seed-funded by the European Union, SiPearl employs 200 people in France, Spain, and Italy. Following a €130 million Series A, the company is launching its Series B round.

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