



SIPEARL

Designing the microprocessor
for the European exascale⁽¹⁾ supercomputer

PRESS KIT

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(1) 1 billion billion calculations per second.

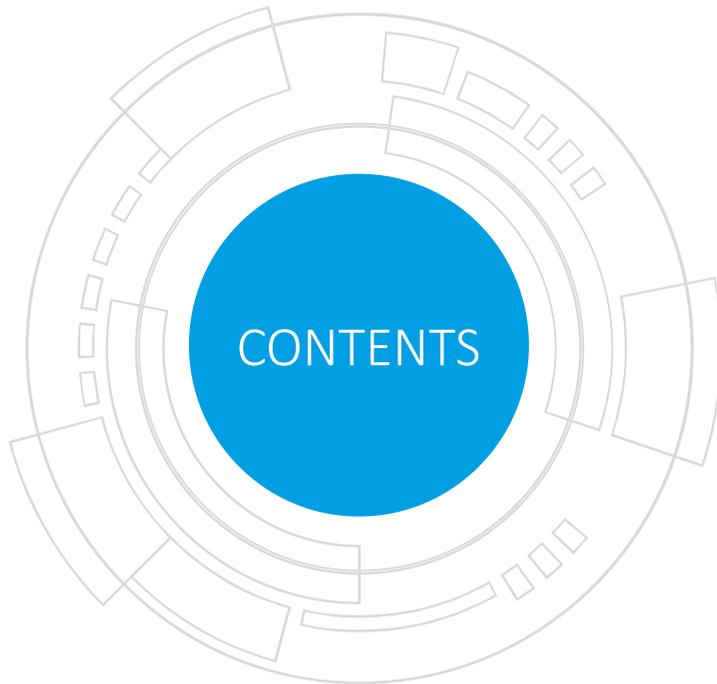
OUR VISION



PHILIPPE NOTTON – CEO AND FOUNDER

We are designing the next generation of high-performance, energy-efficient microprocessors that will form the core of the European exascale supercomputer. Proudly designed in Europe, our range of microprocessors will make it possible to set out Europe's technological sovereignty for strategic markets, from high performance computing to artificial intelligence and connected mobility.





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THE STATE OF PLAY

PREAMBLE

High performance computing, a crucial branch of IT for meeting scientific and industrial challenges

Definition:

High Performance Computing (HPC) is a branch of IT that is focused on engineering and scientific modelling and simulation tasks that require such high levels of resources that they cannot be processed with general-use computers and instead require supercomputers.

High performance computing is key to meeting a growing range of increasingly complex strategic challenges, both scientific and industrial:

- Historically, it has been used for research, weather forecasting, oil and gas prospecting, defence, chemicals, engineering, finance...
- It has become essential for supporting artificial intelligence, connected mobility, smart cities, bioengineering, cybersecurity, personalized medicine...



Growing needs:
for more and more equipment,
with more and more processing power.

STRONG-GROWTH GLOBAL MARKET

Crucial equipment
for accelerating the development of strategic sectors

The market for high performance computer equipment is structured around two core segments:

- Supercomputers (priced from €2m to over €300m) designed with leading-edge techniques to achieve the highest possible performance capabilities.
- High performance computing servers shared by a working group, department or division (priced at less than €500k).

Milestone to be passed: reaching exascale (1000 Pflop/s, i.e. 1 billion billion calculations per second).

For reference: today, the world's most powerful supercomputer, located at Oak Ridge National Laboratory in the US, has a computing power of 148.6 Pflop/s (148.6 million billion calculations per second)⁽¹⁾.

Challenge to limit energy consumption

- An exascale supercomputer will need to achieve an energy efficiency of at least 35 Gflops/Watt
The Oak Ridge supercomputer's energy efficiency is 14.7 Gflops/Watt⁽¹⁾



\$13.7bn global market in 2018
expected to reach \$20.0bn by 2023
+7.8% / year on average⁽²⁾

(1) Source: 54th ranking of the world's top 500 most powerful supercomputers – November 2019

(2) Source: 2019 Hyperion Research, supercomputer and high performance computing server market

EUROPE, BEHIND THE CURVE

Europe is dependent on non-European technologies for processing data for strategic sectors

High performance computing servers and supercomputers: Europe is dependent on non-European technologies⁽¹⁾

- Europe uses more than one third of the world's high performance computing resources, yet produces less than 5% of them.
- The microprocessors at the heart of Europe's supercomputers are supplied by Intel (94% market share), IBM and AMD (3% each). None of them are European.

Supercomputers: Europe, overtaken by China and the US, is being forced to process more and more data outside of Europe⁽²⁾

- Europe's most powerful supercomputer is no.6 in the global rankings, behind the US and China.
This supercomputer, located at the Swiss National Supercomputing Centre, has achieved 21.2 Pflop/s, compared with 148.6 Pflop/s for the world no.1.
- Its energy efficiency is lower: 8.9 Gflops/Watt versus 14.7 Gflops/Watt for the world no.1.
- Out of the top 500 supercomputers: 94 are located in Europe, compared with 228 in China and 117 in the US.
For reference: 18 are in France.

However, this equipment is used for strategic applications for which sovereignty, security and safety are crucial.



Europe needs to further strengthen its technological sovereignty for low-power high performance computing equipment.

(1) Source: 2019 Hyperion Research

(2) Source: 54th ranking of the world's top 500 most powerful supercomputers – November 2019

EUROPEAN UNION'S RESPONSE

Two flagship initiatives to develop its own high performance computing equipment: the EuroHPC and the European Processor Initiative

In March 2017, Germany, Spain, France, Italy, Luxembourg, the Netherlands and Portugal launched the EuroHPC Declaration to create a Joint Undertaking to deploy a European high performance computing infrastructure.

- The EuroHPC Joint Undertaking, in place since November 2018, will be operational through to the end of 2026.
- It is backed by a €1bn budget from the European Union and the 25 participating countries, as well as €400m from private partners.
- Its objectives are to:
 - Acquire and deploy two supercomputers that can achieve 100 million billion calculations per second (100 Pflop/s) and will be in the top 5 worldwide, and at least two others that will be able to process over 1 million billion calculations per second (1 Pflop/s) and will be in the top 25,
 - Support research and innovation activities to develop a European supercomputing ecosystem, make these resources available to large numbers of public and private users, including SMEs, and promote a technology supply industry.



In this context, the European Union launched a call for proposals in 2017 to draw up, maintain and lead the roadmap for developing a new generation of high-performance, low-power microprocessors for supercomputing, big data processing and emerging applications.

The European Processor Initiative consortium won this call for proposals, with an €80m budget for its first phase.



SIPEARL'S ORIGINS

THE EUROPEAN PROCESSOR INITIATIVE, LAYING THE FOUNDATIONS FOR SIPEARL

The consortium coordinated by Bull won the call for proposals to support the development of a new generation of microprocessors

Out of the three offers submitted for the European Union's call for proposals, the bid from the consortium coordinated by Bull (Atos Group) - the European Processor Initiative (EPI) - was chosen to design, maintain and implement the roadmap for developing a new generation of high-performance, low-power microprocessors for:

- The high performance computing market and especially supercomputers to support their transition to exascale,
- The autonomous mobility and artificial intelligence markets.

Learn more about the EPI at european-processor-initiative.eu

With a total budget of over €120m, the EPI project, which started up on December 1, 2018, will be active through to December 2021 for its first phase. It is currently made up of:

- 27 members, research institutes, universities and supercomputing centres, as well as IT, electronics and automotive specialists: Atos, Barcelona Supercomputing Center, BMW Group, French Alternative Energies and Atomic Energy Commission (CEA), Chalmers, Cineca, E4 Computer Engineering, Elektrobit, ETH Zürich, Extoll, FORTH, Fraunhofer ITWM, Genci, Infineon Technologies, Jülich, Kalray, KIT, Menta, Prove & Run, Semidynamics Technology Services, ST Microelectronics, SURFsara, Technico Lisboa, University of Bologna, University of Pisa, University of Zagreb...

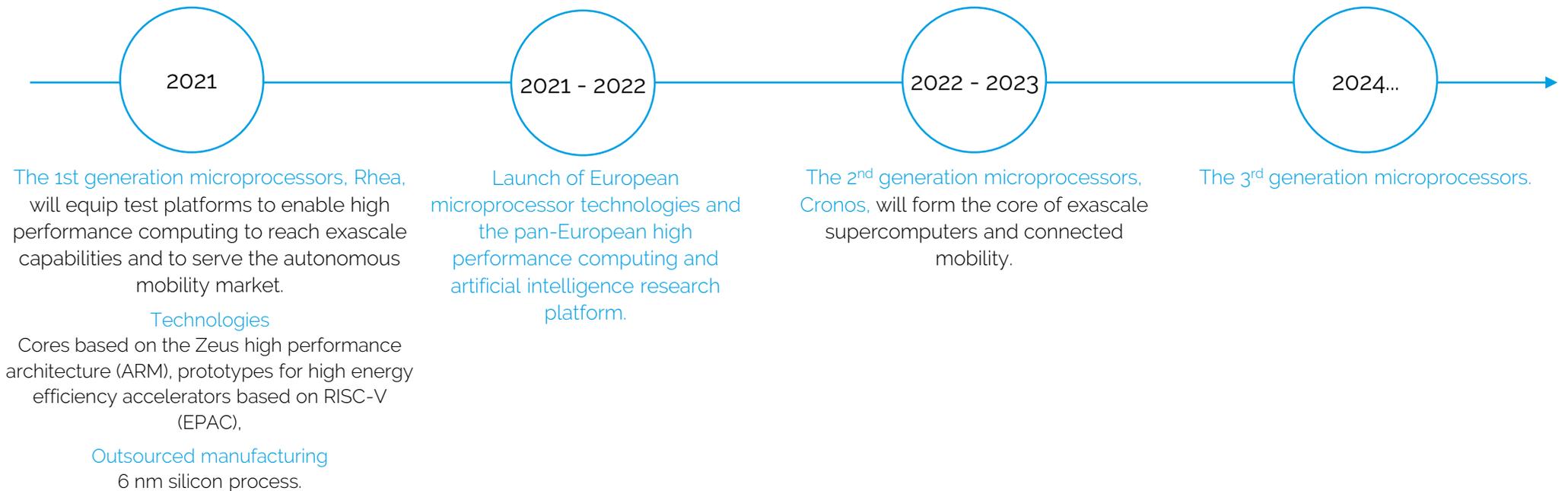


... and SiPearl, the company created within the EPI in June 2019, which has just moved into its operational phase...

EPI'S ROADMAP, SIPEARL'S ACTION PLAN

Milestones and methods to be put in place to develop the next generations of microprocessors harnessing European technology

During its first year of activity, the EPI has built its roadmap. With the European Commission's backing, the consortium members have selected the technologies that will be capitalised on for the next generations of high-performance, low-power microprocessors.



SiPearl will follow this roadmap to design, market and distribute its range of new-generation microprocessors, working closely with the EPI's 26 other members.

SIPEARL



WHO WE ARE

The designer of the microprocessor
for the European exascale supercomputer

Created by Philippe Notton, SiPearl is the company that is bringing to life the European Processor Initiative (EPI) project, designing the high-performance, low-power microprocessor for the European exascale supercomputer.

In line with the EPI's roadmap, the first generation of microprocessors, known as Rhea, will be focused on high performance computing and accelerating the development of artificial intelligence startups. It will be followed by a second generation – Cronos - designed for connected mobility and edge computing, especially for smart cities.

SiPearl will develop and market its offering through close collaboration with its 26 partners from the EPI - scientific community, major supercomputing centres and leading names from the IT, electronics and automotive sectors - which are its stakeholders and potential clients.

This project has received funding from the European Union's Horizon 2020 research and innovation program under specific grant agreement no.826647.

Philippe Notton

FOUNDER OF SIPEARL



Philippe Notton, Senior Executive with deep semiconductor expertise, has built up outstanding expertise in the multimedia, semiconductor and security fields.

Starting from scratch, Philippe Notton successfully led the set-top box division of the Taiwan-based MStar Semiconductor to become number 3 worldwide and number 1 in Asia for pay-television semiconductors.

In 2017, after heading up STMicroelectronics' Consumer division, Philippe Notton joined the Atos Group to set up the European Processor Initiative consortium. He is General Manager of the EPI. In June 2019, Philippe Notton created SiPearl to transform its project into a product.

[Supélec Engineer \(1993\) - Executive MBA from ESSEC & Mannheim \(2008\)](#)



He is surrounding himself with a team of experienced professionals with complementary areas of expertise in various fields, including high performance computing, research and development, chip design and IT architecture.

Various key appointments will be announced over the coming weeks.

OUR OFFERING

The next generation of high performance computing microprocessors, with the following features



Technological sovereignty

Proudly designed and engineered harnessing technologies developed in Europe.



Supercomputing power

Delivering higher computing power than 2,000,000 laptop computers.



Backdoor-free security

Protecting data thanks to secure end-to-end network transmission.

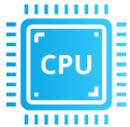


Energy efficiency

Halving power consumption for equal performance capabilities.

OUR OFFERING

The next generation of high-performance, low-power microprocessors for three strategic markets



Supercomputing

The microprocessor for the pilot, then the European exascale supercomputer (1 billion billion calculations per second) for research, weather forecasting, health, energy, defence, nuclear..



Artificial intelligence

The first open acceleration platform enabling artificial intelligence startups to develop their proprietary solutions with very limited licensing costs.



Connected mobility

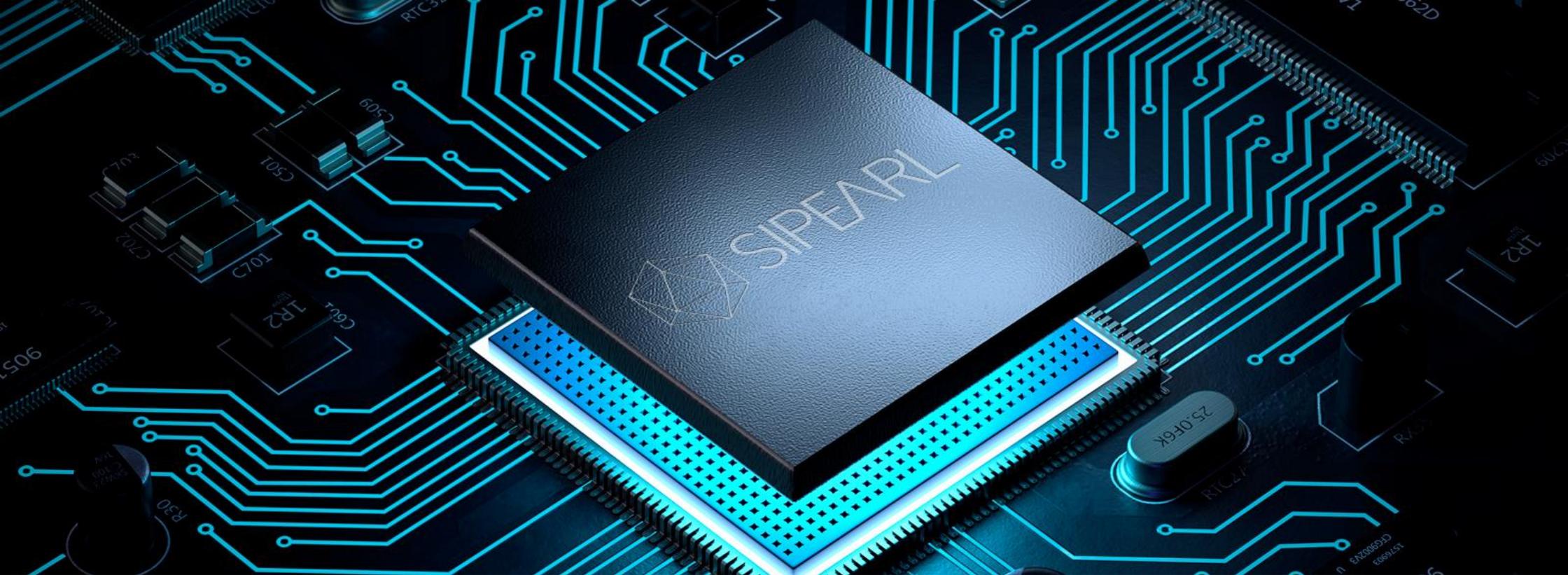
The core microprocessor for secure network with end-to-end data processing from the edge to the cloud: from vehicles to smart cities and the cloud.

THEY TRUST US

The European Processor Initiative's 26 members are our stakeholders and future users

Our partners from the European Processor Initiative (EPI) are our stakeholders and future users. With them and for them, we are developing the high-performance, low-power European microprocessor with end-to-end security, guaranteeing Europe's technological sovereignty for high performance computing, artificial intelligence and connected mobility.





About SiPearl

Created by Philippe Notton, SiPearl is the company that is bringing to life the European Processor Initiative (EPI) project, designing the high-performance, low-power microprocessor for the European exascale supercomputer.

This new generation of microprocessors will enable Europe to set out its technological sovereignty on the strategic markets for high performance computing, artificial intelligence and connected mobility.

SiPearl will develop and market its solutions through close collaboration with its 26 partners from the EPI - scientific community, supercomputing centres and leading names from the IT, electronics and automotive sectors - which are its stakeholders and potential clients.

SiPearl is supported by the European Union.

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