**EPI - European Processor Initiative**


# Periodic Dissemination and Communication report

## Deliverable D24.3

Version N°1

http://www.european-processor-initiative.eu/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Specific Grant Agreement No 826647

# DOCUMENT SUMMARY INFORMATION

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|---|---|
| **Project Title** | **European Processor Initiative** |
| **Project Acronym** | EPI |
| **Project No:** | 826647 |
| **Call Identifier:** | H2020-ICT-2016-2017/H2020-ICT-2017-2 |
| **Project Start Date** | 01/12/2018 |
| **Related work package** | WP 24 |
| **Related task(s)** | |
| **Lead Organisation** | UNIZG |
| **Submission date** | 30.11.2020 |
| **Dissemination Level** | PU |

**History:**

| Version | Date | Author | Affiliation | Comment |
|---|---|---|---|---|
| R.0.1 | 4/11/2020 | Katarina Vukušić | UNIZG | First outline |
| R.0.2 | 16/11/2020 | Katarina Vukušić | UNIZG | Integrating comments from first review, adding additional key messages |
| R.0.3 | 22/11/2020 | Katarina Vukušić | UNIZG | Integrating comments from second review, adding additional info |
| R.0.4 | 27/11/2020 | Katarina Vukušić | UNIZG | Integrating comments from WPL and coordinator, adding additional info |

**Quality Control:**

| | Who | Affiliation | Date |
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| | Frank K. Gürkaynak | ETHZ | 18/11/2020 |
| **Checked by WP Leader** | Mario Kovač | UNIZG | 27/11/2020 |
| **Checked by Project Coordinator** | Michel Gac | SiPearl | 24/11/2020 |
| **Checked PMOffice** | Anna Riverola | BSC | 30/11/2020 |

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## ACKNOWLEDGEMENTS

**EPI** is a project that has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 800928. Please see http://www.european-processor-initiative.eu/ for more information.

The partners in the project are BULL SAS (BULL), BARCELONA SUPERCOMPUTING CENTER - CENTRO NACIONAL DE SUPERCOMPUTACION (BSC), INFINEON TECHNOLOGIES AG (IFAG), SEMIDYNAMICS TECHNOLOGY SERVICES S.L. (SemiDynamics), COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES (CEA), CHALMERS TEKNISKA HOEGSKOLA AB (CHALMERS), EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZUERICH (ETH Zürich), FOUNDATION FOR RESEARCH AND TECHNOLOGY HELLAS (FORTH), GRAND EQUIPEMENT NATIONAL DE CALCUL INTENSIF (GENCI), INSTITUTO SUPERIOR TECNICO (IST), FORSCHUNGSZENTRUM JULICH GMBH (JUELICH), ALMA MATER STUDIORUM - UNIVERSITA DI BOLOGNA (UNIBO), SVEUCILISTE U ZAGREBU FAKULTET ELEKTROTEHNIKE I RACUNARSTVA (UNIZG-FER), FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V. (Fraunhofer), STMICROELECTRONICS SRL (ST-I), E4 COMPUTER ENGINEERING SPA (E4), UNIVERSITA DI PISA (UNIPI), SURFSARA BV (SURFSARA BV), KALRAY SA (KALRAY SA), EXTOLL GMBH (EXTOLL GMBH), CINECA CONSORZIO INTERUNIVERSITARIO (CINECA), BAYERISCHE MOTOREN WERKE AKTIENGESELLSCHAFT (BMW GROUP), ELEKTROBIT AUTOMOTIVE GMBH (ELEKTROBIT), KARLSRUHER INSTITUT FÜR TECHNOLOGIE (KIT), MENTA SAS (MENTA), PROVE & RUN (PROVE & RUN), SIPEARL SAS (SIPEARL). The content of this document is the result of extensive discussions within the EPI © Consortium as a whole.

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# Table of contents

# Table of Figures



# List of Tables

# Executive Summary

This document provides a comprehensive overview of the Dissemination and Communication activities in the second year of the project, from M13 to M24.

The main goal of dissemination and communication in the first year of activities was to establish an online and physical presence in sectors of interest with respect to EPI's mission and vision. This goal was fortified and broadened in the second year of activities, with a plan to expand on that awareness and create a lasting anchor in the playing field – by hosting the First EPI Forum.

The deliverable describes the plans and activities undertaken for the Forum, although unfortunately the actual Forum could not take place as planned, due to rising health concerns and had to be postponed. The plans and activities undertaken for the Forum are described here, regardless of the fact that the Forum was postponed due to the health situation, because it provides a basis for future consideration of EPI visibility.

This document provides a qualitative and quantitative report of activities to complement that provided for the Funding and Tenders portal. As in D24.2, this report groups activities under **Events**: organization of a conference, organization of a workshop, exhibition, flyer, training, participation to a conference, participation to a workshop, participation to an event other than a conference or a workshop, brokerage event, pitch event, trade fair, participation in activities organized jointly with other EU projects, other; under **Interviews/press releases/magazines**: non-scientific and non-peer-reviewed publication (popularized publication), communication campaign (e.g. TV, radio), video/film, press release, under **Scientific publications** and under **website and social media**.

This report also overviews the channels that are used in continuation to promote and disseminate EPI activities. The numbers from social media are listed for the period, but also in comparison to the last report, so as to illustrate the changes and the growth in following.

# Keywords

Dissemination, communication, channels of communication, messages, social media, events, journals, interview, media, magazine

# Abbreviations

COVID-19 – Coronavirus disease

DATE2020 - Design, Automation, and Test in Europe conference

DC – Dissemination and Communication

DoA – Description of Action

Dx.x – Deliverable (followed by a number)

EPAC – European processor accelerator

EPI – European Processor Initiative

GPP - General-purpose Processor

HiPEAC - High-Performance Embedded Architecture and Compilation

HPC – High-performance computing

IP(s) – Intellectual Property

KPIs – Key Performance Indicators

KSC – Korea Supercomputing

OA – Open Access

PCIe - Peripheral Component Interconnect express

PMO – Project Management Office

PoC – Proof of Concept

RIKEN - Rikagaku Kenkyūjo – Japanese Institute of Physical and Chemical Research

WHO – World Health Organization

WP – Work Package (followed by a number)

WPL – Work Package Leader

WRC - Workshop on Reconfigurable Computing

# 1 Introduction

After the first year of EPI activity, the consortium decided to stay the course with regards to communication plans, with a developmental path that leads **towards** the second stage of our proposed life cycle in WP24:

- Dissemination/Communication for Awareness of project results**:** The main objective is to raise awareness of project results by promoting the project, communicating its vision and presenting results achieved. Proper management of communication flows is essential.
- **Dissemination/Communication for Understanding:** The objective is to contribute to knowledge and understanding by publishing the project results to selected target audiences within the international industry, academic and general public communities.
- Dissemination/Communication for Action**:** Aiming to stimulate interactions with external stakeholders and policy makers during the project. External stakeholders can provide relevant support for EPI project.

This meant that after the initial year of setting up the stage to build awareness, the consortium could more actively engage in the playing field, up to a point where we could participate and organize our own very first event. This was planned for M16, but even though it was only days until final execution, it had to be abruptly postponed, because of the rising threat in the health situation caused by the pandemic of COVID-19[1].

The pandemic substantially changed consortium's plans and activities, which was addressed in the Intermediate COVID Plan (D24.1 Update), and this report reflects what was done to overcome those unprecedented challenges.

The chapters of this deliverable present all DC activities with the key messages that the EPI members gave to the audience attending events, publishing articles, giving interviews, submitting scientific publications, and all of this with coverage on social media and the website.

[1] The outbreak of the novel coronavirus, COVID-19, was declared by the WHO a Public Health Emergency of International Concern on 30 January 2020. [https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen]

# 2 Visual identity – maintained

The previous report described the creation of visual identity for EPI – logo and designed materials. WPL24 has consistently checked and maintained the templates and materials, so as to enable and ensure all partners were using correct materials to maintain the message and brand.

All materials were updated with the latest EPI roadmap and maintained to reflect visual guidelines of partner institutions (e.g. changes of partner logos).

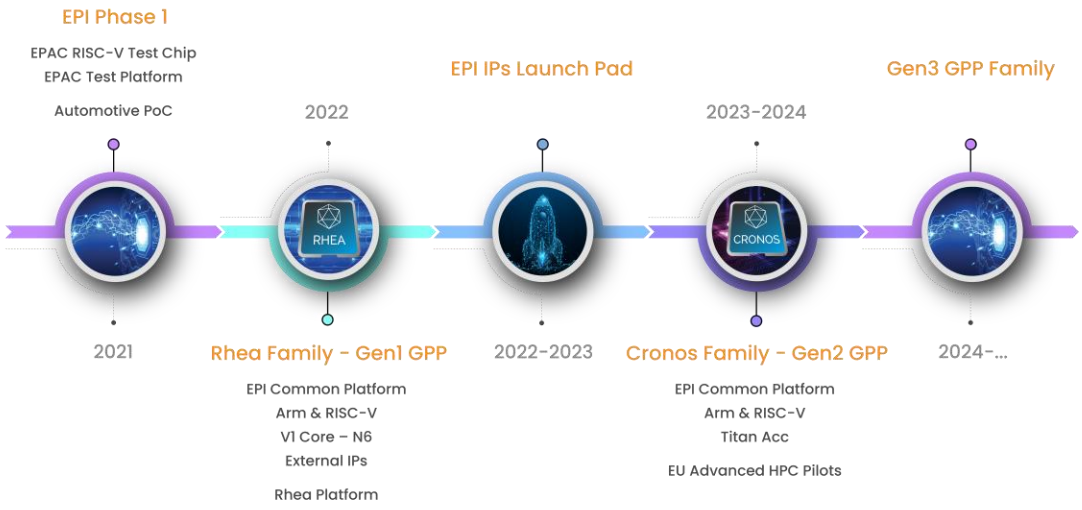


**Figure 1. Updated EPI roadmap**

**Promotional materials**

Promotional and informational materials have been distributed and shared during the period when physical events were possible – those that were reported made in D24.2 (phone hoops, USB sticks, lanyards, remove-before-flight keychains, and flyers).

**Informational materials**

In addition to preparing additional factsheets (expanding the general ones, and new factsheets on technologies: co-design, posits, and crypto-tile), a special edition booklet was designed, representing EPI factsheets, to use at events and the EPI Forum[2].

The partners also created the first episode of EPI podcast, with the goal of continuing this platform where technology is the focus and is being discussed by one or more EPI consortium members.

[2] Unfortunately, no physical events have taken place for most of 2020, which limited the use of these informational materials.

All materials are always made available in the project Dissemination and Communication Press Repository online: https://www.european-processor-initiative.eu/project/dissemination-materials-repository/, unless they are of confidential nature.


**Figure 2. Cover of Factsheet brochure (special edition booklet)**

# 3 Reports on main DC activities

In D24.1 Dissemination and Communication Plan, the consortium set forth a list of DC activities to execute, with the purpose of building awareness on EPI and get involved in discussions related to European HPC independence, which is EPI's mission.

The KPIs set out in DoA are reported on in D22.5 Technical and Scientific Progress Report for the second project year (M13-M24).

## 3.1 Events

In the second year of the project, the consortium continued to participate in numerous events, in the same two categories as in the first year:

1) Partners presenting EPI on behalf of the entire consortium
2) Partners attending events in their own capacity, but using the opportunity to promote EPI

The ramp-up towards EPI's own event in M16 included a full tutorial on EPI at HiPEAC conference in Bologna in M14, and a participation at RIKEN event in Kobe, Japan in M15. However, the very next big event where EPI should have been present – Supercomputing Asia, as the last stop before EPI Forum, was cancelled due to the pandemic.

The following table (Table 1) gives a complete list of all events where the consortium has taken the opportunity of building EPI awareness. The table lists events, materials presented at those events (whether it was an exhibition-type or presentation/lecture-type event), the main group of attendees per sector (academia, inudstry, civil sector, media, customers, etc.) and what was the key message communicated by EPI to those attendees through its activity.

In addition to these listed here, several EPI industrial partners also keep WP24 apprised of face-to-face or virtual meetings with their respective clients, which are not officially reported, due to confidentiality issues of their own institutions and industrial-type discussions.

**Table 1. Events report**

| Event | Partner | Activity, materials used | Attendees group | Key message for attendees on EPI |
|---|---|---|---|---|
| **SOS23 Workshop** | ATOS-BULL | Presentation by Jean-Marc Denis, "EPI: The EuroHPC Industrial Cornerstone" (**from March 2019, Y1, but mistakenly was not submitted to D24.2*) | Attendees from science and industry | EuroHPC Joint Undertaking is a new European Union's strategic entity focused on pooling of the Union's and national resources on HPC to acquire, build and deploy the most powerful supercomputers in the world within Europe. European Processor Initiative is one of the cornerstones of this European HPC strategic plan. |
| **Bordeaux Electrical Engineering (IEEE Student Branch)** | UNIPI | Presentation by Sergio Saponara, "IEEE DL "Measurement Performance of Sensor Systems towards Autonomous Vehicles"", additional Newsletter report on this same lecture | Academia | The race towards Autonomous and Connected cars will revolutionize the mobility of people, with a tremendous social and economic impact. EmbeddedHPC is a key enabling technologies for this revolution and EPI ecosystem can be at the core of this revolution. |
| **IBM AI Bologna - Anomaly detection in Finance & AutoAI** | E4 | Presentation by Fabrizio Magugliani | Mostly academia, small number of industrial representatives | The presentation of E4 provided a panorama of the current options and included an overview of the EPI GPP and how this processor could meet the requirements of the financial market. |
| **RISC-V Summit 2019** | FORTH | Poster presented by Nick Kossifidis | Attendees from science and industry | EPI adopts the RISC-V technologies for some accelerators and contributes to the community. |
| **SURF Super Day** | SURFsara | Booth and presentation by Maxime Mogé and Peter Michielse | Attendees from the academia | Making it known to a wider audience why Europe's independence in ICT technology is important as well as the need for expertise. |
| **CES** | Prove & Run, Kalray, SiPearl | Booths for all three participants, booth with Kalray demo running, SiPearl suite for first meetings<br><br>Kalray technology was also present on the NXP booth, which demonstrated the NXP BlueBox 2nd generation Autonomous Driving Development platform with production ready automotive silicon, accelerated by the Kalray MPPA3 | Mostly Industry | Prove & Run, as the security leader of the EPI project, has actively engaged the other partners of EPI to ensure that this major European initiative delivers products offering a very high level of security.<br>Kalray: Kalray MPPA3 processor ran 15FPS real-time in FP16.32 arithmetic. The MPPA3 now runs at 20FPS, while the NVIDIA Xavier runs at 18FPS.<br>SiPearl: |

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| | | processor. | | Private business meeting with Silicon stakeholders and customers and EPI preparation meeting (for the EPI forum) with WesternDigital, Codasip and SiFive. |
| **IESF** | SiPearl | Presentation by Philippe Notton | Private meeting | Standard EPI update to the French engineering community. |
| **14th HiPEAC Workshop on Reconfigurable Computing (WRC'2020)** | Menta, KIT | Presentations by Imen Baili (Menta), Jürgen Becker (KIT) | Academia | Menta: Use of the eFPGA in the EPI GPP Chip, HPC and Automotive use cases; KIT: Basic presentation of EPI objections, vision, and mission |
| **HiPEAC conference, Eurolab4HPC Industrial Session on Open Source Hardware** | BSC | Presentation by John Davis, "Enabling HW/SW Co Design for IoT to HPC" | Academia | More and more global IT actors are adopting RISC-V architectures to be vendor independent, and so is EPI |
| **Accredited PhD course at UNIPI** | BSC | Critical Embedded Computing Systems: Introduction and Major Hardware/Software design Trends | 25 attendees/students | The message of the PhD training was relevant to use of High-Performance Computing for mission critical applications |
| **International Cybersecurity Forum (FIC)** | Prove & Run | Booth, flyer | Customers and industry | Prove & Run, as the security leader of the EPI project, has actively engaged the other partners of EPI to ensure that this major European project delivers products offering a very high level of security. |
| **PRACE Training Centre (PTC) course** | UNIBO, CINECA | Course with presentations by Andrea Bartolini and Daniele Cesarini, "Energy Efficiency in HPC" | Academia and industry | The second edition in the PRACE Training center in Energy Efficiency in HPC has seen EPI partners as co-organizers and presenters (Daniele Cesarini from CINECA and Andrea Bartolini from the University of Bologna). Andrea Bartolini (EPI's power management work package leader) has presented the basics of power management in digital ICs and the power-management common-platform strategy of the Initiative. Daniele Cesarini (EPI co-design expert) has presented to the heterogeneous audience (HPC, academic and industrial experts) the state-of-the-art and new |

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| | | | | approaches for the co-design for power management in today's HPC systems in production. |
| **First Workshop of the Red-RISCV network** | SemiDynamics | Presentation by Roger Espasa, "Overview of the RISC-V Core Market" | Academia and industry | EPAC RISC-V Accelerator would be included as a tile in the GPP architecture in EPI. |
| **Private event at Ecole Polytechnique** | SiPearl | Presentation by Philippe Notton | Industry | Standard EPI and SiPearl update, with focus on digital sovereignty to the Students from Ecole Polytechnique. |
| **Communication campaign with reporters** | SiPearl | Press conference and an informal chat with reporters by SiPearl | Media | Standard EPI and SiPearl update |
| **2nd R-CCS International Symposium** | ATOS-BULL | Presentation by Jean-Marc Denis, "EPI: the European approach for Exascale ages" | Academia, industry, and policy makers | EPI's approach is:<br>• One CPU to rule all accelerators;<br>• ARM is the best choice: performances, openness, unique IoT to Supercomputer, ecosystem<br>• Chiplet based approach<br>• Common Open Platform |
| **IBM BarCamp No5** | KIT | Talk by Jürgen Becker, "Open Hardware" | A wide variety of attendees, including scientific, industrial, and civil society representatives | Presentation of the open hardware on-goings in EPI (RISC-V), Overview of the overall project and status |
| **AHPC2020** | SiPearl | Presentation by Philippe Notton | Academia | EPI update to the Austrian HPC community |
| **Undergraduate course** | CINECA, E4, UNIBO | Introductory session of the course: Electronic Industrial Systems Architecture and Programming Laboratory T-A | Students | Fabrizio Magugliani for E4 and Daniele Cesarini for UNIBO/CINECA presented at two sessions the overall strategy of EPI, the architecture of the GPP and the timeline. |
| **Graduate course** | CINECA, E4, UNIBO | Introductory course for the Hardware/Software Design Methodologies course of Prof. Benini, at UNIBO | Students | Fabrizio Magugliani for E4 and Daniele Cesarini for UNIBO/CINECA presented at two sessions the overall strategy of EPI, the architecture of the GPP and the timeline. |
| **Embedded World 2020** | Kalray, Prove & Run | Two booths, presentation by Kalray's CTO Benoît Dupont de Dinechin, "Deep Learning Inference on MPPA3 Manycore | Academia, general public and media, and most notably, | Prove & Run, as the security leader of the EPI project, has actively engaged the other partners of EPI to ensure that this major |

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| | | Processor" | industrial representatives | European initiative delivers products offering a very high level of security. Kalray offers a new type of processor targeting the booming market of intelligent systems |
| **OSS.5 - Operational Safe Systems for Level 5 Automation** | Kalray | Booth, EPI materials on the booth, keynote | Industrial attendees | Stephane Strahm gave a keynote on Multiple neural network and computer vision, and the needs for spatial isolation into computing devices aimed at automotive applications |
| **EDA284 Parallel Computer Architecture - Master Course** | Chalmers | EPI-related lesson: "The EPAC Accelerator", in the Chalmers Master Program on HPC | Master students | Sonia Rani Gupta and Bhavishya Goel gave two presentations in which they presented the vector programming approach taken by the EPAC accelerator and gave an overview of design challenges for cache coherence |
| **ESA Workshop: Space powering the Green Deal and the Digital Economy** | UNIZG-FER | Presentation by Mario Kovač, "EUROPEAN PROCESSOR INITIATIVE: The Industrial Cornerstone of EuroHPC for Exascale Era" | Academy, industrial and policy makers | Space related science, technologies and applications require processing of vast amount of data and there is a large need for efficient HPC – EPI aims to provide an EU HPC processor and system/application design that could further enhance future ESA activities |
| **AI Computing for Automotive Powering Autonomy – Webcast** | Kalray | Presentation by Stéphane Cordova | Industrial | Stéphane Cordova addresses the challenges of the automotive industry: need of performance and how to consolidate the electronic functions ensuring mandatory and high levels of security and safety |
| **Virtual DATE2020** | EPI | Virtual exhibition of EPI posters at HiPEAC booth | Academic | EPI poster with vision exhibited: European independence in High Performance Computing Processor Technologies<br><br>Based on solid, long-term economic model, Go beyond HPC market<br><br>Address the needs of European industry (car manufacturing market) |
| **HPC3 CoE Council Meeting** | JÜLICH, SiPearl, GENCI | Dirk Pleiter from JÜLICH presentation, "Co-design in EPI" | Academic | The goal of the processor-level co-design in EPI is to identify applications' requirements for co- |

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| | | | | designing EPI's hardware and software. |
| **Automotive Microcontroller FAE Training 2020** | IFAG | Internal automotive training | Industry | Presentation of EPI project, automotive activities (Stream4) as well as automotive platform to engineers. Explanation of Safety Concept to incorporate non safe processors into ASIL-D capable platform for autonomous driving functions. Role of ASIL-D MCU in this specific setting. |
| **IEEE 6th Virtual Forum - for presenting papers** | KIT | Presentation by Tim Hotfilter, "Embedded Image Processing the European Way: A new platform for the future automotive market" | Academia, industry | Presentation of joint work between KIT, BMW and Menta. Quick intro into the project with focus on the automotive stream. |
| **Autoware Course Lecture 4: Platform HW, RTOS and DDS** | Kalray | Presentation by Stephane Strahm | General public | This lecture provided a view of the base hardware and software systems of an autonomous car, on top of which the intelligent software is built. |
| **SemIsrael Virtual Tech week 2020** | Menta | Presentation by Imen Baili, "Menta eFPGA Technology For a Changing World" | Industry | The use of the eFPGA in the EPI Automotive platform: face recognition use case |
| **ESIWACE Workshop** | ATOS-BULL, BSC | Presentations by Jean-Marc Denis and Jesus Labarta | Academia | This talk aimed at answering the questions, "Which will be the next HPC system? What impact will it have on our codes? Which is the status of future computing systems in Europe?" The talk discussed the European Processor Initiative (EPI) project and in particular its RISC-V vector accelerator, targeting HPC starting from the performance analysis of weather forecasting HPC codes to show how to get insights and architectural implications that can influence the design of future HPC systems. |
| **International Conference on Supercomputing 2020** | UNIBO, SemiDynamics | Presentation by Andrea Bartolini, "RISC-V open-ISA and open-HW - a Swiss army knife for HPC", presentation by Roger Espasa, "Hardening an academic core for industrial use" | Academia and industry | UNIBO: The ETHZ Snitch architecture at the base of the EPI STX RISCV accelerator is 2x more energy efficient than classical vector units in computing a DGEMM kernels.<br><br>SMD: SemiDynamics is currently developing a RISC-V OOO core with a vector unit for EPI |

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| | | | | accelerator |
| **Edge Computing: an innovative and scalable "manycore" HW / SW platform for intelligent systems** | Kalray | Presentation by Stephane Strahm | General public | In this seminar, Kalray presented the new needs of intelligent platforms and edge computing, and presented the scalable solution of using manycores for efficient parallel processing |
| **31st IEEE International Conference on Application-specific Systems, Architectures and Processors** | IST | Presentation of article "Reconfigurable Stream-based Tensor Unit with Variable-Precision Posit Arithmetic" | Academia, with minor industrial attendance | EPI is powering a new generation of low power processing units, towards a European supercomputing leadership. |
| **IEEE CAS** | KIT | Keynote presentation by Jürgen Becker | Academia and industry | EPI goals presented, together with an overview of joint work and the automotive applications / use cases |
| **ACACES 2020 HiPEAC Summer School** | ETHZ | Two sessions by Luca Benini and Frank K. Gürkaynak titled "Working with RISC-V: from open ISA to open Architecture to open Hardware" | Academia, industry, and civil society | In this two-part lecture, Luca Benini and Frank Gürkaynak talked about how RISC-V based systems are impacting research in computer architecture based on their experience from their open source PULP platform. The talks started from simpler 32bit cores and moved to more complex 64bit systems around their Ariane processor that have also found use within the EPI project. |
| **Technology Symposium & Open Innovation Platform® Ecosystem Forum** | SiPearl | Accelerating HPC market adoption with Arm Neoverse POPTM IP | Industry | Ying-Chih Yang, SiPearl's Chief Technical Officer, Craig Prunty, SiPearl's Vice President Marketing and Business Development, and Dr Selma Laabidi, Arm Product Expert, lead a conference on "Accelerating HPC market adoption with Arm Neoverse POPTM IP".<br>For this online event, SiPearl worked alongside Arm, the global semiconductor technology supplier, to host a conference on "Accelerating HPC market adoption with Arm Neoverse POPTM IP". |

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| **RCML2020** | KIT | Keynote by Jürgen Becker, "Neuromorphic FPGA Integration – HPC, Reliability and NN as Key Enablers" | Academia | The talk at the workshop on reconfigurable computing for machine learning focused on the work we did together with Menta on the eFPGA in the EPI context. This involves the facial recognition of persons using eFPGA accelerated neural networks. |
| **SiDO Event** | Prove & Run, Kalray | Separate booths from P&R and Kalray, with EPI materials | Industry mostly | Prove & Run: Prove & Run, as the security leader of the EPI project, has actively engaged the other partners of EPI to ensure that this major European initiative delivers products offering a very high level of security.<br>Kalray: demos running on Kalray booth (CNN and heterogenous multiprocessing) + round table about "Edge/Cloud: Where does the battle of AI take place?" with Eric Baissus, Kalray CEO as speaker. |
| **RISC-V Global Forum** | ATOS-BULL, SemiDynamic | Keynote by Jean-Marc Denis, "EPI, The European Approach for Exascale ages. The Road Toward Sovereignty"; Presentation by Roger Espasa, "Semidynamics New Family of High Bandwidth Vector-Capable Cores" | Academia and industry | ATOS-BULL: By 2022-2023 EPI delivers: a GPP for HPC machines can be developed in EU by an EU company – SiPearl; the fundamental IPs for a 100% European accelerator, based on RISC-V can be developed in the EU, and the expertise for developing high-end and complex processing units in Europe, after decades of dis-investment – exists!<br><br>SD: SemiDynamics Avispado core is fueling the RISC-V take off in the EPI accelerator |
| **FPL2020** | BSC | Presentation by Oscar Palomar, "Energy-efficient vector architectures" | Mostly academia, minor industrial attendance | An overview of the EPAC tile and of the VPU architecture was given, in addition to discussion of several implementation details of the initial version and trade-offs faced that involved energy efficiency.<br>Potential energy-focused optimizations in future revisions of the VPU was highlighted. |
| **Meeting with Alexandra Dublanche** | SiPearl | Presentation of EPI and SiPearl development | Policy maker | EPI and SiPearl can add value to French and EU economy |

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| **Summer School on Enabling Technologies for IoT 2020** | UNIPI | Presentation by Sergio Saponara, "Embedded High-Performance Computing: the challenge of the H2020 European Processor Initiative" | 25 students attending | The evolution in IoT and high-performance EDGE will revolutionize the industry (Industry4.0) and the mobility (Internet of Vehicles), with a tremendous social and economic impact. EmbeddedHPC is a key enabling technologies for this revolution and EPI ecosystem can be at the core of this revolution |
| **CoSim-CPS2020** | CEA, UNIPI | Paper presented "Cross-level co-simulation and verification of an automatic transmission control on embedded processor" | Academia | Joint work between CEA and UNIPI using the simulation platform Sesam/VPSim for co-simulation on an automotive use case study. |
| **SMARTCOMP2020** | UNIPI | Paper presented "A Novel Posit-based Fast Approximation of ELU Activation Function for Deep Neural Networks" | Academia | Work by UNIPI in EPI about use of new formats like Posit for a smart implementation of activation functions in DNN computing |
| **Autosens** | Kalray | Booth and presentation by Stephane Strahm, "How the Manycore architecture can support multiple types of sensors computing needs" | Industry | Kalray presented during this webcast how to manage and optimize multiple type of sensor computing needs |
| **AI PARIS** | Kalray | Presentation by Eric Baissus, "En quoi les systèmes intelligents vont-ils révolutionner l'IA et les véhicules autonomes? " | Industry | Kalray discussed about the future challenges of autonomous driving, in terms of learning, determinism, safety |
| **Russian SC days** | BSC | Presentation by Mateo Valero, "Designing and Building Supercomputers @ BSC" | Academia and industry | Mateo Valero highlighted the need of a European processor highlighting the EPAC architecture as well as BSC's role as the original initiator of EPI and most active proponent in the scientific and technical community. |
| **Linaro Virtual Connect 2020** | ATOS-BULL, SiPearl | Keynote by Jean-Marc Denis, "EPI: the European approach for Exascale ages. The road to sovereignty";<br>Keynote by Craig Prunty, "Developing Rhea, the SiPearl European High-Performance Processor" | Academia and industry | SiPearl: Video presentation by Craig Prunty about Rhea, the SiPearl European High-Performance Processor<br><br>ATOS-BULL: By 2022-2023 EPI delivers: a GPP for HPC machines can be developed in EU by an EU company – SiPearl; the fundamental IPs for a 100% European accelerator, based on RISC-V can be developed in the EU, and the expertise |

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| | | | | for developing high-end and complex processing units in Europe, after decades of dis-investment – exists! |
| **Korea Supercomputing Conference** | ATOS-BULL | Keynote by Jean-Marc Denis, "EPI: Europe technology for Exascale Top Ten" | Academia and industry | There is now expertise for developing high-end and complex processing units in Europe, after decades of dis-investment, and a General-Purpose Processor for HPC machines can be developed in EU by a EU Company (SiPearl) |
| **IEEE IMS Virtual Distinguished Lecturer Webinar Series** | UNIPI | DL by Sergio Saponara, "Sensing and Computing Systems towards Autonomous Vehicles" | Academia | The race towards Autonomous and Connected cars will revolutionize the mobility of people, with a tremendous social and economic impact. EmbeddedHPC is a key enabling technologies for this revolution and EPI ecosystem can be at the core of this revolution |
| **PhD Training** | UNIPI, FORTH | PhD Course: High Performance Computing: Architectures and Systems by Vassilis Papaefstathiou (FORTH) and Sergio Saponara (UNIPI) | 30 PhD Students | This PhD course covered High-Performance Computing (HPC) architectures from a systems hardware perspective. The lectures presented the theory behind advanced processing elements and memory systems and presented the relevant architectures found in the top HPC systems today. The lectures covered high-performance out-of-order processors, vector processors, GPUs, and high-performance memory systems. During the course the relevant EPI technologies, i.e. ARM GPP & SVE, RISC-V Vector and HBM, were discussed and the attendants showed great interest for the upcoming EPI technologies and how they can use them for their research. |
| **8th OpenFOAM Conference** | CINECA, E4 | Presentation by Ivan Spisso, "HPC Benchmark Project: follow-up" | Industrial attendees | There is progress of the benchmarking activities aimed at benchmarking and profiling different architectures using different datasets on OpenFOAM, one of the codes selected by EPI for the co-design. It is envisioned that the same datasets will be used on Rhea as soon as it is available, providing important data with |

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| | | | | respect to the improvements to implement on the second generation. |
| **MICRO 2020, 53rd IEEE/ACM International Symposium on Microarchitecture** | UNIZG-FER | Virtual booth with EPI branding and Factsheets | Academia | Virtual booth which showcased factsheets and posters – stating Europe's ambition is to design a roadmap of future European low-power processors targeting extreme scale computing, HPC big data, emerging applications, and sovereignty. |
| **IEEE International Conference on Computer Design (ICCD) 2020** | UNIBO | Paper "An Open-Source Scalable Thermal and Power Controller for HPC Processors" presented, Low Power and Energy-Efficient Computing Session | Academia | Early evaluation of the European power controller architecture and policy. |
| **2020 Third International Symposium on Signal and Image Processing** | UNIZG-FER | Keynote by Mario Kovač, "European Processor Initiative: Europe's Industrial Technology Cornerstone for the Exascale Era" | Academia | The European Processor Initiative (EPI) is a part of a broader strategy to develop and independent European HPC industry based on domestic and innovative technologies as presented in the EuroHPC Joint Undertaking proposed by the European Commission. |
| **Euronaval 2020** | Prove & Run | Physical tradeshow cancelled, replaced by B2B online meetings | Industry | Prove & Run, as the security leader of the EPI project, has actively engaged other partners of EPI to ensure that this major European initiative delivers products offering a very high level of security. |
| **FZJ Online Visit** | JÜLICH | Presentation of FZJ activities, including EPI | Academic | The goal of EPI is to develop processor technologies in Europe and the role of JSC is to lead the co-design activities. |
| **HPC3 Europa Users Meeting** | BSC | Keynote by John Davis, "Keynote: LOCA: Embracing Open Source Hardware to create an Open Source Ecosystem" | Academic | In the same way BSC led the development of ARM processors for HPC in the various MontBlanc projects, now it leads the RISC-V HPC accelerator development in EPI |
| **Open Source Summit** | BSC | Keynote by Jesus Labarta, "The RISC-V vector processor in EPI" | Academic | The goal of this talk was to describe the fundamental vision behind the design of such an accelerator and its architectural features. |
| **Design and Verification Conference in Europe (DVCon** | SemiDynamics, SiPearl | Panel Session: Verification Challenges of an Exascale Supercomputer (Ying-Chih Yang, Roger Espasa) | Industry | EPI is taking a huge leap forward with the goal to design a low-power, high-performance exascale supercomputer |

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| **Europe)** | | | | |
| **AI hardware summit** | Kalray | Invited talk by Eric Baissus | Industry | Eric Baissus participated in a panel about Architecting AI Systems for Autonomous Vehicles, the Interplay of Hardware & Software |
| **CINECA GPU Hackathon** | E4, CINECA, JÜLICH | Coding session and presentations by EPI team members | 13 Developers | The long-term objective for the hackathon is getting developers accustomed with the Arm ecosystem (HW and SW) in perspective of the availability of the EPI first-generation microprocessor, for which the roadmap has been presented. |
| **Supercomputing20** | EPI | EPI and EU exascale projects virtual booth,<br>E4 and SiPearl presentation at Arm HPC User Group at SC virtual talks,<br>Keynote at the HPC Workshop at SC20 digital by Jean-Marc Denis, "The European approach for Exascale ages" | Academia, industry | At the joint virtual booth – EPI presented its factsheets, with general goals outlined, and materials from 9 more EU exascale-related projects.<br><br>At the roundtables and vendor talks, partners presented their relationship with Arm, while at the Workshop, Jean-Marc Denis stated EPI will be ready to move to the next step: engage on the development of a 100% EU IP general purpose processor. |
| **ApplePies** | UNIPI, BSC | General Chair of the conference Sergio Saponara,<br>keynote by John Davis, "RISC-V, Enabling a Wide-Open Future of HPC" | +120 enrolled people at the conference with people from Academia and industries | RISC-V roadmap in Europe and EPI for accelerators and CPUs presented within the context also of open HW EU initiative |
| **IEEE Sensors France Chapter workshop** | UNIPI | IEEE Lecture by Sergio Saponara, involving EPI developed technologies for sensors signal processing and Autonomous driving | Academic | The race towards Autonomous and Connected cars will revolutionize the mobility of people, with a tremendous social and economic impact. EmbeddedHPC is a key enabling technologies for this revolution and EPI ecosystem can be at the core of this revolution |
| **PhD Workshop** | UNIPI, BSC | PhD Workshop on Hardware accelerators for AI and HPC applications with lectures by J. Labarta (BSC), M. Cococcioni, F. Rossi and S. Saponara (UNIPI) | Academic | Presentations on RISC-V roadmap in EPI particularly for HPC accelerators and on new research efforts on DNN acceleration functions |

## 3.2 EPI organized event – EPI Tutorial - First steps towards a made-in-Europe high-performance microprocessor

As a continuing practice, EPI organized another full tutorial collocated with the HiPEAC 2020 conference held in January 2020, in Bologna, Italy. Colleagues from UNIZG-FER gave a general introduction into the tutorial, while partners from CEA covered General EPI overview and details of EPI's common Platform and Rhea 1st implementation. Team from BSC and UNIBO followed up with two very important aspects as well – accelerators in EPI and EPI power management, while the first section of the tutorial was closed by a presentation from colleagues from E4 on EPI PCIe daughter card as a software development vehicle. After a short break, colleagues from BSC colleagues closed the tutorial with a session on "Bringing up EPI RISC-V Vector Architecture Software", that included a demonstration on software-emulated vector instruction explorations for RISC-V-based accelerator. Even though occupying an unfavorable slot in the program (almost the last session of the last day of the conference), the attendance was excellent, which was the result of announcements on social media and other numerous activities of the EPI team at HiPEAC conference – EPI booth, presentation at the industrial session and three presentations at other workshops – where consortium members advertised the tutorial and the project itself (Menta at WRC workshop, KIT at WRC, BSC at EuroLab4HPC session – all listed in the Events section).

The full report and materials of the tutorial are available on EPI website: https://www.european-processor-initiative.eu/epi-hipeac-in-bologna/


Figure 3. Tutorial Captains from EPI

Figure 4. Packed room (>50 attendees) at the tutorial

## 3.3 The First EPI Forum – Organized and Postponed

The first EPI-organized event at a bigger scale was to be the first EPI Forum in Paris, in M16. In this period, WPL, WP24 Group, the General manager, Chairman of the Board and the PMO worked on preparation of the first EPI Forum.

The purpose of the Forum was to give EPI a bigger stage to attain increased visibility, which is marked by the list of prominent names that have accepted the invitation to speak at the Forum. Agenda was developed for a two-day event, with the goal of providing the ecosystem with more information on EPI, as well as giving other experts in the field and other initiatives a chance to share their views and engage in discussion.

From the event management aspect, the organization was locked in:

- the venue was chosen, contract signed and the space in Paris spot-checked
- promotional materials were acquired
- logistical details such as travel, payment, registration were finalized
- speakers confirmed and itineraries agreed upon
- website and promotion set up
- press release issued
- sponsors confirmed
- ~150 people preregistered to attend

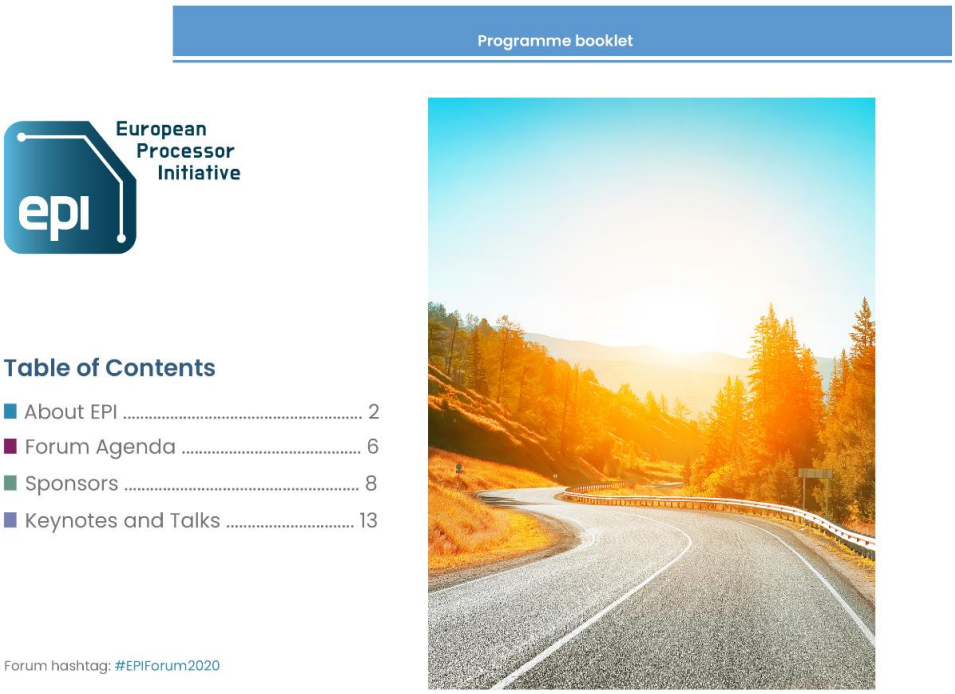


**Figure 5. EPI Forum Booklet ToC**

Unfortunately, the period of the plans for the Forum coincided almost to the day with most of the lockdown starts in Europe. The decision to postpone was brought in the first week of March, because the situation in France, but also in other parts of Europe, was becoming precarious.

Going forward, EPI consortium is evaluating how to organize the Forum to reach its full potential in either version – whether it is a physical event or a digital one, since the original plan has not lost its luster and the project made significant steps.


**Figure 6. EPI Forum Agenda**

# 3.4 Press releases, Magazine articles, Interviews and Coverage

## 3.4.1 Press releases

During the second year of the project, the consortium had issued two press releases: the first to announce the EPI Forum which was subsequently cancelled due to the COVID-19 pandemic, and the second to round up the second year of activities and show an updated roadmap.

EPI's industrial hand, SiPearl, on the other hand, issued several press releases of their own, to gain

independent coverage and announce its presence in the playing field.

As usual, press releases were published in the Press/Media kit section of EPI website as well as in EPI's Dissemination and Communication Press repository. They are also linked to EPI's social media channels (Twitter, LinkedIn) to maximize outreach. SiPearl's press releases were shared through EPI's social media channels as well.

**Table 2. Press release list**

| Press release | Topic, link | Multiplied | Key message |
|---|---|---|---|
| First EPI Forum to take place in Paris | https://www.european-processor-initiative.eu/first-epi-forum-to-take-place-in-paris/ | 6 websites, 8 retweets, 1 share on LinkedIn (4.39% engagement rate) | EPI is proud to announce its first EPI Forum to take place in Paris, in March 2020. |
| European Processor Initiative: Second year of activities | https://www.european-processor-initiative.eu/european-processor-initiative-second-year-of-activities/ | 5 websites, 18 retweets, 12 shares on LinkedIn (10.71% engagement rate) | Second year of the project, EPI roadmap is updated, EPI virtual booth at Supercomputing announced |

**Table 3. SiPearl Press release list**

| Press release | Topic, link | Multiplied | Key message |
|---|---|---|---|
| Launch of SiPearl, designing the microprocessor for the European exascale supercomputer | https://sipearl.com/press/PR_SiPearl_launching_21012020.pdf | 9,000 views on social media and website | Created by Philippe Notton, SiPearl is the company that is bringing to life the European Processor Initiative (EPI) consortium project, designing the high-performance, low-power microprocessor |
| SiPearl launches its development with €6.2m of European funds | https://sipearl.com/press/PR_SiPearl_eurosM-6-2_european_funds.pdf | 6,000 views on social media and website, multiplied on 15 websites | €6.2m of European subsidies will be used to launch SiPearl's development, which will be followed by a major round of fundraising. |
| Ying-Chih Yang joins SiPearl as CTO | https://sipearl.com/press/PR_SiPearl_Ying-Chih_Yang_CTO_EN.pdf | 5,000 views on social media, HPC Wire | Ying-Chih Yang (49, Master's in Electronic Engineering from National Chiao-Tung University in Taiwan) is joining SiPearl's leadership team as Chief Technical Officer. |
| SiPearl signs a major licensing agreement with Arm for the development of its first-generation of microprocessors | https://sipearl.com/press/PR_SiPearl_ARM_Contract_EN.pdf | 50,000 views, multiplied on 29 websites | SiPearl has signed a licensing agreement with Arm, the global semiconductor IP provider, in which SiPearl will use the next-generation high performance, secure, and scalable Arm Neoverse platform, codenamed "Zeus" |
| SiPearl chooses | https://sipearl.com/pres | 20,000 views | SiPearl is opening its first |

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| Germany to open its first international operational subsidiary | s/ PR_SiPearl_First_operational _subsidiary_in_Germany.pdf | | international subsidiary in Duisburg, in the Ruhr region, in order to build closer connections with its German partners and future clients. |
| SiPearl appoints Craig Prunty as Vice President Marketing and Business Development | https://sipearl.com/press/ PR_SiPearl_Craig_Prunty_ VP_marketing_and_business_ development_EN.pdf | 10,000 views | Craig Prunty (Master's in Electrical Engineering from San Diego State University) is joining SiPearl's leadership team as Vice President Marketing and Business Development. |
| Frédéric Hannoyer appointed as SiPearl's Chief Operating Officer | https://sipearl.com/press/ PR_SiPearl_Frederic_ Hannoyer_COO_EN.pdf | 15,500 views on social media and website, multiplied on 12 websites + 1 retweet on Twitter & 2 shares on LinkedIn | Frédéric Hannoyer (48, Ecole Polytechnique Paris, Ecole des Ponts Paris, Massachusetts Institute of Technology) has been appointed as SiPearl's Chief Operating Officer. |
| SiPearl & Arm will be present at the Open Innovation Platform® Ecosystem Forum organized by TSMC on Wednesday 26 August | https://sipearl.com/press/ PR_SiPearl_TSMC_ Forum_2020_EN.pdf | 9,200 views, 2 websites | During this annual event, which brings together stakeholders from the ecosystem created by TSMC, Ying-Chih Yang, SiPearl's Chief Technical Officer, Craig Prunty, SiPearl's Vice President Marketing and Business Development, and Dr Selma Laabidi, Arm Product Expert, will lead a conference on "Accelerating HPC market adoption with Arm Neoverse POPTM IP |
| SiPearl Joins the CXL™ Consortium Behind Compute Express Link™, the Breakthrough CPU-to-Device Interconnect | https://sipearl.com/press/ PR_SiPearl_consortium_ CXL_EN.pdf | 4,500 views on social media and website, multiplied on 10 websites + 2 retweet on Twitter & 3 shares on LinkedIn | SiPearl has joined the CXL™ Consortium founded by the world leaders Alibaba, Cisco, Dell EMC, Facebook, Google, Hewlett Packard Enterprise, Huawei, Intel Corporation and Microsoft. They are behind Compute Express Link™ (CXL), the new high-bandwidth, low-latency interconnect protocol between microprocessors and devices that leverages the PCI Express® (PCIe®) 5.0 physical layer infrastructure. |

### 3.4.2 Magazine articles and interviews

**Table 4. Interview/text/article list**

| Interview, Text, Article | Date of publication, Publisher | Original link | Reach | Key message |
|---|---|---|---|---|
| **Peter Michielse: Developments in EuroHPC** | Mar-18-2020, Weekly IoT Radar on LinkedIn | https://www.linkedin.com/posts/wisse-hettinga-3791b77_pcbite-embeddedworld2020-arduino-activity-6646702510058807296-deiO | 837 views, 4 shares on IoT | Peter Michielse on European efforts in Exascale and related to EuroHPC |
| **Philippe Notton Exclusive for AT** | Apr-17-2020, Architecnologia | https://architecnologia.es/philippe-notton-interview-epi-sipearl | 1 retweet, 2 quote tweets on Architecnologia account, 681 views on website | For HPC, EPI has the full chain from IP designers – chip makers – software providers – machine makers – users of the machine with datacenters – application providers.<br><br>For automotive, EPI has the full chain also from chip and software vendors – to equipment makers and car makers. |
| **Philippe Notton on SiPearl** | May-1-2020, Weekly IoT Radar on LinkedIn | n/a | n/a | Video interview of Philippe Notton about EPI, SiPearl & Arm |
| **SiPearl's chip will be a platform open to other start-ups to develop accelerators for - An interview with Philippe Notton from SiPearl** | May-15-2020, Primeurmagazine | http://primeurmagazine.com/weekly/AE-PR-06-20-68.html | 2 retweets, 3 quote tweets on Primeur account | SiPearl is developing and seeking VC financing, as well as opening branches in other parts of Europe. EPI's IP will be used. |
| **Andrea Bartolini for The Next Platform TV** | July-9-2020, The Next Platform TV | https://www.nextplatform.com/2020/07/09/next-platform-tv-for-july-9-2020/ | n/a | EPI is fueling the RISC-V take off in HPC - making Europe leading the race |

### 3.4.3 Press coverage

The Initiative continued to attract significant press coverage from international press. The table below includes selected coverage, which is also to be found in the Press repository online.

**Table 5. Press coverage list**

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|---|---|
| **Business Wire** | **Server Microprocessor Markets - Worldwide Insights & Forecasts to 2024 - ResearchAndMarkets.com**<br>https://www.businesswire.com/news/home/20191202005910/en/Server-Microprocessor-Markets---Worldwide-Insights-Forecasts<br>Europe is a chapter in the key market trends - global markets |
| **Inside HPC** | **Radio Free HPC Recaps SC19**<br>https://insidehpc.com/2019/12/radio-free-hpc-recaps-sc19/<br>EPI is a new initiative from Europe to help gain independence, BSC has various angles of supercomputing down (use of HPC, geopolitical ideas) - they are championing open systems, Atos and Arm, but also RISC-V. (one of the hosts referenced a bet - there will be a machine with RISC-V system in Top 500 next year) |
| **Gadgets Now** | **Silicon is hot in Silicon Valley again**<br>https://www.gadgetsnow.com/tech-news/silicon-is-hot-in-silicon-valley-again/articleshow/72956534.cms<br>EPI mentioned as European initiative, right after consideration of what Google, Facebook, Apple, Amazon are doing - customized chips. |
| **EE Times India** | **Blog: The Strength of Europe's Homegrown Innovation**<br>https://www.eetindia.co.in/news/article/Blog-The-Strength-of-Europes-Homegrown-Innovation<br>Comparison between European approach and Silicon Valley - consideration of Mazzucato report on government funded research |
| **Hackster** | **The European Processor Initiative Gets Ready for Commercialization with Startup SiPearl**<br>https://www.hackster.io/news/the-european-processor-initiative-gets-ready-for-commercialization-with-startup-sipearl-9b11c8df4fcb<br>SiPearl is launched and it is a company dedicated to developing commercialized implementations of the project's technology |
| **HPC Wire** | **SiPearl Joins EPI Consortium, Aims to Design Microprocessor for European Supercomputer**<br>https://www.hpcwire.com/off-the-wire/sipearl-joins-epi-consortium-aims-to-design-microprocessor-for-european-supercomputer/<br>Europe is not independent, and its fastest supercomputer is much slower than Summit - world number one - so Europe's response is to insure independence on the HPC market |
| **Inside HPC** | **European SiPearl Startup designing microprocessor for Exascale**<br>https://insidehpc.com/2020/01/european-sipearl-startup-designing-microprocessor-for-exascale/<br>By delivering supercomputing power, energy efficiency and backdoor-free security, the solutions that we are developing with support from the EPI members will enable Europe to gain its independence and, more importantly, to ensure its technological sovereignty on the |

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| | market for high performance computing, which has become one of the key drivers for economic growth", explains Philippe Notton, SiPearl's CEO. |
| **EE Times Asia** | **New Computing Architectures Needed to Achieve European Green Deal**<br>https://www.eetasia.com/news/article/New-Computing-Architectures-Needed-to-Achieve-European-Green-Deal<br>The Green Deal makes projects think about how to be more power efficient - including EPI |
| **Primeur** | **European Processor Initiative spins off SiPearl to commercialize the EPI microprocessor**<br>http://primeurmagazine.com/flash/AE-PF-01-20-4.html<br>SiPearl will be developing and marketing the next generation of high-performance, low-power microprocessors. As a natural candidate to equip the future European exascale supercomputer, SiPearl and its solutions will help drive the development of the European market for high performance computing (HPC), as well as its strategic applications such as artificial intelligence and connected mobility. |
| **Primeur** | **What are the implications for EuroHPC of the USA and China fight over Dutch chip manufacturing technology?**<br>http://primeurmagazine.com/weekly/AE-PR-02-20-51.html<br>Dutch ASML cannot export its specialized machine to China, due to US-China trade and diplomatic wars, and the article explains how a similar situation can happen in many fields in Europe. Being dependent for key technologies from other countries, like China, or the USA is seen as a threat for Europe's prosperity. The European Processor Initiative, that wants to design a processor based on European technology that can be used in both HPC and automotive is seen as an important element of the European strategy. |
| **The Next Platform** | **European Processor Initiative Readies Prototype**<br>https://www.nextplatform.com/2020/01/27/european-processor-initiative-readies-prototype/<br>While Europe may ultimately lose the exascale horserace, it has used the milestone to do something more important – to develop homegrown processors and the requisite expertise to fuel its domestic HPC ambitions for years to come. |
| **KitGuru** | **The European Union prepares its own prototype CPU**<br>https://www.kitguru.net/components/cpu/james-dawson/the-european-union-prepares-its-own-prototype-cpu/<br>In a recent conversation between the EPI Chairman Jean-Marc Denis and The Next Platform, details of the new prototype EPI processors were outlined. Denis confirmed that they will be manufactured using TSMC 6nm EUV process and is expected to part of a larger 2.5D interposer-based package that will include HBM memory, PCIe 5.0 and have DDR links. |
| **EE Times** | **Energy-efficient Computing Vital for Green Ambitions**<br>https://www.eetimes.com/energy-efficient-computing-vital-for-green-ambitions/<br>The Digital Europe program — one of the successors to Horizon 2020 and a key part of achieving the European Green Deal — will be at the core of the new direction for Europe's growth strategy. Projects will need to look at creating architectures that are more power efficient, including within projects such as the European Processor Initiative. |
| **Les Numeriques** | **Le projet de processeur européen est toujours sur de bons rails**<br>https://www.lesnumeriques.com/cpu-processeur/le-projet-de-processeur-europeen-est-toujours-sur-de-bons-rails-n146747.html<br>Coverage of The Next platform interview - the chip in development is based on an ARM base composed of Zeus cores in association with a Titan accelerator (RISC-V) for AI calculations, a Kalray chip for massively parallel calculations, as well as with other specialized |

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| | coprocessors. The assembly should take place on an Interposer which will integrate HBM memory and support for the PCI-Express 5.0 standard. As for the manufacturing, it will be entrusted to TMSC and will therefore benefit from a 6 nm EUV etching process. |
| **Scientific Computing world** | **Exascale in Europe**<br>https://www.scientific-computing.com/feature/exascale-europe<br>Europe has developed a strategy for exascale computing, through partnerships and collaboration of European HPC vendors, academic institutions and HPC centres. It aims to deliver exascale-class systems and place the continent in the top three powers for supercomputing and science and industry using HPC. |
| **Architecnologia** | **Calista Redmond of the RISC-V: exclusive interview for AT**<br>http://architecnologia.es/calista-redmond-of-the-risc-v-exclusive-interview-for-at<br>On RISC-V development in general and the exciting developments it could bring to the EPI and future of exascale. |
| **ICT Business** | **EU pokrenula Inicijativu za Europski procesor za superračunala**<br>https://www.ictbusiness.info/poslovna-rjesenja/eu-pokrenula-inicijativu-za-europski-procesor-za-superracunala<br>The EU has started the Initiative to build a microprocessor |
| **Automotive World** | **EB's contribution to world-class European high-performance computing and big data ecosystem**<br>https://www.automotiveworld.com/news-releases/ebs-contribution-to-world-class-european-high-performance-computing-and-big-data-ecosystem/<br>On EB's contribution to EPI and how EPI will launch Rhea in 2021 |
| **HPC Wire** | **SiPearl Begins Development of European Processor with €6.2M**<br>https://www.hpcwire.com/off-the-wire/sipearl-begins-development-of-european-processor-with-e6-2m/<br>SiPearl has already secured advanced technologies from its partners within the European Processor Initiative, industry leaders and technology companies, as well as the world's best suppliers. It operates on a fabless model. |
| **Industrie Techno** | **SiPearl lève le voile sur les microprocesseurs du futur supercalculateur exascale européen**<br>https://www.industrie-techno.com/article/sipearl-leve-le-voile-sur-les-microprocesseurs-du-futur-supercalculateur-exascale-europeen.59144<br>SiPearl presents tech choices for microprocessors: mainly based on Arm and done by TSMC in 6nm |
| **L'usine Nouvelle** | **Bruxelles accorde une aide de 6,2 millions d'euros à SiPearl pour construire l'Europe des microprocesseurs**<br>https://www.usinenouvelle.com/editorial/bruxelles-accorde-une-aide-de-6-2-millions-d-euros-a-sipearl-pour-construire-l-europe-des-microprocesseurs.N928804<br>The European Commission is providing a € 6.2 million grant to SiPearl, the start-up responsible for providing Europe with an independent source of microprocessors for supercomputers. What begin its development while waiting for the closure of a major fundraising. |
| **Electronics Weekly** | **€6.2m for europrocessor**<br>https://www.electronicsweekly.com/news/business/sipearl-bags-e6-2m-2020-02/<br>SiPearl, which is designing the europrocessor, has received €6.2 million from the Horizon 2020 R&D programme. |
| **L'usine Nouvelle** | **L'Europe en quête de souveraineté technologique** |

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| | PDF<br>Europe needs its technological sovereignty, in all fields possible, which is why EC is now pushing for this - including for EPI. |
| **Analytics India Magazine** | **Europe's unified strategy to dominate the global AI market**<br>https://analyticsindiamag.com/a-unified-strategy-by-europe-to-dominate-the-global-ai-market/<br>EPI is viewed as a step towards the Europe's independence and improvement in the sector of low-power electronics, in addition to the rest of the article which considers AI, consumer applications and online platforms |
| **Market Journal** | **Microprocessor Industry & Technological Innovation: Major Players Hitting the Reset Button**<br>http://www.marketjournal.co.uk/microprocessor-industry-technological-innovation-major-players-hitting-the-reset-button/100537/<br>Global microprocessor market report, includes EPI as one of the market players |
| **Global Server Microprocessor Market** | **Global Server Microprocessor Market - GROWTH, TRENDS, AND FORECAST (2020-2025)**<br>https://dailyscience.me/2020/03/02/global-server-microprocessor-market-growth-trends-and-forecast-2020-2025/<br>EPI is described as one of the novelties in the market - EU is developing competences in microprocessors |
| **Forbes** | **Data Center Converged Hardware Is Just A Stop On The Road To A Universal Processor**<br>https://www.forbes.com/sites/forbestechcouncil/2020/03/06/data-center-converged-hardware-is-just-a-stop-on-the-road-to-a-universal-processor/#65849ba668f1<br>EPI's CP approach mentioned in an article regarding HPC-AI convergence - among other top players in the global market |
| **HPC Wire** | **Ying-Chih Yang Joins SiPearl as Chief Technical Officer**<br>https://www.hpcwire.com/off-the-wire/ying-chih-yang-joins-sipearl-as-chief-technical-officer/<br>YC Yang, EPI's lead architect, joins SiPearl and becomes CTO |
| **AnandTech** | **European Processor Initiative Backed SiPearl Announces Licensing of Arm Zeus Neoverse CPU IP**<br>https://www.anandtech.com/show/15738/epi-backed-sipearl-announces-licensing-of-arm-zeus-neoverse-cpu-ip<br>SiPearl's press release on signing a licencing agreement with Arm - EPI is moving forward |
| **EE News Europe** | **European exascale project to leverage Arm's Zeus platform**<br>https://www.eenewseurope.com/news/european-exascale-project-leverage-arms-zeus-platform<br>SiPearl's press release on signing a licencing agreement with Arm - EPI is moving forward, a quote from Philippe Notton |
| **The Next Platform** | **Drilling down into the SiPearl European Arm server chip**<br>https://www.nextplatform.com/2020/04/22/drilling-down-into-the-sipearl-european-arm-server-chip/<br>Coverage of SiPearl's new deal with Arm - with an additional interview with the reporters: full production of Rhea is now expected at the end of 2022 |
| **ITP** | **Huawei: Ubiquitous computing will usher in a new era of connected societies**<br>https://www.itp.net/news/92161-huawei-ubiquitous-computing-will-usher-in-a-new-era-of-connected-societies<br>Liang Hua, chairman of Huawei's Board of Directors, cites EPI as a positive example of how EPI gathered 27 partners from 10 European countries who work together across a number of domains, including R&D, production, and application scenarios for computing and chips, |

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| | which has helped to promote robust development in the European computing industry through more concerted cross-sector collaboration. |
| **TechQuila** | **SiPearl – A New Contender For AMD and Intel Arrives**<br>https://www.techquila.co.in/sipearl-new-contender-for-amd-and-intel-arrives/<br>Although SiPearl and EPI are not immediate contenders, Intel and AMD cannot become complacent, because they could be challenged very soon by European efforts |
| **TechRadar.pro** | **Mighty CPU rival to Intel and AMD set to shake up the market**<br>https://www.techradar.com/news/mighty-and-surprising-cpu-rival-to-intel-and-amd-to-come-next-year<br>SiPearl, backed by EPI and EC, is using ARM IP (Zeus Neoverse CPU) to develop a new set of CPUs: Rhea, Chronos and another unnamed model. |
| **ExtremeTech** | **New Startup SiPearl Will Challenge AMD, Intel for Control of the EU HPC Market**<br>https://www.extremetech.com/computing/309901-new-startup-sipearl-will-challenge-amd-intel-for-control-of-the-eu-hpc-market<br>SiPearl has licensed the Zeus core from ARM and has massive ambitions in the HPC space. |
| **Business Weekly** | **Arm technology to drive exascale supercomputer**<br>https://www.businessweekly.co.uk/news/hi-tech/arm-technology-drive-exascale-supercomputer<br>SiPearl has signed up to use the next-generation secure and scalable Arm Neoverse platform, codenamed Zeus, as well as the robust software and hardware Arm ecosystem. |
| **European Investment Bank** | **European Investment Advisory Hub Annual report 2019**<br>https://www.eib.org/en/publications/eiah-annual-report-2019<br>European Investment Bank's Investment Advisory Hub report lists EPI in Project stories, as the one who got advice in help acquiring funds for further development. |
| **Lemagit** | **SiPearl : le processeur européen sera un ARM plus puissant qu'un x86**<br>https://www.lemagit.fr/actualites/252483159/SiPearl-le-processeur-europeen-sera-un-ARM-plus-puissant-quun-x86<br>RHEA will be 80% based on Arm |
| **HPC Wire** | **SiPearl to Open First International Operational Subsidiary in Germany**<br>https://www.hpcwire.com/off-the-wire/sipearl-to-open-first-international-operational-subsidiary-in-germany/<br>By setting up its subsidiary in Duisburg, in the Ruhr region, SiPearl will be able to build closer links with its German industrial, scientific, and academic partners, which are its stakeholders and future clients. |
| **HPC Wire** | **SiPearl appoints Craig Prunty as VP for Marketing and Business Development**<br>https://www.hpcwire.com/off-the-wire/sipearl-appoints-craig-prunty-as-vice-president-marketing-and-business-development/<br>SiPearl development and hiring are continuous |
| **HPC Wire** | **Frédéric Hannoyer Joins SiPearl as Chief Operating Officer**<br>https://www.hpcwire.com/off-the-wire/frederic-hannoyer-joins-sipearl-as-chief-operating-officer/ |

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| | SiPearl development and hiring are continuous |
| **Datacenter Knowledge** | **New RISC-V CTO On Open Source Chip Architecture's Global Data Center Momentum**<br>https://www.datacenterknowledge.com/hardware/new-risc-v-cto-open-source-chip-architecture-s-global-data-center-momentum<br>EU-funded European Processor Initiative is working to develop exascale-capable processors based on Arm, with accelerators based on RISC-V. |
| **HPC Wire** | **EuroHPC Research and Innovation Call Announced**<br>https://www.hpcwire.com/off-the-wire/eurohpc-research-and-innovation-call-announced/<br>This action will complete the European HPC supply value chain and develop a world-class supercomputing ecosystem in Europe. |
| **Heise Online** | **Digitale Souveränität bei Prozessoren**<br>https://www.heise.de/hintergrund/Digitale-Souveraenitaet-bei-Prozessoren-4876945.html<br>The EU supports the development of processors. Among other things, this should make key industries and critical infrastructures less dependent on foreign countries. |
| **HPC Wire** | **European Commission Declares €8 Billion Investment in Supercomputing**<br>https://www.hpcwire.com/2020/09/18/european-commission-declares-e8-billion-investment-in-supercomputing/<br>Ursula von der Leyen: And we want the European industry to develop our own next-generation microprocessor that will allow us to use the increasing data volumes energy-efficient and securely. This is what Europe's digital decade is all about! |
| **Datacenter Dynamics** | **European Commission proposes €8bn supercomputing investment**<br>https://www.datacenterdynamics.com/en/news/european-commission-proposes-8bn-supercomputing-investment/<br>The European Commission has proposed an €8 billion ($9.4bn) investment "in the next generation of supercomputers" over the next 13 years. |
| **Inside HPC** | **Radio Free HPC: RISC-V Deep Dive, CTO Interview**<br>https://insidehpc.com/2020/10/radio-free-hpc-risc-v-deep-dive-cto-interview/<br>RISC-V CTO Mark Himelstein mentions EPI as one of the big initiatives choosing RISC-V. |
| **The Next Platform** | **NEXT PLATFORM TV: OCTOBER 9, 2020**<br>https://www.nextplatform.com/2020/10/09/next-platform-tv-october-9-2020/<br>EPI and SiPeral in the context of players backing Arm (by University of Bristol, Simon McIntosh-Smith and Isambard 2) |
| **HPC Wire** | **SiPearl Joins the Compute Express Link (CXL) Consortium**<br>https://www.hpcwire.com/off-the-wire/sipearl-joins-the-compute-express-link-cxl-consortium/<br>SiPearl's membership in the CXL Consortium will help ensure excellence for our future clients, including major contracting authorities for high performance computing, by offering them a platform that is open to the major future standards for their industries |
| **Engadget** | **RISC-V is trying to launch an open-hardware revolution**<br>https://www.engadget.com/risc-v-upscaled-120000950.html?guccounter=1<br>RISC-V is trying to launch an open-hardware revolution - EPI is in the context of market players who are supporting this revolution. |
| **HPC Wire** | **EuroHPC Exec. Dir. Talks Procurement, EPI, and Europe's Efforts to Control its HPC Destiny** |

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| | https://www.hpcwire.com/2020/11/19/eurohpc-exec-dir-talks-procurement-epi-and-europes-efforts-to-control-its-hpc-destiny<br>The goal is an exascale machine with a European technology footprint, and another is to provide HPC access to researchers in every participating European country and ensure that HPC experience is raised in countries that haven't been in a position to do this adequately before. |

## 3.5 Scientific Publications

In the second year of the project, consortium partners published several journal articles and conference proceedings, listed below.

- M. Cococcioni, F. Rossi, E. Ruffaldi and S. Saponara, "Novel Arithmetics to Accelerate Machine Learning Classifiers in Autonomous Driving Applications," 2019 26th IEEE International Conference on Electronics, Circuits and Systems (ICECS), Genoa, Italy, 2019, pp. 779-782, https://doi.org/10.1109/ICECS46596.2019.8965031

- L. Baldanzi, L. Crocetti, S. Di Matteo, L. Fanucci, S. Saponara and P. Hameau, "Crypto Accelerators for Power-Efficient and Real-Time on-Chip Implementation of Secure Algorithms," 2019 26th IEEE International Conference on Electronics, Circuits and Systems (ICECS), Genoa, Italy, 2019, pp. 775-778, https://doi.org/10.1109/ICECS46596.2019.8964731

- F. Zaruba, F. Schuiki, S. Mach and L. Benini, "The Floating Point Trinity: A Multi-modal Approach to Extreme Energy-Efficiency and Performance," 2019 26th IEEE International Conference on Electronics, Circuits and Systems (ICECS), Genoa, Italy, 2019, pp. 767-770, https://doi.org/10.1109/ICECS46596.2019.8964820

- Bartolini et al., "A PULP-based Parallel Power Controller for Future Exascale Systems," 2019 26th IEEE International Conference on Electronics, Circuits and Systems (ICECS), Genoa, Italy, 2019, pp. 771-774, https://doi.org/10.1109/ICECS46596.2019.8964699

- M. Cococcioni, F. Rossi, E. Ruffaldi, and S. Saponara, “Fast Approximations of Activation Functions in Deep Neural Networks when using Posit Arithmetic,” Sensors, vol. 20, no. 5, p. 1515, Mar. 2020 [Online]. http://dx.doi.org/10.3390/s20051515

- L. Baldanzi, L. Crocetti, F. Falaschi, M. Bertolucci, J. Belli, L. Fanucci, and S. Saponara, “Cryptographically Secure Pseudo-Random Number Generator IP-Core Based on SHA2 Algorithm,” Sensors, vol. 20, no. 7, p. 1869, Mar. 2020 [Online] http://dx.doi.org/10.3390/s20071869

- N. Neves, P. Tomás and N. Roma, "Compiler-Assisted Data Streaming for Regular Code Structures," in IEEE Transactions on Computers, https://doi.org/10.1109/TC.2020.2990302

- M. Cococcioni, F. Rossi, E. Ruffaldi et al., “Fast deep neural networks for image processing using posits and ARM scalable vector extension,” J Real-Time Image Proc 17, 759–771 (2020). https://doi.org/10.1007/s11554-020-00984-x

- M. Kovač, P. Notton, D. Hofman, and J. Knezović, “How Europe Is Preparing Its Core Solution for Exascale Machines and a Global, Sovereign, Advanced Computing Platform,” Mathematical and Computational Applications, vol. 25, no. 3, p. 46, Jul. 2020 [Online]. http://dx.doi.org/10.3390/mca25030046

- N. Neves, P. Tomás and N. Roma, "Reconfigurable Stream-based Tensor Unit with Variable-Precision Posit Arithmetic," 2020 IEEE 31st International Conference on Application-specific Systems, Architectures and Processors (ASAP), Manchester, United Kingdom, 2020, pp. 149-156, https://doi.org/10.1109/ASAP49362.2020.00033

- M. Cococcioni, F. Rossi, E. Ruffaldi and S. Saponara, "A Novel Posit-based Fast Approximation of ELU Activation Function for Deep Neural Networks," 2020 IEEE International Conference on Smart Computing (SMARTCOMP), Bologna, Italy, 2020, pp. 244-246, https://doi.org/10.1109/SMARTCOMP50058.2020.00053

- T. Hotfilter, F. Kempf, J. Becker, D. Reinhardt and I. Baili, "Embedded Image Processing the European Way: A new platform for the future automotive market," 2020 IEEE 6th World Forum on Internet of Things (WF-IoT), New Orleans, LA, USA, 2020, pp. 1-6, https://doi.org/10.1109/WF-IoT48130.2020.9221396

- S. Alcaide, L. Kosmidis, C. Hernandez and J. Abella, "Software-only based Diverse Redundancy for ASIL-D Automotive Applications on Embedded HPC Platforms," 2020 IEEE International Symposium on Defect and Fault Tolerance in VLSI and Nanotechnology Systems (DFT), Frascati, Italy, 2020, pp. 1-4, doi: https://doi.org/10.1109/DFT50435.2020.9250750


Accepted for publication, but not yet published:


- M. Cococcioni, F. Rossi, E. Ruffaldi, S. Saponara and B. de Dinechin, "Novel Arithmetics in Deep Neural Networks Signal Processing for Autonomous Driving: Challenges and Opportunities," IEEE Signal Processing Magazine

- A. Bartolini, G. Bambini, C. Conficoni, A. Tilli, S. Benatti, R. Balas and L. Benini, "An Open-Source Scalable Thermal and Power Controller for HPC Processors," IEEE International Conference on Computer Design (ICCD) 2020

- P. Nannipieri, M. Bertolucci, L. Baldanzi, L. Crocetti, S. Di Matteo, F. Falaschi, L. Fanucci and S. Saponara, "SHA2 and SHA-3 accelerator design in a 7nm technology within the European Processor Initiative," Microprocessors and Microsystems

- F. Zaruba, F. Schuiki and L. Benini, "Manticore: A 4096-core RISC-V Chiplet Architecture for Ultra-efficient Floating-point Computing," IEEE Micro

- C. Bernardeschi, A. Domenici, M. Palmieri, S. Saponara, T. Sassolas, A. Wicaksana and L. Zaourar, "Cross-level co-simulation and verification of an automatic transmission control on embedded processor," 4th Workshop on Formal Co-Simulation of Cyber-Physical Systems

# 3.6 Website and Social Media

EPI's website and social media were set up as the main vehicles of communication to the outside world: used as a platform to explain the project goals, mission, vision, streams of the project, present consortium partners and eventually, present project results.

They were continued to be used as their original purpose was set – to promote EPI, share news, and serve as a platform for disseminating project results and materials.

## 3.6.1 EPI Website and Analytics

The website, in addition to the usage of social media, remained EPI's main tool to share news, factsheets, links to Open Access (OA) of journal articles and conference proceedings, and events' participation. In comparison to M12, the structure remains the same, with the addition of EPI Forum segment, which was used to centralize the news about the Forum and make them more prominent with a separate menu item.

The Dissemination and Communication Press Repository remains the most active part of the website – with now more than 200 items stored and available there – even with considering the confidentiality of some materials which are consequently then not stored there.

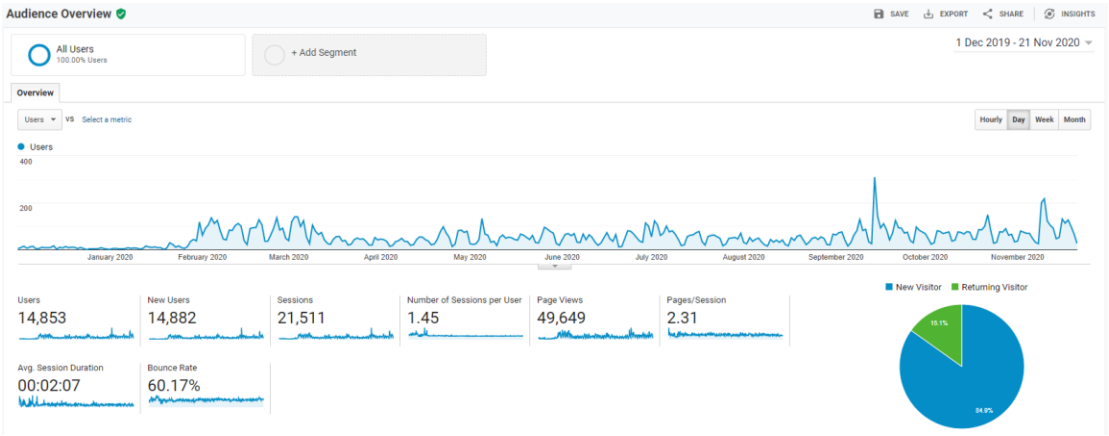


**Figure 7. Audience overview for the period M13-M24**

The report submitted in D24.2 listed 1,864 total users of the website, so the total increase in users in the last year has been a soaring 696% increase.

The peaks in February and March correspond, as in social media visits, to the period of announcing and unfortunately postponing the first EPI Forum. The peaks in September correspond to a soaring activity in EPI online events, with 12 events where EPI partners participated and presented either papers or presentations about the project, while the peak in November is the issue of the second EPI press release.

## 3.6.2 EPI Social Media

In the second year of EPI's existence, its social media channels were aimed at continuing raising awareness and the project was planning on utilizing them towards the stage of sharing some of the

first results of the project, as well as advertising our first EPI Forum. The pandemic put a stop to most of that activity, so EPI refocused its efforts towards sharing links to OA papers, factsheets and other materials created in the lack of attending physical events.

Later in the second year, in M19 onwards, as more and more online events started taking place, social media was once again used to advertise participation in those, as well as to relay materials (paradoxically, even more accessible now since most of the presentations were recorded by default and necessity).

In addition to those, EPI's members started to consider a podcast – with first episode recorded and published. Further episodes are being planned as the project progresses and more results become available, providing topics for in-depth technical discussions.

### *3.6.2.1 Twitter*

Twitter remained EPI's social media channel of choice for its instant quality.

**Table 6. Twitter summary M13-M24**

| Month | Tweets | Tweet impressions | Profile visits | Mentions | New followers |
|---|---|---|---|---|---|
| December 2019 | 7 | 21,400 | 166 | 6 | 33 |
| January | 17 | 31,000 | 378 | 33 | 74 |
| February | 4 | 16,800 | 182 | 15 | 25 |
| March | 7 | 14,100 | 162 | 12 | 30 |
| April | 5 | 9,716 | 265 | 13 | 38 |
| May | 11 | 19,400 | 142 | 4 | 26 |
| June | 5 | 9,868 | 114 | 19 | 38 |
| July | 5 | 8,887 | 127 | 10 | 37 |
| August | 1 | 4,976 | 48 | 9 | 12 |
| September | 7 | 12,200 | 281 | 17 | 50 |
| October | 5 | 10,000 | 213 | 12 | 40 |
| November | 14 | 28,900 | 595 | 44 | 71 |

Overall number of followers in M12 was 545, with 114 tweets, while one year later it is 1,037, with 219 tweets.

Total insights in the moment of writing this deliverable (M24) is as follows:

**Table 7. Twitter insights M13-M24**

| Impressions total | Engagements sum | Total retweets | Total likes | Total URL clicks |
|---|---|---|---|---|
| 134,156 | 3,097 | 277 | 563 | 575 |

### *3.6.2.2 LinkedIn*

LinkedIn numbers are hand-in-hand with the Twitter steady growth in following. With almost one thousand subscribers nearing in M24, EPI LinkedIn has established itself as a channel where professionals from the relevant branches can come access news from the project.

**Visitor Metrics** for page views and job function (Figure 8 and 9) show that, similarly to the first year, the interest peaked at the publication of the press release regarding the Forum, and with notable peaks in days when more online events started happening (e.g. RISC-V Global forum, Linaro Connect, KSC20,…). Unlike the numbers in M12, when top three interest of visitors were Engineering, Research and Business Development, the interest of visitors has also included media to go to the second place – which is a great sign for the visitors section of EPI – more representatives of media are visiting EPI LinkedIn channel.

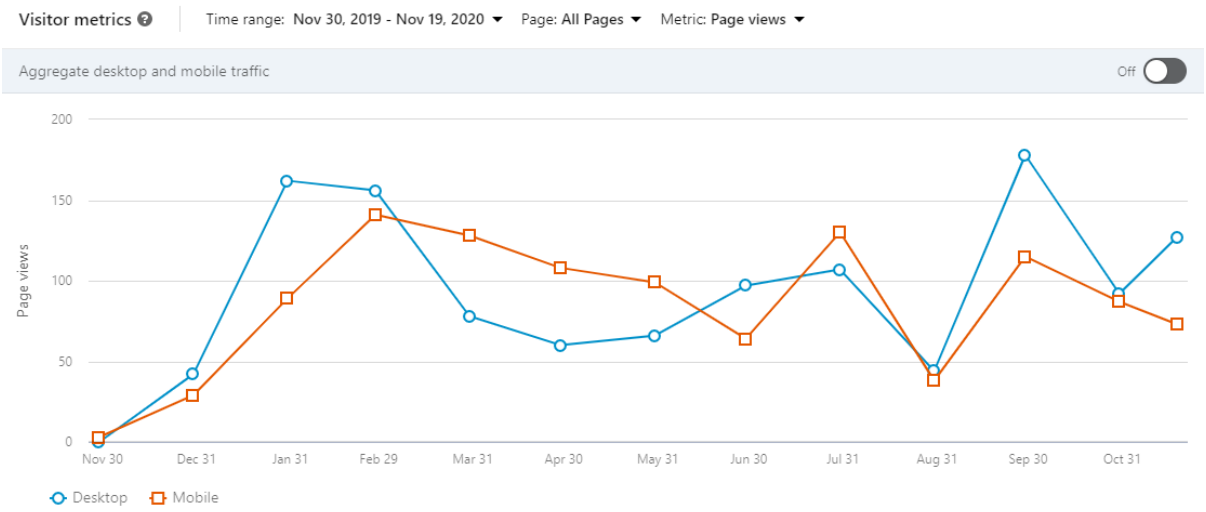


**Figure 8. Visitor metrics on LinkedIn - page views**

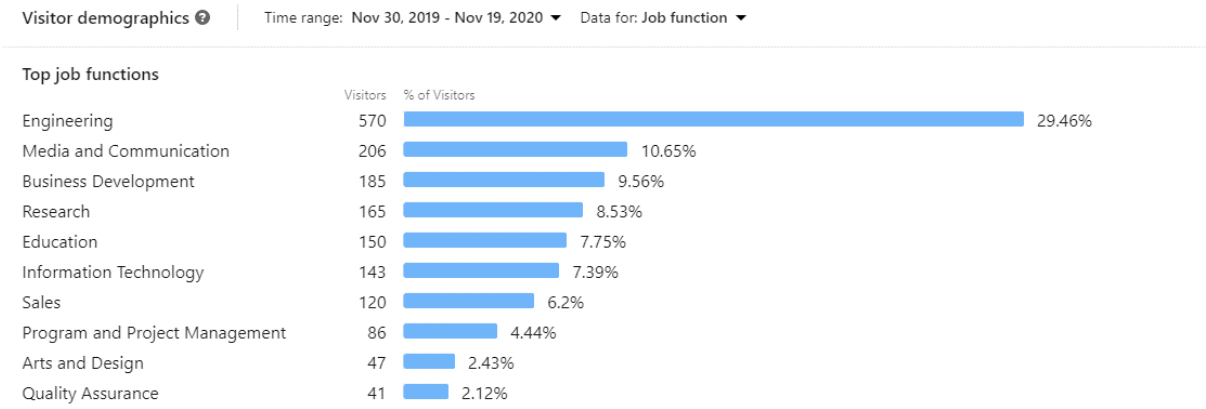


**Figure 9. Visitor demographics on LinkedIn - top job functions**

**Follower Metrics** show the highest number of new followers was attracted (Figure 10), at the announcements of EPI First forum and at the peak of online events' activity in September.


**Figure 10. Follower metrics on LinkedIn - New Followers**

Follower demographics (Figure 11) show correspondence to Visitors. Top three job functions are again Engineering, Research and Business Development, same as last year; while Industry segment is IT and Services, Semiconductors and Research (Figure 12).

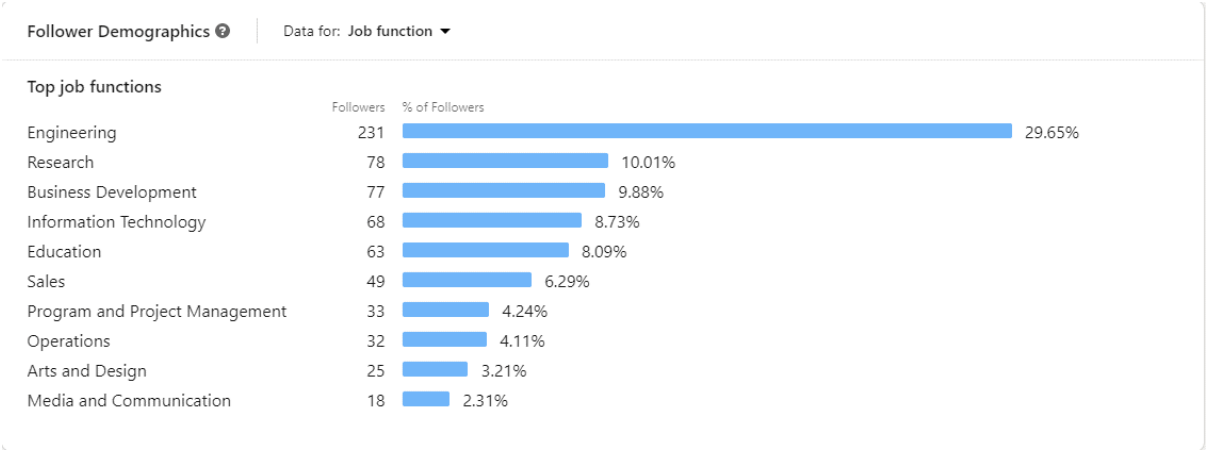


**Figure 11. Follower Demographics on LinkedIn - Job function**

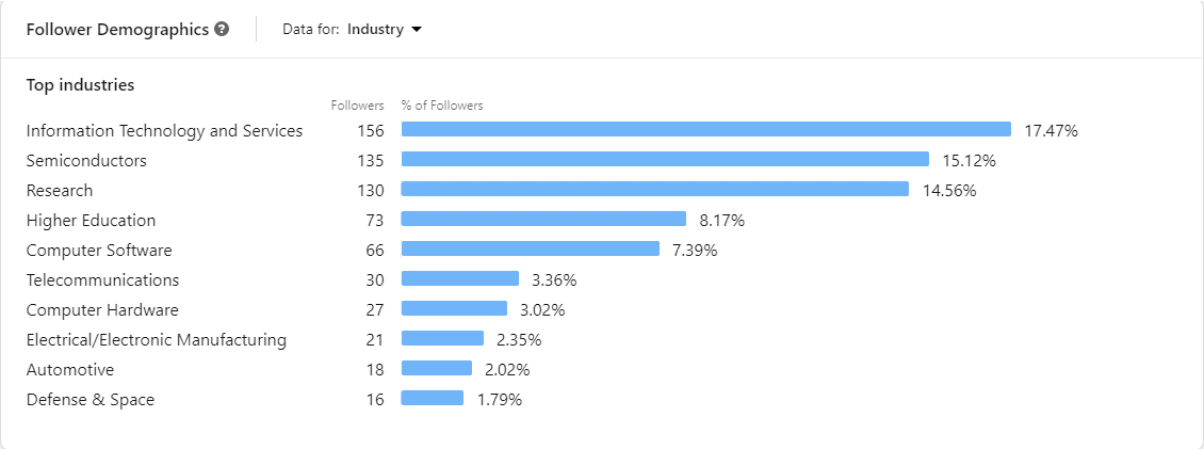


**Figure 12. Follower Demographics on LinkedIn - Industry**

### *3.6.2.3 YouTube*

Figure 13 shows 92 subscribers to our channel, and view numbers for EPI's own videos. What could be utilized more is the potential YouTube has to make EPI's content more visible and distributed. As it was mentioned in D24.2, EPI YouTube remains with two streams of operation – uploading EPI's own videos and linking presentations and speeches by EPI partners and collaborators, where EPI does not own the content. In addition to that, the channel also lists videos where EPI was mentioned or addressed by other notable members of the community (reporters, other experts).

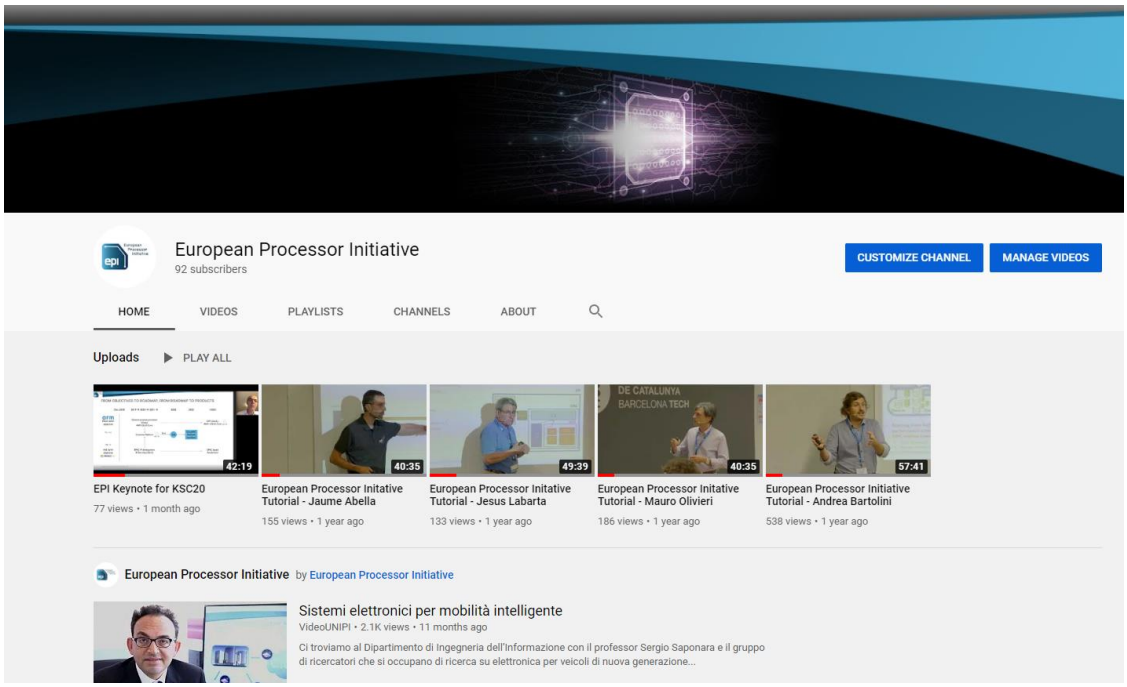


**Figure 13. Views on EPI videos on YouTube at M24**

# 4 Conclusion and Future Plans

The second year of EPI has started off with a strong move towards the second stage, with the ramping up of activities in order to lead to a natural highlight of the year – first EPI Forum, followed by strong events' presence in huge HPC venues like ISC, Teratec, Arm User Group, HPC Summit, DATE2020, etc. Unfortunately, all of this was uprooted and changed fundamentally, starting with the cancellation of what was going to be our debut in international events' presence, up to a globally unprecedented health challenge.

Regardless of these challenges, this report has shown that EPI has managed to maintain its online presence, get a great deal of press coverage and a steady increase in following on social media as well as visits to its website. While face-to-face or in-person meetings are a no-go in the current situation, remote presentations are still a viable communication channel for updating customers and prospects about the status and the outcome of EPI.

Materials are being developed steadily, online participation increased as partners get more involved in this new online-scheduled world and scientific and academic production shows EPI academic and industrial partners are building steadily towards disseminating more and more of the outcome of EPI and of their results.

Future plans include adapting improving even more to the online and virtual reality of dissemination and communication to cope with the pandemic world we now exist in – such as production of more videos, further development of podcast episodes, more factsheets and unwavering presence in EPI's social media channels.