ETP4HPC GENERAL ASSEMBLY

21 MARCH 2017

ETP4HPC- SME Work Group

Progress report

ACTIVITIES 2016-2017

Content / agenda

1. Development of SME members 2016
2. Steering Board activities
3. SME Workshop
4. General Assembly
5. Outlook 2017

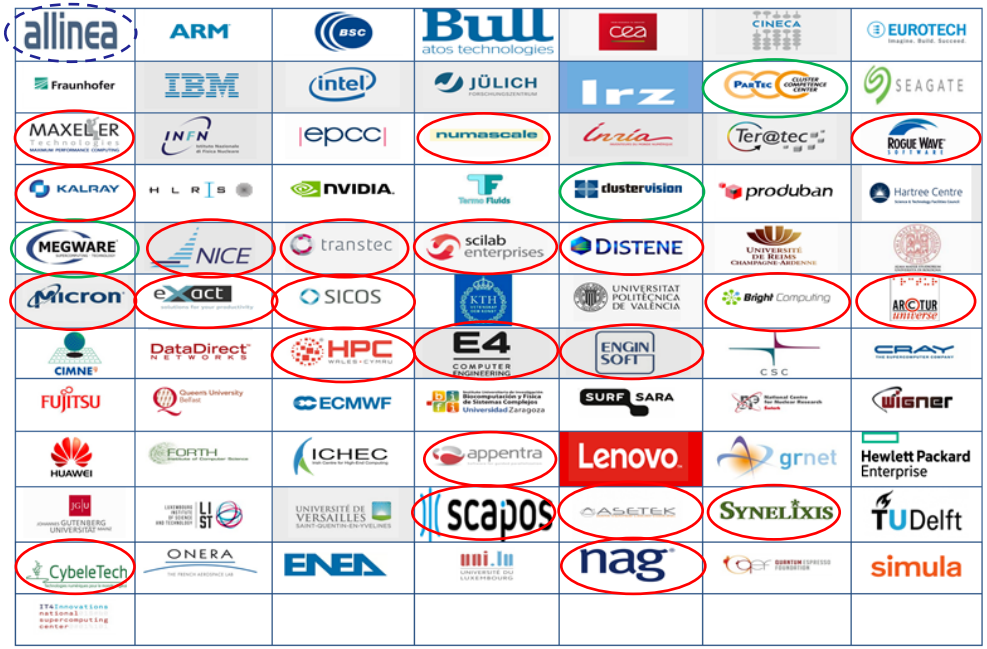
STEERING BOARD 2016

Content / agenda

1. Presentation of a revised high level strategy for SME-WG
2. Closer cooperation between EXDCI and SME-WG
3. Organization of a Workshop
4. Goals for 2017

Overview of ETP4HPC SME members by category

- During 2016, 3 new SME's joined ETP4HPC
- In December 2016, Allinea left as a SB member



We need to map the SME's based on the ecosystem pillars and, if possible, quantify the European sales / FTE's / position and also the latest number of members

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WORKSHOP

The ETP4HPC SME-WG will:

- Communicate more with the members and provide useful information to SME members in order to increase SME involvement in ETP4HPC:
  - EXDCI;
  - SME Instrument;
  - Calls H2020;
  - VC's, EIB-funding, CSA;
- Increase visibility of HPC-SME's within the cPPP and create a platform which stimulates and supports SME's to participate in (consortia's for) EsD projects
  - Have the CE support SME's in participating in EU projects by actively supporting and promoting SME's (by including rules and regulations in Terms and Conditions)
  - Discuss with future leaders of EsD's and large enterprises to include SME's
  - Promote SME's during the round table discussion at the HPC summit
  - Provide earmarked budgets for SME's
- Organise meet & greet between SME's and CoE's and research organisations (@ the HPC summit in Barcelona)
- Include standard progress report regarding SME activities during the cPPP-meetings
- Continue to promote the 2015 position paper to the EC

POSITION PAPER SME'S JANUARY 2015

ETP4HPC, the European Technology Platform for High-Performance Computing recognises the value of SME participation in the European HPC Value Chain. The development of HPC technologies in Europe should provide a number of SME with an opportunity to become globally competitive players in this market. European SMEs are capable of achieving success in this process; however, a number of support mechanisms are needed to facilitate SME development:

Recommendations:

- After project completion, its results are not market ready. There should be **a 2nd round of financial support** for the projects that qualify during project lifetime **for additional development** (i.e. further funds for the development and market launch phase, e.g. arranging venture capital, marketing activities).
- We suggest an EU supported platform to facilitate communication with **venture capital**. ETP4HPC should approach the EC to request support in managing this continuous venue involving SME, Start-Ups and Capital (as a joint undertaking of ETP4HPC and the EC)
- HPC Centres have introduced a requirement for **a demonstrated track record** in their procurement (e.g. systems in top 500) which excludes SMEs. We recommend lowering this requirement in order to allow SMEs to participate.

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POSITION PAPER SME'S JANUARY 2015

Recommendations:

- System installation happens before payment is executed –which causes problems for small companies by exerting an excessive financial load on them **SMEs need instruments for finance their orders.** 1/ Request a change in the procurement process (e.g. in the US procurers sometimes pay in advance). 2/ Special loans to be requested from the European Investment Bank (the EC could facilitate this request). It is also recommended to 3/ increase the length of procurement cycles (following the US example).
- **H2020 SME Instrument** should be analysed in order to identify the areas that might benefit SMEs active in HPC
- In the next phase (i.e. following a successful start-up) – **training and consulting on SME growth** is needed to stimulate development
- **Access to the EC and its knowledge resources** – there should be regular meetings between SMEs and the EC
- SME's finds it hard to enter projects because of their size. SME needs the ability to partner up in consortia and they require the **knowledge** of the procedures related to **EC funding and projects**.
- We recommend establishing an **ETP4HPC SME Award** – for the best European SME in the area of HPC technology.
- Creating co-design / co-development **partnerships with Research Centres/Universities** and other customers (e.g. industry)

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KPIs and cPPP report

Jean-Philippe Nominé
ETP4HPC Office

ETP4HPC General Assembly

Munchen – Tuesday, March 21st , 2017

Importance of Ecosystem and Programme Monitoring

- Important aspect of the cPPP: impact assessment
- Supported by EXDCI H2020-funded project (CSA)
  - WP7 ‘small’ team
  - Joint effort with DGCNECT

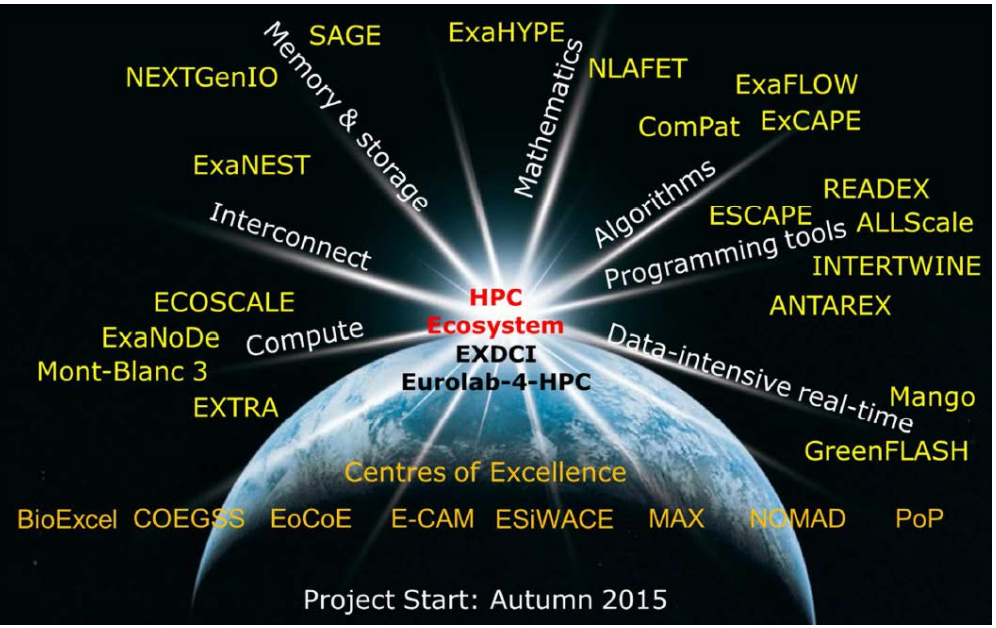
Work in Progress

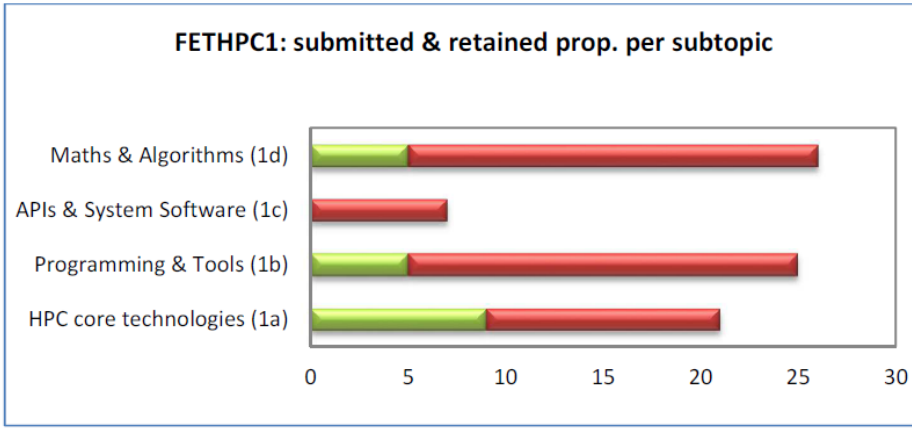
- Internal reports 2014, 2015
- Mid-term review 2017 = 2016 report
- Diversity of sources
  - ETP4HPC activities
  - EXDCI survey
  - ETP4HPC surveys (thank you for contributions…)
  - EC
  - IDC/Hyperion study
  - PRACE
  - …
- Quantitative (socio/eco) indicators / under construction

QUICK HIGHLIGHTS

ETP VS. NON ETP – INDUSTRY VS. RESEARCH…

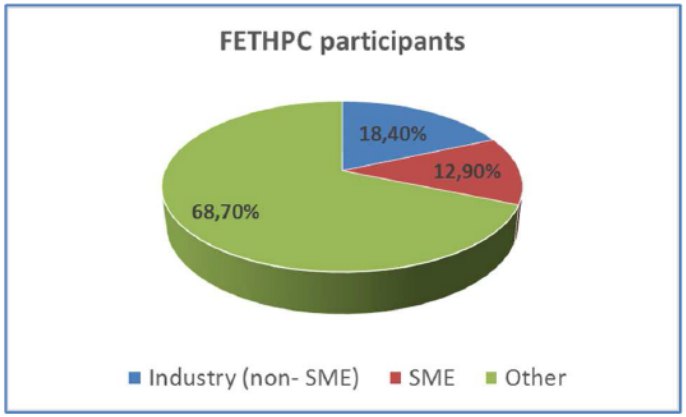
Topic	*Type of actions*	*Funding*	*Closing Date*
FETHPC-1-2014: HPC Core Technologies, Programming Environments and Algorithms for Extreme Parallelism and Extreme Data Applications[7]	RIA	€93.4 M	25 November 2014
FETHPC-2-2014: HPC Ecosystem Development[8]	CSA	€4 M	25 November 2014
E-INFRA-5-2015: Centres of Excellence for computing applications[9]	RIA	€40 M	14 January 2015

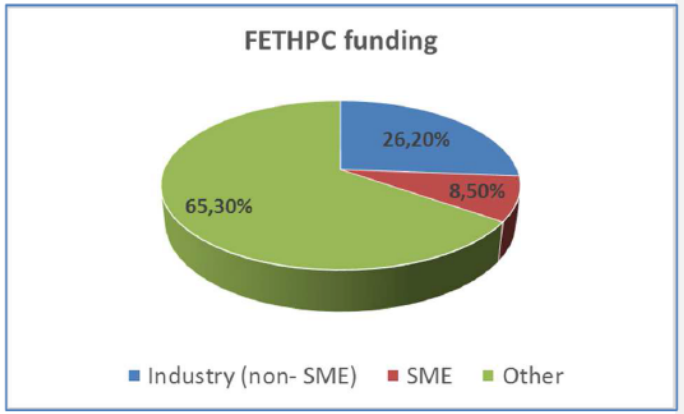


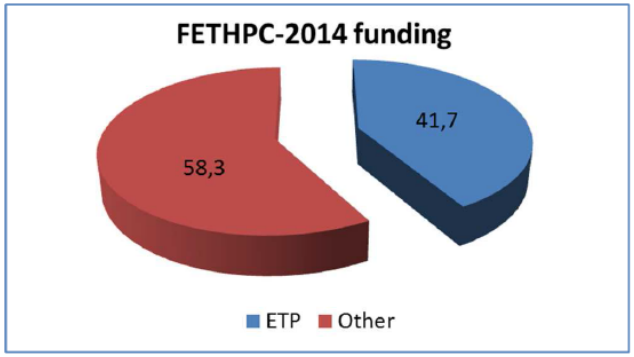


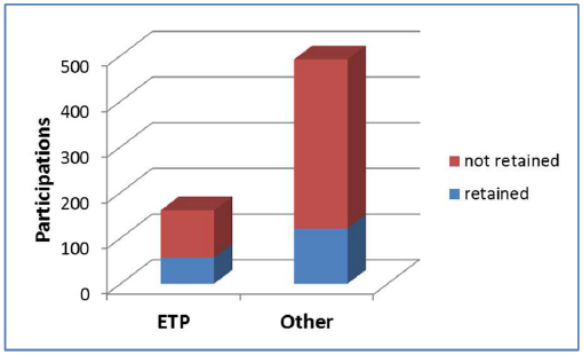
FETHPC-1 (RUNNING PROJECTS)

FETHPC 14-15	Participants	Funding (€M)	% participants	% funding
Industry (non- SME)	51	32,8	18,4%	26,2%
SME	21	8,1	12,9%	8,5%
Other	163	94,5	68,7%	65,3%









Fraction of FETHPC awarded o ETP4HPC members or non-members
(Left: funding – Right: number of participants, also including consortia which were not retained)

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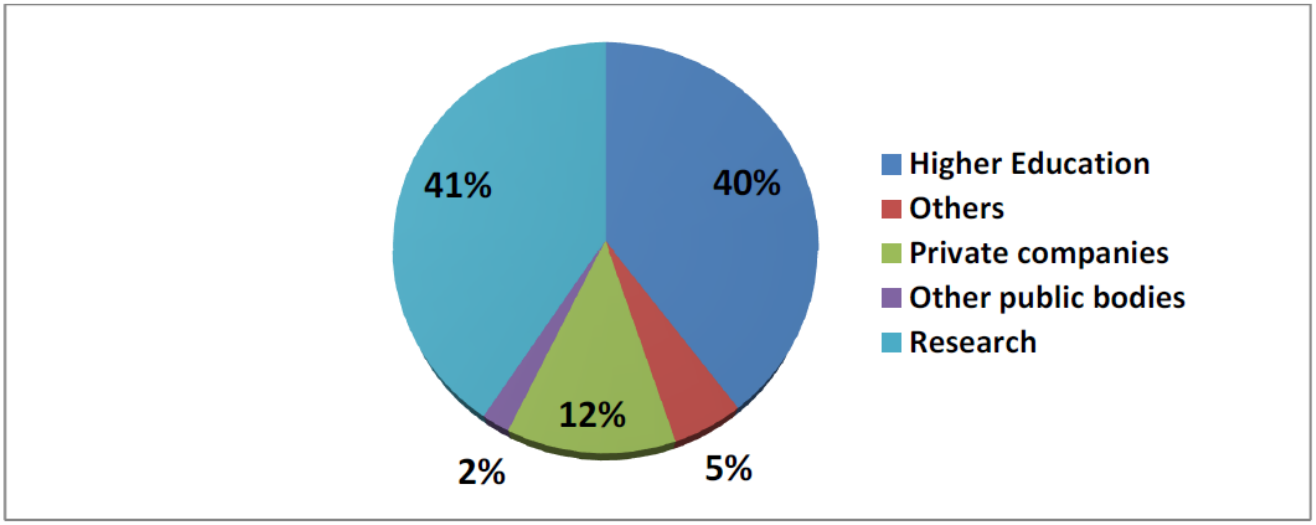
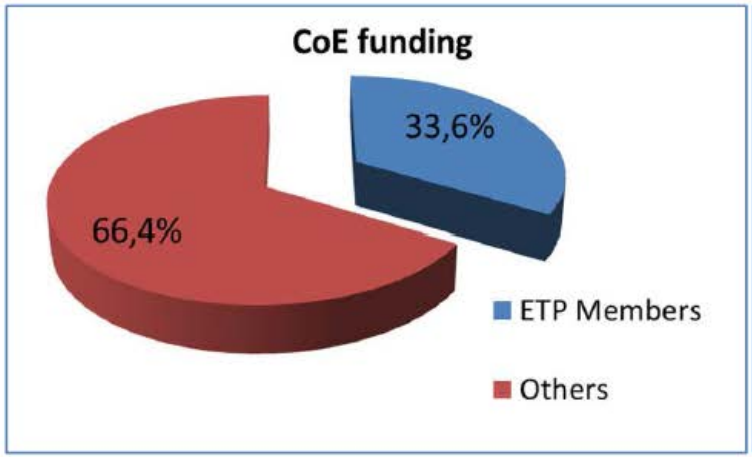
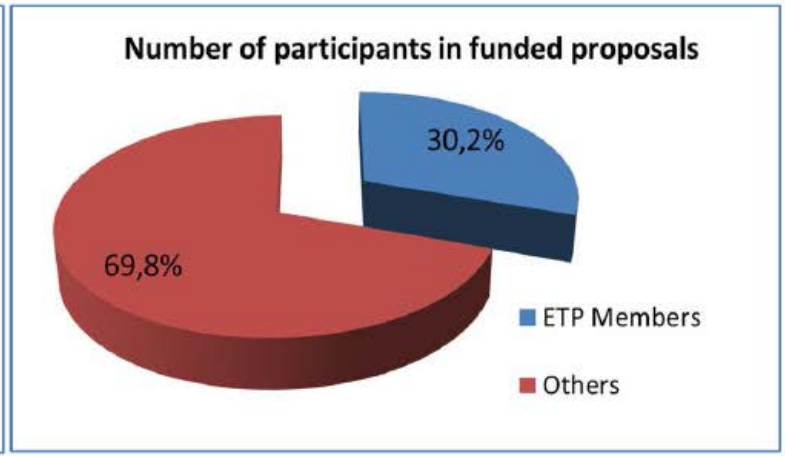
CoEs (8 of 2015)

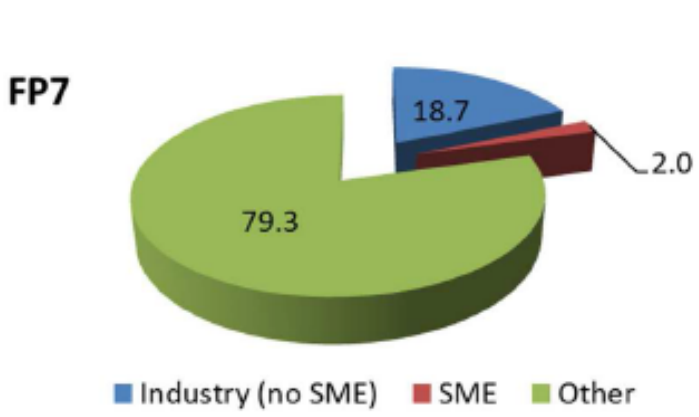


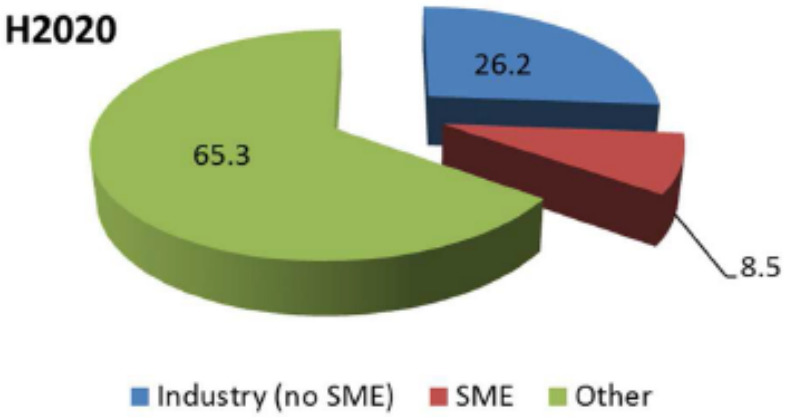
Distribution of number of CoE partners by category
NB: SMEs account for 7% of the total (subset of Private Companies)





In the case of Exascale technology projects, it is possible to measure quantitatively the progress which was made involving industry in this initiative and to assess the impact of the cPPP in raising the visibility of HPC at a European level. Five Exascale projects were funded through a dedicated call during the previous framework programme. In about 2 years, industry and SME participation in Exascale projects (both in terms of EC contribution and number of partners) has increased from about 19% and 2% to 26% and 8.5%, respectively. Therefore, overall industry participation has increased by more than 60% and SME participation has increased by a factor of 4.





FETHPC 2016

- 9 submissions
- 2 projects selected, in the process of joining the portfolio of 19 FETHPC-1 running ones

Topic	***Type of actions***	***Funding***	***Opening Date*** ***Closing Date***
FETHPC-01-2016: Co-design of HPC systems and applications[13] *The Commission considers that proposals requesting a contribution between EUR 10 and 20 million would allow this specific challenge to be addressed appropriately.*	RIA	€41 M	14 April 2016 26 September 2016

QUALITATIVE

- Intense ecosystem exchanges and stakeholders involvement, e.g.:
  - ETP4HPC SRA , incl. EsD concept
    - involving ETP members, PRACE experts, CoEs, BDVA
    - cross-reflections/referencing with HiPEAC and Eurolab-4-HPC
  - EXDCI
  - HPC Summit Week
  - SC BoF sessions
    - promoting EU exascale projects (2015, 2016, 2017 being planned…)

SRA and EsD Workshops

EXDCI Workshop, HPC Summit, May 9, 2016, Prague: The summit week started with the EXDCI workshop, during which, Dr Michael Malms presented ETP4HPC's update on its Strategic Research Agenda (SRA2).Other presentations during this workshop where made by the Centres of Excellence and by the FETHPC Projects.

ETP4HPC Extreme-Scale Demonstrators Workshop, May 12, 2016, Prague: ETP4HPC held its Extreme-scale Demonstrator Workshop during the European HPC Summit Week. This workshop was organised to provide a key input for the preparation of the EsD Calls for Proposals, which ETP4HPC will put forward in Work Programme 2018/20. The workshop was attended by representatives of FETHPC and other European HPC Technology projects, Centres of Excellence in Computing Applications and PRACE (workshop presentations).

ETP4HPC EsD Integrators Workshop, BSC, September 22, 2016, Barcelona: ETP4HPC facilitated a workshop on Extreme-scale Demonstrators (EsDs) during the EXDCI Technical Meeting. The objective of this workshop was to align the scope of the EsDs with the requirements of the European integrators and determine how they would like to get involved in potential EsD projects.

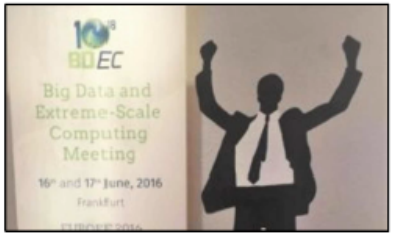
Connecting with BDVA and HiPEAC, BDEC

HiPEAC's Conference January 18 to 20, 2016, Prague: ETP4HPC's chairman, Jean-François Lavignon, was an invited speaker at HiPEAC's 11th Conference, which took place over three days and attracted over 600 delegates this year. He presented ETP4HPC's activities during the 9th edition of the MULTIPROG workshop, which aims at bringing together researchers interested in programming tools, run-times and computer architecture.

BDVA Summit, Nov 29 - Dec 2, 2016, Valencia: ETP4HPC being represented by Marcin Ostasz, in different sessions: panel on collaboration with other European initiatives such as IPCEI and ARTEMIS, giving a presentation on the importance of HPC. Parallel Session/Working Group titled 'High Performance Data Analytics: Big Compute and Big Data Working Together for European Success'

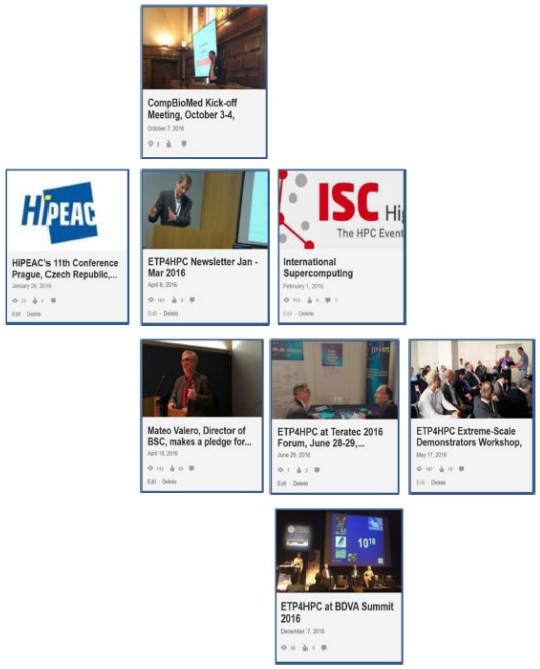
HiPEAC Computing System Week, April 20-22, 2016, Porto: ETP4HPC presented the European HPC eco-system, our Strategic Research Agenda, the main technological challenges of the European HPC technology industry and the EXDCI project.

ETP4HPC participated in the **Big Data and Extreme-Scale Computing (BDEC) 4th closed workshop in Frankfurt.** BDEC brings together experts from the U.S., Japan and Europe on Big Data and exascale developments, focussing "Pathways to Convergence" between big data and exascale computing.



GOVERNANCE OF THE cPPP

- Governance of the cPPP
  - 2 Partnerships Board / year
  - now encompassing reps. of all nine CoEs



Participation in EC events

[cPPP-ICT Proposers' Day](#) **2016, September 27, Bratislava:** Marcin Ostasz, ETP4HPC Office expert at BSC, took part in a panel discussion, during the 'Inside contractual Public Private Partnerships' (cPPPs) Ideal-ist Workshop, with other cPPP representatives. The areas of discussion covered: 5G; Photonics; HPC; Cybersecurity; FoF; Big Data; and Robotics.

Dr Kalbe of EC HPC & Quantum Computing Unit met ETP4HPC on the occasion of his BSC visit, Sept 23, 2016, Barcelona: He joined the Steering Board meeting, where he provided an update on the EC-related developments, saying that HPC remains one of the top priorities of this new DG, with ETP4HPC remaining the body contributing to the EC's research work programme.

Round-table on Digitising European Industry, September 20, 2016, Brussels: The Chair of ETP4HPC, Jean-François Lavignon, attended - as an observer - the Round-table on Digitising European Industry with Commissioner Oettinger, and with also Commissioners Bienkowska and Moedas present. This Round-table kicked-off the governance and coordination framework for the "Digitising European Industry" (DEI) initiative.

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HPC SOFTWARE WG

Prof Mark Parsons
m.parsons@epcc.ed.ac.uk

Working Group Remit

- "HPC Software WG" is a forum for discussion around issues concerning software in HPC and HPDA
  - Software = scientific software, system software, libraries, …
- Aim is to share knowledge and experiences, to identify strengths & weaknesses, and (possibly) influence funding calls
- Three core areas identified for the WG to address
  - Scalability & efficiency
  - Engineering & design
  - Sustainability
- Encouraging uptake of software from existing FET projects & COEs

WG Life To Date

- WG first announced at GA 1 year ago
- Kick-off call 10th June 2016
  - 13 attendees
  - Focus on defining the remit
- Follow-up call 12th January 2017
  - 12 attendees
  - Gap analysis: What does Europe already do well? Where can we improve?

Immediate Next Steps

- Follow-up planned for April
- Actions
  - Complete gap analysis
  - Survey HPC software landscape in FET-HPC and CoE projects
  - Update WG website

EASC 2018

- Established by EPCC in 2013
- Exascale Applications and Software conference
  - Focus on software for the Exascale
  - 100+ attendees from Europe, USA, Russia and Japan
  - Previous instances in Edinburgh (2013, 2015) and Stockholm (2014, 2016)
- Skipping this year, next conference in Spring 2018
- Want to involve and leverage HPC Software WG

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BIG DATA EXTREME SCALE COMPUTING - BDEC

General Assembly, Munchen, March 21st

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Presentation agenda

- What is BDEC ?
- Status of BDEC
- International news

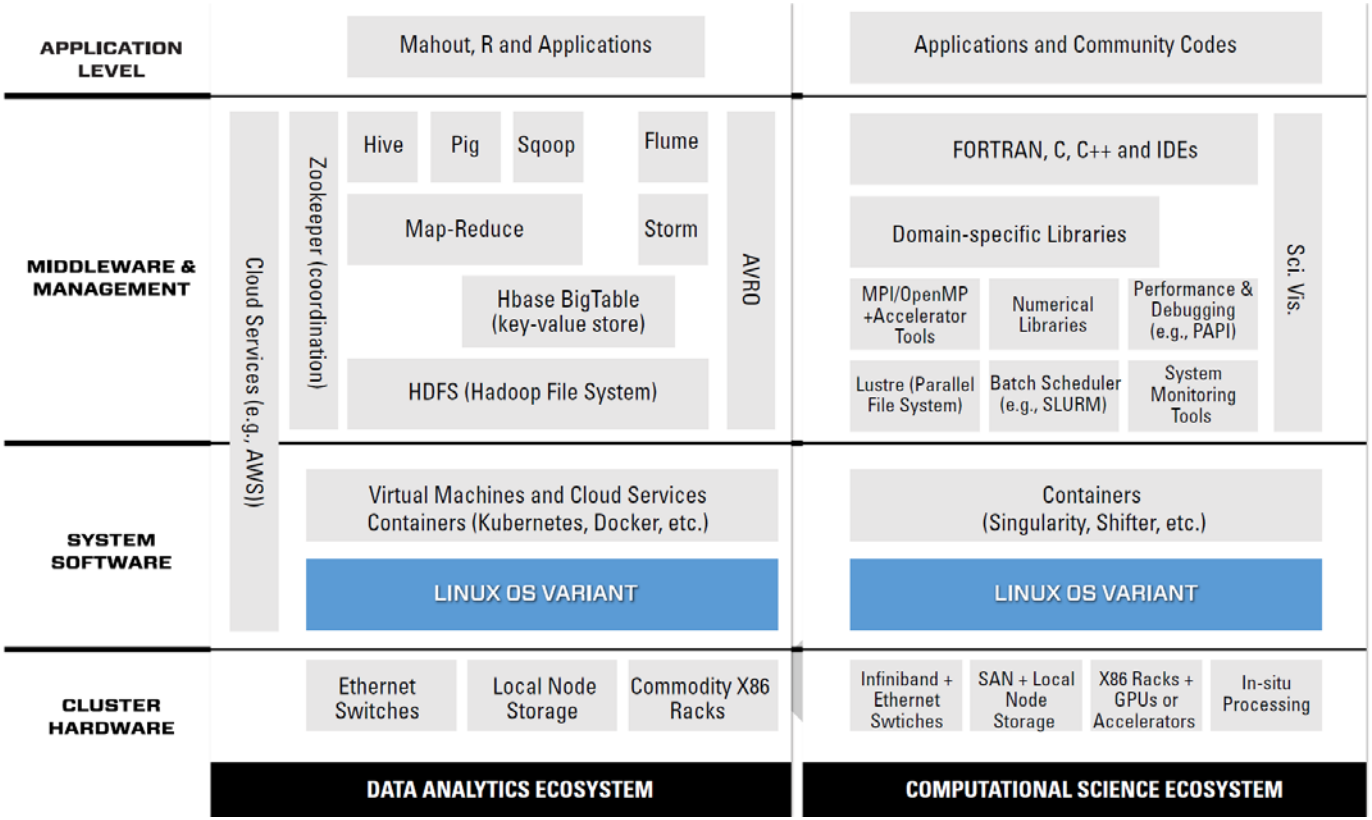
BDEC ID CARD

- Think tank
  - Experts from US, Asia and Europe with expertise in HPC and data
  - Continuation of IESP (International Exascale Software Project)
  - Aiming to develop a common vision on software challenges for BDEC applications
- How does it work ?
  - 2 days workshops with ~80 attendees : Charleston, Fukuoka, Barcelona, Frankfurt, Wuxi
  - Some meetings during ISC and SC
- Output
  - A document “pathways to convergence”
- More details
  - http://www.exascale.org/bdec/

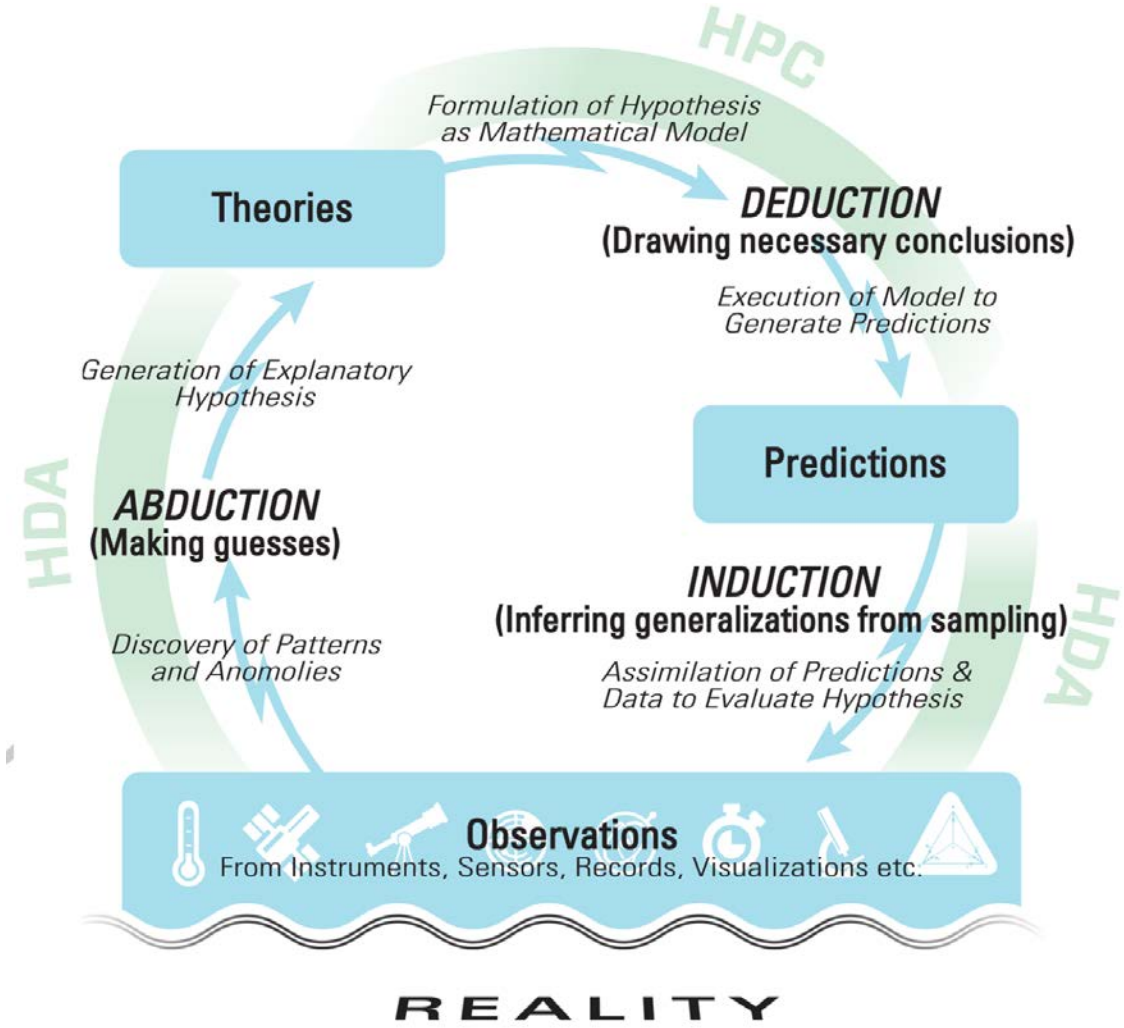
BDEC IN ACTION

VISION FOR BDEC APPLICATION

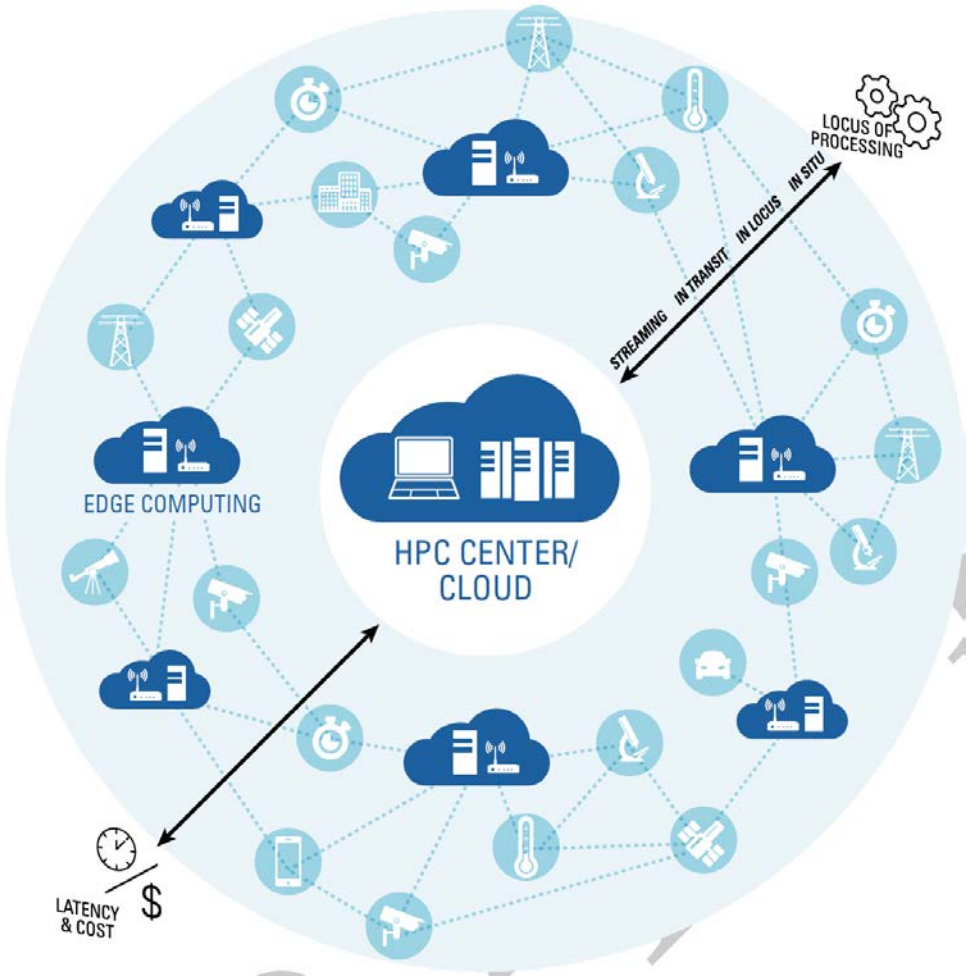
- Today 2 approaches for BD and HPC



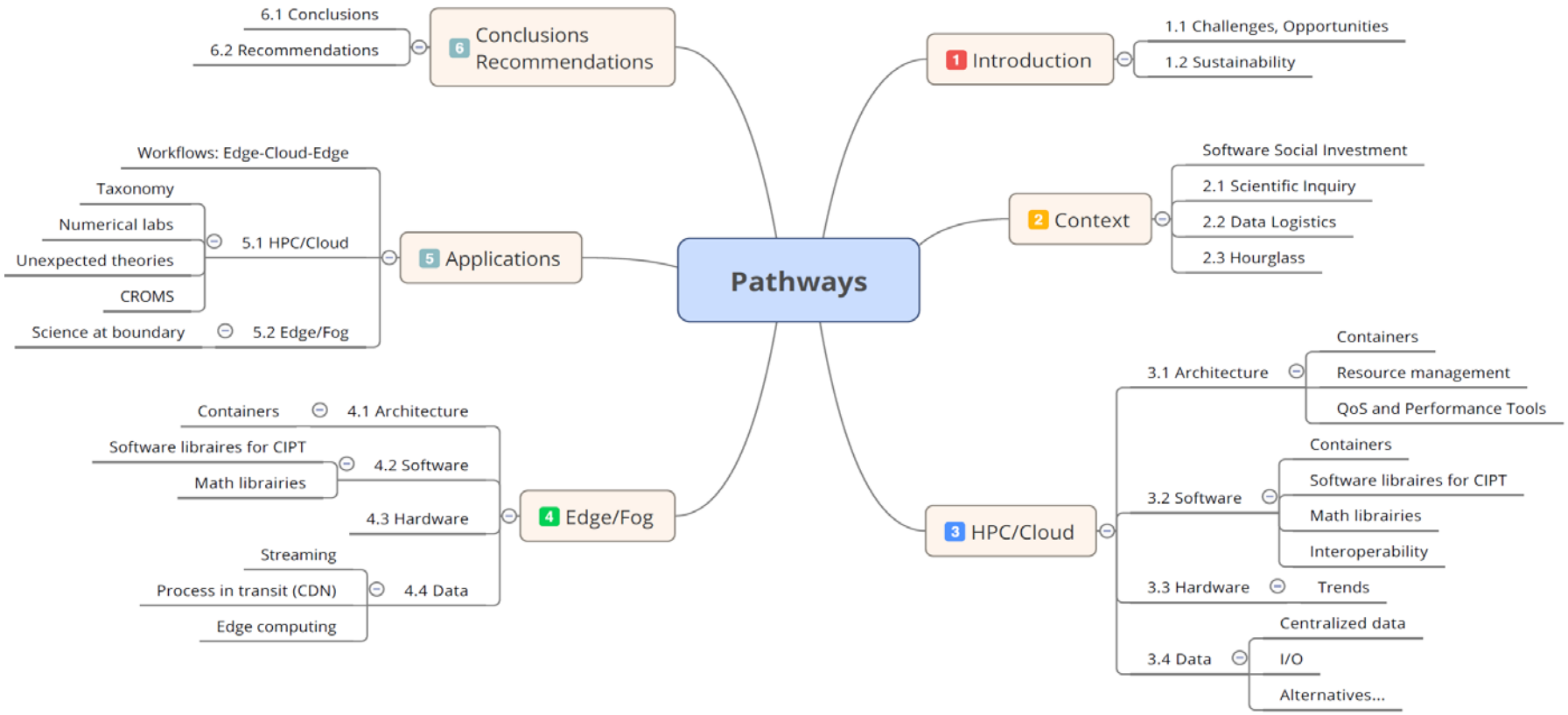
OBJECTIVE IS TO SUPPORT END TO END APPLICATIONS



FRAMEWORK FOR INTEGRATED COMPUTING



Draft document "pathways to convergence"



China

- Wuxi Sunway TaihuLight system

China projects

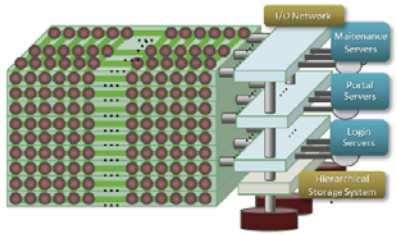
- MOST HPC plan 2016-2020
  - 3 exascale pilot systems in parallel
    - Sunway successor
    - Tianhe successor
    - Sugon
  - Selection end of 2017 for national exascale system
  - Support of 19 HPC applications project for 310Y M
- Other efforts on Big Data
  - 15 projects for 389YM
  - Use of Tianhe for Big Data
  - Development of a Deep Learning framework on Sunway

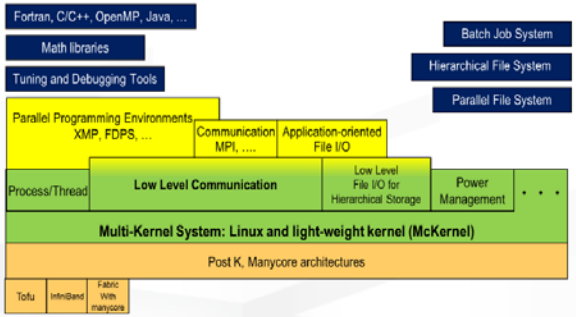
JAPAN POST K

An Overview of Post K

- **CPU architecture**
  - ARMv8-A + SVE + Fujitsu's extension

    FP64/FP32/FP16
- **Completion of Functional design of system software and start of implementation**

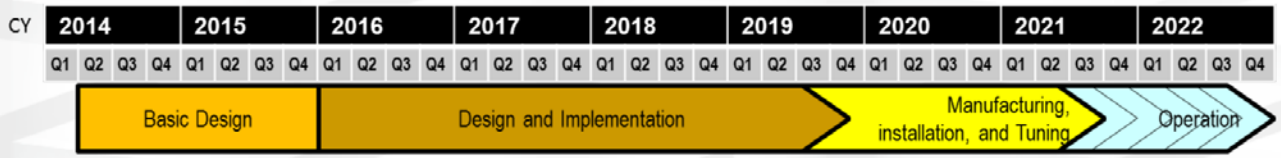




- McKernel is a light-weight kernel with Linux API.
  - New features, such as for manycore and deep memory hierarchy, can be implemented without modification of Linux
  - It runs on Intel Xeon and Xeon phi, and Fujitsu FX100 (SPARC)

- McKernel is running on the Oakforest-PACS supercomputer, 25 PF in peak, at JCAHPC organized by U. of Tsukuba and U. of Tokyo

- **Schedule**



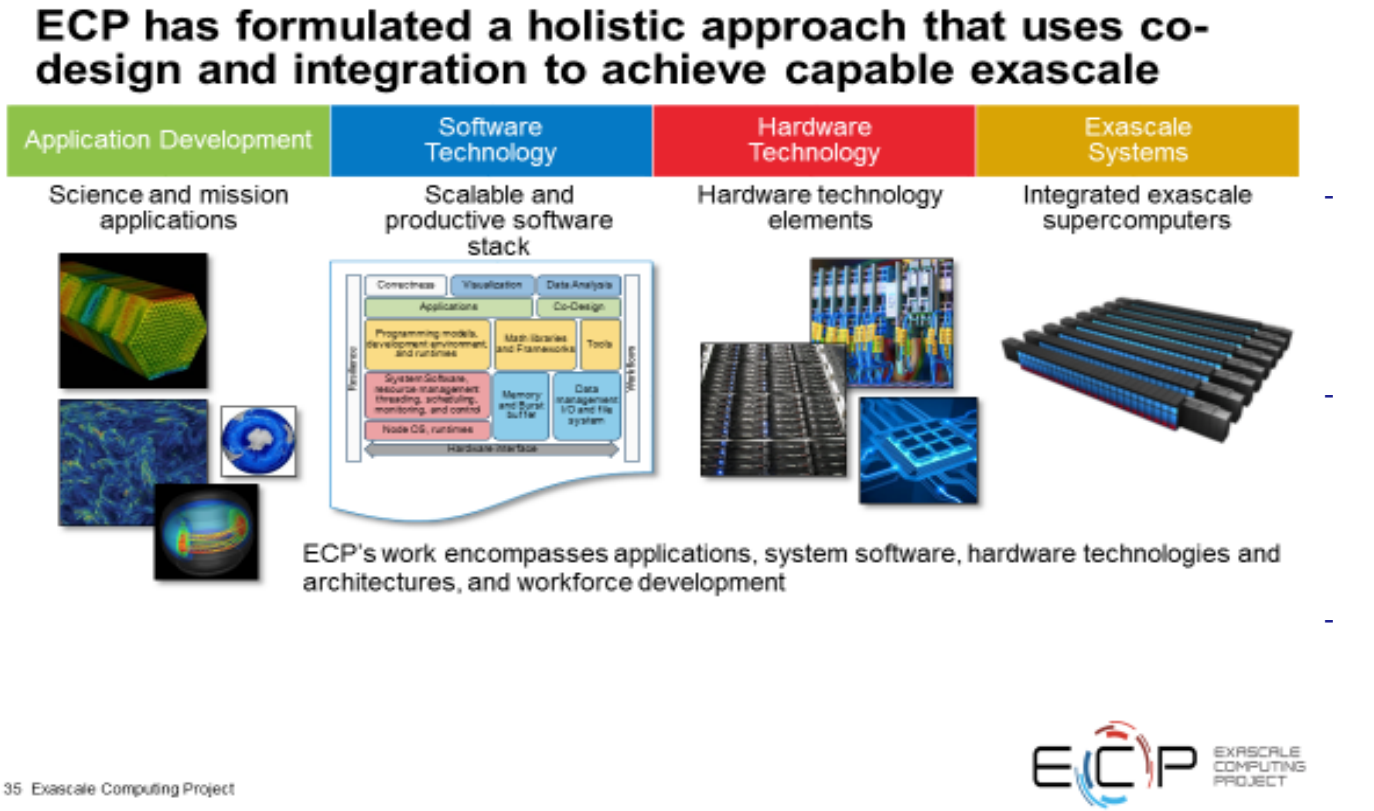
Cooperation Riken

- DoE
- CEA

JAPAN AI AND BD

- Systems with accelerators
  - Oakforest : KNL 25 Pflops
  - Tsubame 3 : GPU : 24 Pflops
- Support of research on AI
  - METI+MEXT+MOST commitment for AI : $1billion
  - Creation of the AI Researh Center (more than 300 p)
  - AI Bridging Cloud Initiative ABCI : 200 IA Pflos in 2018
  - Fujitsu Deep Learning Processor

US



- Software development : 35 projects selected
- Exascale co-design center : 5 centers selected
- Application development : 15 projects selected

US

- Software for BD and HPC in ECP
  - Tools : debuggers, profilers, software development, compilers
  - Data Management and Workflows : I/O Interfaces and Data Services, Checkpoint/Restart, Compression, workflows
  - Data Analytics and Visualization :In Situ Data Reduction, Infrastructure Improvement
- NSF plan
  - integrate support for the revolution in data-driven science
  - provide one or more systems for applications that require a single large,tightly-coupled parallel computer
  - eliminate barriers to cost-effective academic use of the commercial cloud

QUESTIONS & ANSWERS

DISCUSSION

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EUROPEAN TECHNOLOGY PLATFORM FOR HIGH PERFORMANCE COMPUTING

MATHEMATICS FOR INDUSTRY AND INNOVATION: THE EUROPEAN SITUATION

ETP4HPC Annual meeting

Munich, March 21, 2017

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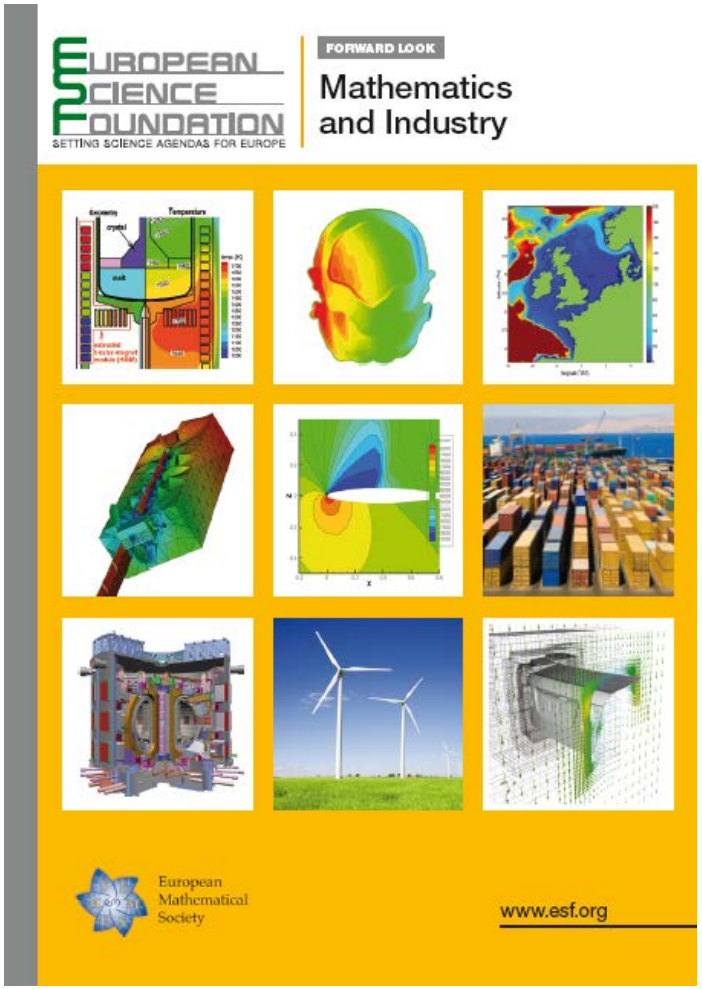
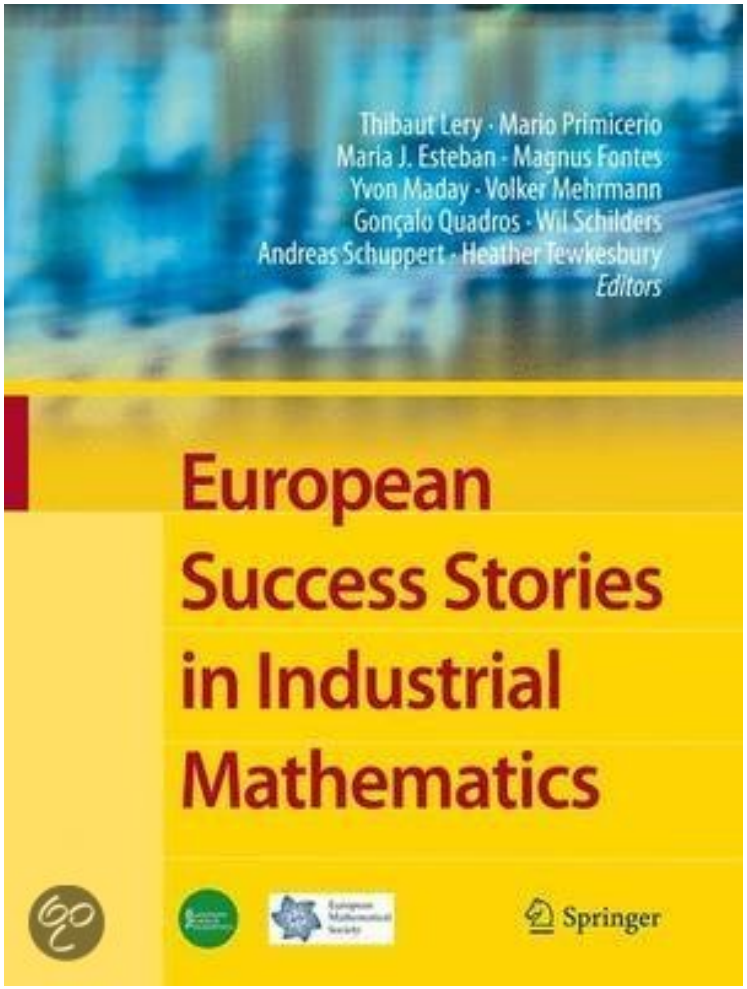
Forward Look project "Mathematics and Industry" 2009-2011





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European Technology Platform for High Performance Computing

EU-MATHS-IN: A UNIQUE NETWORK

- EU-MATHS-IN is a network of national networks that represent the entire community in their respective countries with respect to mathematics for industry – started November 2013
- National networks currently on board:
  - *IMNA (Austria)*
  - *BE-MATHS-IN (Belgium)*
  - *CNMI (Czech Republic)*
  - *AMIES (France)*
  - *KoMSO (Germany)*
  - *HSNMII (Hungary)*
  - *MACSI (Ireland)*
  - *Sportello (Italy)*
  - *NNMII (Norway)*
  - *PL-MATHS-IN (Poland)*
  - *PT-MATHS-IN (Portugal)*
  - *RO-MATHS-IN (Romania)*
  - *math-in (Spain)*
  - *EU-MATHS-IN.se (Sweden)*
  - *PWN (The Netherlands)*
  - *Smith Institute (UK)*

- *<u>Mission:</u> EU-MATHS-IN aims to leverage the impact of mathematics on innovations in key technologies by enhanced communication and information exchange between and among the involved stakeholders on a European level.*

ETP 4 HPC EUROPEAN TECHNOLOGY PLATFORM FOR HIGH PERFORMANCE COMPUTING

Mathematics as a Key Enabling Technology

- Key Enabling Technologies (KETs) are the main driving force behind the development of future goods and services
- Despite the undisputed role of mathematics, there is serious concern about its support in EU programs
- Mathematics has not been officially considered a KET in the official documents of the EU program HORIZON 2020
  - The situation is frequently evaluated by policy makers as no problem.
  - It is argued that mathematics is supposedly present in many projects, and the projects are to be focused as a rule not on the development of particular disciplines

We strongly believe that mathematics does satisfy the criteria of Key Enabling Technology, and therefore EU-MATHS-IN is undertaking steps to achieve this status for mathematics.

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Consultations Excellence in Science – preparing for the work programme '18-'20

Proximus 18:54 86%

ec.europa.eu

Consultations

In preparation of Work Programme 2018-2020.

FET Flagships

Share your ideas about grand Science and Technology Challenges for Europe.

FET Proactive

Share your ideas about new game-changing future technologies.

Mathematics

Inform the future work programmes with innovative mathematical content.

e-Infrastructures

Identify the key challenges of the future e-infrastructures.

Quick links

FET

Future and Emerging Technologies

Citizen Science

Science for the people, by the people

Open Access

Free access to scientific publications & research data

HPC

High-Performance Computing systems & services

message, loud and clear, that mathematics have a lot to offer to science and innovation. The response has exceeded all our expectations both in terms of quantity of responses and in the quality of contributions received.

What are the challenges for tomorrow's e-infrastructure?

Augusto Burgueño Arjona

The process towards the third and last Horizon 2020 Work programme covering the period 2018-2020 has started, and we would like you to help us identify the challenges faced by the European e-infrastructure stakeholders. What are the key challenges ahead? How to answer the increasing scientific data needs? How can industrial actors fully benefit from the services provided by European e-...

Want to talk innovation? Check out the Innovation4EU debates!

stephanie matt

Innovation is multi-flavoured. It can be digital, open, responsible, social or industrial, disruptive or data-driven. Innovation brings creativity and knowledge, it drives data and research. Innovation is everywhere. But where does Europe stand? How can we become more innovative in order to be more competitive? How can innovation policy help overcome problems in bringing European ideas to market...

More blog posts

Reports on the economic value of mathematics

- Published in UK (2012), Netherlands (2014) and France (2016)
- 25-30% of GVA can be attributed to mathematical sciences
- A coordinated effort is needed to enhance the cooperation between mathematics and business/society in order to fully exploit the potential of mathematics for innovations

EU-MATHS-IN

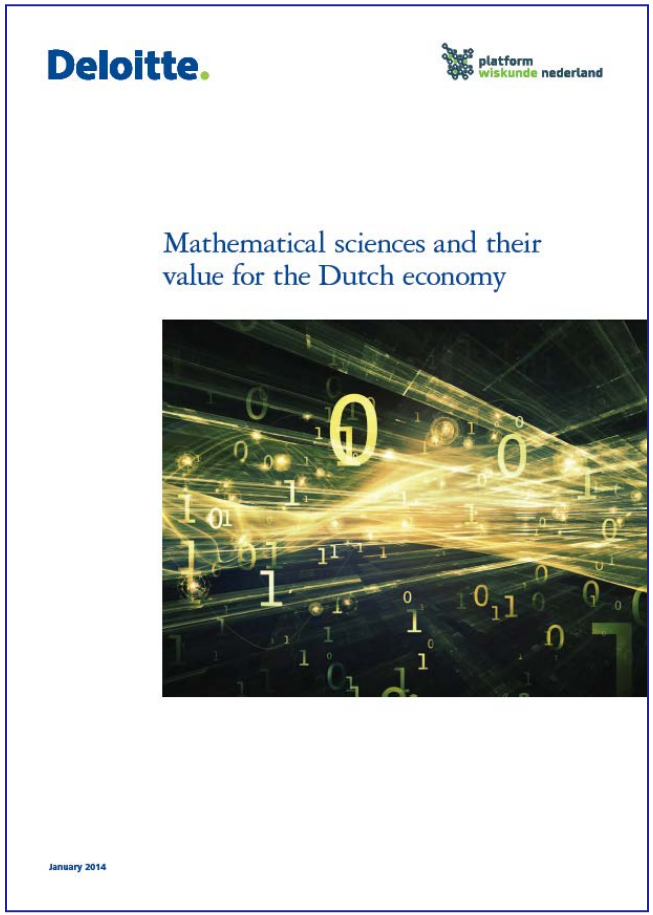

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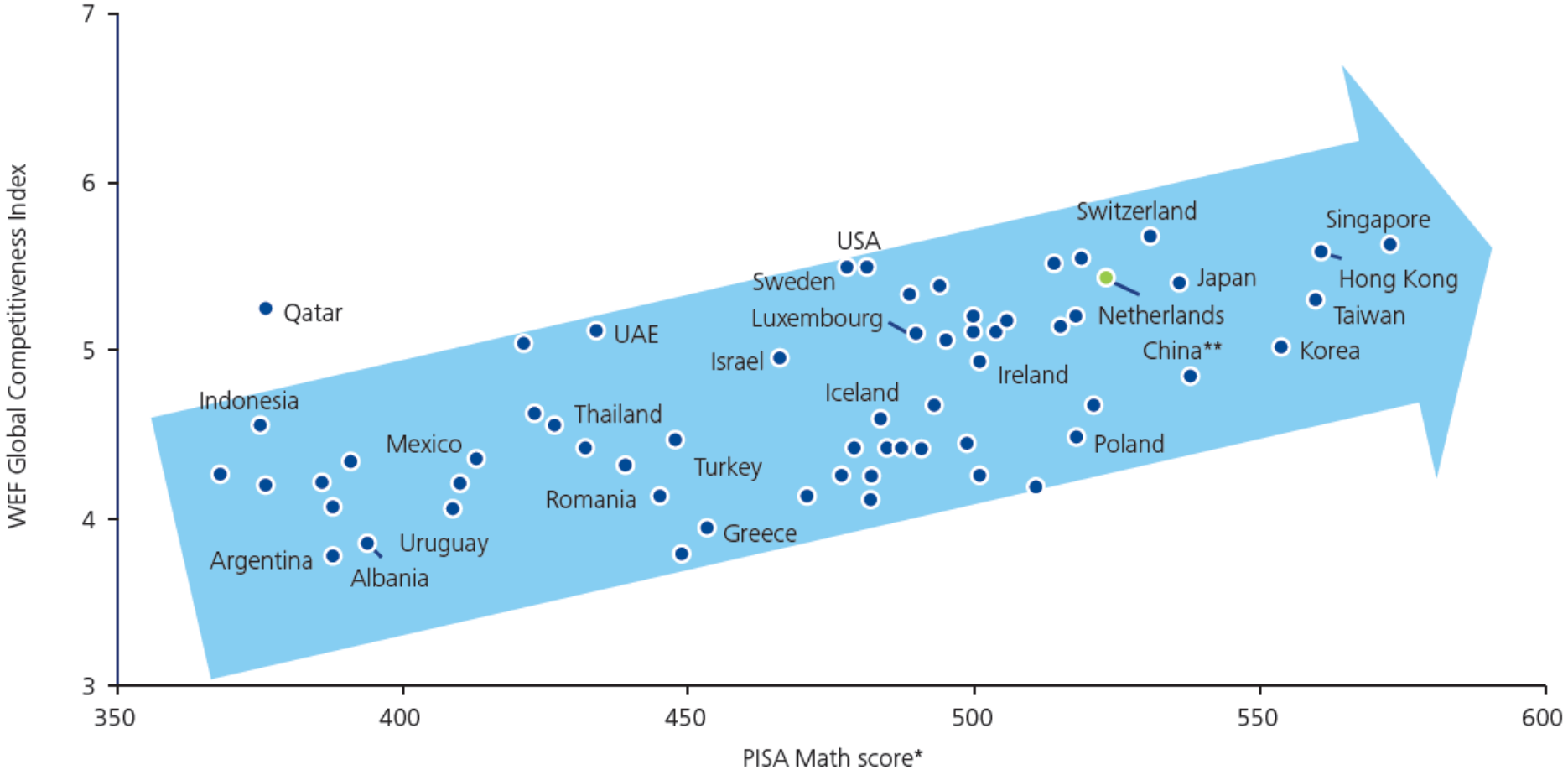
Figure 4. Relation between mathematical ability and country competitiveness



* Mathematical ability as defined by OECD – PISA study among 15 year old

** PISA score of Macao

Source: World Economic Forum (2013), OECD-PISA (2013); Deloitte analysis

"Revolutions in computational science, big data, statistics and analytics are likely to substantially increase the importance of mathematical sciences"

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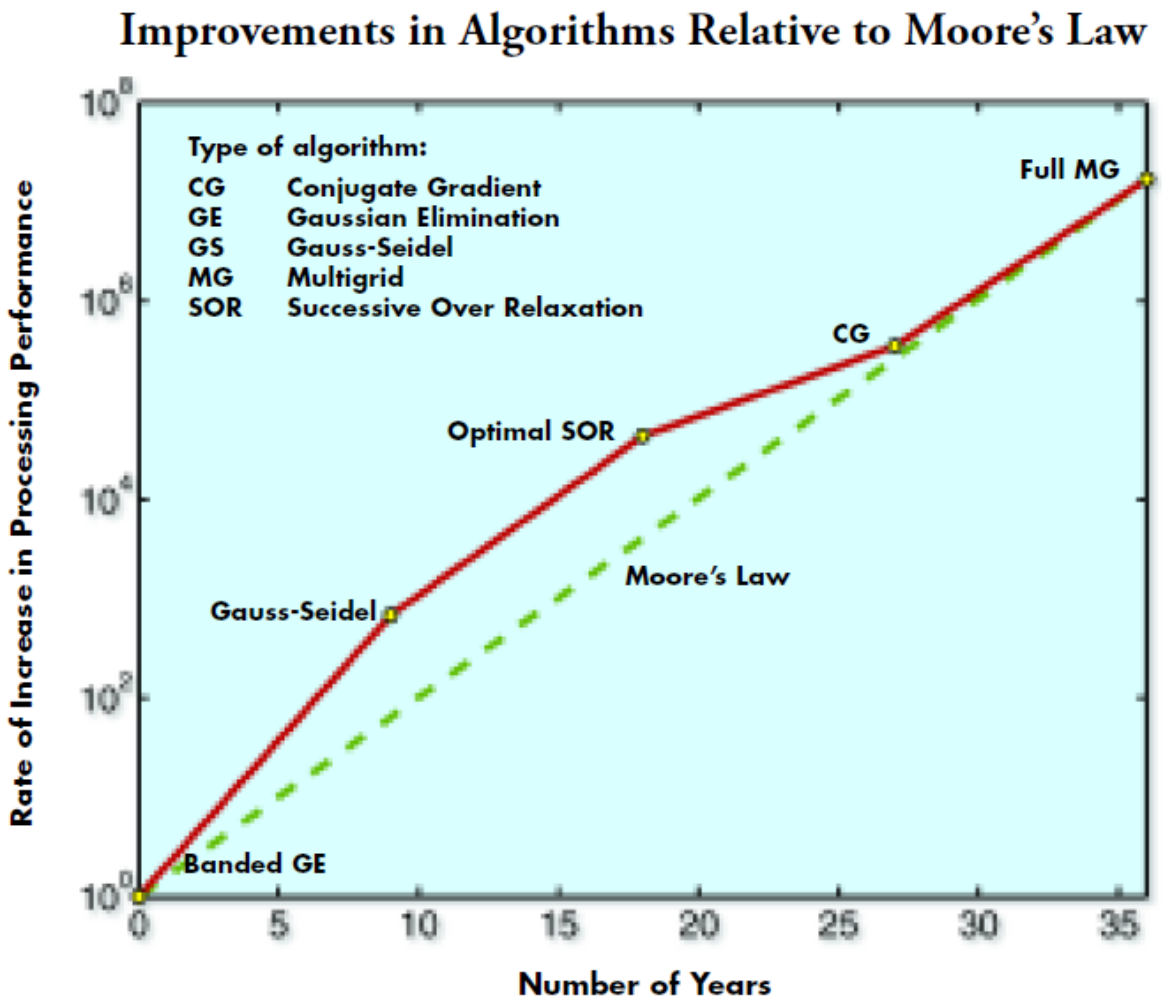
Moore's Law for mathematical methods



These effects (machines and algorithms) strengthen each other!

SIMILAR DEVELOPMENT IN OPTIMIZATION

Progress in LP: 1988—2004

(Operations Research, Jan 2002, pp. 3—15, updated in 2004)

- Algorithms (*machine independent*):

  Primal *versus* best of Primal/Dual/Barrier 3,300x

- Machines (workstations →PCs): 1,600x
- NET: Algorithm × Machine 5,300,000x

  (2 months/5300000 ~= 1 second)

If we would rely solely on performance improvements in hardware, we would now be doing the simulations of the 1990's!

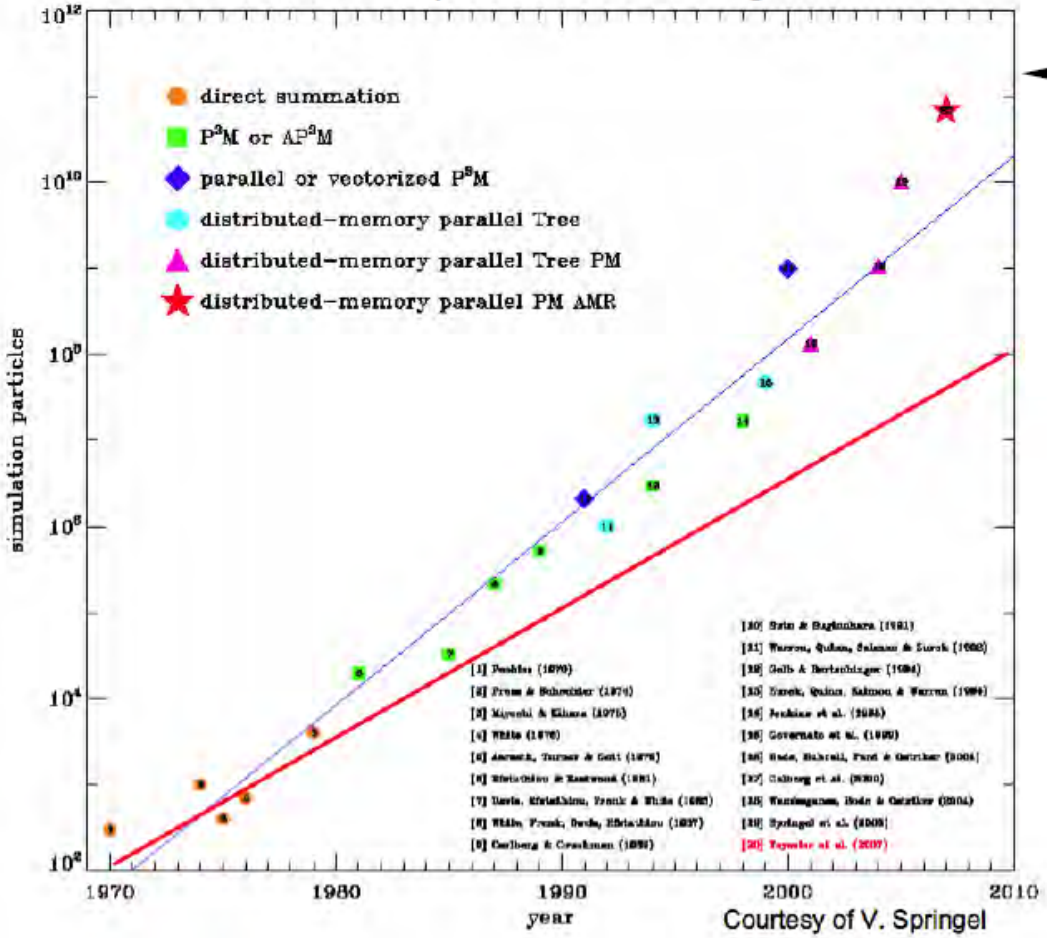
Gurobi MIP Speedups 2009-2014

- Gurobi 1.0 and CPLEX 11.0 roughly equivalent
- Gurobi version-to-version improvements
  - Gurobi 1.0 -> 6.0: 29.4X
- **Overall improvement:** 1990 to 2014
  - **Algorithms:** 870,000x
  - **Machines:** 6,500x
  - NET: Algorithm x Machine 5,600,000,000x
    (180 years / 5.6B ~= 1 second)

La Loi de Moore pour les Applications

Les progrès « *algorithmiques* » contribuent très significativement à l'accroissement de performance des applications.

N-corps en cosmologie



550 Milliard de particules sur Curie

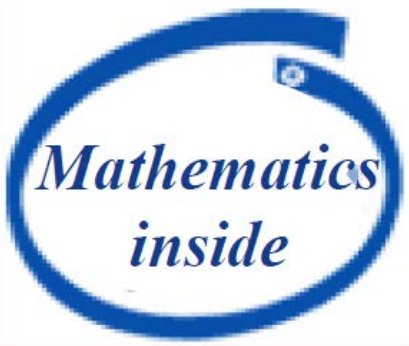
Loi de Moore

"I would rather have today's algorithms on yesterday's computers than vice versa." – Ph. Toint

MATHEMATICS VS HARDWARE

- Mathematical methods contribute significantly to speed-ups in Computational Science and Engineering
- In all cases, algorithmic speed-ups clearly outperform hardware speed-ups
- These experiments should be repeated on a regular basis in order to have actual figures for policy makers

We should do a much better job at PR!

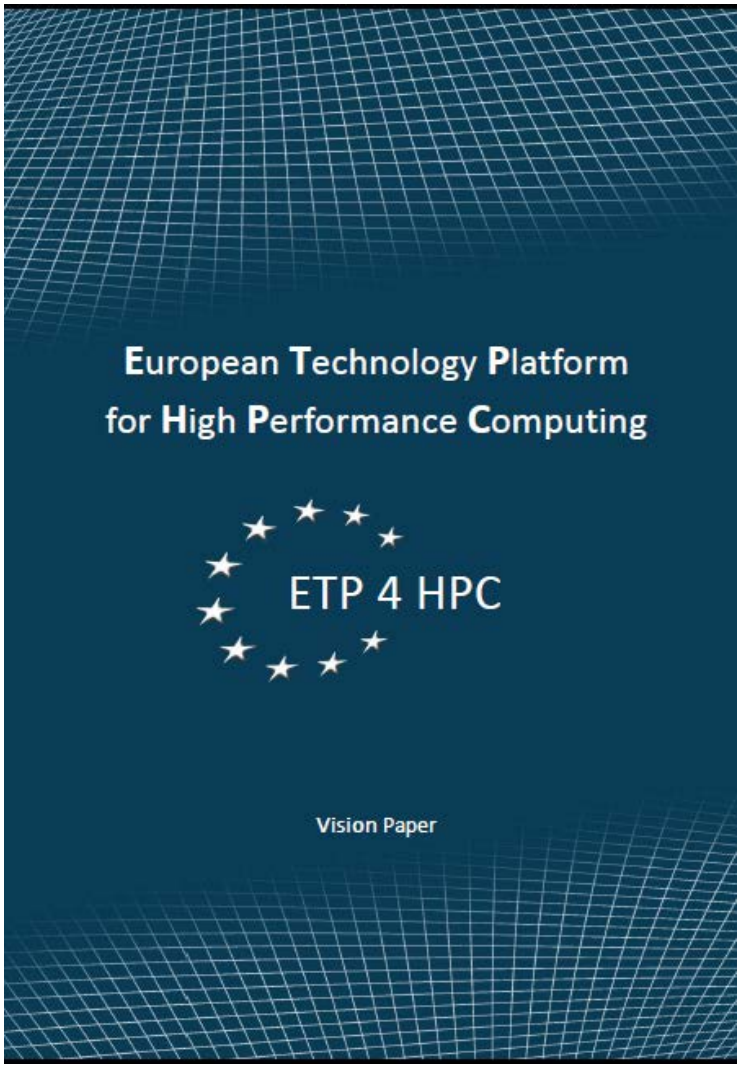


HPC IS AHEAD OF US

- European Technology Platform for High Performance Computing
- www.etp4hpc.eu
- Industry-led, vision paper released

European Technology Platform for Mathematical Modelling, Simulation and Optimization

ETP4MSO



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Conclusions

- Our efforts are two-fold:
  - Influencing policy makers and convincing them that more mathematics is absolutely needed for industry and innovation
  - Making mathematicians aware of the ample opportunities and many challenges
- Both tasks are not easy: there is reluctance on both sides that we need to break
- International cooperation is vital, learning from each other and joining forces wherever possible
- We are aiming at
  - Making mathematics a Key Enabling Technology (KET)
  - Starting a European Technology Platform for Mathematical Modelling, Simulation and Optimization (ETP4MSO)
  - Vision document and Stragetic Research Agenda for MSO
  - **Closer cooperation with ETP4HPC and other relevant ETPs**
    - ***Mathematics topic in FET Proactive HPC (thank you!)***

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HIGH PERFORMANCE COMPUTING FOR EUROPE

ETP 4 HPC

IMPROVING ACCESS-TO-FINANCE FOR HIGH PERFORMANCE COMPUTING

Roland Berger

Improving Access-to-finance for High Performance Computing

Aim of the study, working hypotheses, timeline, invitation to participate

Gordon Wollgam, Roland Berger

European Investment Bank

Munich, 21st of March 2017

The aim of our study is to develop recommendations on how access to finance can be improved for the European HPC/Cloud sector

Guiding question and methodology of the study

Our guiding question:

"How can financing conditions be improved for HPC/Cloud computing in Europe?"

Our approach:
Combination of interviews and best-practice research

> What are the most relevant market segments for financing? (hardware? software? services?)

> What are the major barriers for a stronger uptake of HPC solutions in the market? – Focus on SMEs

> What are the relevant business models?

> Do investors properly understand HPC business models?

> What kind of financing is needed (grants, debt, equity, …)?

> What could the **European Investment Bank** and the **European Commission** do to improve financing conditions?

> **Interviews** with HPC businesses, investors and intermediaries in Europe

> **Background discussions** with experts

> Research of **best practice cases** for HPC financing worldwide

With regard to SMEs, HPC in Europe is an early stage market in need of facilitation and further business model development

Overview of our initial working hypotheses

HPC Players, esp. SMEs...

> ...are often not familiar with the benefits of HPC for their business

"Awareness is the biggest challenge" HPC cloud service provicer

> ...are highly risk-averse

"The HPC solution must look exactly like the legacy workstation application" HPC application advisor to SMEs

> ..have very limited financing experience

"SMEs are reluctant to take up financing being tied to HPC activities. They rely on grants instead." Head of European HPC center

Investors ...

> ...often find it hard to understand HPC business models

"Banks and even Venture Capital firms know nothing about HPC" HPC market participant

> Venture capital appears to play an important role in financing HPC

"We finally found a venture capital firm to finance our expansion" HPC cloud service provider

Market trends

> Software development appears to be a key market driver

"Software is the future" Director of HPC center

> Intermediaries are needed to facilitate the uptake of HPC by SMEs

"Outreach is the most important aspect of market development" Head of European intermediary

You can contribute in our current project phase and shape future solutions for your industry

Timeline of the study

Conducting interviews

> Expert interviews with HPC stakeholders to gather in-depth understanding of financing situation

> Exchange with financing institutions on financing conditions for HPC businesses

JOIN THE DISCUSSION NOW

Invitation to participate - Talk to us to critically discuss our hypotheses

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