Update on HLRS and new activities

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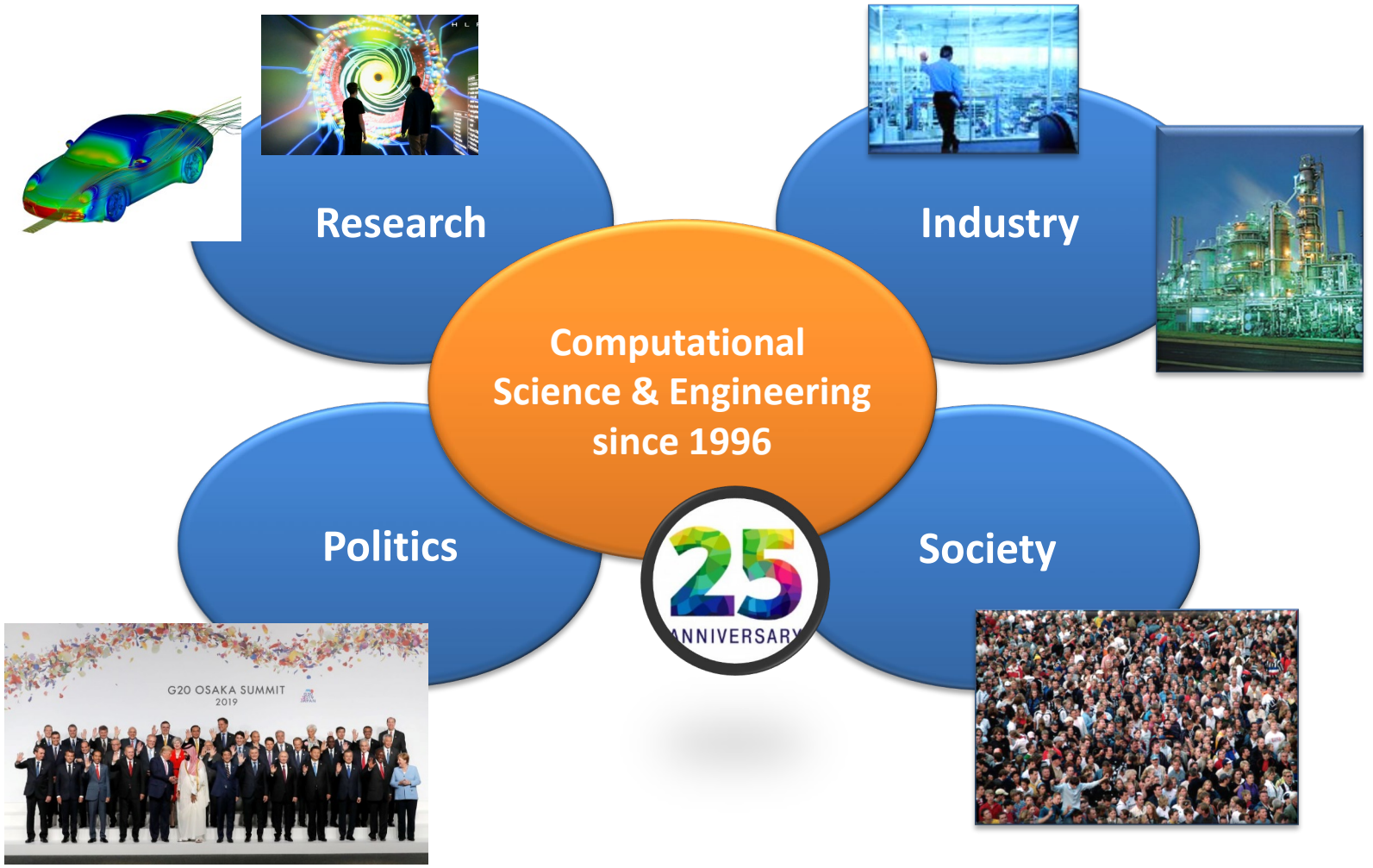
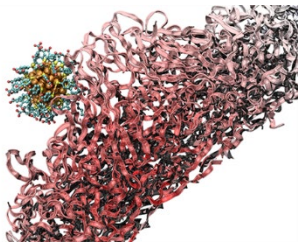
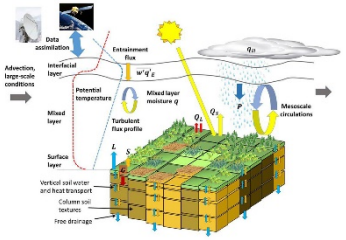
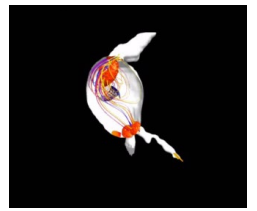
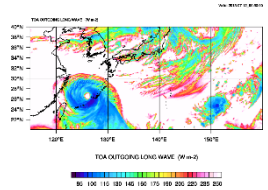
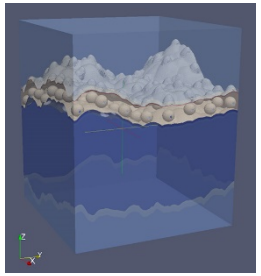
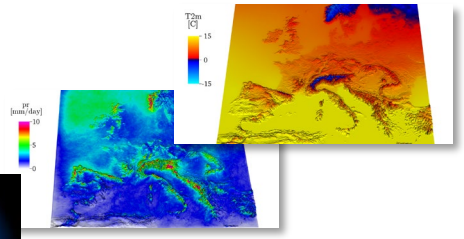
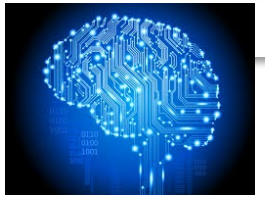
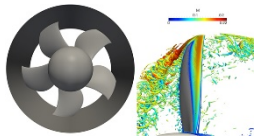
Mission of HLRS

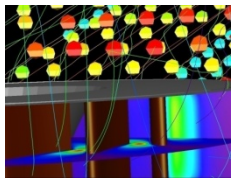
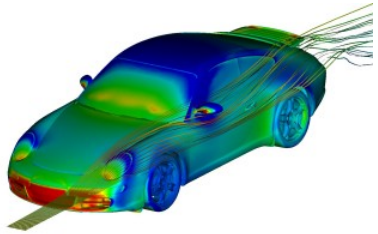
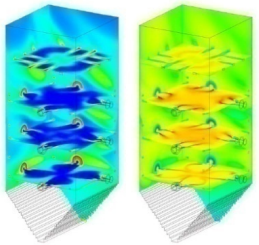


Issues

- Topics
  - Energy
  - Climate Change & The Environment
  - Health & The Aging Society
  - Mobility in the 21st Century
  - Digital Societies
  - Combinations of topics
- Technologies
  - Data to Solution (D2S)/AI
  - Cyber Security
  - **High Performance Computing**
  - Green-IT



HLRS HPE “Hawk”

- HPE Apollo 9000
  - Technology
    - 720.896 cores AMD EPYC “Rome”
    - 1,44 PB Main Memory
    - ~26 PetaByte Disk
  - Performance
    - ~26 PetaFlops Peak
    - >2 PetaFlops Sustained
  - Network connectivity
    - Intern 200 Gbit/s
    - Extern 100 – 800 Gbit/s

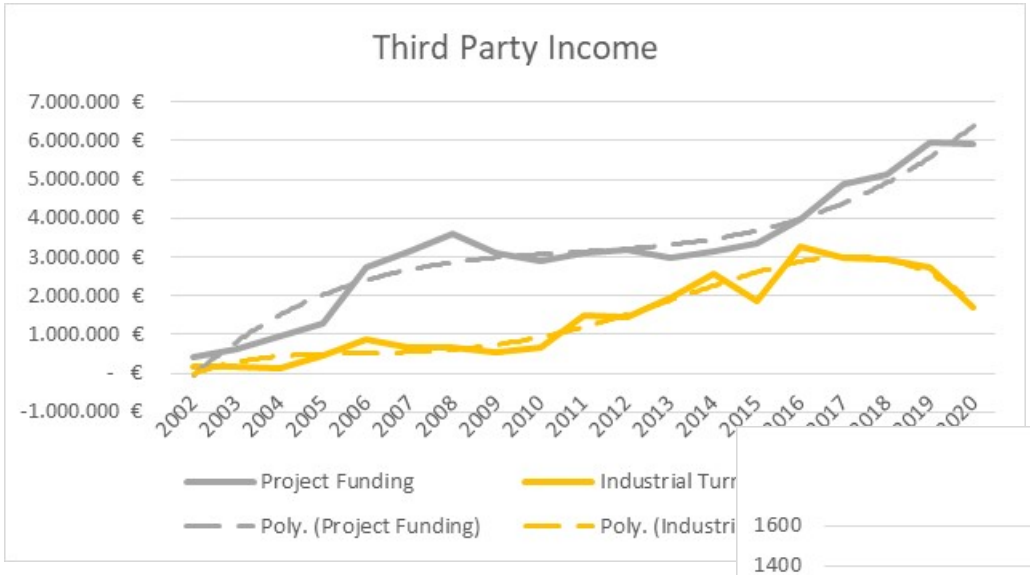
More on systems

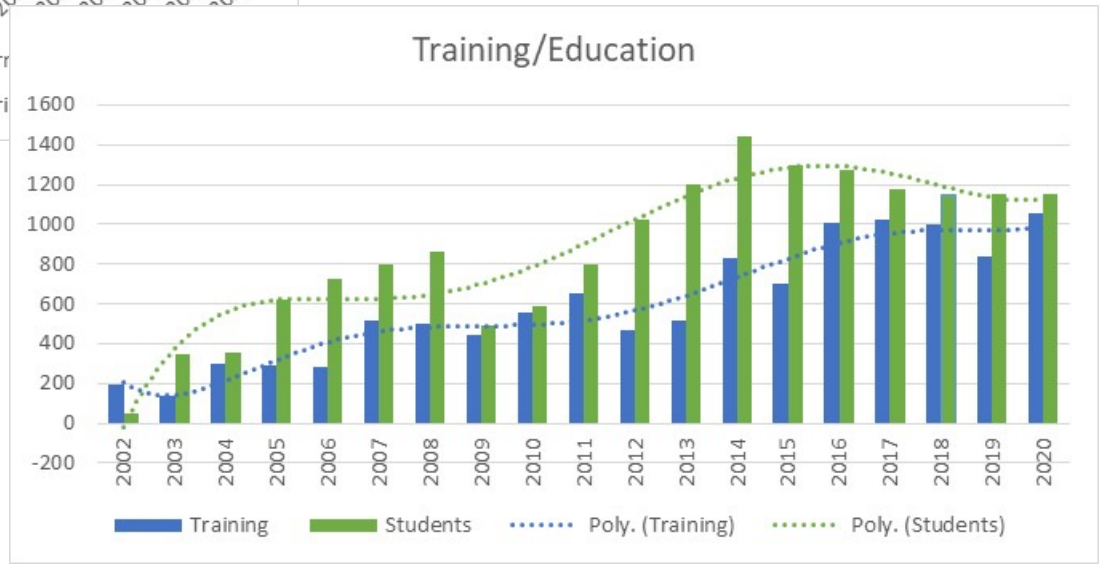
- HLRS „Hawk“ Extension Q2/2021
  - 24 HPE Apollo 6500 Gen10 + systems
  - 192 NVIDIA A100 GPUs
  - ~120 Pflops AI Performance
  - Extension of the hybrid HPC/AI research activities
- AMD COVID-19 HPC fund system now in place
  - AMD Radeon GPUS
  - Supporting COVID related research

Basic Numbers of HLRS / IHR

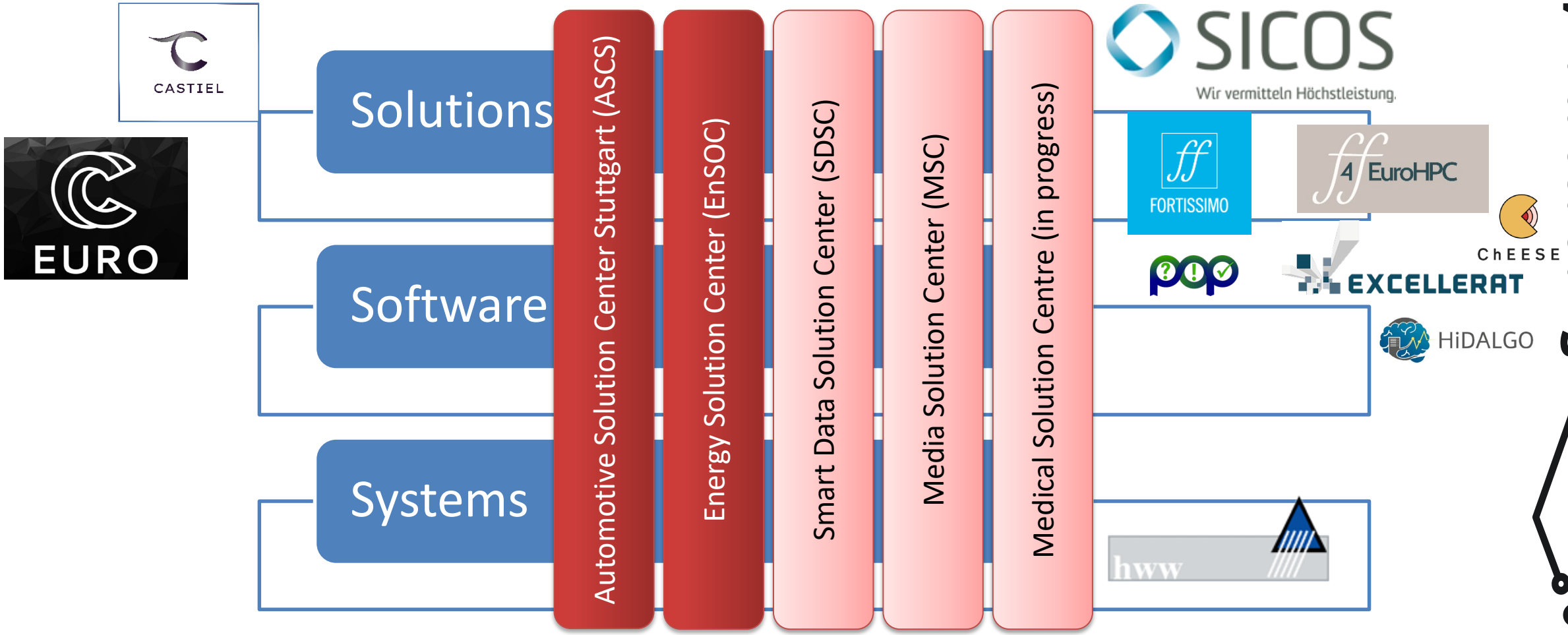
- Staff
  - About 155 head count
  - ~120 Sci., 20 Tech., 15 Others
- Annual Budget (2021):
  - 11.9 M€ annual budget
    - 3.4 M€ State Funding (maintenance, …)
    - 0.5 M€ University Funding
    - 6.0 M€ Project Funding (research)
    - 2.0 M€ Industrial Income (reinvest)
  - Power/Cooling covered by University/State Government and Federal Government
  - Funding for investment from SiVeGCS

Key Performance Indicators



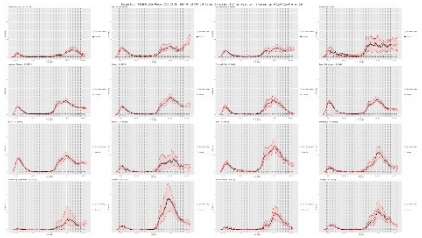


Strategic Setup



Selected highlights

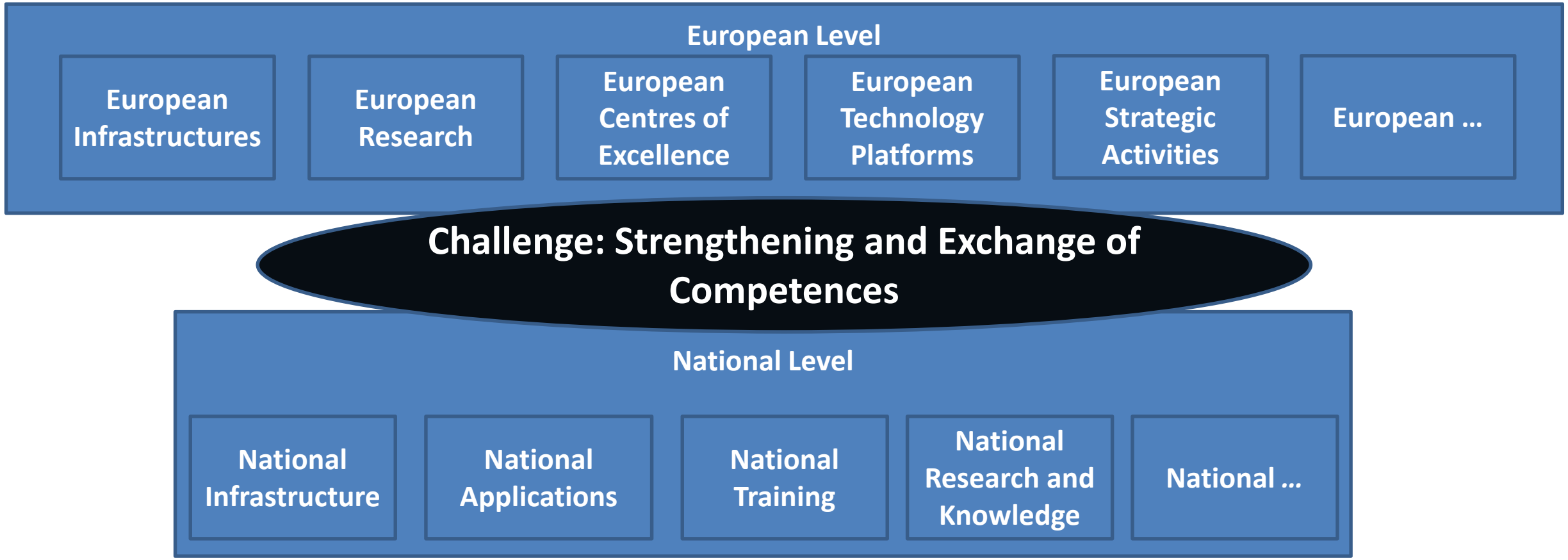
- Collaboration with the Federal Institute for Population Research
  - Spatial age-structured microsimulations to predict intensive care capacity coverage
  - Started from small problem size → covering Germany as a whole and on state level



- EXCELLERAT (European Centre of Excellence in Engineering), led by HLRS, deployed a intelligent data transfer platform, focused on industry
  - Was also applied in the collaboration with the Federal Institute as it supports simple usability and secured data transfer

FOSTERING COMPETENCES AND INDUSTRIAL UPTAKE

Tackling the competence challenge in Europe

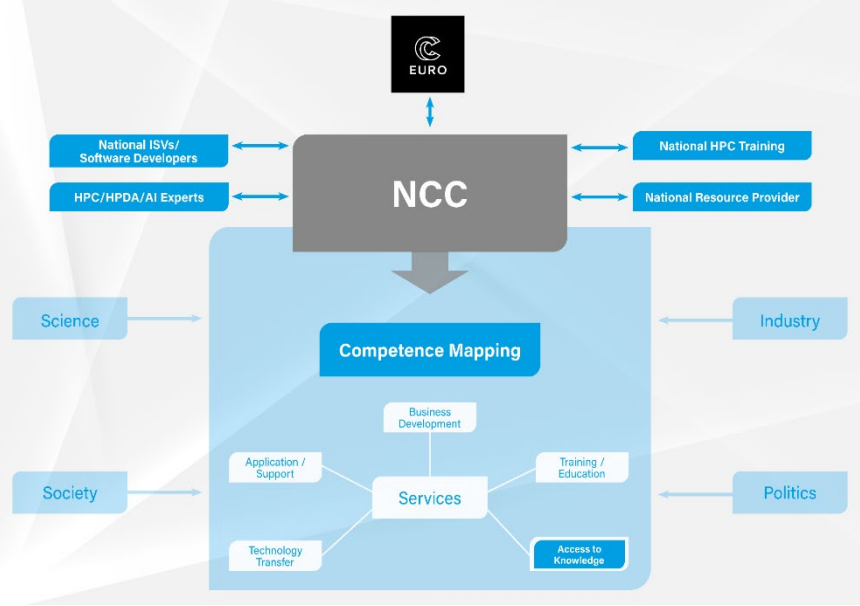


EUROCC – Setting Up National Competence Centres

- Research and Innovation Action (RIA), 24 months duration
  - 36 main participants , 33 nations
- Started: 01/09/2020; Budget: 56,4 M€
- https://www.eurocc-project.eu/
- LinkedIn: EuroCC; Twitter: @EuroCC_project
- Coordinator:
  - Germany, Bulgaria, Austria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Ireland, Italy, Lithuania, Latvia, Poland, Portugal, Romania, Slovenia, Spain, Sweden, United Kingdom, France, Netherlands, Belgium, Luxembourg, Slovakia, Norway, Switzerland, Turkey, Republic of North Macedonia, Iceland, Montenegro

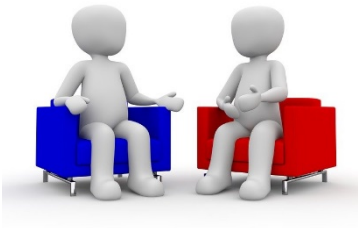
A glance on the EuroCC mission

- EuroCC to set up National Competence Centres (NCCs)
  - Mission:
    - To take into account the different levels of maturity and activities within each participating nation
    - To implement within the first phase a structure, allowing to identify existing competences and to set up the necessary frame for the implementation of the NCCs
- Focus on commonalities (as identified early in the preparation)
  - Training and Skills Development
  - Technology Transfer/Business Development
  - Industrial Collaboration
  - Competence Mapping
  - Facilitation of access to scientific and technical expertise and knowledge pools
  - Awareness Creation



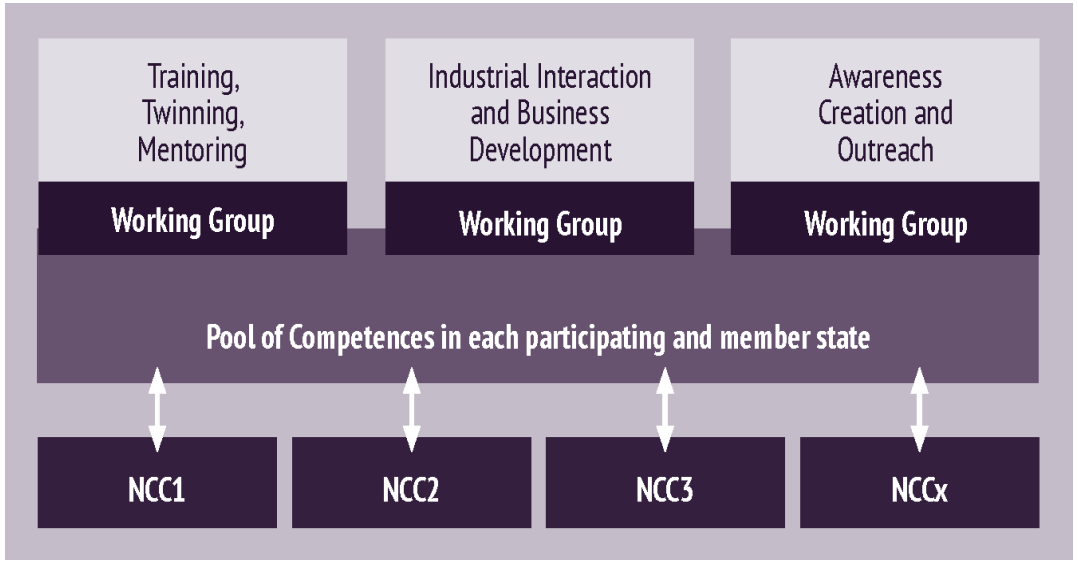
Linking the National and the European Level

- Integration of the NCCs in the choice and definition of workshops on common topics of interest
  - Training, Twinning, Mentoring
  - Industrial Interaction and Business Development
  - Awareness Creation and Outreach
- Elaboration on best practices to strengthen the NCCs
- Support by enabling access to knowledge, expertise and success stories
- All NCCs can participate and bring in their requirements and needs
- Enabling of exchange of experts
  - In Groups
  - Bilateral
  - Mentoring….

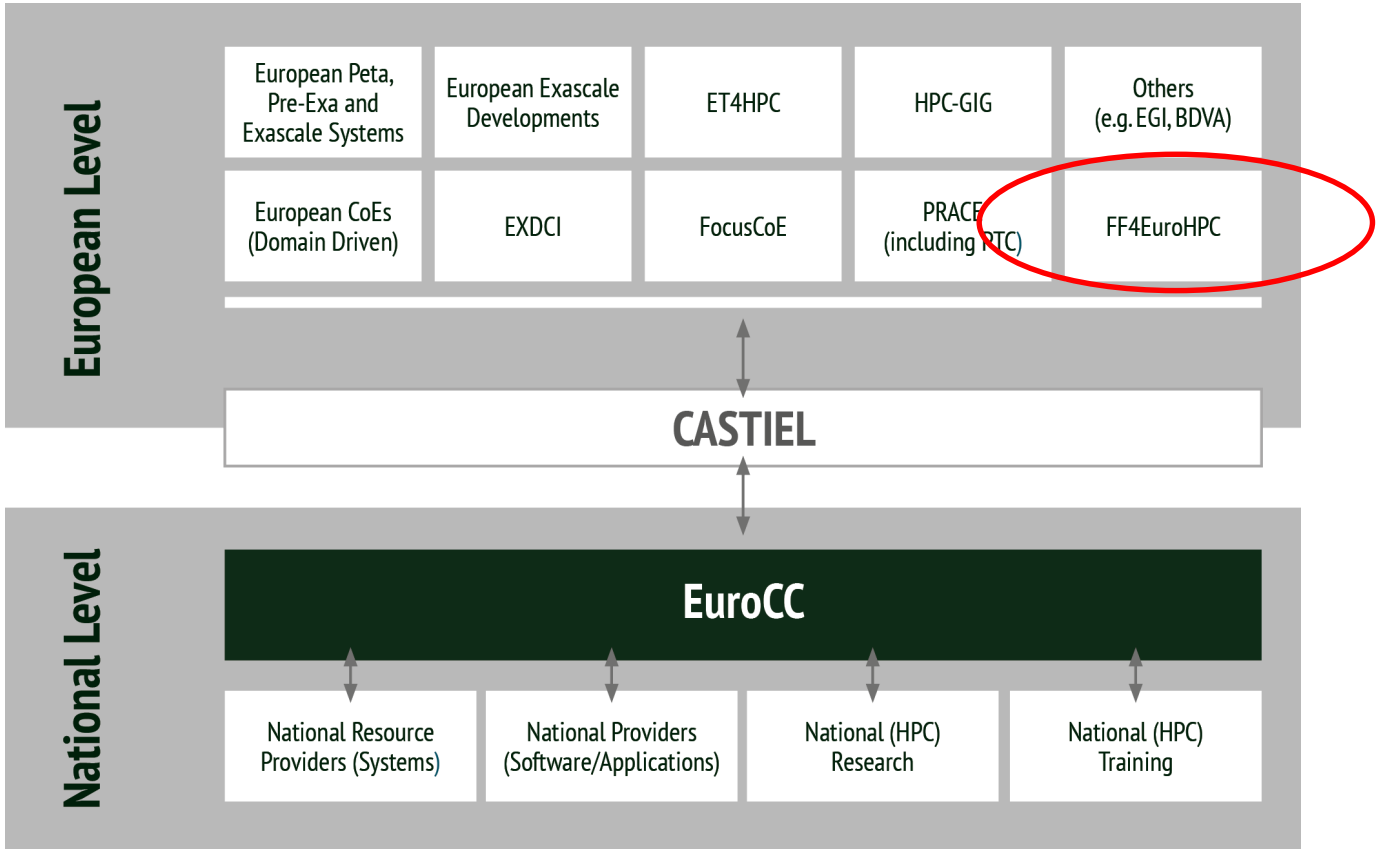


CASTIEL – Facts and Figures

- Coordination & Support Action, Started 01/09/20, Runtime: 24 months
- https://www.castiel-project.eu/
- LinkedIn: CASTIEL, Twitter: @CASTIEL_project
- Close link and Collaboration with EuroCC
- Working groups are set up and active
  - First meetings with different communities



Fostering industrial take up



Continuing the Fortissimo Approach

- Fortissimo - €22m FP7 project – Jul 2013 to Dec 2016 (42 months)
  - 122 partners
  - 53 Experiments in three tranches
  - Focus on HPC enabled modelling and simulation for manufacturing SMEs and Mid Cap
- Fortissimo 2 - €11m H2020 project – Nov 2015 to Dec 2018 (38 months)
  - 93 partners
  - 39 Experiments in three tranches
  - Fortissimo focus plus High Performance Data Analytics
- Central theme: the successful execution of „experiments“ with SMEs, delivering **real business impact** through HPC → Success Stories
- The bulk of project funding is used for those experiments and the highest quality, innovative SME-oriented experiments are acquired through the execution of **open calls for proposals**

The FF4EuroHPC project

- **FF4HPC: HPC Innovation for European SMEs**
- Funded under the H2020-JTI-EuroHPC-2019-2 Call
- Commenced 1.9.2020; 36 months duration
- Webpage: https://www.ff4eurohpc.eu/
- Mission: **To successfully extend and continue the mission of Fortissimo and Fortissimo2**
- Budget: 10M€ (2M€ Core business, 8 M€ for Open Calls)
- Coordinator:

High-Performance Computing Center | Stuttgart

Open Calls within FF4EuroHPC

Open Call 1 (Submission Deadline was Jan 27th 2021, 17:00 CET)

- Expected duration of participation: 15 months, expected commencement 1. June, 2021
- The indicative total funding budget is € 3 M.
- Maximum funding request per proposal: € 200,000 (covering all participants)
- 68 proposals received (coordinated by 19 countries, involvement of >150 organisation of 25 countries)
- Evaluation starts now

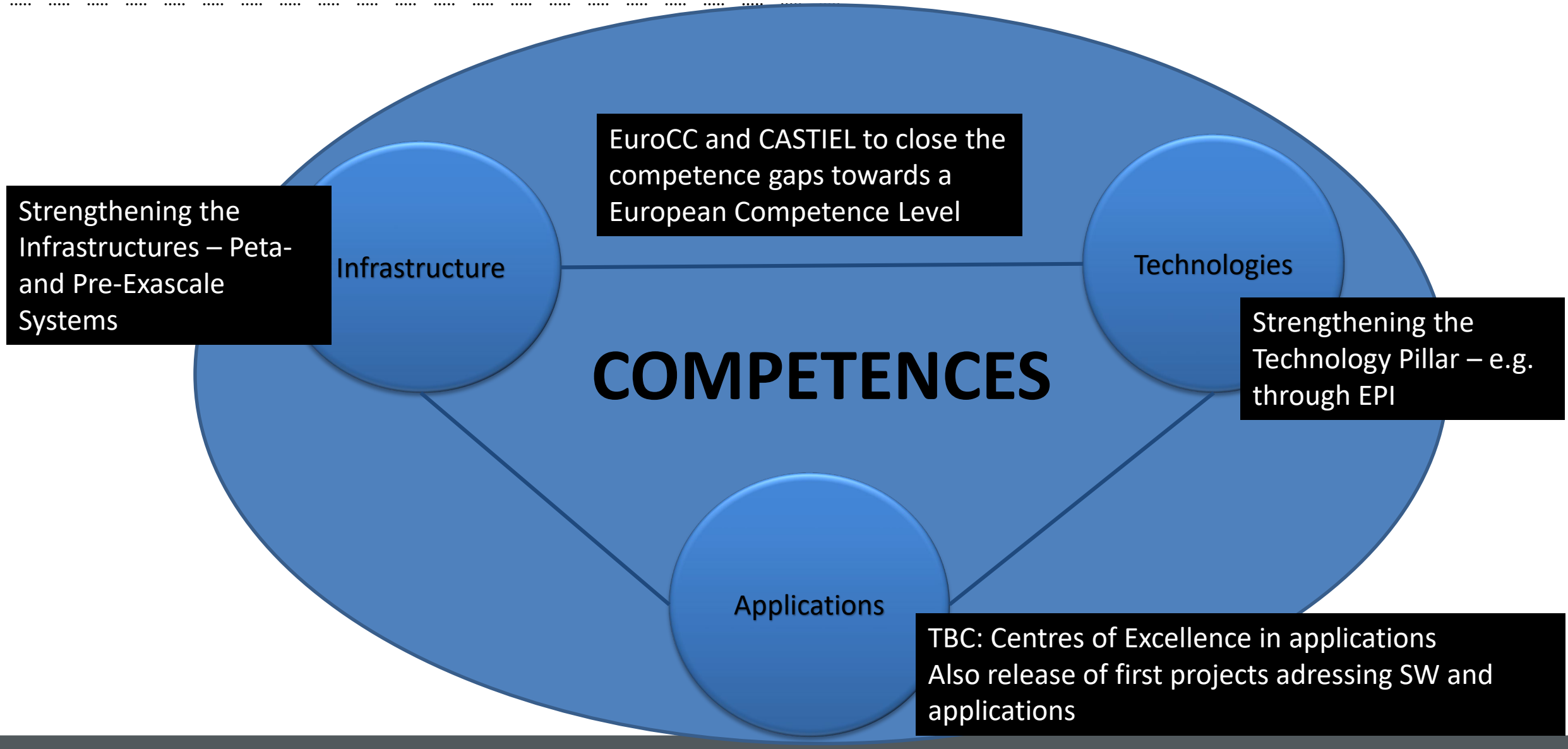
Open Call 2

- Opening approximately June 2021
- Indicative total funding is € 5 M.

Conclusions

- HLRS in a continuous change process
  - Stabilizing core business but also extending its capabilities and exploring new opportunities
- Success stories as a key
  - Only possible when we understand and integrate our user communities
  - Close interaction with the developers of hardware and software improves capabilities and expertise
- EuroCC and CASTIEL are flagship activities to foster uptake HPC on national level and on European level
  - Exploring synergies between the Nations and supporting knowledge and experience transfer in Europe
- FF4EuroHPC as a valuable tool to create success stories
  - With a particular focus on SMEs
  - Success Stories → Creating awareness of the potential

QUESTION: WHAT ARE THE MOST IMPORTANT THINGS EUROHPC HAS ACCOMPLISHED?


EuroCC and CASTIEL to close the competence gaps towards a European Competence Level
Strengthening the Infrastructures – Peta- and Pre-Exascale Systems
Infrastructure
Technologies
Strengthening the Technology Pillar – e.g. through EPI
COMPETENCES
Applications
TBC: Centres of Excellence in applications
Also release of first projects adressing SW and applications

Thank You!

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