

NumPEX

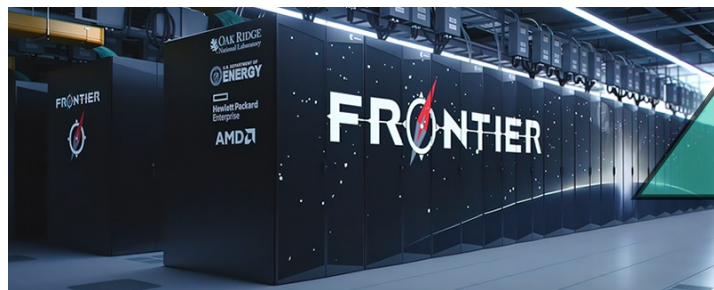
High Performance Numerics for Exascale

Dr J. BOBIN CEA, co-director of NumPEX

Pr M. DAYDE CNRS, co-director of NumPEX

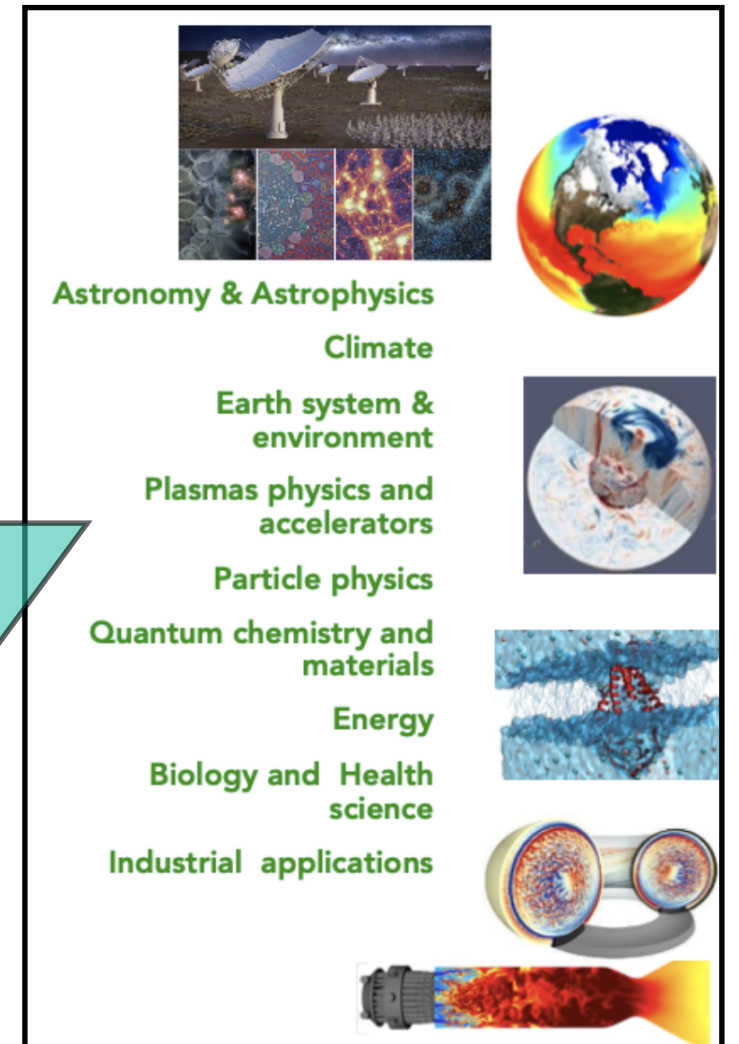
Dr J-Y. BERTHOU INRIA, co-director of NumPEX

Towards the Exascale: challenges



Exascale system

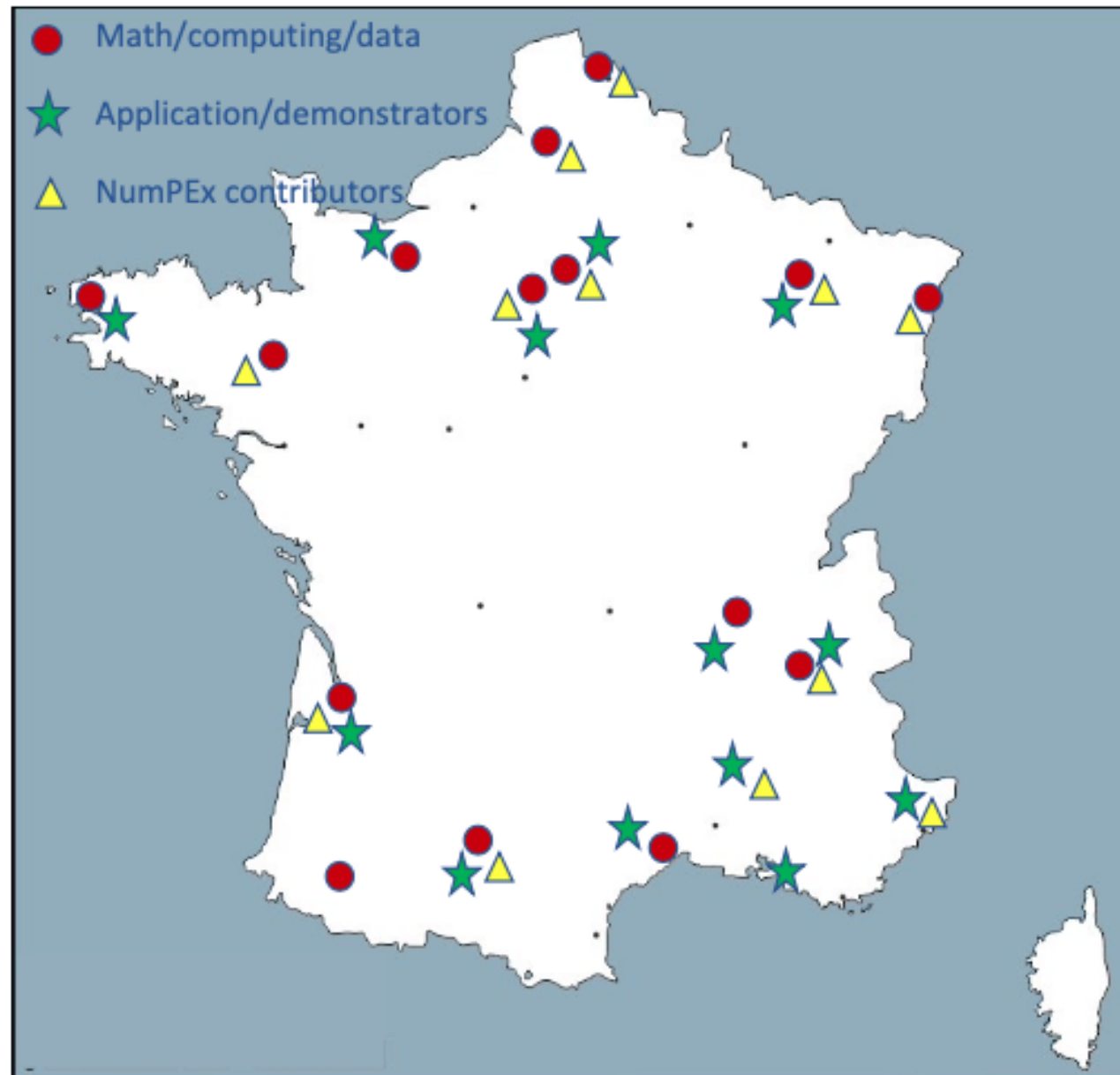
Software stack



Applications

Preparing the applications for the Exascale era requires a major effort to re-design the software stack, by co-design

In the national ecosystem



5 Years
40,8 M€

A five-year effort

**Core
Research
Institutions**

Core national Research Institutions:
CNRS, CEA, INRIA, Universities,
Engineer schools, Industry

**3
Focus
Area**

Software stack development (PC 1-3)
Wide-area workflows and architecture (PC 4)
Integration and application development (PC 5)

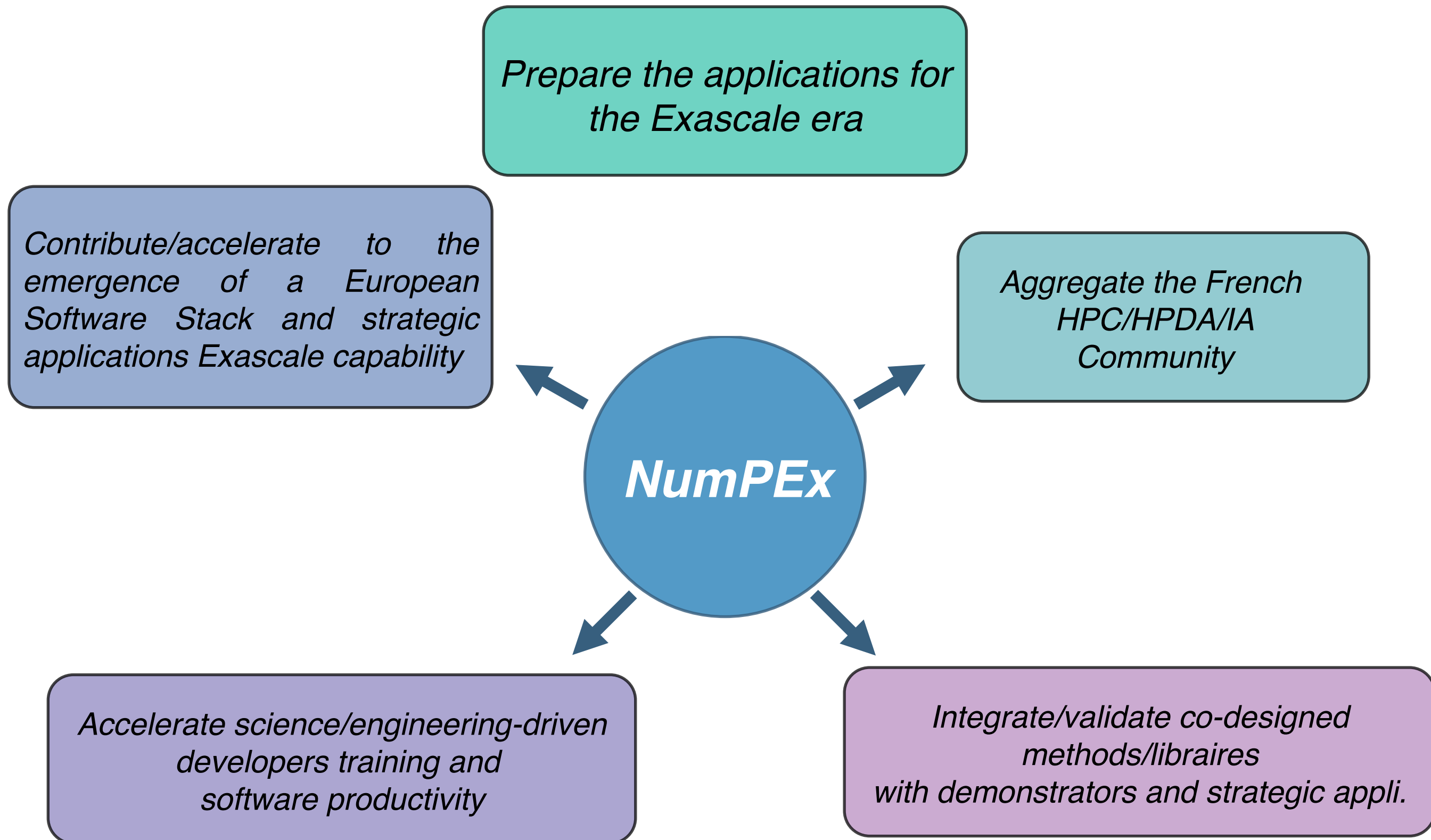
**80
R&D teams
500
Researchers**

80+top-notch R&D teams
About 500 researchers

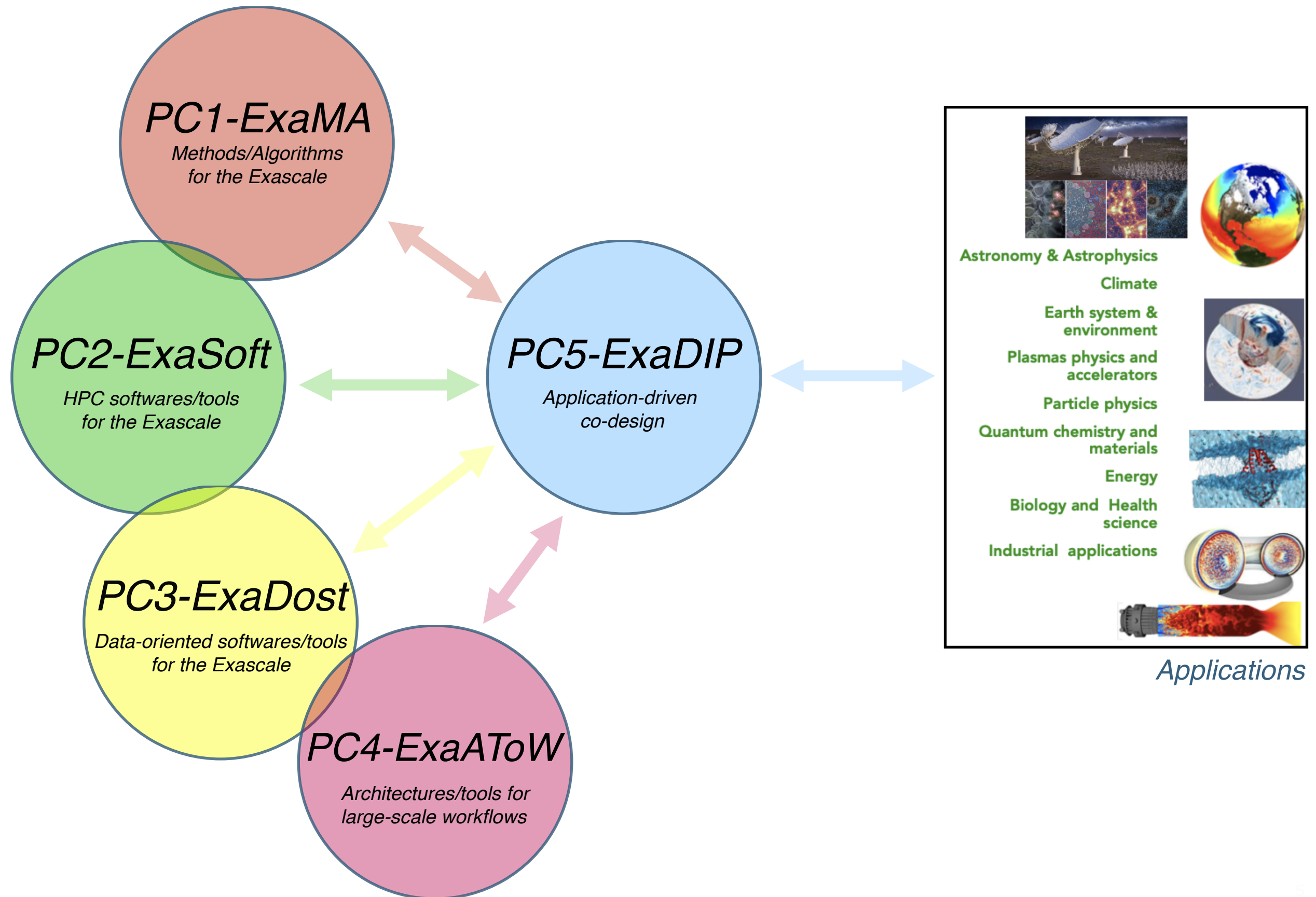
25+to be hired for co-design
development

NumPEx as the software/middleware component of France Exascale

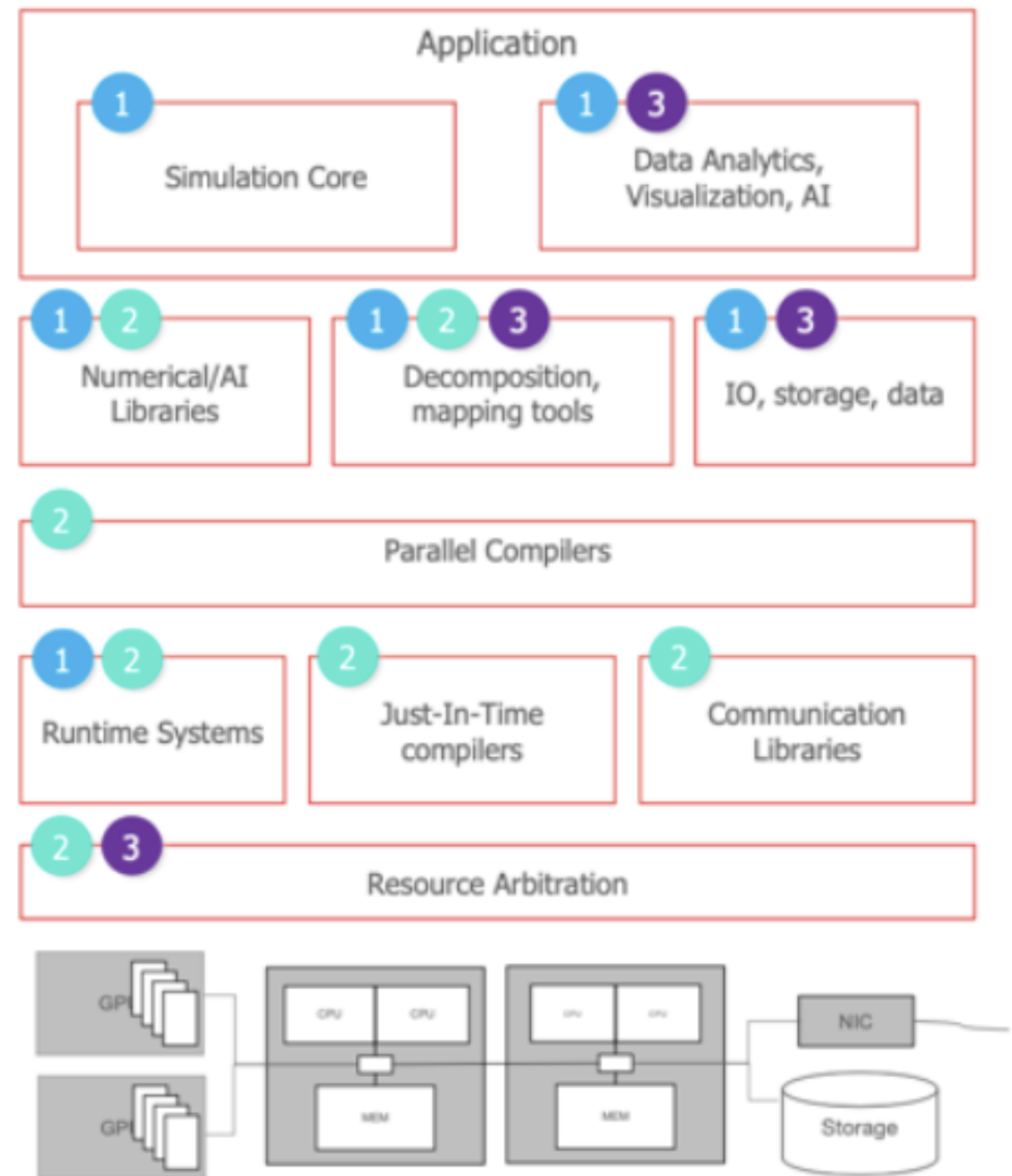
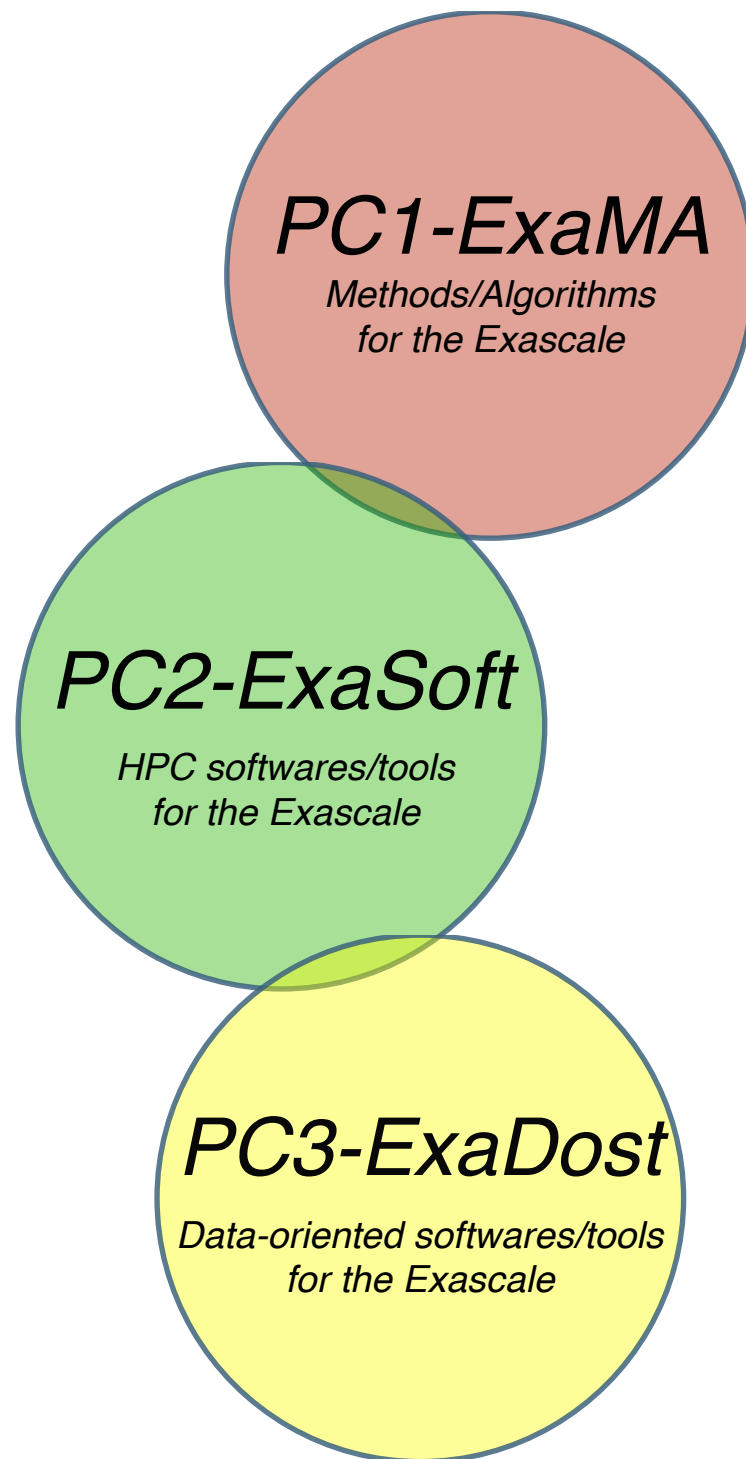
NumPEx, an overview



NumPEx Organisation

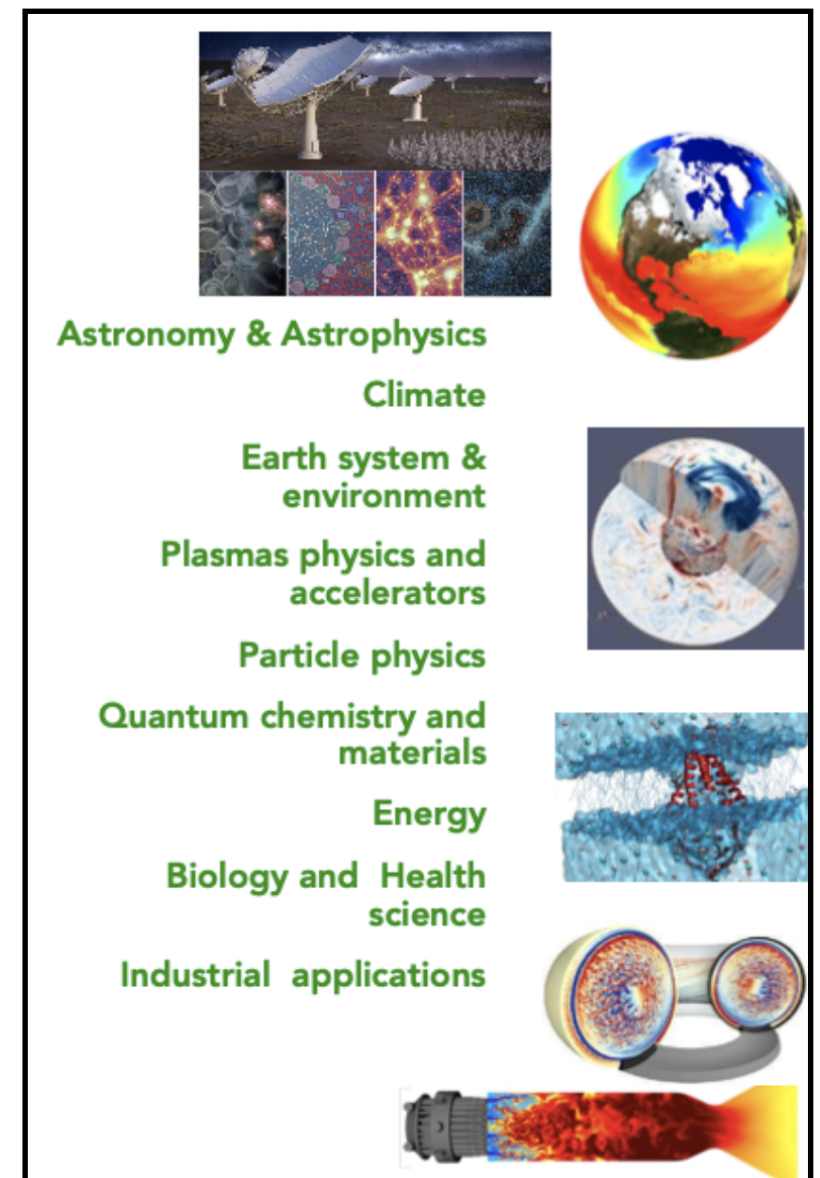
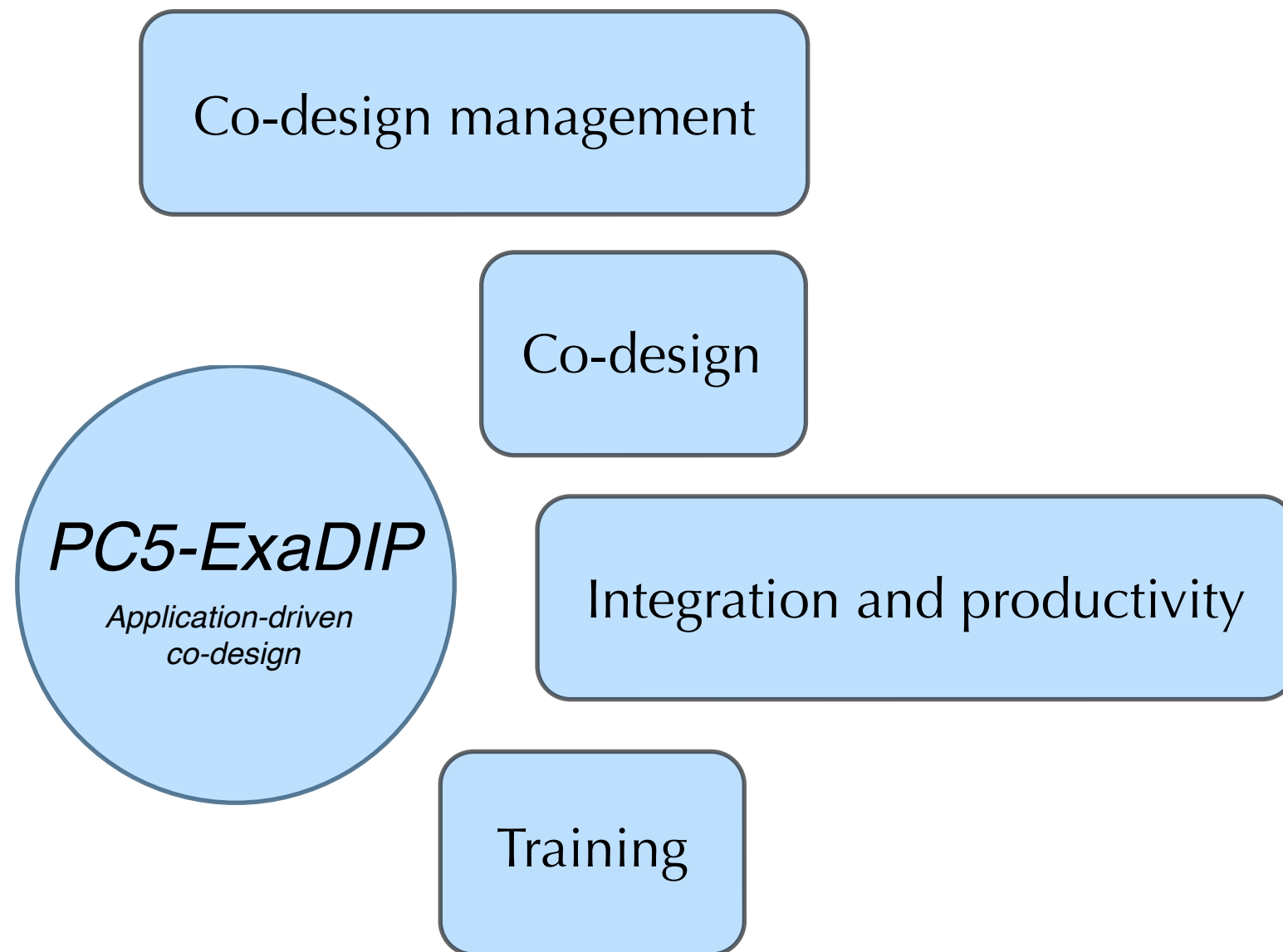


NumPEX software stack



NumPEx ExaDIP

Application-driven co-design software development, integration and productivity

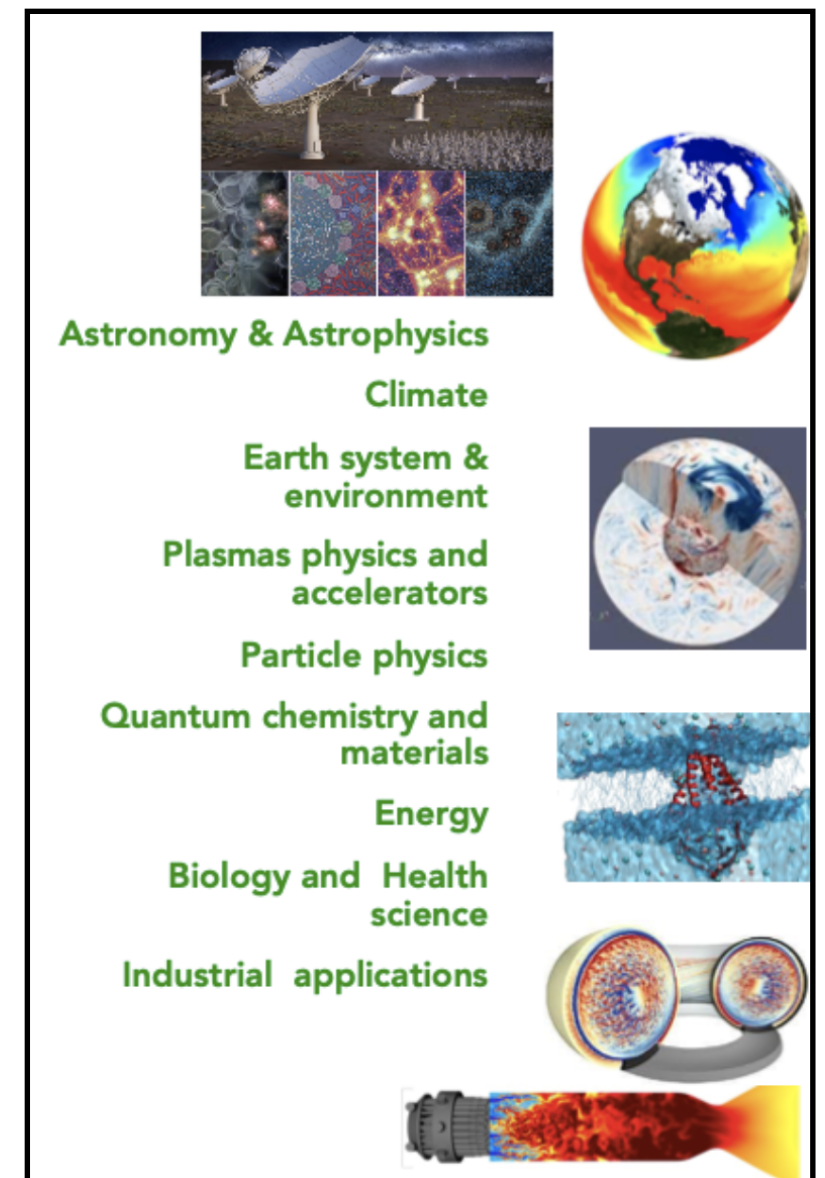
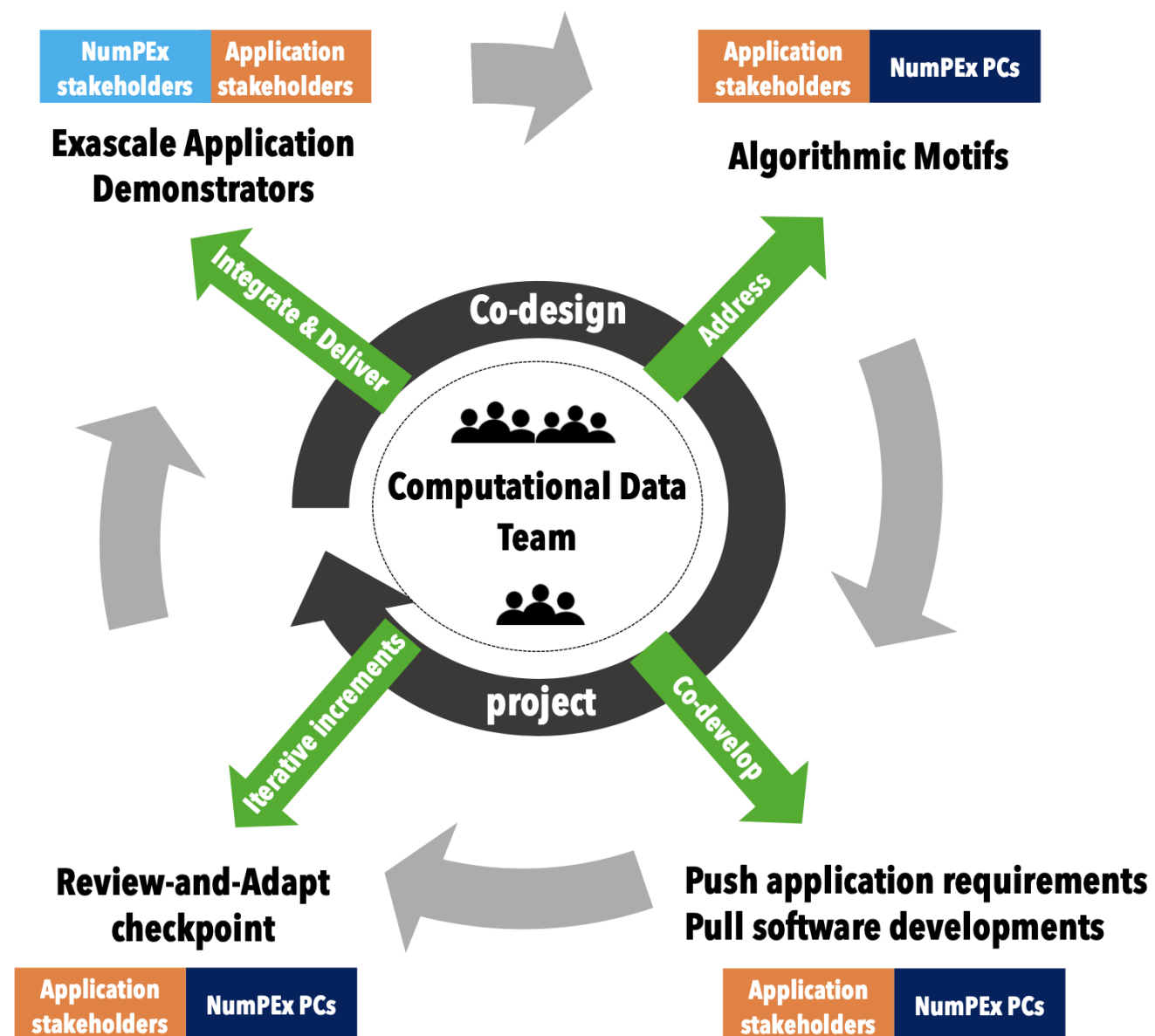


Applications

NumPEx, co-design

Application-driven co-design software development, integration and productivity

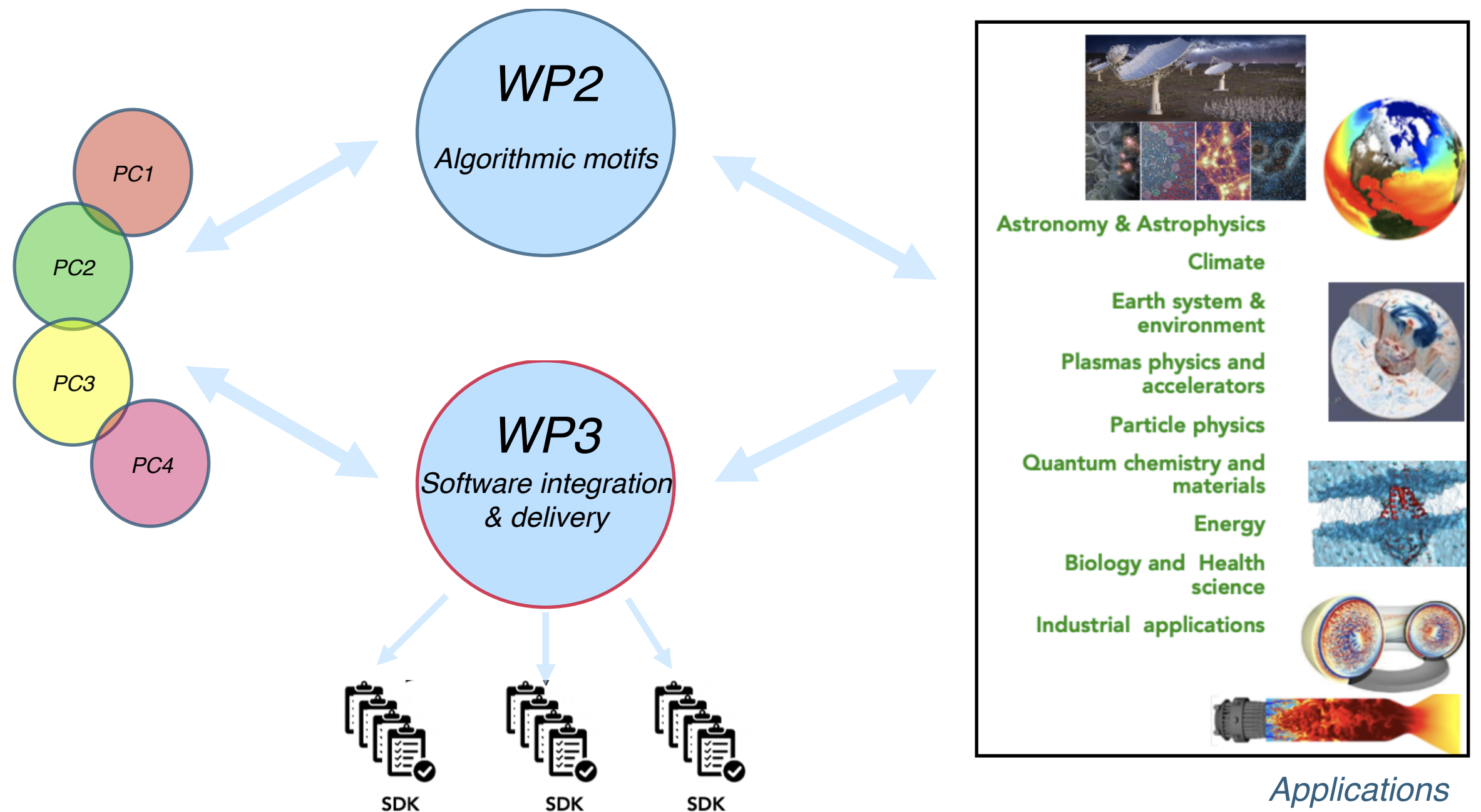
**Identify/develop common/transverse
algorithmic/library motifs**



Applications

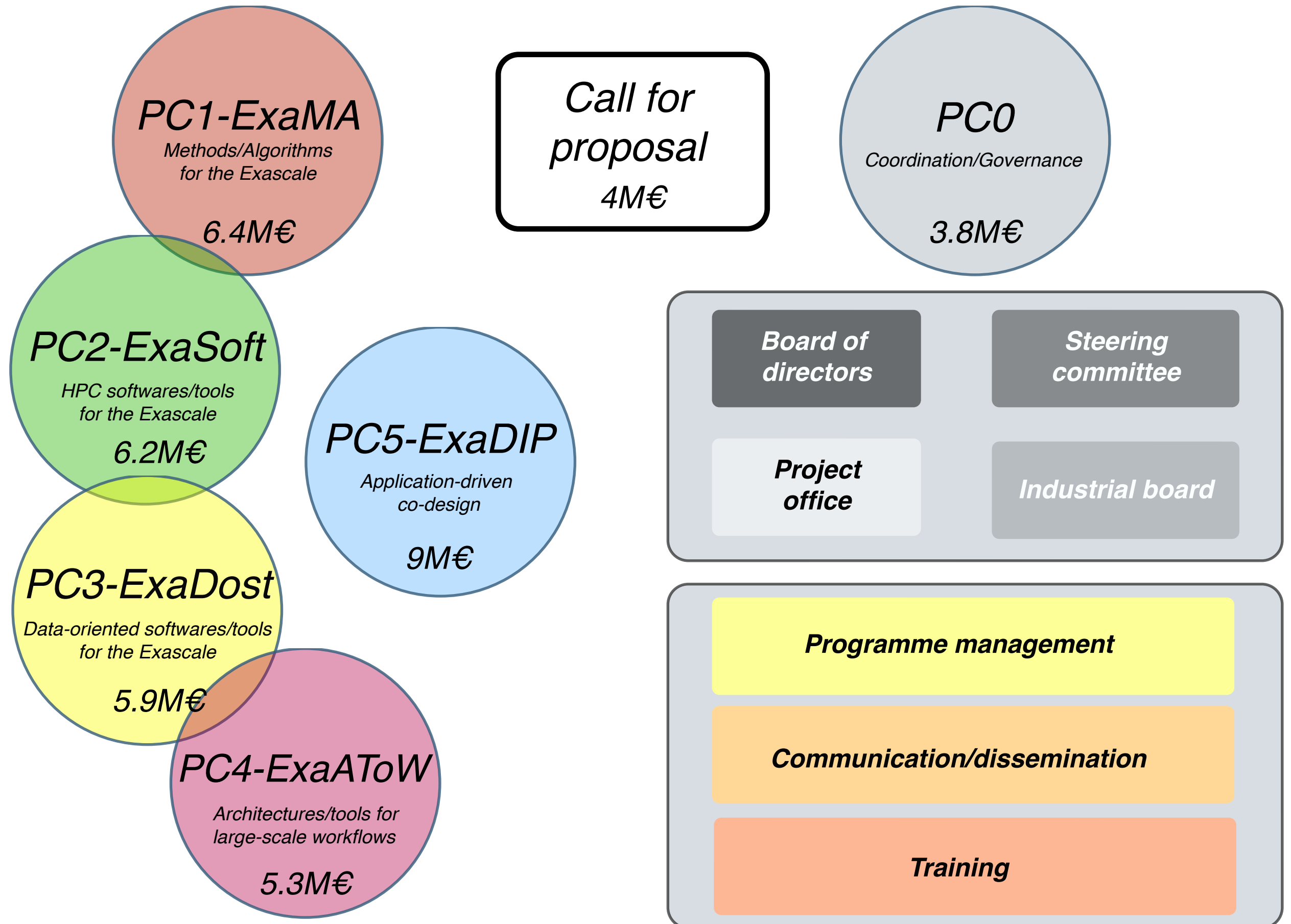
NumPEx, co-design integration/productivity

Application-driven co-design software development, integration and productivity



- Logical application-driven collections of value-added interoperable software components
- Integrated and packaged using common meta-builder systems enabling combined deployment of software components as needed by CSE applications

NumPEX, sum-up



NumPEx, take-away messages

NumPEx is an ambitious program to:

- prepare the scientific/engineering applications for the forthcoming HPC syst.
- contribute to the French/European software stack for future Exascale systems
- bridge the gap between the computer science/application communities
- help building a community for advanced scientific software development

Open to propositions of applicative demonstrators !
Many job openings too!

www.numpex.fr