# The MSA story of the DEEP projects family

## 1) Motivation

### General purpose systems

- **+** Highly flexible
- **-** High energy consumption
- **+** Preferred by many applications

### Highly scalable systems

- **-** Few (highly parallelizable) codes can fully exploit them
- **+** Highly energy efficient

## 2) Can one combine the best of these two worlds into a single system? → Yes! Exploit heterogeneity!

### Homogeneous cluster

- General purpose CPUs attached to a high-speed network

  - **+** Easy to use, very flexible
  - **-** Power hungry

### Traditional heterogeneous cluster

- Attach accelerators (e.g. GPUs) to each CPU

  - **+** Energy efficient, easy management
  - **-** Static assignment of accelerators to CPUs

## 3) The basis for the MSA: The Cluster-Booster Concept

The MSA developed in DEEP-EST builds on the so-called Cluster-Booster architecture. It was first conceptualized and proven with prototypes in the DEEP project. It is a combination of a standard HPC Cluster and a tightly connected HPC Booster.

### Cluster-Booster architecture

- **+** Energy efficient, high flexibility, dynamic ressource assignment