



# HPC in Cloud or Cloud in HPC: myths, misconceptions and misinformation

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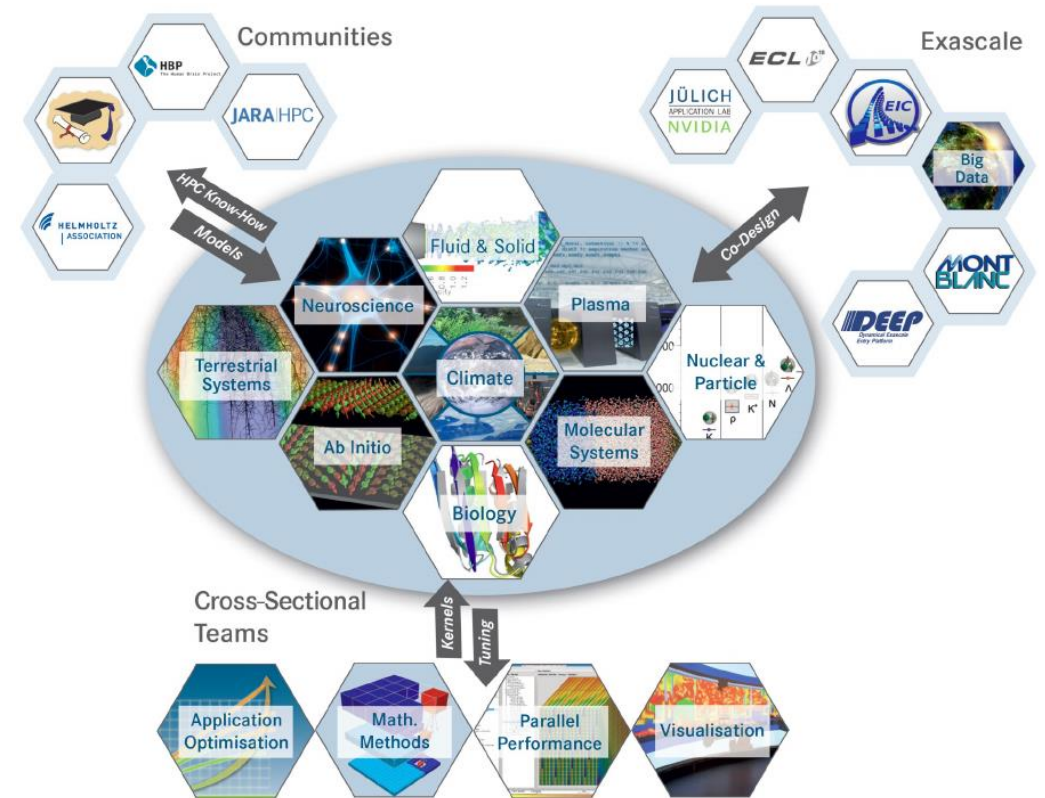
# Introduction

- **Jülich Supercomputing Centre**

- Regional, national and European centre
- Education and training, application support
- Research and development
  - Computational science: SimLab
  - Algorithms, performance analysis and tools
  - HPC architectures and technologies: Exascale Laboratories
  - Community data management service

- **Role of research communities**

- Materials science
- Earth system modelling
- Brain research



# “Convergence” of cloud and HPC or mutual enrichment?

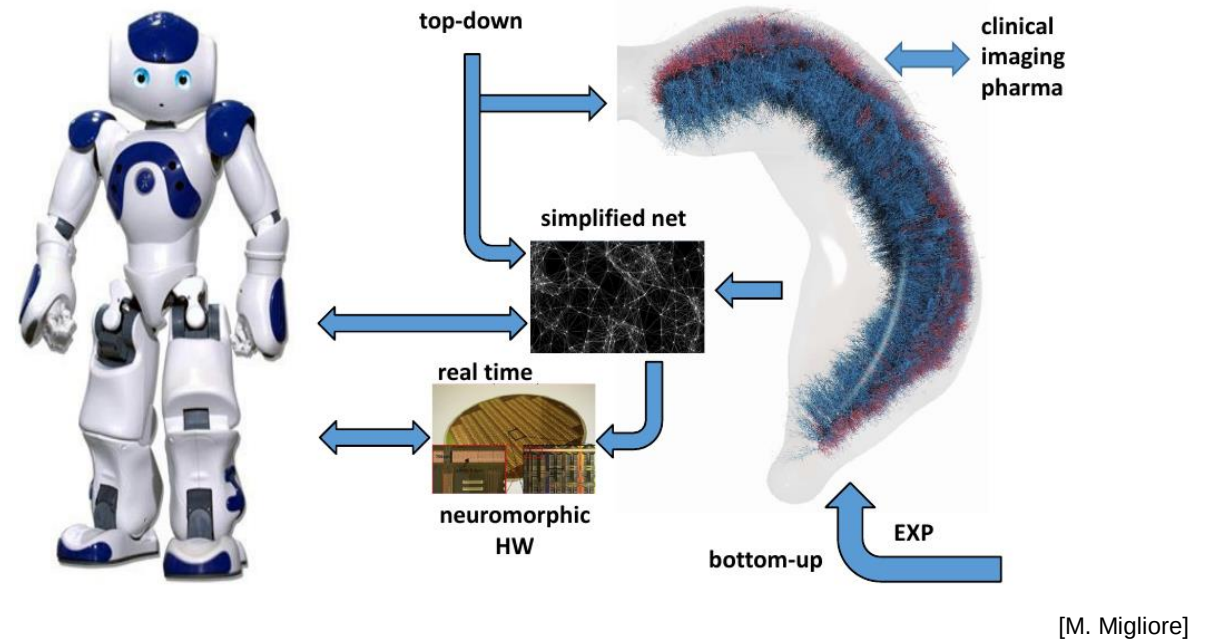
- **No convergence in the sense of an unavoidable process with known outcome**
  - Need for focus on benefits of mutual enrichment driven by willingness to enable changes in response of new opportunities and changing user needs
- **Awareness of differentiators**
  - Role of data locality and resource awareness
  - Security
  - Unique, complex works flows vs. consolidated solutions
  - Need for performance vs. benefits of elasticity
  - Role of virtualisation

# Established Benefits of Mutual Enrichment

- **Scientific computing perspective**
  - Facilitate creation of science community specific platforms
  - Enable of new types of work flows
  - Support data curation and provenance tracking mechanisms
  - Facilitate collaborative research through federation of services
- **HPC centre perspective**
  - Consolidate and improve support of different research communities
  - Improve utilisation of resources
  - Opening towards new communities

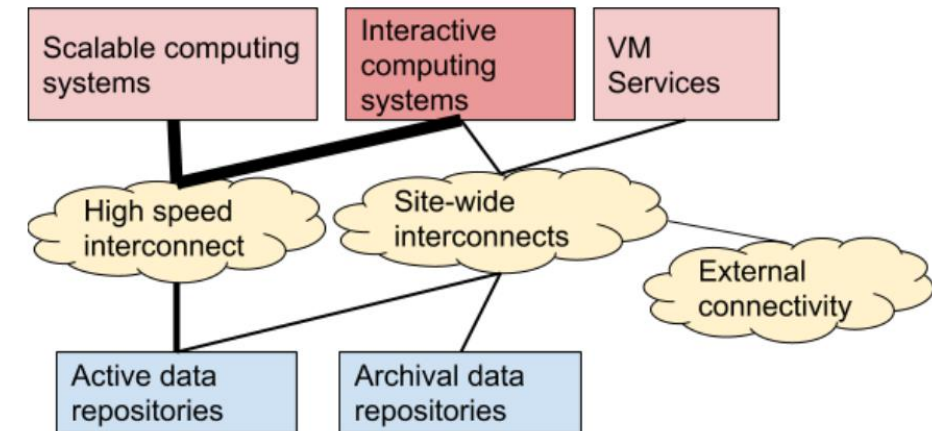
# Cloud and HPC: Opportunities for Enabling Research

- **Example:**  
**Brain research community**
- **Need to bring together**
  - Integration and sharing of data from diverse data sources
  - High-performance data analytics
  - High-performance computing for modelling
  - Coupling of different types of simulations
  - Support of interactive framework likes Jupyter notebooks
  - Integration of special purpose computers



# Example: Fenix

- **European project towards a federated provisioning of infrastructure services**
  - Partners today: BSC, CEA, CINECA, CSCS, JSC
  - Main science driver: Human Brain Project
- **Unified site architecture**
  - Different implementations
- **Key services**
  - Scalable compute, interactive compute, VM services
  - Active and archival data repositories
  - Data location, transfer and mover services
- **Integration in single AAI infrastructure**



# Thank you