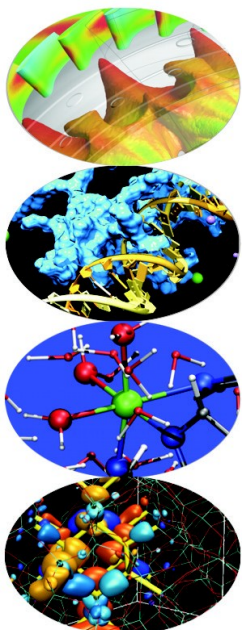
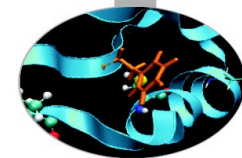


A2 - Knights Landing configuration on Marconi

Silvia Giuliani @ SCAI Cineca

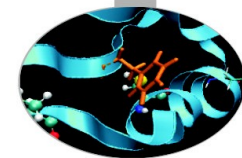
2017/20/03





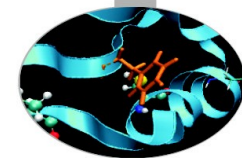
A2 Architecture

- Model: **Lenovo** Adam Pass
- Processor:
 - **intel xeon phi 7250**
 - xeon phi 2nd generation: **KNL**
- Performance:
 - theoretical peak performance: **11 Pflop/s**
 - maximal LINPACK performance achieved: **6 Pflop/s**
- Internal network: **Intel OmniPath**



A2 Architecture

- Processor family: **xeon phi**
 - brand name used for all products based on their Many Integrated Core (Mic) architecture
 - Knights Corner (Galileo) → compute node accelerator
 - Knights Landing (Marconi A2) → standalone processor



A2 Architecture

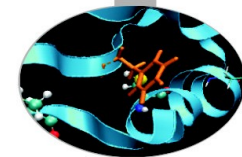
- ⌚ Processor number: **7250**
 - ⌚ best performance/watt
 - ⌚ 68 core
 - ⌚ 1.4 GHz of clock
 - ⌚ 1.60 GHz of clock with Turbo Boost → off
 - ⌚ Intel(R) AVX-512 (512-bit extensions to the 256-bit Advanced Vector Extensions)
 - ⌚ Iperthreading: 4 threads per core

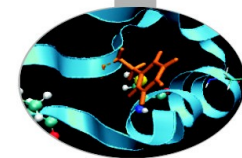
A2 Location

50 racks

Sala F - 46 racks (pink)

Sala M - 4 racks (pink)





A2 Cooling system

Water based free cooling system

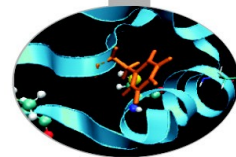
- Free cooling is an approach to lowering the air temperature in a building or data center by using naturally cool air or water instead of mechanical refrigeration
- The water cooling system is installed on racks doors of A2 system

A2 Configuration

- 50 ranks
- 72 nodes/rank
- 68 cores/node

TOT cores 244,800

- 45 ranks for accademic users
- 5 ranks for eurofusion users



A2 Configuration

• Compute node:

- 1x Intel Xeon Phi 7250 → 68 core
- Iperthreading → 272 threads (4 threads per core)
- Mcdram → cache (93GB)
- NUMA → quadrant
- 3,600 compute nodes

A2 Configuration

• Login nodes:

- 2 x Intel Xeon Processor E5-2697 v4users
- 3 nodes available for regular users
- 6 service nodes for cluster management

Users login nodes are shared between A1 and A2. Service login nodes are separated (6 for each partition), although they are identically configured.