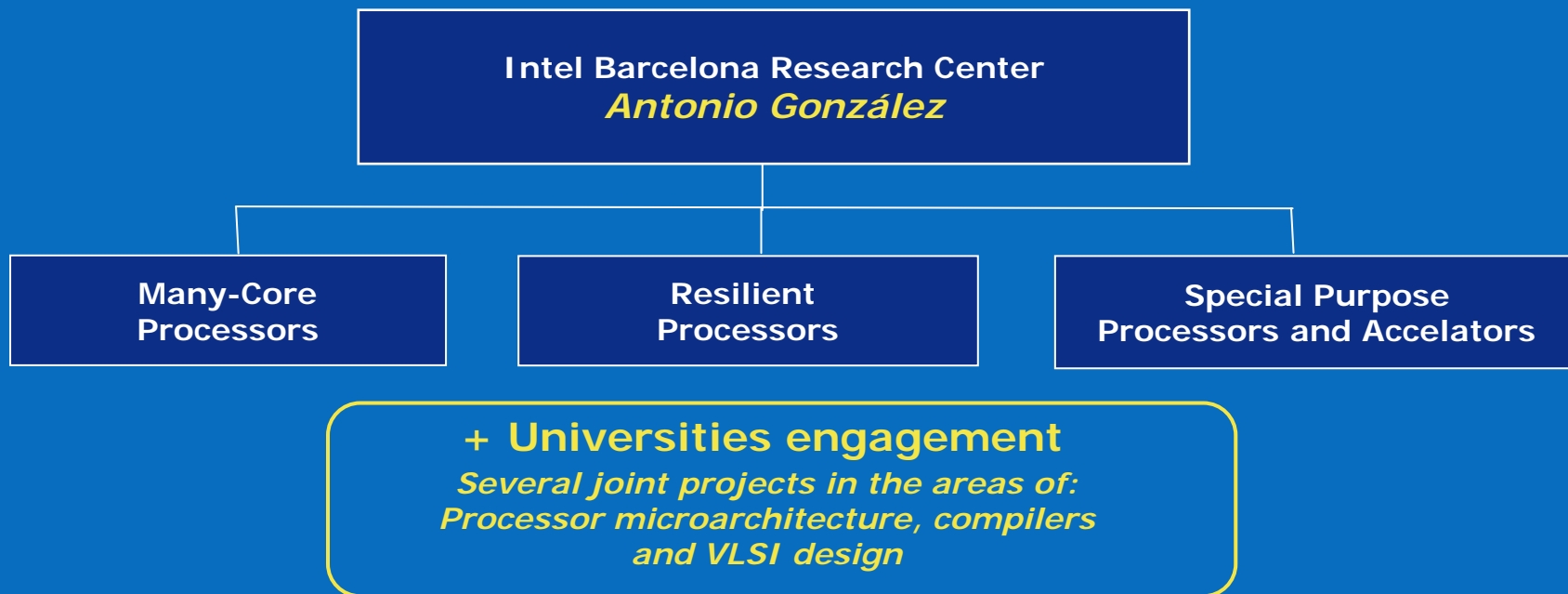# Intel Barcelona Research Center

- Why in Barcelona
  - Best architecture in the world
- A large and highly experience department on computer architecture at UPC
- Excellent schools all over Spain with very solid curricula in computer architecture

(intel)

Intel Barcelona Research Center (IBRC)

- Established in 2002
- Located in Barcelona (Spain) at UPC campus
- 18 Employees

Intel Barcelona Research Center
Antonio González

Many-Core Processors

Resilient Processors

Special Purpose Processors and Accelators

+ Universities engagement
*Several joint projects in the areas of:
Processor microarchitecture, compilers
and VLSI design*

Core Competencies

Processor Microarchitecture

Compilers

(intel)
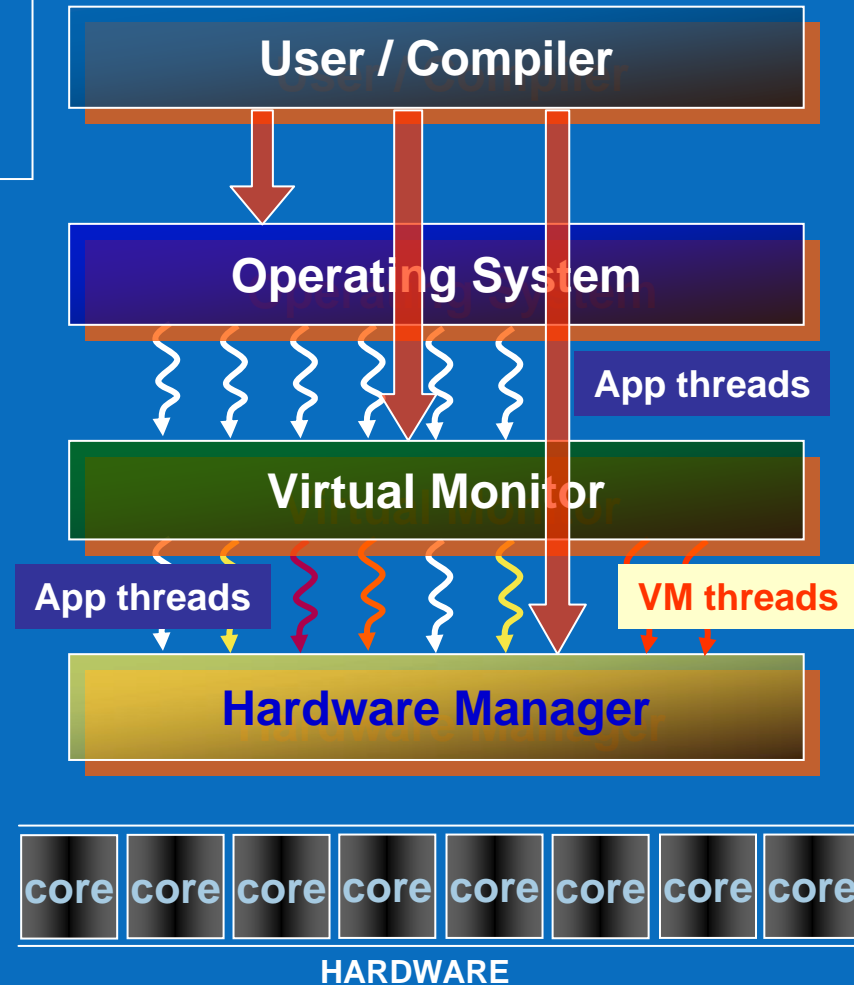
IBRC Main Research Focus

Microarchitecture and Compiler support for
- High Performance and
- Reliability
- Under Power Constraints

- Multitreaded Processors
  (Multicore & SMT)
  - Non speculative MT:
    For highly parallel workloads
  - Speculative MT:
    For lightly (no) threaded workloads
- Adaptive Microarchitectures
  - Adaptive hardware and software
- Power- and Thermal Management
- Resiliency
  - To deal with parameter variations and increase reliability

User / Compiler

Operating System

App threads

Virtual Monitor

App threads

VM threads

Hardware Manager

| core | core | core | core | core | core | core | core |

HARDWARE

(intel)

IBRC Main Research Activities

- Co-designed virtual machines

- Speculative multithreading

- Software dynamically scheduled processors

- Adaptive memory architectures

- Power and temperature control in many-core processors

- Resilient architectures for soft errors

- Microarchitectures to mitigate wear out

- Hardware accelerators for media and game physics

(intel)