Numerical Libraries

• Cat I: Uniquely exascale
  • Fault oblivious, Error tolerant software
  • Smart (AI based) algorithms

• Cat II: Exascale + trickle down
  • Async methods
    – Overlap data and computation
  • Algorithms that minimize communications
  • Self-adapting

• Cat III
  • Autotuning based software
  • Standardization activities
  • Architectural aware algorithms/libraries
  • Energy efficient algorithms
  • Mixed arithmetic
  • Hybrid and hierarchical based algorithms (e.g., linear algebra split across multi-core and GPU)