



DOE Advanced Scientific Computing Research

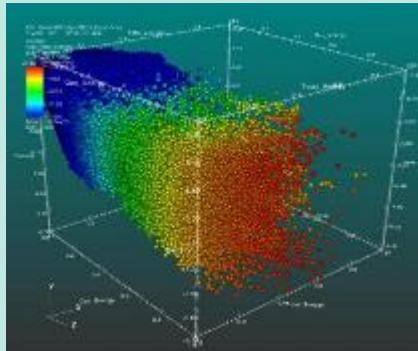
Ceren Susut, Associate Director

November 14, 2023

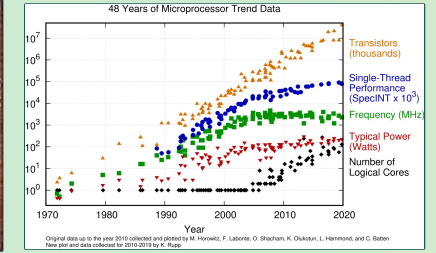
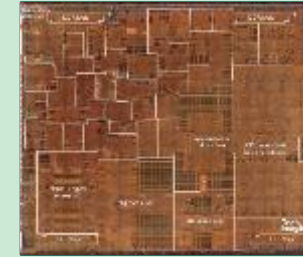
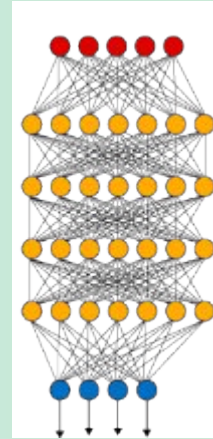


Critical Technology Trends Motivating ASCR Today

Data, Privacy, and Scientific Integrity



Artificial Intelligence and Deep Learning



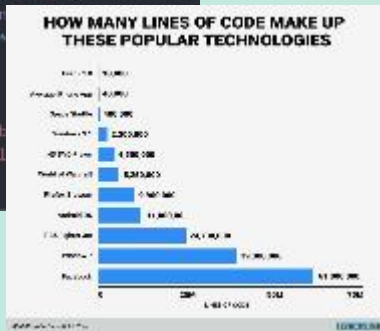
Heterogeneous, Distributed, Special-Purpose, Energy-Efficient Computing

Exploding Software Complexity

```

1 constexpr double fib(int n) { // function
2   if(n == 1) return
3   return fib(n-1) +
4 }
5
6 int main() {
7   const long long b
8   std::cout<<bigval
9 }

```



Scientific Computing and Networking: from HPC to the Edge

A New Science Era: Exascale Today Enables the AI of Tomorrow

Long-term investments in applied mathematics and computer science enabled exascale.



TOP500 1	GREEN 500 6	HPL- MxP 1
--------------------	--------------------------	-------------------------

Frontier and Aurora #1 and #2 on the Top500, lead the world in computational capability, and is also #6 in the world in energy efficiency, and is #1 in the world for AI capability.

The exascale and AI-enabled science era will lead to dramatic capabilities to predict extreme events and their impacts on the electric grid across weather and climate time scales...



and will accelerate the design and deployment of clean-energy technologies to create a better future.

