## “Beyond Moore’s Law”

- Gordon Moore, co-founder of Intel in 1965 predicted that every two years the number of transistors they could fit on a chip would double. Has held true for decades!
- This exponential growth enter the popular vernacular as a proxy for why everything is perpetually getting smaller and cheaper.
- Predictions that we have hit the physical limits of the von Neumann architecture underlying all of our digital devices.

- Future?
  - Massively parallel computing
  - Optical computing
  - Quantum computing
  - Biological computing

## Computer & Information Science & Engineering (CISE)

- **Computing and Communication Foundations (CCF)** *reorganized*
  - Algorithmic Foundations (AF)
  - Communications and Information Foundations (CIF)
  - Software and Hardware Foundations (SHF)

- **Computer and Network Systems (CNS)**
  - Computer Systems Research (CSR)
  - Networking Technology and Systems (NeTS)

- **Information & Intelligent Systems (IIS)**
  - Human-Centered Computing (HCC)
  - Information Integration and Informatics (III)
  - Robust Intelligence (RI)

## Near future funding trends

- **Core Programs** (09-557)
- **Cross-Cutting Programs** (09-558)
    - Data-intensive Computing
    - Network Science and Engineering (NetSE)
    - Trustworthy Computing

- Cyber-Enabled Discovery and Innovation (CDI) w/ everyone
- Social-Computational Systems (SoCS) w/ SBE (09-559)
- Virtual Organizations as Sociotechnical Systems (VOSS) w/ OCI
- CreativeIT (09-572)
- Collaborative Research in Computational Neuroscience (08-514)
- Foundations of Data and Visual Analytics (FODAVA) (09-525)

## Near future development and education funding trends

- **Computing Research Infrastructure** (08-570)
- **CPATH***, undergraduate education* (09-558)
- **Broadening Participation in Computing** (09-534)
- **HECURA, high-end computing** (09-530)