

The Computation Institute

- **Joint Institute with Argonne National Laboratory**
 - 50 affiliated scientists and faculty
- **Mission:**

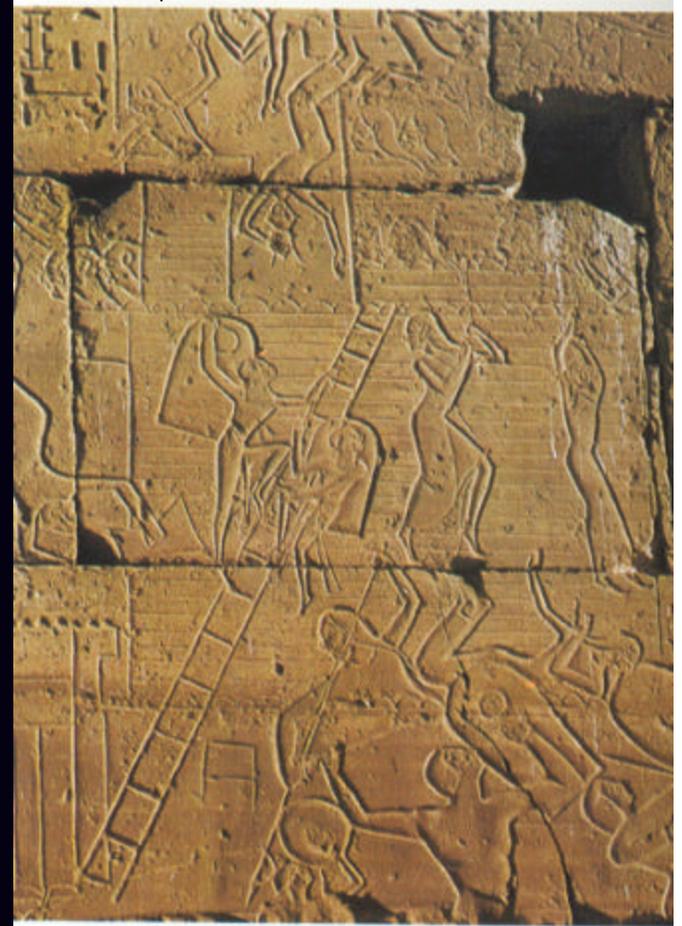
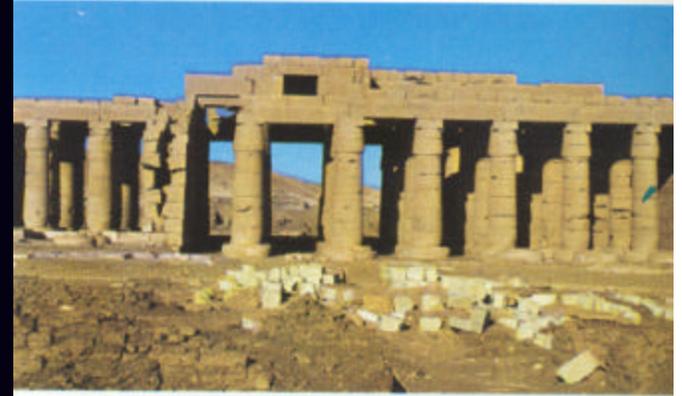
Research in high-impact multidisciplinary applications of large-scale computing and the research and development of future computing and communications technologies
- **Focus on projects beyond the scope of a single investigator**
 - Fosters collaboration and larger-scale investigations
 - Draws from all divisions of the university

Distinguished Advisory Board selected from Academia, Industry and Government

- Caltech, IBM, AOL-Time, Microsoft, LBNL, U Illinois, UCSD, etc.

Digital Archeology

- Digitally capture and archive cultural heritage sites for future study and analysis
 - Exabytes of images
 - Petabytes of 3D models
- Enable global network access to cultural databases and image repositories
 - Automated analysis and translation
 - Automated reconstruction of sites
 - VR multi-user walkthroughs



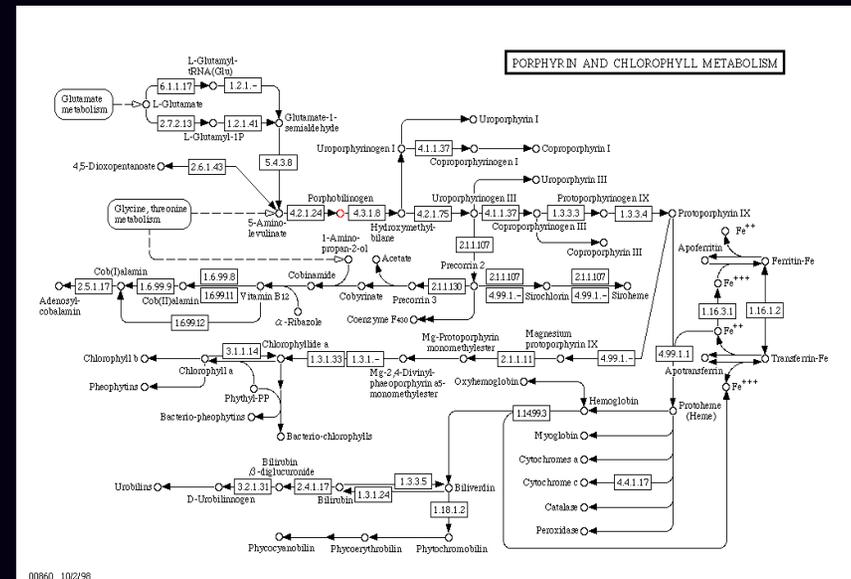
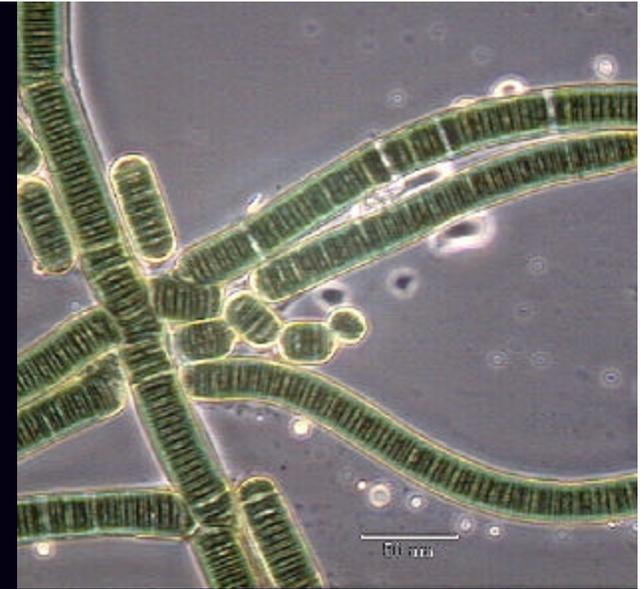
Whole Internet Simulation

- $\sim 10^6 - 10^8$ routers
- $\sim 10^9 - 10^{11}$ devices
- Modeling of network routing and dynamic resource management
- Determining the response of the internet (and other networks) to accidental and intentional disruptions
- Creating a basis for an automated marketplace for bandwidth, network CPU cycles, lambdas and network storage, etc



Biological CAD: Tools for Design in Life Science

- Understand biological systems from an information systems standpoint (e.g., organization, communication, transformation)
- Modeling biological systems: genes, molecules, pathways, organelles, cells, tissues, organs and organisms, communities
- Designing new biological structures and systems
 - New biochemical pathways
 - Genomic CAD
 - Designed microorganisms



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