



Covers Tuition for 2 semesters (full load of 12 credits per semester)

Research Stipend: \$6,000

CIARA Information Technology Science Certificate

What is CyberBridges?

- High-Performance Networking and Grid Computing Augmented e-Science and Engineering Research and Education

How Does the Grad Student Apply?

- Attend a one hour informational workshop. Visit www.cyberbridges.net for dates.
- Fill out the 1 page application form available on www.cyberbridges.net.
- Have the student application endorsed by a faculty advisor via a letter of support submitted with the proposal.
- Attach biographical information or CV (maximum of 2 pages).
- Email info@cyberbridges.net. Visit www.cyberbridges.net for proposal deadlines.
- Selection announcements will be posted on the web site. Visit www.cyberbridges.net for announcement dates.

Selection Criteria:

Selected fellowship applicants will conduct research and perform experiments alongside CI research scientists. This exploration will take place in a multidisciplinary lab environment, with graduate students of various disciplines all exploring applications of CI research. We are looking for:

Candidates who are on a research path that can be augmented by grid computing

Must be a graduate student in Science or Engineering

Some programming background desired— C or C++ preferred, Java, or Fortran.

Positions are limited after: Selections will be based on applicant proposals, research background, and experience with grid computing.

CyberBridges Fellowship Requirements:

First Semester Independent Study: *Special Topics in High-Performance Networking and Grid Computing*. Prerequisite for registration is admission into the CyberBridges program.

Second Semester Independent Study: Students and faculty will write a paper based on the research and experiment results, to be published and presented at an upcoming conference.



First Semester Independent Study: *Special Topics in High-Performance Networking and Grid Computing*

Eric Johnson, Instructor, *Networking* and Chi Zhang, Assistant Professor, *Grid Computing*

Networking

1. Introduction to Ethernet physical components
 - a. Copper
 - b. Fiber
 - c. Switches
 - d. Debugging Tools
2. Introduction to IP networking
 - a. Address space
 - b. Routing
 - c. Debugging Tools
3. Review of issues in high performance computing
 - a. Bandwidth Delay Product
 - b. Frame size
 - c. Latency/Jitter
4. Design of cluster networks
5. Implement cluster networks

Grid Computing

1. Cluster Computing
 - a. Hardware and Software Concepts
 - b. MPI
2. XML and Web Service
 - a. XML and XML Schema
 - b. SOAP
 - c. WSDL and UDDI
3. Grid Computing
 - a. Introduction
 - b. Compute Grid and Data Grid
 - c. Globus Toolkit
 - d. OGSA
4. High-Performance Networking
 - a. High-Speed TCP
 - b. Performance Monitoring

Second Semester: *Independent Study in Collaborative Research*

Students will work on a collaborative project that will augment their individual research topics, resulting in a research paper with the help of the CyberBridges Co-PIs and their faculty advisors. The paper will be based on class research and experiment results, and will be published and presented at an upcoming conference.

Advisory Committee:

Kelsey Downum, *Associate VP of Research*
 Ken Furton, *Associate Dean of Arts and Sciences*
 Norman Munroe, *Associate Director, Applied Research Center (ARC)*

Special Advisors:

John McGowan, *VP/CIO of University Technology Services*
 Yi Deng, *Dean of Computing and Information Sciences*

Investigators:

Heidi Alvarez, *PI* Eric Johnson, *Co-PI*
 Julio Ibarra, *Co-PI* Chi Zhang, *Co-PI*



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CI-TEAM CyberBridges
 NSF Award N°. OCI-0537464
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