

**Sponsoring Organization**

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**Technical Liason**

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**Project title: Stereoscopically visualizing organized structures in the Universe****Description**

Dr. Lee's research group in the Education Department is developing an innovative science curriculum module that takes advantage of cutting-edge visualization technologies. The curriculum module addresses comparing sizes and compositions of various organized structures in the Universe including clusters of galaxies, galaxies, stars, Earth, building blocks of life such as DNA and amino acids, and humans. We invite students who are interested in developing stereoscopic visualizations that can be static, animated, or interactive. The students would also have an opportunity to test them in a real classroom setting.

Dr. Lee's group has developed a portable stereoscopic projection system that uses two data projectors controlled by a Mac Pro running OS X Leopard. Currently, the system can project static stereoscopic images. However, it would be preferable if the projection system could be more interactive. The technical liason is a graduate student who is studying stereoscopy as his likely future dissertation topic. He has over ten years experience with UNIX system administration and is familiar with OS X's UNIX subsystem. His programming skills are restricted to Perl, which cannot be used for this task. He can provide much more detail and guidance (and a demonstration of the current, static system) upon request. A video of previous stereoscopic work can be seen on the education department web site:  
<http://ase.tufts.edu/education/programs/research/MSTEdphd.asp>

The goal of this project is to develop a software program that can project a right/left stereoscopic image and allow some form of interactivity with it.

**Software Requirements**

- Runs on OS X Leopard
- Supports our hardware system:
  - Mac Pro with two nVidia graphics cards driving two projectors (online rumor has it that the nVidia cards have built in stereo modes)
- When given two static images in a common format (JPG, PNG, etc.), it will project one on each of the two projectors
- Needs a batch mode, so that multiple visualizations can be displayed in a predefined order, advanced with a mouse click.
- Ability to allow a form of interactivity with the field of view. Exactly how this is done will be determined in collaboration with the programmer(s). Some ideas:
  - Develop a tool that will load a VRML file and display it from two slightly different angles, on the two projectors
  - Use Quicktime VR to control two projectors at once
  - At a minimum, just a zoom in/out and side-to-side feature added to our static images would still be quite useful
  - We are very open to novel, creative solutions.