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Instrumentation to Enable High Performance Computing  
(Instrumentation Grant)

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6. AUTHOR(S)

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13. ABSTRACT (Maximum 200 Words)

This instrumentation grant supported the acquisition of a 24 node computational cluster and 8 PC workstations for PostDoc use. DOD funded research activities that used this equipment included work on the control of nanoscale morphology in molecular beam epitaxial (MBE) growth of layered semi-conductors, the control of vortex shedding phenomenon, work on image restoration and work on extending level set method technology to multi-phase flow problems.

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**Final Report**  
**Instrumentation to Enable High Performance Computing**  
**(Instrumentation Grant)**  
**F49620-97-1-0194**

**Executive Summary**

This instrumentation grant supported the acquisition of

- A 24 node computational cluster
- 8 PC workstations for PostDoc use.

DOD funded research activities that used this computational equipment included work on the control of nanoscale morphology in molecular beam epitaxial (MBE) growth of layered semi-conductors, the control of vortex shedding phenomenon, work on image restoration and work on extending level set method technology to multi-phase flow problems.

**Personnel Supported**

None

**Project Summary**

The funds in this grant were used to purchase a Beowulf type computational cluster. The machine consists of 24 PC's connected with a 100 MB fast ethernet switch. Each PC contains a 300 MHz Intel Pentium II processor with 128 MB SDRAM and a 4 GB local disk. A 50GB file server is also included in the cluster. The Linux operating system is used with DQS for job management. Since the machines construction in July of 1997, the machine has been running continuously and provided the bulk of the computational cycles for the Virtual Integrated Prototyping (VIP) effort listed below.

The remaining funds in the grant were combined with matching funds from UCLA to purchase PC workstations for UCLA applied math PostDoc's working on DOD related projects.

DOD\ contracts utilizing the equipment.

*Hierarchical Modeling and Simulation Techniques with Application to Computational Fluid Flow Control*

Prof. C. Anderson, Prof. S. Gibson  
AFOSR (F49620-96-1-0327)

*Breakup of a Liquid Drip in High Speed Gas Flow/Numerical Methods for Multiphase Problems with Applications to Underwater Explosions and Ordinance Disposal*

Prof. S. Osher

ONR (N00014-97-1-0027)

*Nonlinear PDE Models and Methods for Image Processing*

Prof. T. Chan

ONR (N00014-96-1-0277)

*Virtual Integrated Prototyping for Epitaxial Growth*

Prof. R. Caflisch, Dr. M. Gyure

(DARPA/NSF) NSF-DMS-961584.