

2008 JPL Space Grant Internship Opportunities

Academic Major	Job Description
Computer Science	Work with a software engineering team to design and develop software-based control systems for the Deep Space Network antennas. Responsibilities will include design, development, testing, and documentation of software. Platforms include SUN, PC, and embedded computers.
ME, MATH	Analyze the pointing performance of the Deep Space Network (DSN) antennas under dynamic conditions. Using computer models, evaluate the performance of different antenna control algorithms. Develop and upgrade computer simulation
EE, ME	Design and develop hardware to interface a real-time antenna control computer to the electro-mechanical drives for Deep Space Network (DSN) antennas. Responsibilities will include hardware-software interface definition, circuit design and development, implementation, and testing.
EE, CS	Design and develop computer-based data acquisition and visualization systems for Deep Space Network equipment. Responsibilities will include the design, development, testing, and documentation of closed-loop antenna control systems and low noise amplifiers.
CS or EE	Implement Ground Support Equipment based on Macintosh OS and Java Applets to control GPS and GPS derived Flight Receivers for Earth and Mars applications.
CS or EE	Develop & Enhance Real-Time Data Packet Library to fly aboard Earth orbiting GPS and GPS derived Flight Receivers. Object oriented Packet Library is tightly coupled with unique, Object-oriented Real-Time Operating System developed at JPL completely using C++.
CS	Support the Software Development of the Web interface to PDMS. PDMS is a database application that manages the configuration of hardware development of flight and ground systems.
Astronomy, Astrophysics	The Gossamer Spacecraft Initiative will develop technology for ultralight-weight, large apertures (20-40m and beyond!) to produce breakthrough science. It is necessary to determine what science can be done with what size telescopes and at what wavelengths. The studies will address such issues as what type of apertures are needed for imaging extra solar planets, what is the statistical probability of earth like planets within the radius of 10, 100, 1000 LY, what resolutions are needed to upgrade the models of jets and accretion disks in distant quasars and more nearby megamasers, what other interesting science can be done with ultra large apertures, etc. The other aspect of the job is to work with the advanced technology team and review what innovative technology will be needed in the next 100(!) years to help answer the most
Physics	Participate in experiments related to laser cooling of atoms and ions for applications in atomic clocks and atom interferometry.
EE	Participate in the development of opto-electronic oscillators based on optical fibers.
Astronomy, Astrophysics	The Gossamer Spacecraft Initiative will develop technology for ultra lightweight, large apertures (20-40m and beyond!) to produce breakthrough science. It is necessary to determine what science can be done with what size telescopes and at what wavelengths. The studies will address such issues as what type of apertures are needed for imaging extra solar planets, what is the statistical probability of earth like planets within the radius of 10, 100, 1000 LY, what resolutions are needed to upgrade the models of jets and accretion disks in distant quasars and more nearby megamasers, what other interesting science can be done with ultra large apertures, etc. The other aspect of the job is to work with the advanced technology team and review what innovative technology will be needed in the next 100(!) years to help answer the most

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Physics / Math	The student will work with the quantum computing technologies group to develop computer-based simulations of optical interferometers that utilize entangled single-photon states for enhanced performance. The computer code will be used to model applications to optical metrology, gyroscopy, microscopy, and quantum imaging.
CS or EE	Support the Software Tool service and the Web interfaces to the users of the tools. Help in the deployment of Software Tool Chains so that every software engineer has access to the tools system.
EE, CS, Physics	Perform digital signal processing analysis and develop related software tools for Radio Science experiments.
EE, Physics	Development of mass spectrometer based analyzer for the quantitative measurement of chemicals dissolved in a sample of water. The student will be required to prepare water samples with known quantities of contaminants in it which will then be analyzed by a specially developed mass spectrometric system.
Environmental Engineering	Development of a portable sensor for the quantitative measurement of air pollutants.
EE or ME	Support the Electronic Libraries for Mentor, Cadence, Synopsis, and Ilogix tools. Their job entails working tool chains to the libraries and have a Web interface to the users of the tools. Help in the deployment of Tool Chains so that every engineer has access to the tools and systems.
Physics/Atmospheric Sciences/	Work with JPL personnel to maintain atmospheric visibility monitoring stations. Troubleshooting skills with C++ software and familiarity with image processing and database software desired.
EE	Will support development of interface electronics for elements of the Mars Sample Return Mission including the lander and orbiter payload electronics box (PEB). Will support preliminary and detailed electrical design for these electronics. Will develop detailed electrical specifications for PEB interfaces.
Mechanical Engineering	Will assist engineers with computer drafting on various engineering tasks for various flight projects in the Mechanical Engineering Section.
Engineering	<p>Support the Flight Hardware Logistics Program (FHLP) in the following areas:</p> <ol style="list-style-type: none"> 1) Transfer residual hardware 2) Coordinate with project engineers to determine spacecraft hardware used or planned for JPL missions 3) Create, expand, and populate a Web-based database of available inventory to Projects 4) Maintaining records of FHLP transactions and program metrics 5) Collection of project needs and inventory requirements

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EE, ME, Aerospace	Participate in the development of physics based spacecraft and mission models and simulation software.
CS, EE	Support existing Client/Server applications such as Just In Time Acquisition System. Monitor daily data loads from/to the Oracle system, reporting processes and EDI transactions; perform first level analysis on cause of errors. Work on development tasks as time allows.
EE	Support design and test of RF signal circuitry for one of a variety of signal processing applications including low power communications transceivers, state-of-the-art stability analyzers or ultra high-speed modulators.
EE, CS	Analyze radar remote sensing data together with ancillary data for scientific applications; computer graphic software development to display and animate the remote sensing data.
CS, Math, Physics, Engineering	Assist primarily with monitoring of data returned from a spacecraft; retrieving times from a web page on a weekly basis, entering those items in a template, checking for diagnostics when running code. Will also assist with archiving of instrument notes, creation of web-based achieving documents, noting times of data return, etc. As time permits, will also assist with graphical representations in IDL of research output.
Aerospace or Mechanical Engineering	Assist engineer in design and testing of Mars rover mobility assembly. Responsibilities include computer drafting, coordinate fabrication or assembly components, and assembly testing.
EE or Physics	Support Nondestructive Evaluation (NDW) Laboratory in the areas of data/image acquisition and processing of real-time radiography and scanning acoustic microscopy.
EE or Physics	Work in a laboratory where we design and test microwave and millimeter wave integrated circuits for use in spacecraft receivers for radio astronomy and atmospheric sensing instruments. Both measure the IC's and develop the equipment and software to perform the measurements.
EE,CE	Will perform as a working member of the X 2000 Integration & Test group. Will perform acceptance tests and integration tests on delivered hardware from vendors. May generate test procedures, write test software, design test equipment, perform environmental tests, and generate test reports.
ME,CS,EE	Develop optical communication Acquisition/Tracking simulation program using Matlab/Simulink. Analyze the performance characteristics of the program.
EE, Physics	Will participate in the development of Trapped Ion Atomic Clocks for high performance frequency and timing application in the Deep Space Network and for flight.

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Physics, ME, or EE	<p>We are engaged in an experimental study of mixtures of helium-4 and helium-3 studying the concentration as a function of temperature near the phase separation curve.</p> <p>The student would be involved in assembling the experimental apparatus, developing computer programs to control the experiment. The student would also help with the development of new, nano-Kelvin resolution thermometers for use at</p>
Biochemistry	Development of protein bioassay technique for Planetary Protection Technology. Candidate must have a broad knowledge or biochemistry. Specifically that involving proteins, as well as a working knowledge of protein purification and analysis techniques. Hands-on experience with biochemical assays would be a plus. The ability to work in a group of scientists with broad backgrounds is a must.
Biochemistry	Development of protein bioassay technique for Planetary Protection Technology. Candidate must have a broad knowledge or biochemistry. Specifically that involving proteins, as well as a working knowledge of protein purification and analysis techniques. Hands-on experience with biochemical assays would be a plus. The ability to work in a group of scientists with broad backgrounds is a must.
CS, EE, Physics	Will develop a LINUX based automated remote monitor and collection capability of engineering data from frequency and timing technologies under evaluation in NASA's Deep Space Network. Will also participate in the evaluation, test, and documentation of LABVIEW based software for Monitor and Control applications.
EE,CS	Digital signal processor programming in C and /or assembly language to support development of communications transceiver algorithms. Motif programming for GUI control programs.
EE, Math,CS	Analysis and simulation of communications systems performance. Development of software decoding algorithms for error correcting codes or software data compression systems.
EE, Math, CS	Development of an integrated software system for on-board science data extraction and buffer management, with progressive data compression. Development of a web-based interactive demonstration test bed.
Business Administration	Will plan, prepare, award and administer subcontracts of all types, including but not limited to fixed-price, cost-plus-fixed-fee and time and material, in support of a variety of JPL Programs/Projects. Job duties will include procurement planning, source list development, preparation of contract and supporting documentation, and administration of all issues concerning the contracts once awarded.

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Business Administration	Will plan, negotiate and administer purchase orders, including preparing Requests for Proposal, evaluation of proposals and selection of sources. Will support the purchase of commercially available supplies and services to support Laboratory
EE	Will work with System-On-A-Chip (SOAC) team in the development, operation, and maintenance of a universal test bed for the measurement and characterization of test chips and SOAC.
EE, CS, Math	Development of client/server and web-based telecom modeling, analysis and simulation systems in a distributed computing environment.
ME, EE	Perform microfabrication tasks in the development of novel micropropulsion technologies. Tasks will include the execution of standard Microfabrication process steps, typically in silion based environment, such as etching (various techniques depending on project), thin-film deposition (various techniques depending on project), mask fabrication, mask design, participation in discussions leading to overall device design, etc. Execution of tasks will require work in clean room environment under strong safety regulations.
CS	Provide support to the continuing development of the Artificial Intelligence base planning and scheduling tool ASPEN.
Any	Participate in the testing of the novel deep drilling mechanisms for extraterrestrial sampling.
CS	Selected applicant will write/modify programs for Earch KAM project that connect front end WWW User Interface and Oracle Database back end. The selected applicant will also interface with other Co-ops and mentors in order to leverage their knowledge to the best advantage of this project.
CS	Selected applicant will write/modify programs for Triana project that connect front end WWW User Interface and Oracle Database back end. The selected candidate will also interface with other Co-ops and mentor in order to leverage their knowledge to the best advantage of this project.
CS	Selected applicant will write/modify programs for the Mars Net Viewer project that connect front end WWW User Interface and Oracle Database back end. The selected candidate will also interface with other Co-ops and mentor in order to leverage their knowledge to the best advantage of this project.
CS	Enhance and modify existing computer codes for analysis of antennas and microwave components. Create interfaces with Matlab and windows, perform mathematics. Analysis as necessary. Program on platforms ranging from desktop computers to the HPExemplar 256 processor supercomputer. Interest in both computer programming and physics/engineering would be ideal.
ME	Will provide Mechanical Engineering support for the Develop New Products Project for the Mechanical Design, Build, Assemble, Test Process. Tasks will include development of solid model libraries for conceptual design, development of mass properties programs/spreadsheets for spacecraft design and real-time support for project design reviews as required.

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CS	Will provide support to the Develop New Products Project for the Mechanical Design, Build, Assemble, Test (MDBAT) Process. Tasks will include development and maintenance of the MDBAT web site, support of CAD visualization tools and customization of COTS software.
Engineering, CX	Light duty computer programming Analysis previously flown missions Interaction with databases
Aerospace/ Mechanical	Assist with various microspacecraft tasks within the group. These could include research into microspacecraft justification for future NASA deep space missions, work in the microspacecraft test bed, and mechanical layout of microspacecraft. Also includes interaction with other NASA center, the Air Force, and possibly international partners.
Any Technical Major	Assist with various JPL proposals. Proposals include cutting edge scientific and technology missions including instruments. Will assist proposal coordinators and proposal managers in the preparation or proposals vital to JPL, NASA, and the nation. Duties may include creation of schedules, interaction with spacecraft partners, challenging graphics, and other system engineering tasks. Be a part of a dynamic team producing cutting edge proposals for future work. Be exposed to the latest in mission ideas in a cost constrained, schedule driven environment.
EE,CS	Development of data acquisition, analysis, and graphical display systems using LabView on both PC and Sun computers.
EE	Participate in the R&D work related to an instrument, based on a new concept, intended for the measurement of chemicals present in a sample of water.
Aerospace/ Mechanical	Assist with various microspacecraft tasks within the group. These could include research into microspacecraft justification for future NASA missions, work in the microspacecraft test bed, and mechanical layout of microspacecraft. Also includes interaction with other NASA centers, DoD, and possibly international partners.
Mechanical Engineering	Will assist engineers with computer drafting on various engineering tasks for various flight projects in the Mechanical Engineering Section.