

WORKING TITLE • Programmer/Analyst IV	PERCENT OF FULL TIME • 100
DEPARTMENT NAME • CASS	DEPARTMENT UNIT CODE • 000219
VC AREA • ACADEMIC AFF	VC UNIT CODE • 1
SUPERVISOR'S NAME • Arthur Wolfe	SUPERVISOR'S TITLE • Director, CASS
SUPERVISOR'S EMAIL • awolfe@ucsd.edu	SUPERVISOR'S PHONE • 47435
TYPE OF SUPERVISION RECEIVED • General Direction	

POSITION OVERVIEW

• Under general direction of the Director of the Center for Astrophysics and Space Sciences (CASS), Organized Research Unit (ORU), lead a team of computer professionals responsible for the information technology (IT) infrastructure and computing resources of CASS. Collaborate and consult as the creative computer expert with technical systems contributions that are original, innovative and significant with the Director, Professors, Principal Investigator's, Administrative staff, Post Docs. Graduate students and the support staff in all facets of computer policy, requirements, security, design, operation, procurement, usage, help desk service, planning, development and analysis. Supervises, plans and administers the goals and policies of the IT organization and it's activities for CASS. Responsible for the direction of the CASS IT that includes the development and implementation of computer systems and their resources to support extramural and University funded projects and responsibility to provide and maintain a state of art IT infrastructure given minimal IT budgets. Selects, trains and supervises technical staff. Schedule work and establish priorities. Manage and plan computer budgets.

	FUNCTION NAME / TASKS	PERCENT	ESSENTIAL
1.	Information Technology Infrastructure	55	Yes
<p>A. The IT resources of CASS are comprised of a complex set of heterogeneous linked multiple-CPU computer servers, mini and microcomputers, workstations, personal computers and notebooks, operating systems and software, networking and associated peripherals that total over 270 computer systems distributed throughout CASS. These systems perform various computing activities and functions supporting the internationally recognized UCSD Center for Astrophysics and Space Sciences with over 70 personnel. These computing resources are typically organized into computer centers related to the research interests and disciplines of the department's groups and funding sources but all must communicate and interact with each other on an infrastructure level.</p> <p>1. Responsible for IT function and all computing aspects of the above described computer centers, hardware and software design, operation and customer support, security, operating systems, applications software, licensing, data protection, backups, associated peripherals, communications equipment, and system administration.</p> <p>a. Examples of The IT functions performed and supported include:</p> <ol style="list-style-type: none"> 1. Web servers such as www.cass.ucsd.edu and http://mamacass.ucsd.edu 2. Workstations and personal computers and notebooks used for general computing functions such as word processing, email and web access. 3. Support CASS Business Office computer operations to allow performance for all necessary functions including access to campus SQL server for general ledger transfers. 4. A highly complex Visualization laboratory with a 3D stereo display wall with video streaming and video conferencing that participated in the international virtual laboratory created at iGrid 2002 in Amsterdam see The Universe: Distributed Virtual Collaboration and Visualization on page 20 at http://www.igrid2002.org/Applications.pdf 5. A remote mainland observing facility for the control and operation of the KECK Telescope at Hawaii. http://www.uclick.org/~kibrick/spie2004/drafts/vnc_paper.pdf 6. An Aspen Systems 32 node cluster Beowulf class parallel computational computer performing theoretical analysis. 7. Multiple-user Scientific Data Processing/Analysis/Control facilities, and data analysis servers of large satellite databases. These systems perform the data acquisition, analysis and control of balloon and spacecraft instrumentation and experiments funded by extramural sources of contracts and grants including NASA and NSF. This includes the remote commanding and real time data acquisition and analysis of telemetry streams in support of instrument integration at remote sites such as GSFC and Kennedy Space Center for spacecraft launch and balloon launches at Alice Springs, Australia. CASS is presently receiving and analyzing data from experiments flying onboard multiple ESA and NASA launched spacecraft experiments and remotely observing from CASS on the KECK telescope in Hawaii. 8. Hardware includes multi-vendor servers, mini and microcomputers, personal computers and notebooks including NAS storage, networking and backup servers. Operating systems include Sun Solaris, Mac OSX, Redhat Enterprise Server, Fedora Core Linux, Debian Linux, Microsoft 2003 Server, Windows XP Pro, and H.P. VMS. Application software include complex in-house written analysis, display and control software and various vendor supplied and open source software such as Microsoft Office, Backup exec, Samba, Sophos Antivirus, Eudora Pro, IDL, IRAF, Solid Works, Fink, and NASA generated analysis software. <p>2. Establish, plan and administer the overall policies and strategic long term goals and procedures for Information Technology for CASS. Analyze the IT needs and establish priorities for feasibility studies, systems design and implementation to develop new and/or modify information processing systems. Determine and plan for the long-term systems needs and hardware and software acquisitions to accomplish objectives. Perform a variety of IT related tasks relying on extensive experience and judgment to plan and accomplish IT goals through familiarity of the IT field's concepts, practices, and procedures.</p>			

3. Responsible for the planning, operations, design specification, marketing analysis, selection and procurement of computing hardware, software and supplies. Manage and support all aspects of computing and network operations including budget, computer support staff, system analysis, repair, maintenance, system and network administration including the development, implementation, operation and maintenance of sophisticated computer applications and telecommunications network and operating systems and the administration of integrated information systems, multi-user interaction, scheduling of systems and peripherals, problem analysis and solution, data protection, and cross-platform Unix/NT integration and engineering.

4. Long range planning and implementation of the budget for computing resources within research groups and department. Managing the financial requirements of CASS' computer resources which includes the design and monitoring of cost, rate, billing and recharge functions of our computer resources to fund the salary of computer support staff and operations and manage the expenses for computer procurement, licensing, software, supplies and operation.

5. Represent the CASS Director, faculty, and Principal Investigators in meetings with extramural agencies, University departments and corporations, on developmental plans, design, capabilities and implementation for CASS computing resources. Represent department and groups in discussions with other UCSD departments and outside organizations and universities.

6. Responsible for the continuing upgrading, operation and maintenance of the department's computer centers; local area network (LAN), connections to campus and to internet, web services, development of security systems, networks and computer communications and environmental control, i.e. power air conditioning, noise control, lab layout and allocation of space.

	FUNCTION NAME / TASKS	PERCENT	ESSENTIAL
2.	Computer Security Management	15	Yes

A. Responsible for performing the cross platform security management of computer systems.

- Determine information security standards, develops and implement security standards and procedures.
- Ensure all system platforms are functional and secure.
- Determine acceptable level of risk for computing platforms.
- Define security risks and recognize and prevent major internet threats
- Implement security measures on various operating systems.
- Perform security audits and provides effective follow-up/computer forensics in the event of a security breach.

	FUNCTION NAME / TASKS	PERCENT	ESSENTIAL
3.	Computer System Design	10	Yes

A. Responsible for performing the design engineering of computer systems. These designs are used for instrumentation in the prelaunch checkout and post launch data analysis of space flight data, data acquisition, space science balloon borne operation systems and experimental laboratory requirements, which involve:

- Applying theoretical and mathematical approaches to computer system design
- Conducting computer system performance analysis, prediction, calculation and design validation using analytical and simulation models.
- Designing computer controlled systems for checkout, test, data reduction and data analysis.
- Researching, planning, development and implementation of state of the art computer systems, communications networks, and computing services with current and long range impact on CASS.
- Specifying system requirements: sizing, speed, flexibility, and interfacing.
- Evaluating vendor products hardware and software.

B. Overall design and development responsibilities of department 's experimental laboratories, satellite and balloon ground support computer hardware, system software, networking and system administration including equipment design and installation.

	FUNCTION NAME / TASKS	PERCENT	ESSENTIAL
4.	Establish Engineering Criteria	5	Yes

- A. Responsible for establishing engineering criteria involving the design, development, assembly and test of computer systems, requiring:
1. Writing engineering reports and documentation relating to computer systems and equipment, describing effectiveness, reliability, configuration and cost to Principal Investigators and research personnel.
 2. Determining feasibility of engineering designs relating to computer systems and equipment.
 3. Preparing proposals and project plans.
 4. Preparing documentation of system designs and test plans
 5. Provide assistance on how to use systems.

	FUNCTION NAME / TASKS	PERCENT	ESSENTIAL
5.	Engineering Liaison and Coordination	5	Yes

- A. Responsible for engineering liaison and coordination throughout construction and test of computing systems. Involves:
1. Coordinating the construction and test of various computing systems and peripheral equipment.
 2. Designing, specifying, purchasing and coordinating logistics of computer equipment, test equipment, spare parts and supplies required to support computer systems and their design.
 3. Performing engineering liaison between Principal Investigators, shop personnel, vendors and extramural funding agencies
 4. Procuring equipment, supplies and materials.

	FUNCTION NAME / TASKS	PERCENT	ESSENTIAL
6.	Supervision	5	Yes

- A. Supervise and provide direction of software programmers, lab assistants and assembly persons in the software implementation, construction, and assembly of various computer components, interfaces, electronic modules and lab work, requiring:
1. Establishing priorities and direction in implementation of software to support system modifications and developments.
 2. Directing assembly, construction and development of computer systems, their operating systems, their peripherals and electronic modules.
 3. Interviewing, selection and hiring.
 4. Assigns tasks and coordinates their activities
 5. Provides direction to assigned staff on priorities, design techniques, methods, and customer and computer support activities.
 6. Provides training in computer support, administration of computer systems and technologies.
 7. Complete annual performance evaluations for supervised staff and assess UCSD campus wide performance standards.

	FUNCTION NAME / TASKS	PERCENT	ESSENTIAL
7.	Detail Design	2.5	Yes

- A. Perform detailed design of electronic circuitry for both analog and Digital functions.
 B. Design interface and controller boards to be used for adapting various experiment's equipment to computing systems that involves:
1. Circuit design
 2. Board layout
 3. Parts selection
 4. Wire list generation
 5. Timing analysis

	FUNCTION NAME / TASKS	PERCENT	ESSENTIAL
8.	Experiment Test Support	2.5	Yes

- A. Conduct the test of computer systems, instrument test systems or flight hardware

involving:

1. Developing test specification, scheduling test facilities.
2. Connection of test equipment.
3. Operation of equipment.
4. Record and analyze results.
5. Evaluate performance.

▶ Knowledge, Skills and Abilities

Describe the knowledge, skills and abilities which are essential for successful performance of this position. List them in descending order of importance and describe the requirement-level of each. Finally, indicate the function number(s) related to each KSA statement listed.

Function Numbers:	Knowledge, Skill, Ability:	Importance Level:
All	Experience and knowledge of design engineering and mathematics sufficient to be able to perform computer systems design and electronics design. Apply the precepts of computer systems design with a comprehensive understanding of the integration of systems hardware, software, and networks and the ability to implement/integrate systems in an innovative manner.	Required
All	Ability to apply experience in computer systems to calculate system requirements, performance prediction, verification, and modeling of systems.	Required
All	Skill to analyze and interpret scientific research objectives to calculate system requirements to meet these objectives.	Required
All	Knowledge of computer based equipment. Technical knowledge of computer hardware components and systems. Knowledge of various types of communication devices and computer equipment. The ability to design, operate, troubleshoot, maintain, take apart, assemble and repair this hardware.	Required
All	Skill to read and write engineering reports, notes, schematics, drawings, and procedures.	Required
I, V, VIII	Knowledge of University Policy and Procedures concerning inventory, procurement, packing and shipping, and environment of lab space.	Required
I, VI, VIII	Skill in operating laboratory test equipment, machinery, and tools.	Required
All	Knowledge of multi-vendor UNIX/NT APPLE & VMS operating systems and their system administration, design, internal structures and concepts including computer software protocols (e.g. TCP/IP, AppleTalk, SMTP, HTTP, SNMP, etc.), and the operating systems and applications programs.	Required
All	Strong verbal and written communication skills to interact/negotiate professionally and effectively with a diverse population.	Required
All	Knowledge of UC Policies and Procedures to oversee the computer recharge system operations and make recommendations for implementing enhancements and changes. Ability to plan and manage the CASS computer budget.	Required
I - VI, VIII	Knowledge of management principles.	Required
I, II	Thorough experience and knowledge of computer and network security, and the security tools and methods used to protect computers.	Required

I, II	Knowledge of UCSD campus minimum-security standards and how to implement on a wide range of computer platforms.	Required
All	Knowledge and the ability to design and implement all types of complex networked servers used in computer centers both serving application level protocols (HTTP, SHTTP, POP, SMTP, etc.) and those providing lower level support (SSL, DNS, DHCP, etc.).	Required
All	Ability to resolve complex computer related problems and issues. Ability to take action and make decisions that has department wide impact in regards to computer matters.	Required
All	Ability to build foundation for IT infrastructure in which the mission of CASS and IT are synchronized by experience with computer systems, support, design and knowledge of computer hardware systems and operating system software and their applications.	Required
All	Strong analytic, inductive, and deductive reasoning skills with the ability to define problems clearly extrapolate consequences and determine the impact of proposed solutions. Demonstrated problem solving and trouble shooting skills relating to computer systems and software problem resolution. These skills include the knowledge of general software debugging techniques and software maintenance techniques.	Required
All	Ability to train and instruct others in the usage of the computer systems hardware and software resources.	Required
All	Knowledge of University, campus, and departmental administrative policies and procedures pertaining to computer related activities.	Required
All	Ability to evaluate workload and available resources, make recommendations, take action to adjust schedules and priorities and to multiplex tasks as required. Ability to direct and assess performance of staff assigned to projects.	Required