Colorado Space Grant Consortium

Spring 2018 Positions

Space Grant is seeking students from Aero, CS, EE/ECE, ME, ATOC, the sciences and engineering or anyone with an interest in gaining real world hands-on experiences.

All levels of experience from Freshman to Graduate students should apply. More positions will be posted in January.

http://spacegrant.colorado.edu/boulderstudents/howtogetinvolved

The current opportunities are with:

Pre-Interest with DigitalGlobe
and
The Colorado Space Grant Consortium

![Colorado Space Grant Consortium Logo]

**Computer Systems** – Build an understanding of how computer systems work. Learn how Linux and Windows servers can work together.

**Lab Team** – Help build tools for Space Grant student teams and help bring knowledge and skills to SG Projects. This interdisciplinary team is looking for enthusiastic students. We will explore ideas around building a CubeSat program.

**RocketSat** – Be a team member to design a sounding rocket payload that will go 72 miles into space. This team is designing a payload, in collaboration with Lockheed Martin, which will measure the density of the ionosphere through utilizing radio frequency engineering. They are currently working on bringing the design to a Critical Design Review level by spring semester and the payload will be flown in summer 2018. Must be a US Citizen.

**HASP** – Build a small reusable habitat to be tested on a balloon platform at 120,000 feet for close to a day.

**RockOn** – Be a team member that enables students to send their hardware on a sounding rocket flight that will go 72 miles into space.
DigitalGlobe

Deploy Team members are needed starting May 2018 through summer until November 2018. Interviews will start in March or April 2018. We will reach out to you when interviews start in March if you register your interest now.

On-Call Student Satellite Calibration Technician

About the Company
DigitalGlobe is a leading provider of commercial high-resolution earth observation and advanced geospatial solutions that help decision makers better understand our changing planet in order to save lives, resources and time. Sourced from the world’s leading constellation, our imagery solutions deliver unmatched coverage and capacity to meet customers’ most demanding mission requirements. Each day customers in defense and intelligence, public safety, civil agencies, map making and analysis, environmental monitoring, oil and gas exploration, infrastructure management, navigation technology, and providers of location-based services depend on DigitalGlobe data, information, technology and expertise to gain actionable insight. DigitalGlobe is a public company listed on the NYSE as DGI.

Summary
Assist remote sensing scientists at DigitalGlobe in field work to calibrate Earth observing satellites. Gain hands-on experience in the operation of field equipment for satellite nadirmetric assessment including field spectrometers, Sun photometers and weather instruments. DigitalGlobe is looking for students to perform on-call scientific field work. Field deployments can occur up to four times per week. The team will start in September and work will continue through mid-November. Deploys will typically begin at 9:30 am and end anywhere between 2:00 – 4:00 pm (dependant upon work to be done that day). We are seeking students who can ideally commit to 2-4 days a week during a normal school week this fall. You can pick which days you want to work depending on your schedule from a list of potential dates given 2-4 weeks in advance. This way you can schedule your availability around classes and mid-term weeks for instance. If the weather or sensor availability prevents a deployment, you will be notified 24-hours before the attempt of the cancelation. If a deploy is canceled last minute (e.g. that morning, due to weather), you will receive 2 hours of pay. Hands-on training will be provided in the field.

Responsibilities
• Deploy and operate scientific field equipment
• Potential for handling and assessment of field data
• Be on-call for 9:30AM to 4:00PM work up to 4 days a week.

Job Requirements
• Must be able to pick up moderately heavy equipment
• Must be able to work outdoors for extended periods of time
• Must be reliable and punctual
• Undergraduate and graduate-level students encouraged
• Must be a US Citizen

Compensation
Competitive starting pay rate with potential increases based on experience, performance and tenure.

Contact
Michele Kaester at DigitalGlobe (mkaester@digitalglobe.com) or Brian Sanders with the Colorado Space Grant Consortium (brian.sanders@Colorado.EDU). This position will be filled through the Colorado Space Grant Program. http://spacegrant.colorado.edu/

www.digitalglobe.com
# Computer Systems

<table>
<thead>
<tr>
<th>Job Title: Server Manager</th>
<th>Position #: CS01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project: Computer Systems</td>
<td>Available Positions: 2</td>
</tr>
</tbody>
</table>

**Description:** This is a great way to learn about Space Grant and gain great exposure to many projects. Learn about computer systems from Windows and Linux servers to network setup. We have a great amount of diverse computer systems and you will gain hands-on experience by learning how they work and how to keep them working. Not a lot of previous experience is required - you will learn all the skills necessary on the job.

**Minimum Requirements:**
- A quick learner and willing to ask questions.
- Can spell Linux ☺
- The ability to coordinate with several different Space Grant teams
- Willingness to learn and adapt

**Preferred/Optional Experience:** Experience with a command line interface, Shell Programming

**Time Commitment:** 6-8 hours/week Volunteer

<table>
<thead>
<tr>
<th>Job Title: Website Manager</th>
<th>Position #: CS02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project: Computer Systems</td>
<td>Available Positions: 1</td>
</tr>
</tbody>
</table>

**Description:** This is another great way to learn about Space Grant and gain great exposure to many projects. Learn about how to manage, maintain, and create content on a large website. You will gain hands-on experience working directly with the Space Grant website and working with student teams to help them update information on the website to inform the public about our student projects. Not a lot of previous experience is required - you will learn all the skills necessary on the job.

**Minimum Requirements:**
- A quick learner and willing to ask questions.
- The ability to coordinate with several different Space Grant teams
- Willingness to learn and adapt

**Preferred/Optional Experience:** Web development, Joomla, or other Content Management System experience

**Time Commitment:** 6-8 hours/week Volunteer
## Lab Team

<table>
<thead>
<tr>
<th>Job Title:</th>
<th>Lab Team</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position #:</td>
<td>L01</td>
</tr>
<tr>
<td>Project:</td>
<td>Lab Team</td>
</tr>
<tr>
<td>Available Positions:</td>
<td>1-2</td>
</tr>
</tbody>
</table>

**Description:** Build Stuff and Learn Stuff. The Lab team will get a broad spectrum of experiences helping to build Space Grant infrastructure and hopefully bring greater knowledge to Space Grant students. Tasks will range from learning about test equipment to helping to improve resources for Space Grant projects. This is a very interdisciplinary team. Learning about Arduinos might be part of the mix of tasks. Additionally, this team will support statewide COSGC educational programs. We may also evaluate other longer term educational efforts for student hardware build projects.

**Minimum Requirements:**
- Student should work well on a team
- Able to learn quickly
- Desire to teach others
- Attention to detail
- Willingness to put energy and time into diverse projects

**Preferred Experience:**
- Microcontroller and embedded systems development experience
- Familiarity with C/C++ programming or mechanical CAD tools
- Soldering skills
- Previous student hands-on project experience

**Time Commitment:** 6-12 hours/week, Paid team lead, Credit or Volunteer
## RocketSat

<table>
<thead>
<tr>
<th>Job Title: Science System Engineer</th>
<th>Position #: R01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project: RocketSat</td>
<td>Available Positions: 2</td>
</tr>
</tbody>
</table>

**Description:** Our payload is using a passive array to measure radio signals between 2.9 and 3.0 GHz coming from the NEXRAD Doppler Radar Network. The science team is responsible for analyzing this data once we recover the payload. The analysis will involve separating the data into different signals for each ground station and determine the orientation of the payload based on which antenna receives the signals first.

**Useful Skills**
- Payload and mission build experiences on a
- Familiar with Radio Frequency (RF) processing
- Great communication skills and able to communicate technical concerns within a team and to non-technical personnel
- Engineering student
- Proficient in MATLAB

**Required Skills**
- Work well on a team, Learn quickly
- Interest in RF technology and data processing
- US Citizen

**Time Commitment:** 8-12 hours/week Volunteer

<table>
<thead>
<tr>
<th>Job Title: Structural Engineer</th>
<th>Position #: R02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project: RocketSat</td>
<td>Available Positions: 2</td>
</tr>
</tbody>
</table>

**Description:** The structural system houses all components required for the success of the mission. A person on this team would be responsible for using Solidworks and similar software to design complex components to be manufactured and assembled using a variety of methods. You will be expected to machine components using a mill and lathe as well as other manufacturing methods ranging from using hand tools to 3-D printing. You will work within the Structural sub team and work closely with other system teams to support their mission objectives so you must be able to communicate engineering principles and ideas well with other engineers.

**Useful Skills**
- ASEN or ME student
- Machining experience
- Knowledge or certified with CNC machines
- Proficient with Solidworks

**Required Skills**
- Work well on a team
- Learn quickly
- Interest in RF technology
- US Citizen

**Time Commitment:** 8-12 hours/week Volunteer
<table>
<thead>
<tr>
<th>Job Title: Avionics</th>
<th>Position #: R03</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project: RocketSat</td>
<td>Available Positions: 2</td>
</tr>
<tr>
<td>Description: The Avionics team will be responsible for the control and electrical hardware and software on an RF receiving payload. This includes selecting and configuring the computing hardware required, interfacing the various electronic components with each other, as well as developing communications and data handling protocol for the payload’s scientific data.</td>
<td></td>
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<tr>
<td>Useful Skills</td>
<td></td>
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<tr>
<td>• EE/ECE, CS or ASEN student</td>
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<tr>
<td>• Programming skills</td>
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<tr>
<td>• Experience with microcontrollers, particularly Raspberry Pis</td>
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<tr>
<td>• Soldering and Arduino experience</td>
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<tr>
<td>• Experience with RF engineering or ham radio operation</td>
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<tr>
<td>Required Skills</td>
<td></td>
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<tr>
<td>• Work well on a team, Learn quickly</td>
<td></td>
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<tr>
<td>• Interest in RF technology and data processing</td>
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<tr>
<td>• US Citizen</td>
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<tr>
<td>Time Commitment: 8-12 hours/week Volunteer</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Job Title: Systems Engineer</th>
<th>Position #: R04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project: RocketSat</td>
<td>Available Positions: 1</td>
</tr>
<tr>
<td>Description: The systems engineer is responsible for the payload mission as a whole and helping each sub team integrate properly and checking compatibility between sub systems. They are expected to understand, with at least familiarity, every sub teams responsibilities and what they are in charge of, in order to ensure compatibility for the entire payload with the platform. The systems engineer is required to plan the needed documentation for the system.</td>
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<tr>
<td>Useful Skills</td>
<td></td>
</tr>
<tr>
<td>• Engineering student</td>
<td></td>
</tr>
<tr>
<td>• Familiar with avionics responsibilities, Radio Frequency (RF) processing, and structural design/analysis</td>
<td></td>
</tr>
<tr>
<td>• Able to communicate, especially technical concerns, within a team and to non-technical personnel</td>
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</tr>
<tr>
<td>Required Skills</td>
<td></td>
</tr>
<tr>
<td>• Work well on a team, Learn quickly</td>
<td></td>
</tr>
<tr>
<td>• Interest in RF technology</td>
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<tr>
<td>• US Citizen</td>
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<tr>
<td>Time Commitment: 10-12 hours/week Volunteer</td>
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</table>
HASP – Miura

These identified positions will not be filed unless we win a flight opportunity with the national HASP program. A proposal was submitted in December 2017 and we expect to find out if we won a Summer 2018 flight in mid-January. Please apply to the positions you are interested in now and we will start interviews immediately after if we win a flight opportunity.

<table>
<thead>
<tr>
<th>Job Title: Project Manager</th>
<th>Position #: H01</th>
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</thead>
<tbody>
<tr>
<td>Project: HASP</td>
<td>Available Positions: 1</td>
</tr>
</tbody>
</table>

**Description:**
The Project Manager will guide the project through design, build, test, flight, and analysis. This includes planning monthly design reviews to be presented to the Directors of Space Grant, managing the schedule and budget, as well as meeting and working with the rest of the team to increase the chance of success of the mission. The project manager will be the primary point of contact between the team, the HASP administrators, and Space Grant leadership.

**Useful Skills**
- Experience with a full project cycle of initial design to flight and analysis.
- Ability to bring a team of diverse students together around a project.

**Required Skills**
- Leadership skills
- Organization skills

**Time Commitment:** 10-15 hours/week Volunteer

<table>
<thead>
<tr>
<th>Job Title: Systems Engineer</th>
<th>Position #: H02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project: HASP</td>
<td>Available Positions: 2</td>
</tr>
</tbody>
</table>

**Description:**
The systems engineers focus on the integration of the subsystems with each other. Responsibilities will be split between systems-level tasks (requirements, mission planning) and component level tasks (ensuring sensors remain within operating limits). The systems engineers aide in management tasks, including: helping to lead design reviews and interfacing with HASP and Space Grant leaders.

**Useful Skills**
- Familiarity with different systems (e.g. Structures, Electronics, Software)

**Required Skills**
- Leadership skills
- Organization skills
- Big-picture and detail oriented

**Time Commitment:** 8-12 hours/week Volunteer
<table>
<thead>
<tr>
<th><strong>Job Title:</strong></th>
<th>Habitat Engineer</th>
<th><strong>Position #:</strong></th>
<th>H03</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project:</strong></td>
<td>HASP</td>
<td><strong>Available Positions:</strong></td>
<td>3-5</td>
</tr>
</tbody>
</table>

**Description:**

One leadership position is available for the Habitat team.

The Habitat Engineers shall be responsible for design, testing, manufacturing, and analysis of a reusable soft-shell habitat capable of maintaining room temperature and pressure in a near-space environment. The system must include a reliable pressure mechanism, a thermal regulation system, and an unobtrusive retraction mechanism.

**Useful Skills**
- ASEN or other STEM major
- Experience with pressure systems
- Experience with thermal systems
- Materials science experience

**Required Skills**
- Work well on a team
- Learn quickly

**Time Commitment:** 5-10 hours/week Volunteer

<table>
<thead>
<tr>
<th><strong>Job Title:</strong></th>
<th>Structures Engineer</th>
<th><strong>Position #:</strong></th>
<th>H04</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project:</strong></td>
<td>HASP</td>
<td><strong>Available Positions:</strong></td>
<td>2-3</td>
</tr>
</tbody>
</table>

**Description:**

One leadership position is available for the Structures team.

The Structures Engineers will be responsible for the design and manufacture of the aluminum housing for the payload. Design factors include weight, accessibility of components, and ability to withstand landing shock. Solidworks and machining experience preferred but not required.

**Useful Skills**
- ASEN or ME student
- Solidworks experience
- Machining experience

**Required Skills**
- Work well on a team
- Learn quickly

**Time Commitment:** 5-10 hours/week Volunteer
**Job Title:** Electrical Power System Engineer  
**Position #:** H05  
**Project:** HASP  
**Available Positions:** 2-3  

**Description:**

One leadership position is available for the Electrical and Power Systems team.

The Electrical Power System (EPS) system shall be responsible for the distribution of power to each subsystem, and management of environmental sensors. The team will design, print, and populate a circuit board to control the power supplied by the platform and interface with the flight computer.

**Useful Skills**
- ASEN, EE, or ECE student
- Circuit design skills
- Experience with Altium or similar software
- High skin resistivity

**Required Skills**
- Work well on a team
- Learn quickly

**Time Commitment:** 5-10 hours/week Volunteer

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**Job Title:** Flight Software Engineer  
**Position #:** H06  
**Project:** HASP  
**Available Positions:** 2-3  

**Description:**

One leadership position is available for the Flight Software team.

The Flight Software (FSW) team shall design and implement flight code to be run aboard the flight computer. The code must be simple, robust, and easy to troubleshoot. Previous missions have used a Raspberry Pi running flight code in Python, which will likely be used again.

**Useful Skills**
- ASEN, CS, or ECE student
- Programming skills, especially Python
- Experience with microcontrollers, especially Raspberry Pi

**Required Skills**
- Work well on a team
- Learn quickly

**Time Commitment:** 5-10 hours/week Volunteer
**RockOn**

<table>
<thead>
<tr>
<th><strong>Job Title:</strong></th>
<th>Prep Team Member</th>
<th><strong>Position #:</strong></th>
<th>RW01</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project:</strong></td>
<td>RockOn 2018</td>
<td><strong>Available Positions:</strong></td>
<td>2-5</td>
</tr>
</tbody>
</table>

**Description:**
The RockOn workshop is a 6-day hands-on workshop held every June at NASA’s Wallops Flight Facility. Approximately 60 college students and faculty participate each year. During the workshop, participants form teams of 3 and then proceed to build a sounding rocket payload from a prepared kit over the first 3 days. The payload is then launched to 72 miles on sounding rocket on the 5 day. The payloads are recovered and the teams analyze their data. The work this semester will focus on preparing the kits as well the handbook/teaching materials for the workshop. The goal is to have all the kits, handbooks, and equipment ready to ship by April 30, 2018. There will be at least one weekly meeting with the team plus common work hours.

**Useful Skills**
- Engineering student
- Attention to detail
- Some experience with either Arduino, electrical design, coding, PowerPoint, and/or machining

**Required Skills**
- Work well on a team
- Learn quickly
- Very organized

**Time Commitment:** 4-12 hours/week Volunteer

Thanks for reading through all the positions offered this semester. There may be other opportunities available in the coming days so feel free to check back in a few days.