Colorado Space Grant Consortium

Student Positions

Mid-Spring 2019 Positions

1. STEAM
Project Description:
The STudent Energetic Activity Model (STEAM) is a multi-year experiment in collaboration with the Southwest Research Institute (SwRI) to search for signatures of nanoflares and open-field transient release of the solar wind, as well as reconnection based coronal heating mechanisms from the Sun in soft and hard x-ray. The experiment is going on one of four satellites that is part of a SMall EXplorer (SMEX) class mission, PUNCH. The planned instrument delivery is 2022 and planned launch is 2023.

Any recommended skills not already known can be learned through employment.

US Citizenship is required for all STEAM positions.
<table>
<thead>
<tr>
<th><strong>Position Title:</strong> Avionics Team Member</th>
<th><strong>Position #:</strong> S_01</th>
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<td><strong>Project:</strong> STEAM</td>
<td><strong>Available Positions:</strong> 1-2</td>
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**Description:** The STEAM Avionics subteam will be responsible for developing the electrical and software interfaces with the off the shelf x-ray spectrometer that will be used on STEAM. Students on this team will also investigate and help develop the electrical interfaces with the primary spacecraft as well as the other systems on STEAM.

**Recommended Skills**
- Code Development in Linux
- FPGA Experience
- VHDL/Verilog
- Eagle/Altium/Other Circuit/PCB software design experience
- PCB Manufacturing experience
- General Programming Experience
- Familiarity with RS-232, RS-422, UART serial interfaces
- Familiarity with DC power conversion and regulation

**Required Skills**
- Have previous project experience (Space Grant, freshman projects, etc)
- Experience programming and wiring microcontrollers (example: Arduino Raspberry Pi)
- Electrical circuit design background
- Previous hands-on experience with electrical circuits (class and lab are acceptable)

**Time Commitment:** 8-10 hours/week at $15/hour
**Position Title:** Structures Team Member  
**Position #:** S_02  
**Project:** STEAM  
**Available Positions:** 1-2

**Description:** The STEAM Mechanical sub-team will be responsible for developing the structural design for the STEAM instrument as well as any support systems needed for internal components. This will involve CAD modeling, physical and software-based payload testing, prototyping, and component manufacturing. Students on this team will also investigate and assist with the development of mechanical interfaces interacting with the primary spacecraft.

**Recommended Skills**
- Actual machining experience  
  - 3D printer, metal shop, CNC  
- Experience with one or more of the following:  
  - Thermal analysis  
    - Thermal Desktop, SolidWorks Thermal  
  - Finite Element Analysis  
    - ANSYS  
  - Radiation shielding analysis  
    - SPENVIS

**Required Skills**
- Have previous project experience (Space Grant, freshman projects, etc)  
- SolidWorks (or other related CAD) experience  
- Familiarity with mechanical design  
- Basic machining experience

**Time Commitment:** 8-10 hours/week at $15/hour
<table>
<thead>
<tr>
<th>Position Title:</th>
<th>Science Team Member</th>
<th>Position #:</th>
<th>S_03</th>
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<tr>
<td>Project:</td>
<td>STEAM</td>
<td>Available Positions:</td>
<td>1-2</td>
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</table>

**Description:** Students on the STEAM science sub-team will work on researching the science behind the STEAM mission, including coronal heating mechanisms, the origin of the solar wind, and solar flaring. The science team is responsible for developing the science data pipeline, instrument ground calibration, analysis of test data, and collaboration with the other sub-teams.

**Recommended Skills**
- Python
- IDL
- Experience with analyzing spectroscopic data
- Experience in modeling emission processes in astrophysical plasmas
- Background in heliophysics/astrophysics

**Required Skills**
- Experience with data analysis
- Have previous project experience (Space Grant, freshman projects, research, etc.)
- Knowledge of basic solar astronomy
- Strong background in math and physics
- Interest in learning more about solar physics

**Time Commitment:** 8-10 hours/week at $15/hour

[http://spacegrant.colorado.edu/boulderstudents/howtogetinvolved](http://spacegrant.colorado.edu/boulderstudents/howtogetinvolved) Updated 10/9/2019