



PISGAH ASTRONOMICAL
RESEARCH INSTITUTE
www.pari.edu

Summer 2024 Communications Satellite Internship

In this document you will find:

1. The description of the summer internship program
2. The expectations and requirements for this internship in communications satellite development

To apply:

- Read this package fully
- Email your resume to: tdelisle@pari.edu with the subject line: 2024 Communications Satellite Internship.

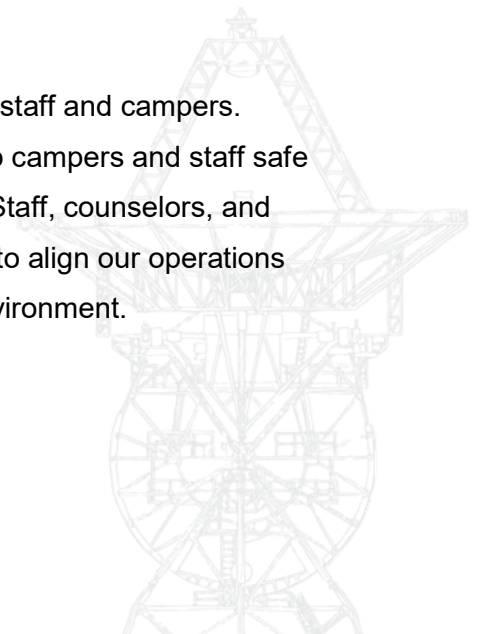
Welcome to the launch of our summer 2024 programs, and thank you for your interest in making PARI your home for the summer! After over two decades of supporting the research and projects of extraordinary undergraduates during our summer season, we are excited to bring a new team on board this year.

In addition to undergraduate internship programs, PARI is also home to astronomy and space exploration summer camps. Many interns have found that being surrounded by the excitement that younger students show when learning new things about the universe is a particularly inspiring part of their summer. Because of this, we give interns the opportunity to share what they are working on with the summer campers if they choose. They are also welcome to join on field trip days and evening recreational activities with the camps. This gives interns a chance to become a part of the inspiration PARI sparks in others and feel a sense of ownership over a facility that has shaped lives.

We also wish to affirm our commitment to the health and safety of our staff and campers. During the recent years the necessity to adjust our procedures to keep campers and staff safe in the midst of COVID-19 required changes throughout the summer. Staff, counselors, and interns met this challenge and rose to the occasion. We will continue to align our operations with government requirements and best practices to ensure a safe environment.

One PARI Drive
Rosman, NC 28772

TEL 828 862 5554
FAX 828 862 5877





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Job Description

Job Title: Summer Intern

Dates of Employment: June 3rd, 2024 through August 10th, 2024

Classification: Nonexempt

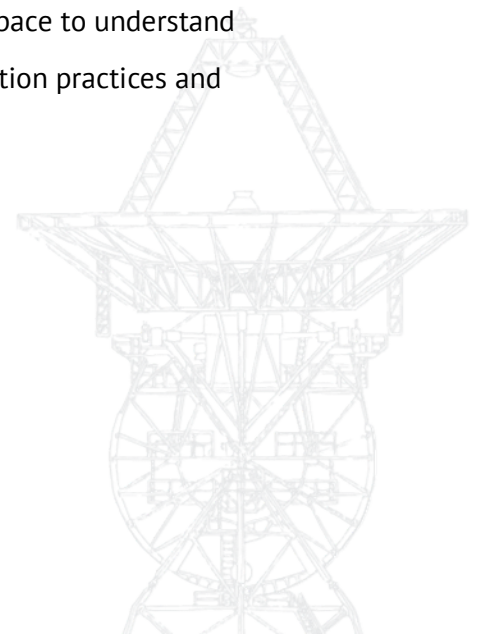
Reports to: PARI Staff

Position Purpose:

An intern in this position will work with a team including other interns, PARI staff, and staff from other relevant entities to develop and build the hardware and software for two small communications satellites. Interns are strongly encouraged to reside on site at PARI in provided housing during the course of the internship. Meals are also provided.

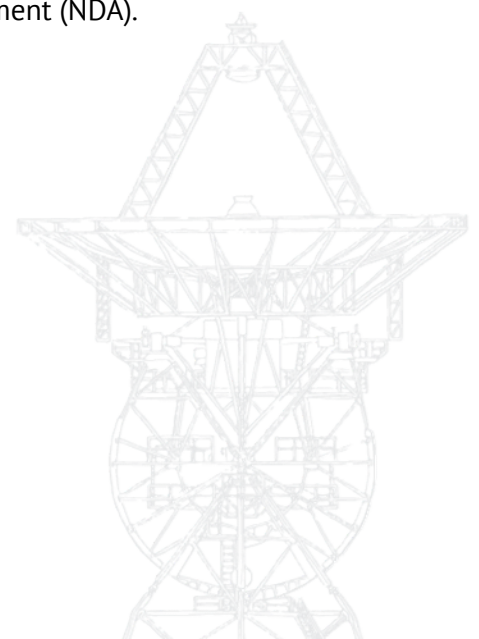
Essential Job Functions:

1. Assist in the creation of two small communications satellites to be launched that will meet the specifications for the mission and for the launch vehicle. Satellites likely follow the design specifications for one of the CubeSat standard sizes.
 - a) Selection, assembly, and testing of structural hardware.
 - b) Selection, assembly, and testing of computational hardware.
 - c) Selection, assembly, and testing of communications hardware.
 - d) Development of a software stack for the selected hardware.
2. Use radio equipment to communicate with satellites already in space to understand existing satellite and ground station capabilities and communication practices and techniques. This will include:
 - a) Sending and receiving radio and/or microwave signals.
 - b) Using data encoding methods, including Morse code.
 - c) Use of large radio dishes and ground based antennas.





3. Use radio communications equipment to test the satellite and its communication capabilities before launch. This will include:
 - a) Use of signal generators.
 - b) Use of spectrum analyzers and spectrometers.
 - c) Use of software defined radios (SDR).
 - d) Testing in environments with varying degrees of interference from: none such as in an anechoic chamber, to natural and simulated high interference settings.
 - e) Use of various antennas, amplifiers, filters, and other RF chain components.
4. Produce complete documentation of the design process and final functioning of the hardware and software of the satellites.
5. Maintain professional behavior appropriate for a shared working environment that houses multiple clients and serves the general public as a museum, education provider, and summer camp.
 - a) Follow and uphold all safety and security rules and procedures.
 - b) Set a good example for others working, learning, and residing at PARI in regard to general site procedures and practices including sanitation, schedule, and integrity.
 - c) Follow and uphold academic standards and ethical practices for the research performed and work produced, including proper citation, respect of copyright, and proper use of licenses.
 - d) Be able to keep work product or research results confidential when necessary, potentially including agreeing to a non-disclosure agreement (NDA).



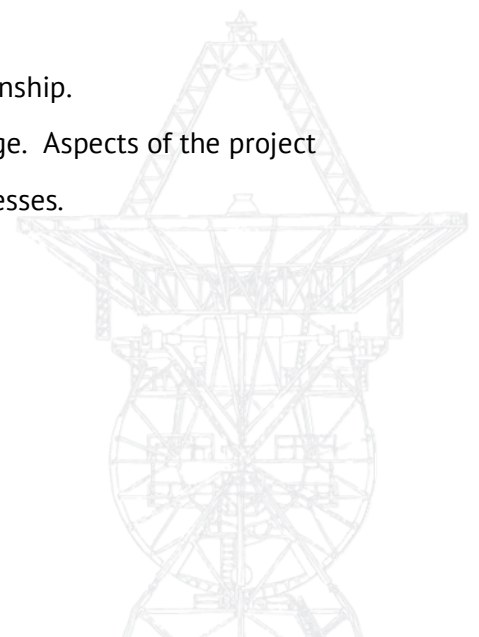


Other Job Duties:

1. Attend PARI site orientation and training.
2. Maintain a clean and safe workspace and follow procedures for building and site security.
3. Maintain clean and safe living and dining spaces and at times assist with some aspects of meal preparation and cleanup during shared group meals.
4. Adhere to campus quiet hours and follow guidelines for maintaining dark skies at night.
5. *Identify other tasks or duties that this position may be expected to perform but are not necessarily the primary focus of this position.*

Knowledge, Skills, and Abilities:

1. Understand and have experience in the fundamentals of computer programming. Having projects or contributions that can be shared in GitHub or a similar code management and version control system is strongly desired.
2. Have familiarity with Linux based operating systems and know basic Linux commands.
3. Have experience with microcontrollers like Arduino and single board computers like Raspberry Pi.
4. Have experience with small electronics including using breadboards for prototyping, basic soldering skills, and ability to use a multimeter.
5. Have or be able to obtain an amateur radio license before the start of the internship. You should be able to show ability to receive acknowledgement from a communications satellite at the start of the internship.
6. Know or be able to learn Morse code before the start of the internship.
7. Be able to adapt to a work pace and environment that may change. Aspects of the project may adapt and timelines may be adjusted as development progresses.





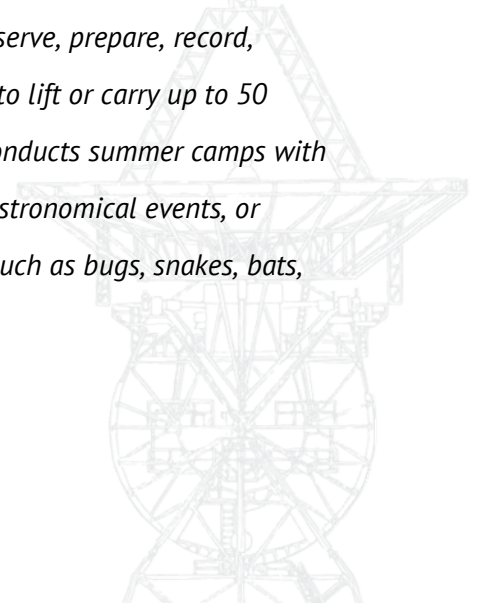
Relationships:

Interns generally have regular working relationships or interactions with PARI staff and volunteers, interns with other projects, summer camp staff and counselors, summer campers ranging 11 to 18 years of age, kitchen staff, program specialists, administrative staff, maintenance staff, and clients of PARI.

Physical Aspects of the Job:

1. Ability to communicate and work with the ages, skill levels, and backgrounds of people you are likely to have relationships with during the course of the internship, as described above in Relationships.
2. Ability to have awareness of your workplace behavior, assess its appropriateness, and follow necessary safety regulations, emergency procedures, quality requirements, and confidentiality requirements.
3. Visual and auditory ability to identify and respond to environmental and other hazards related to workplace activities.
4. Physical ability to respond appropriately to situations requiring first aid. Must be able to assist others in an emergency (fire, evacuation, illness, or injury) and possess strength and endurance required to fulfill the essential job functions.

Some physical aspects of an intern position could be endurance, including prolonged standing, bending, stooping, walking long distances, hiking, climbing, and stretching. Requirements may include hand-eye coordination and manual dexterity to manipulate equipment, a range of hearing and eyesight, or alternative methods of in taking and outputting information, sufficient to observe, prepare, record, document, and communicate experiments and work product, and the ability to lift or carry up to 50 pounds. You must be willing to live in a research facility setting that also conducts summer camps with children and at times work irregular hours sometimes dictated by weather, astronomical events, or satellite passes, with potential exposure to the sun, heat, rain, and animals such as bugs, snakes, bats, space aliens, etc.





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Qualifications: (minimum education and experience)

1. Must be at least 18 years of age and be enrolled in a four year degree program or graduate program in an accredited college or university.
2. Must be able to obtain or gain license in amateur radio license and learn Morse code by the start of the internship.
3. Must submit health history record and examination form prior to first day of work, to include:
 - a. A record of up to date immunizations that includes all immunizations required for school, and a date of last tetanus shot. A physician statement, government immunization report, or school immunization report are acceptable.
 - b. A record of allergies and dietary restrictions.
 - c. Description of any current physical, mental, emotional, social health, developmental, or psychological conditions requiring special restrictions or considerations while in the position.
4. Ability to interact with all age levels.
5. Must agree to and pass a background check.
6. **Must agree to and fully adhere to any COVID19 or other health related guidelines or requirements from governmental bodies to which PARI is subject, or from the American Camp Association, of which PARI is a member. This may include restrictions that effect you during time off and may limit movement and travel beyond the PARI site if quarantine is in place.**





Compensation and Benefits

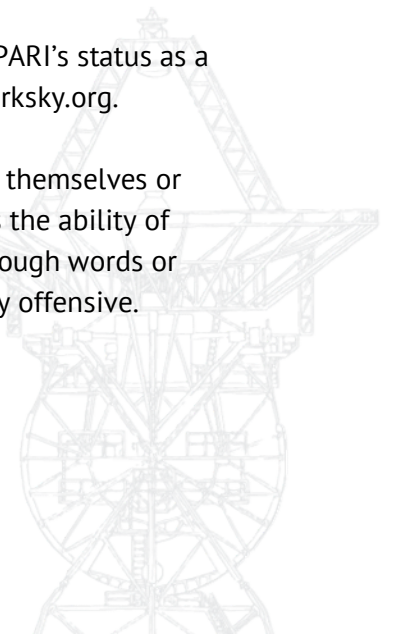
Interns will receive:

- Lodging and meals for the full duration of their employment.
- Stipend of \$2,500, or a prorated amount if less than the full duration of the summer season described in this document is worked.
- Mentorship from PARI staff on projects and research.
- Access to facilities, equipment, and data for the purposes of projects and research you choose to pursue outside of the duties of your internship. This access may be extended beyond the internship period at the discretion of PARI staff.
- Potential extension of the term of internship upon agreement of all parties.
- Potential future employment.
- Potential credit or authorship on published works or attendance or inclusion in conferences.

Dress Code & Behavior

Interns will need to follow a basic dress code and behavioral guidelines while on duty or in shared spaces, or when representing PARI.

- Tops should completely cover the torso, no exposed skin between tops and pants/shorts. If tank tops are worn, the shoulder strap must be at least the width of two fingers.
- Shorts must completely cover your gluteal fold when sitting and standing. Typically this requires at least a 4" inseam.
- Any words or images present on clothing or other personal property must be appropriate for a work environment that includes minors.
- PARI provided camp t-shirts will be required if you attend camp field trips except while swimming. When swimming: No string/thong bottoms or string tops. Closed toe shoes appropriate for hiking may be required during some field trips. Water shoes will be necessary during some field trip activities.
- Quiet times during evening hours must be respected.
- Use of light at night must follow the restrictions necessary to maintain PARI's status as a Dark Sky Park as described by the International Dark Sky Association, darksky.org.
- PARI is a drug, alcohol, tobacco, and vape free campus.
- An intern may not behave in a way that negatively impacts the safety of themselves or others. An intern may not behave in a way that causes harm or removes the ability of others at PARI to have a positive experience during their stay, either through words or actions. This includes speech that is hateful, derogatory, or intentionally offensive.





Frequently Asked Questions

Q. Are the arrival and departure days flexible?

A. PARI is often able to accommodate changes in arrival or departure dates for summer interns so long as sufficient notice is given.

Q. Can I take time off during the summer?

A. Other than normally scheduled days off during the week, any time off should be discussed and approved prior to acceptance of the internship except in the case of emergencies.

Q. I need to take a flight to get to PARI. Can you get me from the airport?

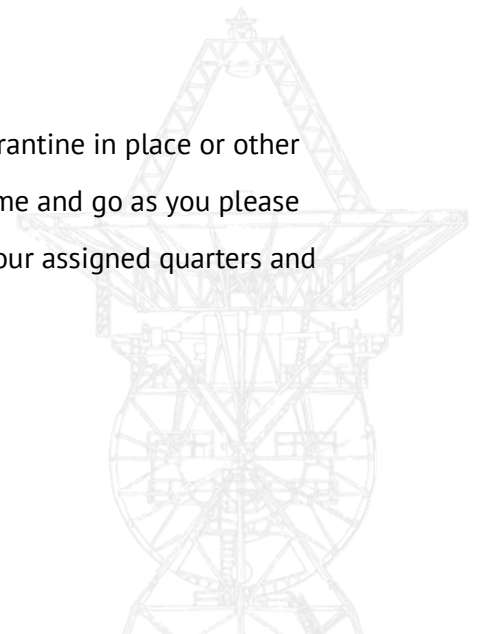
A. We regularly pick up summer staff from the airport in Asheville, North Carolina, airport code, AVL. We encourage booking flights early as Asheville is a tourism heavy area. We will do our best to accommodate flights into other nearby airports, but please check with us before booking a flight to anywhere other than Asheville.

Q. Can I have guests while I am living in PARI lodging?

A. Any guests must be cleared ahead of time by PARI security and may be required to pass a background check before coming on the PARI site. Between summer camp sessions when no minors are present on campus guests can generally be accommodated. While campers are present on campus guests are discouraged and might not be allowed on site.

Q. Can I leave PARI when not on duty?

A. So long as there is not a COVID19 or other health related quarantine in place or other government requirement that would not allow you to leave, you may come and go as you please when not on duty. When sleeping at PARI you are required to sleep in your assigned quarters and adhere to quiet hours.





Q. Do I need any books, equipment, supplies, etc?

A. The materials and equipment you need to perform your internship are provided by PARI.

However, there are some things you should make sure to bring:

- ✓ Flashlight and extra batteries.
- ✓ Rain gear and clothing you can layer (temperatures can range from 50°-90° on some days with rain most afternoons)
- ✓ Shoes appropriate for hiking
- ✓ Day pack or bag appropriate for hiking and swim suit and water shoes for field trips should you choose to attend them
- ✓ Water bottle
- ✓ Bug Spray
- ✓ Sun Screen
- ✓ Laundry Detergent
- ✓ Linens (sheets, towels, washcloths, pillow & pillow case, blanket, etc.) *We know these items can be bulky to bring if you are flying. If you cannot fit them in your luggage please let us know and we can provide some.*
- ✓ Toiletries, a plastic tote is suggested for them as showers and bathrooms will be shared. Shower shoes or flip flops are also recommended.
- ✓ If you bring your own snacks, they must be stored in sealable container and kept in designated areas. Snacks containing peanuts or tree nuts are not be allowed to be in buildings used by summer campers.
- ✓ Any medications, prescription or over the counter, will need to be kept in our Nurse's Station and cannot be kept in any buildings that also are used by summer campers.

