1. **ACS Nuclear & Radiochemistry Summer School.**
   *San Jose State University, San Jose, California, and Brookhaven National Laboratory, Upton, New York*
   
   This is a competitive fellowship program that consists of lecture and laboratory components. It covers the fundamentals of nuclear theory, radiochemistry, nuclear instrumentation, radiological safety, and applications to related fields. Laboratory work will introduce the midshipman to state-of-the-art instrumentation and technology that are used routinely in basic and applied nuclear science. In addition, there are special symposia, guest lectures, and field trips to nearby research centers. This internship helps prepare USNA graduates for service in the nuclear communities.
   
   [https://chemistry.missouri.edu/nucsummer](https://chemistry.missouri.edu/nucsummer)
   
   - Dates: June – July 2020; exact dates TBD
   - Eligible for PTE credit: no (because it is a school)
   - Qualifications: rising 1/C or 2/C, 2 years of chemistry, 1 year of physics, 1 year of calculus
   - Funding: See POC
   - Application: (1) See website above. Deadline: February 2020; exact day TBA. (2) Also, submit online chemistry application. **Note:** See the POC asap before applying.
   - POC: Prof McClean [mcclean@usna.edu](mailto:mcclean@usna.edu)

2. **Armed Forces Radiobiology Research Institute (AFRRI), Bethesda, Maryland.**
   **Radiobiology Research**
   
   Midshipmen will work with military and federal civilian scientists on projects related to AFRRI’s research portfolio in radiation biology, which includes biochemical and physiologic mechanisms, countermeasure development, radiation injury/dose assessment and prognostication, the effects of combined injury involving radiation, and delayed or late effects such as fibrosis and cancer. Specifics of each project will be determined after interaction between intern and mentor.
   
   [https://www.usuhs.edu/afri](https://www.usuhs.edu/afri)
   
   - Dates: Block 1, 2.
   - Eligible for PTE credit: yes
   - Qualifications: 1 year of chemistry. 1 semester of biology desired.
   - Funding: reimbursement for daily commutes from USNA.
   - Application: Submit online chemistry application.
   - Other: Midn must commute daily from USNA.
   - POC: Prof McClean [mcclean@usna.edu](mailto:mcclean@usna.edu)

3. **The Baruch S. Blumberg Institute, Buck County, Pennsylvania.**
   **Hep B Research**
   
   The Baruch S. Blumberg Institute is a leading nonprofit research organization dedicated to hepatitis B and liver cancer. A variety of research projects that center around hepatitis and virus research are available. Selected examples are (1) Early Detection of Disease. (2) Experimental Therapeutics. (3) Molecular Pathogenesis. [http://blumberginstitute.org/](http://blumberginstitute.org/)
   
   - Dates: Block 1.
   - Eligible for PTE credit: yes
   - Qualifications: rising 1/C or 2/C. Chemistry major or biology background.
   - Funding: fully funded.
   - Application: Submit online chemistry application.
   - POC: Prof McClean [mcclean@usna.edu](mailto:mcclean@usna.edu)

4. **The Bureau of Public Health Laboratories-Miami, Miami, Florida.**
   **Infectious Organisms Research**
   
   The Bureau of Public Health Laboratories (BPHL) – Miami is one of 3 state reference laboratories in Florida. It provides testing to private sector laboratories for rare and unusual infectious organisms. BPHL - Miami also may confirm the findings of a private laboratory or perform additional high complexity tests for diseases of public health importance. BPHL also belongs to the National Laboratory Response Network for Bioterrorism (LRN-B). A midshipman participating in this internship will learn the role of public health departments in anticipating, detecting, and mitigating dangers to the health and safety of citizens. Because of its location in a major American city with a large international port and population, the participants will learn about the challenges involved in working with diverse and dynamic public health situations, including detection of bioterrorism agents.
   
   
   - Dates: Block 1.
   - Eligible for PTE credit: yes
   - Qualifications: rising 1/C, 2/C, or 3/C. Completion of 1 semester of biology would be helpful.
   - Funding: fully funded.
   - Application: Submit online chemistry application.
   - POC: Prof Smith [vsmith@usna.edu](mailto:vsmith@usna.edu)

5. **Defense Forensic Science Center (DFSC), Forest Park, Georgia.**
   **Forensic Science**
   
   Interns perform hands-on research and learn about various disciplines of forensic investigation. At the end of the program, Interns present their data to the Director of the Laboratory, the Chief Scientists, Branch Chiefs and other laboratory personnel. Due to the nature of the laboratory and the various areas of forensic analysis performed, the research conducted at this laboratory can vary significantly. However, recent and current projects include: Gunshot residue analysis, Spice detection, explosives testing and detection, DNA mixture separations, and latent fingerprint lifting from mixed
surfaces. Some projects are chemistry related while others are math and engineering related. http://www.cid.army.mil/dsfc-usacil.html
- Dates: All blocks available. Block 0 + 1 preferred.
- Eligible for PTE credit: yes
- Qualifications: rising 1/C or 2/C. Must have completed SC261 and SC262. Completion of a forensic chemistry course would be helpful.
- Funding: fully funded.
- Application: Submit online chemistry application.
- POC: CDR Spencer jaspence@usna.edu

6. National Human Genome Research Institute (NHGRI), Bethesda, Maryland.
   Human Genome Research
   Midshipmen will work with civilian scientists and clinicians on research projects that center around genetics and genomics. They will assist the scientists in carrying out experiments that are aimed at developing better approaches for detecting, diagnosing, and managing genetic disorders. Possible specific research areas are: a study of genetic changes that lead to the initiation and progression of cancer; the identification of genetic abnormalities responsible for human disease; the use of molecular genetics to identify disease-associated gene defects. http://www.genome.gov/10000218
   - Dates: Block 0 + 1 (or by arrangement for a minimum of 6 weeks).
   - Eligible for PTE credit: yes
   - Qualifications: Any class.
   - Funding: not funded.
   - Application: (1) See website above; deadline 1 March 2020. (2) Also, submit online chemistry application. **Note:** See the POC asap before applying.
   - Other: Midn must commute daily from USNA.
   - POC: Prof McClean mcclean@usna.edu

7. Naval Research Laboratory, Washington, D.C.
   Biochemical Aspects of Barnacle Glue
   Hard fouling organisms such as barnacles stick to ship hulls and significantly impede maritime operations, costing the U.S. Navy millions of dollars per year in coating, cleaning and added fuel costs. Such a tenacious underwater bond relies on specialized proteins that form an adhesive for permanent attachment of their hard outer shells to surfaces. NRL’s Chemistry and BioMolecular Science Divisions are applying cutting-edge biomolecular and bioinformatic approaches to produce a new, more comprehensive picture of the specialized proteins found in barnacle adhesive. Midshipmen will investigate the biochemical aspects of barnacle glue, which will involve the development and application of colorimetric/fluorometric assays that are sensitive to the molecular structure of the glue. These assays will also be used to understand the properties of proteins designed to mimic barnacle glue. Projects will involve training/development in standard methods of molecular biology, such as gel-based techniques to characterize proteins (gel electrophoresis, Western Blotting, fluorescence staining) and quantitative polymerase chain reaction (qPCR) to measure the abundance of mRNA in barnacle tissues. https://www.nrl.navy.mil/chemistry/research/6170/6176
   - Dates: Block 1, 2, 3
   - Eligible for PTE credit: yes
   - Qualifications: rising 1/C or 2/C, chemistry or engineering major. Experience in wet chemistry lab. Helpful if applicant has completed biology courses, and/or has background in biology, biochemistry, microbiology, or biophysics.
   - Funding: reimbursement for daily commutes from USNA.
   - Application: Submit online chemistry application.
   - Other: Midn must commute daily from USNA.
   - POC: Prof Yates eyates@usna.edu

8. Naval Research Laboratory, Washington, D.C.
   Synthetic Biology
   Participants in the synthetic biology internship at the Naval Research Lab in Washington, DC, will create living sensors to protect Navy divers and submariners from toxic chemicals. Interns will gain wet lab experience and basic skills in microbiology and molecular genetics to create bacterial cells that glow when exposed to toxic chemicals. By the end of the internship midshipmen will have experience designing PCR reactions, cloning DNA, and transforming bacterial cells with new DNA. They will also gain fundamental understanding of the field of synthetic biology. https://www.nrl.navy.mil/cbmse/
   - Dates: Block 1, 2, or 3.
   - Eligible for PTE credit: yes
   - Qualifications: rising 1/C, 2/C, or 3/C. Any major. Helpful if applicant has completed some biology or biochemistry courses.
   - Funding: reimbursement for daily commutes from USNA.
   - Application: Submit online chemistry application.
   - Other: Midn must commute daily from USNA.
   - POC: CAPT Kennedy l kennedy@usna.edu

9. Naval Surface Warfare Center - Indian Head EOD Technology Division (NSWC IHEODTD), Indian Head, Maryland.
   Energetic Materials Research
   NSWC IHEODTD is the Department of Defense (DoD) Energetics Center and serves as the DoD Explosive Ordnance Disposal Technology Program. Internship projects center around the following: (1) lab work on propellants. (2) propellant testing (including field testing). (3) explosive manufacturing research. (4) robotics support & explosive detection equipment. (5) work on warhead designs, fuzing efforts, and lethality studies (to include modeling and simulation studies). Midshipmen will be matched to projects, based on their majors. http://www.navsea.navy.mil/Home/WarfareCenters/NSWCIndianHeadEODTechnology.aspx
   - Dates: Block 1, 2, or 3.
   - Eligible for PTE credit: yes
   - Qualifications: rising 1/C or 2/C, chemistry, physics, and engineering majors.
   - Funding: lodging & meals provided at NSWC-Indian Head.
   - Application: Submit online chemistry application.
   - POC: Prof McClean mcclean@usna.edu
10. Purdue University, West Lafayette, Indiana.  
**Chemical Composition Analysis of Naval Tactical Fuels and Engineering of Solar Cells**

Two projects are available: (1) The first project will involve helping to determine the chemical composition of Naval tactical fuels. The NAWCAD Fuels Team has identified a capability gap related to identifying the root cause of fuel instability. The midshipman-intern will help to develop a validated analytical method for the identifying of oxygenate classes in fuels. (2) In the second project, the midshipman-intern will work with a team to apply organic chemistry and nanotechnology principles to design novel intrinsically stable lead-free organic-inorganic hybrid perovskite materials. High-performance, light-weight, and flexible solar cells based on these new materials will be fabricated and characterized.

https://www.chem.purdue.edu/?ga=2.58103530.1512865733.1574089659-1794472535.1574089659

- Dates: Block 1, 2.
- Eligible for PTE credit: yes
- Qualifications: rising 1/C or 2/C chemistry major. Other STEM majors with chemistry background.
- Funding: fully funded.
- Application: Submit online chemistry application.
- POC: Prof Luning Prak prak@usna.edu

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11. Vanderbilt University, Nashville, Tennessee.  
**Multianalyte Microphysiometry Methods**

This internship will involve research with the Cliffel lab, which is developing new multianalyte microphysiometry methods with applications in cancer, diabetes, and toxicology. This is done through electrochemical detectors for many metabolic analytes into the microfluidic chamber to give a complete dynamical picture of the live cell population. Work is always progressing, but recent projects included glucose, choline, and glutamine detection. The midshipman will work on either fabricating devices or testing detection capabilities.

http://www.vanderbilt.edu/chemistry/faculty/cliffel.php

- Dates: Block 1 and Block 2 are available. Block 0 + 1 is preferred.
- Eligible for PTE credit: yes
- Qualifications: Completion of SC261 & SC262. Completion of SC361 & SC364 is desired.
- Funding: fully funded.
- Application: Submit online chemistry application.
- POC: CDR Spencer jaspence@usna.edu

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**To Apply**
Go to the chemistry department internship webpage and apply online.

**Need Additional Information on an internship?**
Contact the POC for that internship.

**Chemistry Department Internship Webpage**

**Chemistry Department Internship POC:**
Prof McLean mcclean@usna.edu

**Medical Internships**
The chemistry department also sponsors medical internships. Information can be found on the chemistry department internship website.

**Other Internships with Chemistry Projects**
- Naval Air Systems Command in Patuxent River, Maryland: Sponsored by the Mechanical Engineering Department at USNA. Types of Projects: Materials, Polymers and Composites research.
- A complete list of internships - some with chemistry projects - can be found on the USNA internship website: https://intranet.usna.edu/AcResearch/USNA-Approved-Internships.php