Unique Student Opportunities

Postdoctoral Programs in Math & Physical Sciences

• IC Postdoctoral Research Fellowship Program

The Intelligence Community (IC) Postdoctoral Research Fellowship Program (IC Postdoc Program) supports unclassified basic research in areas of interest to the IC. The Program annually supports several Postdoctoral Fellows (Postdocs) from U.S. accredited colleges, universities, and U.S. Government laboratories across the country. In collaboration with Research Advisors, Postdocs develop and submit technical research proposals that align with research opportunities proposed by the IC community. The research is conducted by the Postdocs while working in partnership with the Research Advisor, and collaborating with an advisor from the Intelligence Community (IC Advisor). More information available at https://orise.orau.gov/icpostdoc/.

• Technology & National Security Fellowship (TNSF)

The Technology and National Security Fellowship (TNSF) is an opportunity for technologists and entrepreneurs to serve their country by embedding with key decision makers at the top levels of the U.S. Government to provide advice and emerging expertise for issues at the critical intersection of national security and technology. More information available at https://www.nsin.us/tnsf/.

• National Research Council (NRC) Research Associateship Programs (RAP)

The NRC Research Associateship Programs (RAP) promote excellence in scientific and technological research conducted by the U.S. government through the administration of programs offering graduate, postdoctoral, and senior level research opportunities at sponsoring federal laboratories and affiliated institutions. More information available at https://sites.nationalacademies.org/PGA/RAP/index.htm.

Grants/Scholarships

- <u>Cyber Scholarship Program (CySP)</u> The Department of Defense (DoD) Cyber Scholarship Program (CySP) is sponsored by the DoD Chief Information Office and administered by the National Security Agency (NSA). For additional information contact the DoD CySP Program Office at <u>AskCySP@nsa.gov</u> or you can visit: <u>https://public.cyber.mil/cysp/</u>
- Graduate Fellowships for STEM Diversity (GFSD)

Formerly known as the National Physical Science Consortium, Graduate Fellowships for STEM Diversity (GFSD), is a partnership between government agencies and laboratories, industry and higher education. GFSD's goal is to increase the number of American citizens with graduate

degrees in STEM fields, emphasizing recruitment of a diverse applicant pool. NSA sponsors students pursuing doctorate degrees in mathematics, engineering, computer science and physics. NSA also provides technical mentoring and at least two summers of employment to each sponsored student. More information available at <u>www.stemfellowships.org</u>.

• Intelligence and National Security Foundation (INSF) Scholarship Program

The Intelligence and National Security Foundation (INSF) launched a scholarship program for undergraduate and graduate students pursuing a degree in Intelligence Analysis, Computer Science, Cybersecurity, International Affairs, National Security Studies, Public Policy, or a comparable field of study. INSF is a 501(c)(3) nonprofit dedicated to addressing contemporary intelligence and national security challenges. More information available at https://www.insaonline.org/foundation/.

OnRamp II Scholarship/Research Program

The National Security Agency's (NSA) OnRamp II Program fosters educational partnerships between NSA and academic institutions to promote the technical health and diversity of students in Science, Technology, Engineering and Mathematics (STEM). An important element of this partnership includes: scholarships, internships, and opportunity for mission-focused research. More information available at https://www.nsa.gov/Resources/Students-Educators/OnRamp-II/.

• Science, Mathematics & Research for Transformation (SMART) Scholarship

Students, including current DoD employees seeking advanced degrees, work in a full-time, paid summer internship. Participants must be pursuing degrees in science, technology, engineering and mathematical (STEM) fields of study. Benefits include full tuition and fees, stipend and guaranteed employment upon graduation. More information available at https://www.smartscholarship.org/.

Research Experiences for Undergraduates (REUs)

REUs are intensive summer programs that provide advanced course work. The goal of these programs is to bring undergraduates up to speed for rigorous graduate level programs. Find more information about REUs in Mathematics at https://www.nsa.gov/what-we-do/research/math-sciences-program/. NSA Research recently expanded their REU scholarships in Science of Security and Physical Sciences at Carnegie Mellon University. For more information about potential REU scholarships contact Research Partnerships@nsa.gov.

NSA's current REU partners and programs include the following:

- American University
 - Summer Program in Research & Learning (SPIRAL) | www.spiralreu.org
- North Carolina A&T University (NCA&T)
 - Data Science REU Program | https://math.sciences.ncsu.edu/2020/01/21/reu-at-nc-atstate-university/

- North Carolina State University (NC State)
 - Directed Research for Undergraduates in Mathematics & Statistics (DRUMS) | https://math.sciences.ncsu.edu/undergraduate/drums/
- Oregon State University (USO)
 - Research for Undergraduate Summer Institute of Statistics (RUSIS) | https://stat.oregonstate.edu/rusis%40OSU
- Pomona College
 - Pomona Research Experience in Mathematics (PRiME) | https://pages.pomona.edu/~ehga2017/prime.html
- Texas State University
 - REU on Algebra, Combinatorics, and Statistics | https://www.math.txstate.edu/research-conferences/summerreu.html
- University of Connecticut
 - o REU in Markov Chains | https://markov-chains-reu.math.uconn.edu/
- University of Michigan-Dearborn
 - REU on Mathematical Analysis and Applications | https://sites.google.com/a/umich.edu/math-reu/
- University of Virginia
 - REU at University of Virginia | https://uva.theopenscholar.com/reu/program
- Carnegie Mellon University (CMU)
 - REU at CMU | https://cps-vo.org/sos/lablet/cmu

Research Summer Internships

• <u>Cryptanalysis and Signals Analysis Summer Program (CASA SP)</u>

The CASASP gives undergraduate mathematicians and computer scientists a chance to contribute to mission-essential technical operations. CASASP's mission is to transform collected data into a form analysts can readily consume for intelligence purposes by analyzing signals and protocols, and overcoming security measures. More information available at intelligencecareers.gov/nsa/nsastudents.html.

• <u>Director's Summer Program (DSP)</u>

The DSP is the NSA's premier outreach to the nation's most outstanding undergraduate mathematics majors. Each summer we invite 25 students to collaborate with each other and with NSA Mathematicians on problems critical to the intelligence gathering and information assurance missions of the Agency. DSP participants work on a wide range of problems in mathematics, cryptology, and communications technology. At the beginning of the summer, students are presented with introductory lectures on modern cryptologic mathematics and with descriptions of the summer problem sets. Students choose one or two problems as the focus of their research and document their work in technical papers, which are internally published at NSA. More information available at intelligencecareers.gov/nsa/nsastudents.html.

• <u>Graduate Mathematics Program (GMP)</u>

The GMP provides an opportunity for exceptional mathematics graduate students to work directly with NSA Mathematicians on mission-critical problems and experience the excitement of the NSA mathematics community. GMP participants work together on problems involving mathematics, data analysis, cryptology, and communications technology. Students document their work in technical papers, which are internally published at NSA. More information available at intelligencecareers.gov/nsa/nsastudents.html.

• Science of Security (SOS) Summer Intern Program

The National Security Agency (NSA) Science of Security (SoS) & Privacy Lablets Summer Internship Program is for undergraduate and graduate students currently enrolled at U.S. universities and colleges. The program provides an opportunity for exceptional science, technology, engineering, and math (STEM) students to work directly with NSA SoS Champions on mission-critical hard problems and experience the excitement of the NSA research community first-hand. Additional information at https://www.intelligencecareers.gov/nsa/nsastudents.html.

Visiting Professors/Sabbaticals

NSA Employees currently serve at a number of academic institutions across the United States, representing NSA and teaching Agency coursework in public, private, and military universities.

NSA Research has hosted professors in Sabbaticals. If interested please email <u>Research_Partnerships@nsa.gov</u>.

Opportunities at Cryptologic Centers

NSA/CSS has offices around the world and four cryptologic centers outside of the headquarters in Maryland within the United States. The four cryptologic centers are NSA/CSS Colorado, NSA/CSS Georgia, NSA/CSS Hawaii, and NSA/CSS Texas.

A highlight of current opportunities at the cryptologic centers includes:

• Hawaii Summer Technical Intern Program

Students will gain hands-on work experience while building knowledge and skills in fundamental aspects of the NSA mission. Internship positions are offered in multiple mission areas requiring a range of competencies including computer science, programming, engineering and analysis.

• NSA Georgia Summer Internship Program

Students will gain hands-on work experience while building knowledge and skills in fundamental aspects of the NSA mission. Internship positions are offered in science and technology, applied mathematics, computer/systems engineering, electrical and mechanical engineering, computer

science, computer forensics, cyber intelligence and security, information assurance, information technology and information security.

• Texas Summer Intern Program

Students will gain hands-on work experience while building knowledge and skills in fundamental aspects of the NSA mission. Internship positions are offered multiple mission areas requiring a range of competencies to include but not limited to computer science, computer programming, networking and engineering, math, cybersecurity, telecommunications, geography, international affairs/politics/relations, intelligence/security studies and others.

More information available at intelligencecareers.gov/nsa/nsastudents.html.

NSA Research Programs

• <u>Science of Security (SOS)</u>

The National Security Agency (NSA) Research sponsors the <u>Science of Security (SoS) Initiative</u> for the promotion of a foundational cybersecurity science that is needed to mature the cybersecurity discipline and to underpin advances in cyber defense. The program includes Grants for university research in SoS (Lablets and Sub-lablets); *Best Scientific Cyber-security Paper Competition; HoTSOS (Hot Topics in Science of Security). More information available at* https://cps-vo.org/group/sos/.

 An annual research event centered on Science of Security, which aims to address the fundamental problems of security in a principled manner. Additional information at <u>https://cps-vo.org/group/hotsos</u>.

• NSA Mathematical Sciences Program (MSP)

The National Security Agency Mathematical Sciences Program (MSP) was started at NSA in 1987 in response to an increasingly urgent need to support mathematics in the United States. Indeed, the NSA realizes the mutual benefits of maintaining a vigorous academic mathematics community and is proud to offer grant funding for eligible faculty members through the MSP. More information available at https://www.nsa.gov/what-we-do/research/math-sciences-program/

Other Opportunities

• <u>Codebreaker Challenge</u>

The NSA Codebreaker Challenge provides students with a hands-on opportunity to develop their reverse-engineering / low-level code analysis skills while working on a realistic problem set centered on the NSA's mission. While the challenge is intended for students, professors are encouraged to participate as well. Furthermore, the site was designed to make it easy for those

professors interested in incorporating the challenge into their courses to do so. Additional information at <u>https://nsa-codebreaker.org/home</u>.

Hackathons

Hackathons are innovative marathons, where students with an interest in technology can attend to learn, build, and share their computer programming projects. NSA engages with exceptional technical talent at numerous hackathons near our NSA facilities to includehackGT, Bitcamp, Technica, RowdyHacks, hackUMBC and TAMUhacks.

• INSuRE (Information Security Research and Education)

The INSuRE (Information Security Research and Education) project aims to build research skills and experience for graduate students through a research network between CAE-Rs (Centers of Academic Excellence in Cyber Research) in Information Assurance/Cyber Defense. Through the project, students engage in interdisciplinary, distributed-team research on tasks in the national information security domain. The students learn research by doing, building skills, expertise, and connections that will enable them to hit the ground running faster on information assurance research projects later in their careers. More information available at https://caecommunity.org/initiative/insure.

• International Collegiate Programming Contest (ICPC) North America Championship (NAC)

The International Collegiate Programming Contest is an algorithmic programming contest for college students. Teams of three, representing their university, work to solve real-world problems, fostering collaboration, creativity, innovation, and the ability to perform under pressure. Through training and competition, teams challenge each other to raise the bar on the possible. The North America Championship (NAC) is a new competition designed to increase competitiveness and diversity throughout the U.S. and Canada. NSA was the Titanium sponsor for the inaugural ICPC NAC in 2020 and is the Titanium sponsor for the 2021 NAC; sponsorship included speakers, presentations, challenge problems and puzzles, as well as information booths. Additional information available at https://nac.icpc.global/

• NSA Cyber Defense Exercises (NCX)

The NSA Cyber Exercise (NCX) is a year-round, education, training and exercise program. NCX culminates in an annual three-day cyber competition that challenges students at the U.S. Service Academies and Senior Military Colleges in near full-spectrum Cyber operations. This culminating cyberspace training exercise helps to develop and test cybersecurity skills, teamwork, planning, communication, critical thinking, and decision-making. NCX helps prepare the Nation's next generation of cyber leaders and warriors in defending the Nation from an ever-increasing number of cyber threats. The winning school receives the coveted NCX trophy. More information available at https://www.nsa.gov/What-We-Do/Cybersecurity/NCX/.

• NSA Publication: The Next Wave

The Next Wave (TNW) is a quarterly research publication of the National Security Agency to disseminate technical advancements and research activities in telecommunications and information technologies. Additional information at https://www.nsa.gov/News-Features/the-next-wave/