The Marian E. Koshland Integrated Natural Sciences Center (KINSC) catalyzes and facilitates programs that maintain Haverford’s position at the leading edge of academic excellence in the sciences.

To achieve this end, the KINSC promotes scientific scholarship involving close collaboration between faculty and students and provides opportunities for these activities to expand beyond the borders of the Haverford campus.

The KINSC is unique among Haverford’s three academic centers in that it is both a building and a program. The 185,000 square foot building is the epicenter of natural science research at Haverford. It was constructed to facilitate sharing of ideas, instruments, and expertise across disciplines and to contribute to a climate of cooperative problem solving and investigation.

The KINSC includes the departments of Astronomy, Biology, Chemistry, Physics, Psychology, Mathematics and Statistics, and Computer Science. To supplement the efforts of the departments, the KINSC supports interdisciplinary interactions. In addition to directly funding students and faculty, the Center supports academic activities initiated with outside grants and individual faculty awards.

The KINSC funds individual research projects and sponsors symposia, seminars, curricular initiatives, student conference and research travel, courses, and scholarly projects that go beyond the bounds of a single discipline and involve students and faculty from multiple departments.
The range of programs supported by the KINSC is limited only by the imagination of the Haverford science community.

Currently, the KINSC supports the following activities:

- Summer research opportunities for students on-campus or at other institutions
- Fall research symposium, showcasing work by students from Haverford, Bryn Mawr, Swarthmore, and other area colleges
- Travel for students to pursue research during the academic year with collaborators in labs either within the USA or abroad
- Travel for students to attend conferences, to present research or to gain experience applicable to future careers (in collaboration with the Green Fund)
- Student and faculty training in new science-related techniques
- Special projects initiated by science faculty
- Events, such as research talks, film screenings and panels
- Annual career panel for science majors, in collaboration with the Center for Career and Professional Advising
- Annual Student Scientific Imaging Contest
- Mentoring and Student Teaching Program (MAST)
- Research and travel for science students from groups under-represented in the sciences, through the Access and Achievement Fund.

We are committed to supporting a wide variety of creative ideas in the sciences; students should not feel limited by the categories listed.
KINSC BY THE NUMBERS:

2016

RESEARCH & CONFERENCES

267
Awards

- 5 students received funding for international research travel
- 10 students received summer funding through the Frances Velay Women’s Science Research Fellowship
- 22 students received funding as KINSC summer scholars
- 31 students received funding to attend off-campus conferences/workshops
- 85 students performed summer research with faculty in the KINSC
- 114 students performed academic year research with faculty in the KINSC

NATURAL SCIENCE MAJORS

311
Majors

- 6 Astronomy Majors
- 6 Astrophysics Majors
- 35 Physics Majors
- 40 Computer Science Majors
- 42 Mathematics Majors
- 54 Chemistry Majors
- 56 Psychology Majors
- 72 Biology Majors

*Student research opportunities are funded through the KINSC and through individual faculty grants from the NSF, NIH, and more.

*This figure captures Juniors and Seniors who have declared a major in the sciences. Students do not declare majors until the end of the sophomore year.

25
On-campus faculty supervising student researchers

100%
Science majors who graduate with research experience

$4.9 M
External funding for research by our natural science faculty

*This figure captures Juniors and Seniors who have declared a major in the sciences. Students do not declare majors until the end of the sophomore year.

KINSC 2016 | 5
In 2016, the KINSC supported 22 students for 10-week summer research projects at Haverford and at other colleges and universities across the country. Twelve of these students worked with faculty on campus, while 10 worked in labs in England, Canada, New York, California, Oregon, and Michigan as well as in the Philadelphia area. Selected student profiles from the 2016 Summer Scholars are featured on pages 16 - 18.
STUDENT RESEARCH FUND
The Student Research Fund provides travel support for research conducted outside of the Philadelphia area. The KINSC funds domestic or international student research during breaks in the academic year. Preference is given to those applying for support related to senior thesis research. Students traveling to present their research may also receive support from the Louis Green Fund, administered by the Provost’s Office.

ACCESS AND ACHIEVEMENT ENDOWED FUND
The Access and Achievement Endowed Fund supports diversity in the sciences and provides an additional source of funding for science students from underrepresented groups to attend conferences, perform research, take off-campus courses, attend workshops, and participate in activities that will enhance their scientific experience as students at Haverford. Nine students received funding for research through the Access and Achievement Endowed Fund in 2016.

INTERNATIONAL TRAVEL STIPENDS
KINSC faculty maintain collaborations with scientists at other institutions throughout the world, creating opportunities for our students to travel abroad in the course of their research. International travel stipends are provided by the KINSC or through external funding for faculty projects.

In 2015-16, five Haverford students traveled internationally to perform research.

- Ruben Aguilar ’16 traveled to Lund, Sweden to conduct research on the optimization of the synthesis of surface-modified gold nanoparticles with Dr. Tommy Cedervall’s research group in the Department of Biochemistry and Structural Biology at Lund University.

- Claire Cote ’17 visited Chaing Rai, Thailand to conduct research on cadmium exposure in Northern Thailand at Mae Fah Luang University.

- Charles Hale ’17 spent the summer at Johannes Gutenberg University in Mainz, Germany studying the phenotypes of behavioral genes via RNAi.

- Tionney Nix ’17 examined the fairness-aware classification systems in machine learning models while in Ifrane, Morocco at Al Akhawayn University.

- Benjamin Soloway ’18 spent the summer at Imperial College in London working on a project involving the laserwriting of nanostructures and numerical/theoretical modeling of 2D materials.
2015-16 STUDENT CONFERENCE TRAVEL
Conferences students attended with funding from the KINSC:

- Mid-Atlantic Regional Zebrafish (MARZ) Conference, Bronx, NY
- MERCURY Conference on Undergraduate Computational Chemistry, Lewisburg, PA
- Society for Neuroscience Conference, Chicago, IL
- Grace Hopper Celebration of Women in Computing, Houston, TX
- American Chemical Society Fall 2015 National Meeting, Boston, MA
- Undergraduate Research Symposium in the Chemical and Biological Sciences, Baltimore, MD
- Compilation Techniques Conference, San Francisco, CA
- American Astronomical Society Winter Meeting, Kissimmee, FL
- Association for Behavioral and Cognitive Therapies, Chicago, IL
- 2016 Ocean Sciences Meeting, New Orleans, LA
- American Medical Association Research Symposium, Atlanta, GA
- Society for Integrative and Comparative Biology2016 Annual Meeting, Portland, OR

2016 FALL RESEARCH SYMPOSIUM
Every year, the KINSC hosts a fall research symposium showcasing the summer work of students from Haverford, Bryn Mawr, Swarthmore, and other area colleges.
MENTORING AND STUDENT TEACHING

Another spring semester at Haverford means another cohort of students attending the annual Mentoring and Student Teaching (MAST) program, which for three decades has given local secondary school students an opportunity to experiment with hands-on science and hone writing skills in close collaboration with Haverford student mentors.

The program, which meets Saturday mornings from late January through early April, is characterized by an intimate student-tutor setting. Each Haverford tutor is matched with two to four high school or middle school students from a diverse array of Philadelphia-area schools. MAST provides the 60 to 65 students enrolled each year with both laboratory experience and writing sessions, which can help students refine college application essays. The program also creates a unique bridge between the College and its surrounding community, giving secondary school students a chance to learn in fun, collaborative ways, and providing a unique opportunity for Haverford students to serve as teachers and mentors.

MAST was the creation of the late Emeritus Professor of Biology Slavica Matacic, who founded the program in the fall of 1987. Initially, its focus was on giving students of color from the surrounding community a chance to conduct laboratory experiments under the tutelage of Haverford students of color in an environment that would increase student confidence with college-level curricula. In a field that traditionally has lacked racial, gender, and class diversity, MAST’s mission was to create a space for underrepresented students to explore science, ask questions, and be supported in an empowering scientific community.

Sasha Mathrani ’18 and Ashley Guzman ’19, this year’s coordinators of the middle school and high school science programs, respectively, are veterans, entering their second year in these positions. Mathrani, who is majoring in biology and minoring in education, says that as a coordinator, a focus of hers is, “making science fun, as opposed to this scary thing [where] you have to study for tests and memorize a bunch of facts,” as well as making the experience more about “learning to ask questions, to mess up and figure things out.”

“It’s really funny when you go into lab thinking you’re prepared, and then a kid asks you a question and you’re just like, ‘Oh actually, I didn’t know this,’ … So you just go with it, and you see what they have to say about it,” explains Guzman.

After many years of MAST, the program has developed an extensive legacy of former students and tutors. Some have even boasted both distinctions. Franklin “Jay” Garcia ’16 was a MAST student in his junior year at a charter high school in Philadelphia. He went on to be a Chesick Scholar and MAST tutor at Haverford. Garcia, after graduating with a degree in biology last May, is now a Fulbright recipient conducting research in Groningen, Holland.

“My writing and science curricula up to that point had been subpar, and MAST helped supplement that,” said Garcia, who hopes to go into pediatric medicine. “As a tutor, I enjoyed working with children who were in the same position I had been.” The program not only gave him preliminary experience with new material, he says, but also showed him some challenges of working with young people. “Keeping a handful of teenagers focused during a shark dissection is easy. But keeping that same group focused during [trigonometry] or an aspirin-synthesis lab is not.”

No two years of MAST are exactly alike, with new labs, curricula, students, and tutors characterizing the program’s activities and atmosphere. Still, one thing promises to remain the same: a chance for students of many ages, experiences, and backgrounds to learn from each other.
Superlab brings together professors from different research areas, and sometimes different departments, to team teach a stand-alone junior laboratory course dedicated to solving real world problems. It is a testament to the collaborative spirit in which the KINSC was conceived.

Superlab was initiated by the Biology Department in 1964 with the support of an NIH grant, the first such grant to a liberal arts college. Development of a Chemistry superlab followed soon thereafter. Most recently, members of the Biology and Chemistry Departments have collaborated to offer a combined superlab experience for students interested in working at the interface of these two fields. Though students report spending up to 20 hours a week in the laboratory and rate it as one of their most challenging courses, many also rate it as the best class they’ve taken.

Teaching the lab in a stand-alone format and not requiring that each lab be keyed to a particular set of lectures allows students to explore several experimental problems per year under the guidance of a pair of experienced faculty members teaching in their areas of expertise. Students learn to be independent thinkers and researchers. Students have 24-hour access to the laboratories so they can continue to work on their experiments and analyses outside of the formal laboratory periods.

Close faculty-student relationships are developed over the long hours spent in lab together. The availability of excellent equipment, along with carefully designed experiments, allows each student to work with state-of-the-art technology to answer the experimental question posed at the beginning of the lab. Superlab prepares students to take on the independent research required of all senior science majors.

In addition to designing and conducting their own experiments, students develop excellent record-keeping skills and learn how to present their findings clearly in both written and oral form. Students present their results as a poster, talk or paper at the end of each seven-week section. Students who have completed Superlab are in demand around the region as summer research interns, and as research assistants after graduation.
In keeping with Haverford College tradition, students celebrated April Fools’ Day by decorating the KINSC in a variety of themes. This year, the building was transformed into scenes from *Star Wars*. 
MULTIDISCIPLINARY PROGRAMS

HEALTH STUDIES MINOR
This minor program speaks to all issues of health care and its provision from the perspectives of the sciences, social sciences and the humanities. It directly addresses the intersection of public health and social justice. The Health Studies Minor is designed to provide context for the issues facing health professionals on local, national, and global scales. The structure of this program is intentionally multidisciplinary, bringing scientists together with social science and humanities professors to guide students through the political, cultural and ethical questions that address health issues worldwide. The minor is a perfect complement to a more traditional science major, especially for those students planning to go into medicine, nursing, physical therapy, psychotherapy and other clinical fields. It is also designed to give scientific context to students of the social sciences and humanities who are interested in policy, economics, health care management, health education, medical narratives and more. In this Bi-college minor, courses are taught by Haverford and Bryn Mawr faculty across many disciplines.

ENVIRONMENTAL STUDIES MINOR
The Environmental Studies Minor cultivates students’ capacity to identify and confront key environmental issues through the lenses afforded by multiple disciplines. Since 2011, Haverford, Bryn Mawr and Swarthmore colleges have cooperated to offer a Tri-College Environmental Studies Minor, involving departments and faculty in the natural sciences, the social sciences, the humanities and the arts, encompassing historical, cultural, economic, political, scientific and ethical modes of inquiry. Students and faculty together explore the interactions among terrestrial and marine systems, local and global environments, and human societies.

SCIENTIFIC COMPUTING CONCENTRATION
Many disciplines in the natural and social sciences include components that are explicitly computational, particularly in astronomy, biology, chemistry, economics, and physics. The concentration in Scientific Computing provides students with the opportunity to develop facility with the tools and concepts necessary to apply computation to a scientific problem and explore the computational aspects of their own major disciplines. Students in the Scientific Computing Concentration are required to complete a project-based experience in which computation is applied to investigate a real-world phenomenon.
In this health studies course supported by the KINSC and the Hurford Center for the Arts and Humanities, students engaged with recent work in critical disability studies across a range of humanistic disciplines, including literary studies, visual studies, history, and philosophy. Drawing on these varied perspectives, they explored how disability theory and engaged community practice inform and shape one another. Disability studies is inherently an interdisciplinary field that opens up new ways of approaching topics from neuroscience to ethnography to literary criticism.

Two biology majors, Lindsey Lopes ’16 and Sarah Waldis ’16, designed and led a BioArt project with students and participants from the Center for Creative Works (CCW), a vocational art program for adults with disabilities. The KINSC and biology faculty provided laboratory space, exhibition space, and logistical support. As part of a BioArt collaboration, Haverford and Bryn Mawr students and artists from the CCW painted agar plates with colorful strains of Streptomyces bacteria to produce the living biological artwork seen in the image.

PUBLIC POLICY FORUM

Haverford’s second annual Public Policy Forum, which took place on campus March 21, was a day-long event co-sponsored by the Center for Peace and Global Citizenship, the Koshland Integrated Natural Sciences Center and the Center for Career and Professional Advising, and involved the participation of faculty members, students, and alumni from many different departments of the College. This event featured panels on topics such as law, health care, and international and domestic policy.
According to a recent report by the National Science Foundation, women earn roughly half of all science and engineering undergraduate degrees, but make up only 29 percent of the science and engineering workforce. In 2016, the Koshland Integrated Natural Sciences Center (KINSC) was invited to participate in the newly established Frances Velay Women's Science Research Fellowship Program, which provides summer research opportunities for the College's women scientists. The fellowship, named for the late Frances Velay, is designed to encourage women's leadership in the sciences by supporting the summer work of female undergraduates, helping prepare them for graduate study and professional careers in scientific fields.

Velay earned a master's degree in chemistry in 1947 when few women pursued graduate training in the sciences. Before her death in 2007, she created a fellowship fund to help young women scientists access research opportunities. In the first year of the three-year grant, the KINSC Steering Committee awarded this fellowship to 10 students, providing them with stipends to conduct research full-time during the summer.

Six students—Sarah Betti ’17, Valentine Courouble ’17, Kristen Fiore ’17, Grace Thiele ’17, Zexi Geng ’18 and Caroline McKeon ’18—conducted their summer research on campus with Haverford faculty. Four students—Francesca Ciocco ’17, Rose Glass ’17, Keri Cronin ’18 and Katie Sullivan ’18—found research internships at other institutions. The Velay Fellowship supported a diverse slate of projects spanning cellular biology, astronomy, biogeochemistry, and more.

Sullivan flew cross-country to Stanford University, where she studied the relationship between the protein calreticulin and different cancer cell types. “My research hopes to create a better understanding of this complex interaction,” she says.

Cronin worked at the Children’s Hospital of Philadelphia, and her project concerned the interdisciplinary study of the cellular mechanisms underlying the development of epilepsy. “The primary aim of this [work] is to better understand the mechanistic links between significant central nervous system injury and the resulting development of epilepsy,” she says.

Betti, who worked on campus with Senior
Postdoctoral Research Associate Alex Hill, measured the magnetic field of the Smith Cloud, a hydrogen cloud located below the plane of the Milky Way that has fallen through the Milky Way’s disk. From computer simulations, the Smith Cloud should have lost more hydrogen to the galactic disk than observed, but the magnetic field is one suggestion for the survival of the cloud. “By measuring the polarization of radio waves from sources located far behind the cloud, we can measure the strength and magnetic field of the cloud, which gives information about how the cloud survived intact through the Milky Way,” she says.

For Thiele, who worked with Assistant Professor of Chemistry Lou Charkoudian, the fellowship allowed her to devote intensive time to research “that could shape my future academic interests.” This summer, she continued her work studying the interactions between proteins from polyketide and fatty acid synthases. “I feel like having a more independent and focused lab experience over the summer is really beneficial [for] building confidence as a chemist and helping develop more intellectual ownership for my project as I move toward thesis,” she says.

Geng, who was mentored by Associate Professor of Chemistry Helen K. White, examined how marine fungi degrade oil, and how the oil changes chemically when degraded. “I have always been interested in research that relates to environmental issues and I plan to continue this type of research when I graduate,” she says. “The Velay Summer fellowship is an amazing opportunity to allow me to work in the lab, develop skills and come up with ideas that might lead to new research directions.”

McKeon investigated the acyl carrier protein’s environment, shape, and function during lipid sequestration by incorporating non-canonical amino acids containing probe groups into the protein in Associate Professor of Chemistry Casey Londergan’s lab. “The amount of attention and work I put into the project dictates how successful I am,” she says. “My experiences working on my own project have taught me how to think independently of a protocol handed to me.”

She says that the nature of the Velay Fellowship intensifies the honor of receiving the scholarship. “Pursuing a career in science is a daunting task, especially for women,” McKeon says. “Encouragement in the form of support for research is unbelievably valuable as we push ahead into the science community.”

Fiore, who also worked in Londergan’s lab, used IR experiments to understand the binding mechanism and conformational dynamics of alpha-synuclein. “[It is] an honor to receive a fellowship in the honor of a woman who blazed the way for others in science,” she says, “and I can only hope to follow her by example and use the skills I learn with this opportunity, to help give back whatever I can to the larger community.”

Glass traveled to the University of California, San Diego, for her research, in which she helped to characterize the transcriptional profile of CASK, a transmembrane scaffolding protein [in which mutations are] linked to intellectual disabilities. “Along with being grateful for the opportunity to have a completely new research experience, I’m happy that I’m supported by a fellowship intended in help include more women in science,” she says.

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Ciocco, who studied a habituation deficient strain of zebrafish in the Granato Lab at the Perelman School of Medicine at the University of Pennsylvania, is also “very proud of the larger meaning” of the Velay fellowship.

“As a board member of Women in STEM at Haverford, I have seen the importance of support in networks among women in science fields and think this fellowship has a large impact,” Ciocco says.

Courouble, who also worked in the Charkoudian lab on campus this summer, is grateful to be carrying on Velay’s legacy with this fellowship and her research.

“As a woman in science, Frances Velay never backed down from a challenge or opposition,” she says, “and I can truly say that I [carried] that attitude with me while conducting research this summer.”
I’m grateful to have received a Summer Scholars stipend from the KINSC, for it gave me the opportunity to conduct research at Haverford’s chemistry department last summer. I worked in the laboratory of Professor Karin Akerfeldt, alongside two other Haverford students. We studied hydrogel forming peptide sequences of semenogelin (Sg), the main protein found in semen. I had a truly amazing and fulfilling time. As a first-year, I believe the science programs at Haverford are extremely beneficial in that undergraduate students play a fundamental role in research projects. Moreover, we are given freedom to devise our own experiments, which greatly prepares us for work in graduate school or the job market, which require independent thinking. The experience has greatly broadened my understanding of organic chemistry and the invaluable lab skills I’ve acquired are aiding me in my currently chemistry laboratory course and will likely continue to do so in my future chemistry career.

Charlie Hale ’17
Research Internship at Johannes Gutenberg University, Germany

I was funded by the KINSC Summer Scholars program to travel to Mainz, Germany, and investigate the genetic basis of ant foraging behavior at the Johannes Gutenberg University of Mainz. I used RNA interference to knock down the function of a particular gene of uncertain function, but known to be associated with foraging behavior in ants. I then performed behavioral assays to determine that the gene appears responsible for maintaining a diurnal foraging rhythm in colonies. Earlier in the summer, I was funded by the KINSC to present my research from the past summer at the annual American Society of Microbiology (ASM) conference, which brings in around 10,000 researchers doing a huge variety of microbiology-related research. It’s in no small part due to that experience, in which I was exposed to some projects that fascinated me, that I’m now planning on going to grad school for microbiology in the future. It was the warmth and tight-knit nature of the student body that caused me to decide on Haverford, but what I’ve come to appreciate over the past few years is how those same characteristics apply to student-faculty relationships.

Kaiwei Wang ’19
Chemistry Internship at Haverford College

“It was the warmth and tight-knit nature of the student body that caused me to choose Haverford, but what I’ve come to appreciate over the past few years is how those same characteristics apply to student-faculty relationships.”

– Charlie Hale ’17
**Amy Zamora ’18**

*Research Internship at the University of Pennsylvania*

Thanks to the support of the Multicultural Scholars Program and the KINSC, this past summer I was given the opportunity to work alongside Haverford Professor Roshan Jain at the University of Pennsylvania. With the Jain lab, I used zebrafish in order to investigate genetic mutations which cause behavioral disorders; particularly in a neural circuit which affects decision-making. I specifically focused on determining the role of a gene called ap2s1 in a decision making process known as short-term habituation, where an organism reduces its reaction over a short period time to non-consequential auditory stimuli. The Jain lab was particularly interested in learning more about this gene since humans have a genetic equivalent, which is related to diseases such as schizophrenia and epilepsy. With all of our results at the end of the summer, the lab and I confidently knew and observed that when ap2s1 was mutated, habituation failed to take place in zebrafish, thus opening the door for more research surrounding the gene. In Professor Jain’s lab this summer, I was able to experience a side of biological research, which I had never dreamed of having the opportunity to interact with. As a low-income student, chances like these are few and far in between, making me so grateful and inspired by my experience. In fact, my experience was so eye opening and transformative that it has influenced me to look towards biology inclined careers in my future endeavors. As a math major, I was originally only interested in performing math research, but now I have been motivated to mix my two passions, math and biology, to find a perfect fit for me in my graduate studies.

“**As a math major, I was originally only interested in performing math research, but now I have been motivated to mix my two passions, math and biology, to find a perfect fit for me in my graduate studies.”**

– Amy Zamora ’18

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**Tionney Nix ’17**

*Research Internship in Ifrane, Morocco*

I was awarded KINSC summer funding for two summers of research- one summer at Haverford and one summer in Morocco. My first summer of research at Haverford was really important to me because it helped set the direction of my desired career path. That summer I worked on a computer science project that involved removing social discrimination from machine learning models. From this project, I realized that I really enjoyed social computing research, and I hope to go to graduate school to continue this sort of research. Doing research in Morocco was also an amazing experience. Aside from being in a beautiful country, I had the chance to learn from a very different research experience. It was interesting to get takes on universal research problems from a different perspective and also to be around other students working on really cool projects. KINSC research grants are the icing on top of the cake for students in STEM in a 4-year college like Haverford. Attending Haverford had the dual benefit of allowing me an intimate small liberal arts college experience while also providing amazing research opportunities that are usually only available to university students. I came into college knowing that I wanted to study computer science, but after coming to Haverford, I realized that I also had an interest in math. Math courses here are challenging in the most interesting ways which makes solving problems a much more rewarding process.
Rose Glass ’17  
_Society for Neuroscience Conference_

While presenting a poster at the annual meeting for the Society for Neuroscience with Dr. Laura Been, I got a three-day whirlwind tour of current neuroscience research. At the conference I met with an investigator from UC San Diego and arranged to work with her over the summer on a protein involved with intellectual disability, which the KINSC also funded. While perusing the posters, I ran into Eric Marsh, a Haverford alum who is now a neurologist at the Children’s Hospital of Philadelphia. We arranged for me to do my senior thesis in his lab studying a mutation that leads to circuitry abnormalities and pediatric epilepsy. I also contacted five professors at several different neuroscience graduate programs and talked to them about their research and what it’s like to attend graduate school. Going to this conference helped me expand my academic family, gain more research experience, and learn more about what attending neuroscience graduate school would be like.

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A three-hour road trip sitting shotgun to my professor with two other lab members in the back was a great bonding experience with the people I had worked with every day that summer. _—Richard Phillips ’18_

Richard Phillips ’18  
_Mercury Conference on Undergraduate Computational Chemistry_

The Mercury Conference was a formative trip for me as an aspiring scientist. A three-hour road trip sitting shotgun to my professor with two other lab members in the back was a great bonding experience with the people I had worked with every day that summer. It definitely was not an experience I’d expect as an undergrad at a larger university. We headed to Bucknell University, where I briefly spoke and presented a poster. I met professional computational chemists and I got a good sense of what leaders in the field work on and speakers from academia and pharmacology helped me to further explore drug design. I also met many undergraduates who were near graduation and presenting their own thesis research. I felt drawn to the computational aspects of computational chemistry and the experience helped me decide to switch my major from chemistry with an emphasis in computer science to computer science with an emphasis in chemistry. Now, much of my research deals with the statistical justifications for forming and testing chemical hypotheses.
Christopher Garling ’17
Research Travel to the Subaru Telescope in Mauna Kea, Hawaii

My junior year, I traveled to Mauna Kea, Hawaii to observe on the 8.2 meter Subaru Telescope over fall break. This is cutting-edge science impossible at any other observatory in the world. I was kicking it beside the beach one day and at an altitude of 14,000 feet the next. This experience epitomized my time at Haverford in every sense. Some people write off small schools, especially colleges without graduate programs, as being less research-focused than large universities. For me, this was anything but true -- I began my research in astrophysics the summer of my freshman year and have been involved in research ever since, working on two different comprehensive projects and presenting my senior thesis as a junior so I could graduate early. I’ve worked with three different professors, one from Haverford and two from major research universities, and presented my work at three different professional conferences. For me research has always been at the forefront of my academic college experience, and I would have it no other way. At larger schools it can be difficult to get dedicated attention from a mentor, as they have graduate students who get first priority in research. This can also result in undergraduates getting stuck with less interesting research projects. But the focus at Haverford is always on undergrads, and it has done wonders for me.

“Some people write off small schools, especially colleges without graduate programs, as being less research-focused than large universities. For me, this was anything but true – I began my research in astrophysics the summer of my freshman year and have been involved in research ever since ...

– Christopher Garling ’17

Caroline McKeon ’18
Genetic Code Expansion Workshop

The lectures and lab sessions I attended at the workshop laid the groundwork for my project in the Londergan Lab back at Haverford. I was nervous to enter the greater chemistry community and to represent Haverford in a lab setting across the country. But I learned that even my most basic skills provided me the ability to latch on to concepts and participate in a workshop alongside post-docs, grad students, and veteran MD/PhD researchers. Interacting with other chemists in various stages of their careers at the workshop gave me an window into what my life would be like if I pursued a graduate degree in chem or biochem. I appreciated and enjoyed meeting other women in science who were passionate about their project and were sharing ideas with other chemists hailing from around the country. The experience strengthened my momentum for grad school. I came into Haverford thinking I wanted to study biology and started working in a chemistry lab the summer after my sophomore year. I appreciated the discipline and reward I found in the sciences and felt like I thrived there more than any other subject I explored. I have never known what it is like to study chemistry at a university with a graduate school, but I do know I have been granted the opportunity to collaborate closely with a professor every day since my freshman year. I know my professors well, they know me, and they have gotten to know what I am capable of. I couldn’t ask for much more!
For more information about studying in the natural sciences at Haverford College, please visit:

haverford.edu/KINSC

KINSC Steering Committee

Judy Owen
Director, Koshland Integrated Natural Sciences Center, Elizabeth Ufford Green Professor in the Natural Sciences and Professor of Biology

Marielle Eaton
Program Coordinator

John Dougherty
Associate Professor of Computer Science

Kate Heston
Instructor in Biology

John Mosteller
Assistant Vice President for Academic Resources

Joshua Schrier
Associate Professor of Chemistry

Student Advisory Committee
This committee is appointed each year and meets regularly with the Program Coordinator and annually with the Steering Committee as a whole.

Sarah Betti ’17
Xiwen Jia ’19
Helen Jung ’18
Irfan Munir ’18
Richard Phillips ’18
Yixuan Zhou ’20

Photo: Brett Pogostin ’18 runs laser tests in the East Wing of the KINSC. Brett works in Karin Åkerfeldt’s lab using Raman spectroscopy to find the pKa of histidine in a hydrogel-forming tri-peptide. Photographer: Holden Blanco ’17.