

KINSC

ANNUAL REPORT

2014

THE MARIAN E. KOSHLAND INTEGRATED NATURAL SCIENCES CENTER
AT HAVERFORD COLLEGE

MAJOR PROGRAMS

Astronomy
Astrophysics
Biology
Chemistry
Chemistry - ACS Certified
Computer Science
Engineering (see below)
Geology (at Bryn Mawr)
Interdisciplinary Physics
Mathematics
Physics
Psychology

MINOR PROGRAMS

Astronomy
Chemistry
Chemistry - ACS Certified
Computer Science
Environmental Studies
Health Studies
Mathematics
Neuroscience
Physics
Psychology
Statistics

CONCENTRATIONS

Biochemistry
Biophysics
Computer Science
Geoarcheology (at Bryn Mawr)
Geochemistry (at Bryn Mawr)
Mathematical Economics
Scientific Computing

DEGREE PARTNERSHIP PROGRAMS

4+1 Bioethics with UPenn
4+1 Engineering with UPenn
3+2 Engineering with CalTech

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 this end, the KINSC promotes scientific scholarship involving close collaboration between faculty and students and provides opportunities for these collaborations 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 instruments, methodology, and expertise across disciplines and to contribute to a climate of cooperative problem solving and investigation.

The KINSC comprises 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 dialogue and collaborations**. In addition to directly funding students and faculty, the Center supports academic activities initiated with outside grants and individual faculty awards.

The programming and funding functions of the Center support the faculty and students of these departments as well as others within the college who wish to pursue research in the sciences. The KINSC funds individual research projects and also sponsors symposia, curricular initiatives, courses, and scholarly projects that go **beyond the bounds of a single discipline** and involve students and faculty from multiple departments.

COVER: 2014 KINSC Imaging Contest second place winner: Tian Yang '15

The ARC 3.5 m telescope in Apache Point Observatory shoots a beam of accurately-timed laser pulses to the moon, and detects the reflected signal from the Lunar Retro-reflectors placed by Apollo astronauts and Soviet Union rovers. Scientists measure the round-trip travel time of the laser and calculate the relative acceleration of moon and the earth toward the sun. Eventually, the data from this operation will be used to test Einstein's theory of general relativity. Haverford students visited Apache Point for Spring Break, but are also able to use the telescope remotely from computers at Haverford.

OPPOSITE: The Marian E. Koshland Integrated Natural Sciences Center.



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:

- ▶ Fall research symposium, showcasing student work from Haverford, Bryn Mawr, Swarthmore, and other area colleges
- ▶ Travel for students to pursue academic year research 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)
- ▶ Support for training students (or faculty) in new science-related skills
- ▶ Science Faculty special project grants
- ▶ Events, such as research talks, film screenings, panels, etc.
- ▶ Annual career panel focusing on careers for science majors, in collaboration with the Center for Career and Professional Advising
- ▶ Annual Student Scientific Imaging Contest
- ▶ Mentoring and Student Teaching Program (MAST)
- ▶ Multicultural Scholars Program

We are committed to trying to support all creative ideas in the sciences, so we encourage students to submit an application even if their idea doesn't align with a specific funding category.

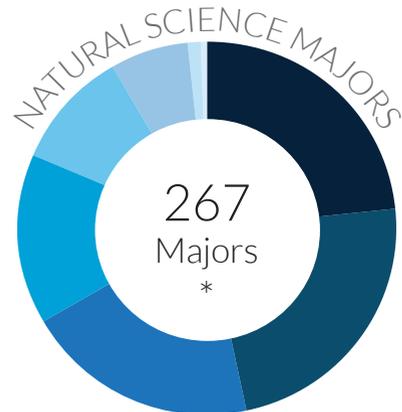
KINSC BY THE NUMBERS:

2014



- 5 STUDENTS RECEIVED FUNDING FOR INTERNATIONAL RESEARCH TRAVEL
- 14 STUDENTS RECEIVED FUNDING AS KINSC SUMMER SCHOLARS
- 23 STUDENTS RECEIVED FUNDING TO ATTEND OFF-CAMPUS CONFERENCES
- 79 PERFORMED ACADEMIC YEAR RESEARCH WITH FACULTY IN THE KINSC
- 89 PERFORMED SUMMER RESEARCH WITH FACULTY IN THE KINSC

*Student research opportunities are funded through the KINSC and through individual faculty grants from the NSF, NIH, and more. Some students take advantage of multiple funding opportunities.



- 1 ASTRONOMY MAJOR
- 3 ASTROPHYSICS MAJORS
- 18 PHYSICS MAJORS
- 27 COMPUTER SCIENCE MAJORS
- 40 MATHEMATICS & STATISTICS MAJORS
- 53 CHEMISTRY MAJORS
- 62 PSYCHOLOGY MAJORS
- 63 BIOLOGY MAJORS

*This figure captures all Seniors, Juniors, and Sophomores who have declared a major in science.

41

Number of faculty supervising student researchers

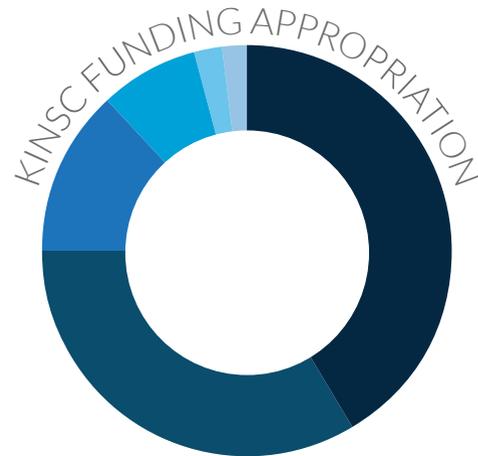
100%

Science majors who graduate with advanced research experience

\$5 M+

External funding for research being done by our natural science faculty

KINSC FUNDING INITIATIVES



- FACULTY SPECIAL PROJECTS
- STUDENT SUMMER RESEARCH
- STUDENT TRAVEL GRANTS
- MAST PROGRAM
- EVENTS AND SYMPOSIA
- FACULTY TRAVEL GRANTS

STUDENT RESEARCH FUNDING



KINSC SUMMER SCHOLARS PROGRAM

In 2014, the KINSC supported students with a **\$4400 stipend for a 10 week summer research project.**

Fourteen students received support for research internships at Haverford and at other colleges and universities across the country. Five of these students worked with faculty on campus, while nine worked in labs in Maine, California, Oregon, and Ohio as well as in the Philadelphia area. Their research concerned a variety of topics, from the seasonal ecology of endangered bats in Baja, Mexico to the analysis of photosynthetic mutants of maize at the University of Oregon.

STUDENT RESEARCH FUND

The Student Research Fund provides **travel support for research conducted outside of the Philadelphia area**. The KINSC will fund domestic or international student research during breaks in the academic year. Preference is given to those applying for funds 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 under-represented groups to attend conferences, perform research, take courses, attend workshops, and participate in activities that will enhance their scientific experience as students at Haverford. The Multicultural Scholars Program, supported by this fund, offers workshops for science students from historically under-represented groups and enables students to perform research during the summer months.

INTERNATIONAL TRAVEL STIPENDS

Due to faculty collaborations with scientists at other institutions, **there are 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 2014, five Haverford students traveled abroad to perform research.

- ▶ Dan DeLuzio '15 traveled to the Mt. Stromlo Observatory in Canberra, Australia to study Stellar populations of Globular Clusters in the large and small Magellanic Clouds.
- ▶ Maryna Khromava '16 and Renee King '16 traveled to France to work on a collaborative study led by Casey Londergan (Chemistry) and Dr. Sonia Longhi at the Centre National de la Recherche Scientifique in Marseille. Their work investigates proteins made by myxoviruses such as Measles, Nipah and Hendra viruses.
- ▶ Abigail Healy '15 and Jennifer Willemsen '15, along with Beatrice Ary '15 of Bryn Mawr College, traveled to Lund University, Sweden to engage in research with Dr. Sara Linse, a collaborator of Karin Akerfeldt (Chemistry), studying the protein calmodulin, which is involved in many processes regulated by calcium.

2013-14 STUDENT CONFERENCE TRAVEL

Some of the conferences students attended with funding support from the KINSC:

- ▶ Consortium for Computing Sciences in Colleges, Providence, RI
- ▶ Grace Hopper Celebration of Women in Computing Conference, Minneapolis, MN
- ▶ Geological Society of America, Denver, CO
- ▶ New England Science Symposium, Boston, MA
- ▶ GSA Annual Meeting & Exposition, Denver, CO
- ▶ SC'13 Supercomputing Conference, Denver, CO
- ▶ Cognitive Neuroscience Society 21st Annual Meeting, Boston, MA
- ▶ Vision Science Conference, Tampa, Florida
- ▶ The American Chemical Society National Meeting and Exposition, Dallas, TX
- ▶ Ocean Sciences Meeting, Honolulu, Hawaii
- ▶ Eastern Psychological Association Conference, Boston, MA
- ▶ Gulf of Mexico Oil Spill & Ecosystem Science Conference, Mobile, AL

2014 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.



TRI-CENTER INITIATIVES

To promote dialogue and learning that extends across the College's academic community, the KINSC cooperates with the College's other two Academic Centers, The John B. Hurford '60 Center for the Arts and Humanities and the Center for Peace and Global Citizenship, to support projects with impacts that include but extend beyond the natural sciences. Projects of interest and relevance to the mission of all three centers are becoming a larger proportion of the work we support.



In 2014, four students were awarded fellowships to travel to the Gulf Coast to document environmental chemistry fieldwork pursued by Helen White (Chemistry) and her students. The project received support from all three Academic Centers, the Office of the Provost's Louis Green Fund, and the Department of Instructional and Information Technology Services. The film they produced, *Wake*, explores the presence of the oil industry and the role of the community in the southern Louisiana towns of Grand Isle and Lafayette.

Other tri-center initiatives from 2014 included a lecture by retiring Chair of our Board of Managers Cathy Koshland inaugurating the final piece of our 4+1 Engineering Program, events to celebrate the initiation of the multi-disciplinary Health Studies Program, and a conference held in recognition of the 50th anniversary of the publication of Chinua Achebe's "Arrow of God" trilogy.

SUPPORTING FACULTY RESEARCH

In 2013-14, six faculty research projects received funding from the KINSC. Faculty special grants have been used to supplement work done on federal grants, to provide seed money to generate preliminary data that can be used to support new grant proposals or to support small, discrete projects that do not meet the size criteria for federal funding.

Suzanne Amador Kane

Associate Professor of Physics



Through its Special Projects Fund, the KINSC has facilitated my transition to research in the newly christened field: The Physics of Behavior. Students in my group now apply physics-based experimental and theoretical techniques to the study of animal biomechanics and sensory ecology. We explore such topics as how raptors (birds of prey like falcons and hawks) pursue their prey—and how the prey animals maneuver evasively in response—and how birds use calls during predation and flocking. This work has resulted in student-coauthored publications, wide coverage in the international media and an accompanying YouTube video that received over 2.6 million views.



With the help of travel funds from the KINSC, Haverford undergraduates in my research group have performed research fieldwork in the Sierra Nevadas, at the New Jersey shore, and in Europe. These projects provide opportunities for our students to learn about topics as diverse as organismal biology, bioacoustics, computer simulations, machine vision and even CGI-methodology. In such a young discipline, even first-year students can contribute novel research questions, methods of analysis or experimental techniques.

Most recently, this fall Carolyn Oehrig '15 and I have been working with the Cape May Raptor Banding Project (CMRBP), an organization that conducts long-term monitoring of the status and population trends of migrating diurnal raptors (hawks, falcons and eagles). We have been volunteering in their programs to capture, examine and band these magnificent birds of prey, then to film their release and subsequent flight using 3-D video. Our initial scientific goal is to understand how raptors take off and maneuver, a subject about which surprisingly little is known. However, we are also collecting ideas for future projects by observing these birds in their natural environment and interacting with experts on raptor biology.

Jennifer Lilgendahl & Benjamin Le

Associate Professors of Psychology

With support from the KINSC, we launched the Identity Pathways Project (IPP) at Haverford College in 2013. Working with a collaborator at Western Washington University (WWU), the project aims to understand how students transition to college, develop their academic and career goals, navigate existing and new relationships, and change during this four-year phase of their lives. We are studying identity development through the lens of students' own voices, in the context of how they narrate and derive meaning from both academic and social experiences.

Approximately 40% of the class of 2017 participated in the first year of the study, completing questionnaires and writing narratives about their experiences as new students at Haverford at the beginning, middle, and end of the year. During the Fall 2014, the sample at Haverford began the second year of the study, and a new cohort of first-year students at WWU started the study.

This is really important research for Haverford because it investigates how students come to develop their academic passions and career identities, as well as cultivate interpersonal relationships. There is much past research demonstrating that these are two very important goals for college students, and we hope that our work will highlight how the College is facilitating students' growth, and where we can improve the ways we are supporting them. Of particular interest in this regard is our focus on understanding the development of science and math-related career interests and how to improve persistence in these fields, particularly among women and underrepresented minority groups. This project is also groundbreaking because it is the first research that uses a narrative approach to investigate how young adults form and maintain their relationships.

During summer 2013, Hanaan Bing-Canar '15, Ellen Reinhart '15, and Rebecca Suzuki '16 worked as research assistants on the project. They will present some of their findings at the 2015 meeting of the Society for Personality and Social Psychology in Long Beach, CA.

Read more about this project at identitypathwaysproject.org.





Helen K. White

Assistant Professor of Chemistry & Director of Environmental Studies

Oil spills are known to have significant and lasting impacts on marine ecosystems and increases in offshore drilling indicate that oil production and the associated environmental risks are unlikely to diminish in the coming years. Following the Deepwater Horizon oil spill in the Gulf of Mexico, my research group has been monitoring the changes

in composition of oil from the spill that continues to wash ashore along the Gulf coast. Thanks to generous funding from the KINSC, I have been able to perform fieldwork with eight Haverford College students for the past three summers. In the summer of 2014, my research students and I were also able to collaborate with four additional students led by our Artist-in-Residence and filmmaker, Vicky Funari, as part of the Interdisciplinary Documentary Media Fellowship. By visiting the Gulf coast each summer, we have obtained important insight into the evolution, persistence, and fate of petroleum in the marine environment. Students participating in this research have presented their findings at on-campus symposia as well as at the 2013, 2014, and 2015 Gulf of Mexico Oil Spill & Ecosystem Science conferences, and at the 2014 Ocean Sciences Meeting. Most recently, data obtained by Shelby Lyons '15 and Max Findley '15 from samples collected as part of this project were published in the journal *Environmental Science and Technology Letters*.

Funding for the Gulf Coast research project enabled participating students to gain valuable field experience observing the direct impacts of the Deepwater Horizon oil spill on the Gulf Coast ecosystem. As the students collected samples, they were able to view offshore drilling platforms, talk to residents and beach goers, observe wildlife including fish, dolphins, and rays, and talk to people whose livelihoods depend on the various industries in the region. The value of the students' experience in the lab, is equaled by their experience gaining insights into the complexity of our relationship with the environment.

SUPERLAB: A HAVERFORD TRADITION

Superlab is a testament to the collaborative spirit in which the KINSC was conceived and brings together professors from differing research areas, and sometimes different departments, to team teach a **stand-alone laboratory course dedicated to solving real world problems.**

Now in its 50th year, the Superlab was initiated by the Biology Department in 1964 with the support of an NIH grant, the first such grant to be given to a liberal arts college.

Superlab serves as a great bonding experience for its participants. Though students report spending up to **20 hours a week in the laboratory** and rate it as one of the most challenging courses they've taken, most also rate it as the best course 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 four problems per year alongside an experienced scientist with expertise in a specific sub-discipline. Students are taught to be independent and are then entrusted with the means to be so. Outside the formal laboratory periods, students have **24-hour access to the laboratories** and ancillary equipment rooms.

Faculty teach what they know and **close faculty-student relationships** are developed over the long hours spent in lab together. The availability of excellent equipment, along with carefully designed experiments allow each student to work with state-of-the-art technology to answer the experimental question posed at the beginning of the lab.

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 post-graduation as research assistants after graduation.

Superlab prepares students to take on the high-level research required of all senior science majors.



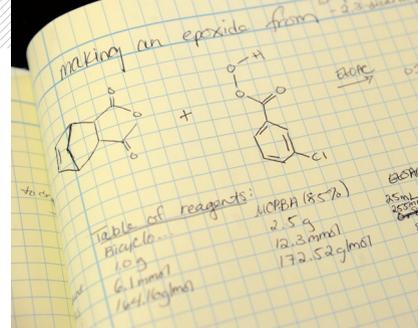
Professor Mel Santer was the first to teach Superlab in 1964.



MENTORING AND STUDENT TEACHING (MAST)

The Mentoring And Student Teaching program (MAST) is a long-standing outreach program at Haverford College. The program provides laboratory experiences and writing tutorials for 40-50 Philadelphia-area high school and middle school students who come from backgrounds traditionally underrepresented in the sciences. The young students come to the Haverford campus for ten Saturdays in the spring semester and spend mornings in the lab pursuing scientific experiments and afternoons working on writing skills. Haverford and Bryn Mawr College students prepare the course curricula, devise and teach the science labs, and work with small groups of high school and middle school students as writing tutors.





MULTI-DISCIPLINARY PROGRAMS

HEALTH STUDIES MULTIDISCIPLINARY MINOR

At Haverford, we value the intersection of public health with social justice, and this course of study enables students to approach these issues with greater knowledge and understanding. The Health Studies minor is designed to give greater context to 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 relate to 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. However, 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. This is a Bi-College minor, and courses are taught by Haverford College and Bryn Mawr College faculty across many disciplines.

ENVIRONMENTAL STUDIES INTERDISCIPLINARY MINOR

The Environmental Studies Interdisciplinary Minor aims to cultivate in students the capacity to identify and confront key environmental issues through a blend of multiple disciplines, encompassing historical, cultural, economic, political, scientific and ethical modes of inquiry. Haverford, Bryn Mawr and Swarthmore colleges have been cooperating since 2011 to offer a Tri-College Environmental Studies Interdisciplinary Minor, involving departments and faculty from the natural sciences, the social sciences, the humanities and the arts. Our aim is to bring students and faculty together to explore the interactions among earth systems, human societies, and local and global environments.

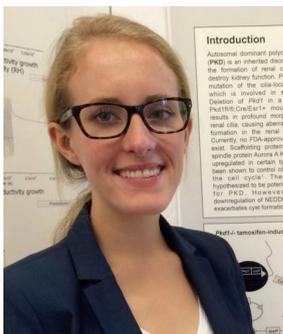
SCIENTIFIC COMPUTING CONCENTRATION

Many disciplines in the natural and social sciences include a significant sub-discipline that is explicitly computational. This is certainly true in astronomy, biology, chemistry, economics, and physics. In some fields, the use of computation has become so widespread that basic literacy in computation is essential. The concentration in scientific computing gives students an opportunity to develop a basic facility with the tools and concepts involved in applying computation to a scientific problem, and to explore the specific 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.

STUDENTS IN THEIR OWN VOICES

Once, when speaking to an oncologist from a top university, I was told: "I only hire Haverford grads to work in my lab. Haverford is the best science educator out there."

- Louisa Eckman '15



Louisa Eckman '15 Fox Chase Cancer Center Research Internship

This past summer I was awarded a stipend to participate in research on polycystic kidney disease at Fox Chase Cancer Center. I worked side-by-side with doctors and learned what it means to be both a physician and a scientist. I got real-world hands-on experience and developed skills that set me apart from other college

graduates. Once, when speaking to an oncologist from a top university, I was told: "I only hire Haverford grads to work in my lab. Haverford is the best science educator out there." As both a researcher and future medical student, what I have learned here has been incredibly valuable. My time at Fox Chase was very validating for me because it showed me that the work I do at Haverford was applicable off-campus. I interacted with a variety of people such as physicians, scientists, grad students and lab techs; I gained the confidence to contribute to what they were doing. Most of all, I got to exercise my brain in a new setting, and that has already shown itself as I prepare to start my senior thesis. I feel like I know what I'm doing! And if I don't know, I can figure it out.



Louisa Eckman's lab mates at Fox Chase Cancer Center.

D. Max Findley '15 Oceanic Chemistry Research Internship, Bigelow Laboratory for Ocean Sciences

This past summer I worked at Bigelow Laboratory for Ocean Sciences in Maine, analyzing how DDT decays in deep-sea environments. During DDT's heyday, it was common practice to dump unwanted barrels of the pesticide in the deep-sea, then believed to be completely isolated from surface ecosystems. Now these barrels are leaking at several dump sites neighboring major cities, making DDT decay an immediate concern for public health and the fishing industry. While at Bigelow Lab, I optimized a novel method originally developed by my mentor to measure chlorine isotopes on a Gas Chromatographer-Mass Spectrometer. I applied the technique to several contaminated



cores from the Los Angeles region, taken from over 500 meters below sea level. Using isotope ratios between DDT and its decay products, I was able to identify exactly how DDT had decayed in this extreme environment and generated a technique applicable to DDT measurements everywhere. The KINSC funded the majority of my stay at Bigelow, and covered my travel expenses to the conference where I was introduced to my mentor. My work at Bigelow inspired my newfound interest in laboratory instruments, exposed me to research in oceanography and fields I never considered at school, and now serves as the basis of my senior thesis. I cannot imagine a better way to have spent my summer.



Juliette Rando '15

Neuroscience Research Internship, Haverford College

I love Haverford's Biology Department because each professor is serious about their research while also extremely invested in student learning. This past summer, I received funding from the KINSC Summer Scholars program to conduct neuroscience research in the laboratory of Assistant Professor Michael Grider. In his lab, I was able to design my own project researching the effects of ischemic stroke on expression of genes encoding neurotrophic factors, signaling molecules that promote neuronal growth and survival. I investigated whether or not administration of estrogen (which exhibits neuroprotective properties) could counteract the effects of stroke on gene expression, thereby increasing neuronal survival. I was extremely excited about this project because it combined my interests

in genetics and neuroscience. My time in Dr. Grider's lab has broadened my understanding of neuroscience research and this will be invaluable when I apply to Ph.D. programs for neurogenetics.

Omotolani Babatunde '16

George Washington University Research Internship

Thanks to funding from the Multicultural Scholars Program and the KINSC, I have spent the last two summers working with Dr. Michael Massiah (HC '92) at George Washington University. Dr. Massiah's lab employs multi-dimensional Nuclear Magnetic Resonance (NMR) spectroscopy to characterize the structures of proteins, and to examine protein-protein interactions. We focused on identifying the structure of a protein called MID1. By knowing the structure of MID1, we can then determine its functions and rationalize how specific mutations, or changes in amino acids, affect the overall function of the protein. Mutations in MID1 are linked to X-linked Opitz G syndrome (XLOS), which is characterized by cleft lip and palate, wide-spaced eyes, and defects in the brain, heart, and genitalia. In Dr. Massiah's lab I learned valuable lab techniques and analytical skills that further solidified my interest in biochemical research. I also had the opportunity to mentor high school students who worked in the lab. In addition to the technical skills that I developed, I have become a better critical thinker and communicator through Dr. Massiah's requirement that lab assistants give oral presentations weekly on the current research being performed within and outside our lab.



My research experience has allowed me to become a co-author on a paper that was recently published by PLOS ONE: "XLOS-observed mutations of MID1 Bbox1 domain cause domain unfolding." Thanks to the MSP and the KINSC for their support, this internship was truly a rewarding experience.



It wasn't until I got involved with Haverford Professor Rob Fairman's research project that I realized just how fascinating and practical biomedical research is.

-Jay Garcia '16

Jay Garcia '16

University of Colorado, Research Internship

This summer, I worked at the Link Lab at the University of Colorado Boulder. At the Link lab, I used *Caenorhabditis elegans* (worms) to study Alzheimer's, a disease caused by mutated proteins. We expressed these proteins and determined what Alzheimer's looks like in the worms. Every neuron in the worm has been previously studied, and this allowed us to tie an aberrant copy of the 'tau' protein to 'bad memory' in the worms and to problems with chemotaxis (following chemical signals via smell). These experiments serve to validate the use of worms as a model for the disease. Since very similar proteins cause Alzheimer's in both worms and humans, finding out ways to fix the proteins in worms would provide us with clues regarding how we should approach treatment in humans. It wasn't until I got involved with Haverford Professor Rob Fairman's research project (using worms to study Huntington's, another neurodegenerative disorder caused by mutant proteins) that I realized just how fascinating and practical biomedical research is. My combined experience working in both the Fairman lab at Haverford and Chris Link's lab at CU-Boulder, served to qualify me for my current lab position studying mutant proteins in intestinal cells for Professor Jonathan Hodgkin at the University of Oxford through Haverford's study abroad program.

ATTENDING CONFERENCES

Julie Ta '16

Grace Hopper Celebration of Women in Computing Conference

The Grace Hopper Conference was my first time attending a professional conference. I was able to attend about ten different sessions, workshops, and talks. I also explored the career fair where I had three interviews for internships for next summer (one of which led to an internship offer in app development!) One of the sessions I attended was "Latest Trends in Data Science." The session was mainly about data analytics and working with "Big Data" in industry and research. I was particularly interested in attending this session because there is a course called Data Science in the Computer Science department at Haverford that I have yet to take. Overall, I found the information that the panelists presented to be very compelling, and I learned so much about data science, how relevant it is in computer science, and how much the field is growing.





Zara Atal '14

American Psychological Association Conference

With support from the KINSC and the Louis Green Fund at Haverford College, I presented my thesis research on the effect of constructive contact on perceptions of mental illnesses in an Italian community at a poster session as part of the APA's

international division. Results from my research showed that even a small amount of mostly indirect contact via a vocational rehabilitation center could positively impact people's perceptions of individuals with mental illnesses. The poster session was a great opportunity to share and discuss my results with leaders in this field. An important aspect of my thesis was the effect these results could have on policy changes in the US and abroad through the creation and support of community-based rehabilitation programs. Throughout the conference I met several people involved with mental health policy decisions and was able to discuss the possible impact of this research on future work in this field. I also attended several sessions on mental health care policy and what the new Affordable Care Act means for mental health care. Attending this conference was a great opportunity to meet with and learn from experts in this field. I now have a much better idea of what research is being done, what research needs to be done, and what impact I can have on improving the care and treatment of individuals with mental illnesses.

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- Zara Atal '14



Adriana Cvitkovic '16

Grand Challenges, Great Solutions: American Society of Agronomy, Crop Science Society of America, Soil Science Society of America International Annual Meeting

In addition to learning about current research in the fields of organic farming, forest soil science, soil reclamation, and biochar, I learned a great deal about my own academic interests. At this tri-society meeting, I attended large poster presentation showcases where I spoke with scientists and graduate students on heavy metal

pollutants in soil and remediation of acid mine drainage (AMD) sites. These conversations were meaningful because I am currently doing research on acid mine drainage with Dr. Selby Cull at Bryn Mawr. Our discussions, as well as other sessions I attended throughout the meeting, directed my interest in doing thesis research on remediation of AMD sites. Without attending this conference I would not have been aware of the expanse of research being done on soil remediation. I found connections between soil science and my major (Geology), minor (Environmental Studies), and concentration (Peace, Justice, and Human Rights). I imagine I will continue drawing on this experience next semester, next year, and beyond. I was encouraged to discover graduate school programs that align with my academic interests and values. This conference offered me the opportunity to meet other students and professionals I may work with one day.

KINSC Staff

Judy Owen

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

Marielle Eaton

Program Coordinator

KINSC Steering Committee

Lou Charkoudian

Assistant Professor of Chemistry

Kate Heston

Instructor of Biology

John Mosteller

Assistant Vice President for Academic Resources

Jeffrey Tecosky-Feldman

Senior Lecturer in Mathematics,
Director of Multicultural Scholars Program

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

Sarah Choi '15

Helen Jung '18

Anna Malawista '15

Geoffrey Martin-Noble '16

Lee Rosenthal '15

Alana Thurston '16

For more information
about studying in the
natural sciences at
Haverford College,
please visit:

haverford.edu/KINSC



HAVERFORD
COLLEGE

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