



Research and Education Opportunities for the Sciences 2019-2020
College of the Atlantic and the Bar Harbor Area
Updated October 31, 2019

This list includes research and education opportunities for COA students. Some of these opportunities are during the academic year, but many of them are summer opportunities. Contact the individual faculty member or relevant sponsor of each opportunity for more information. More generally, you can also check through the internship office for other resources including connections to alumni mentors.

Information about Research Experiences for Undergraduates

This is a good overview of how to go about getting internships, especially through the National Science Foundation's research experience for undergraduates. You can get to it from Dave's advising page: <http://hornacek.coa.edu/dave/Advising/reus.html>

INBRE Summer Student Fellowships: Jackson Laboratory & MDI Biological Laboratory

INBRE summer student fellowship program offers research opportunities for students to work with researchers at the Jackson Laboratory (JAX), Mount Desert Island Biological Laboratory (MDIBL), and other research institutions in Maine in biomedical sciences, bioinformatics, and molecular biology. Two fellowships are awarded to COA students each year, and depending on funding, we sometimes can do 1 or 2 more. They pay for room and board, as well as a stipend for each student. U.S. citizenship is NOT a requirement. The application materials for the fellowship are accessible at: <https://mdibl.org/education/hs-undergrad/undergraduate-applications/inbre/>

Application deadline is January 28, 2020.

In addition, both MDIBL and JAX have their own student fellowship programs that are nationally competitive. These applications are very similar to the INBRE application, so they are pretty easy additions.

The MDIBL fellowships can be found at:

<https://mdibl.org/education/hs-undergrad/undergraduate-applications/>

The MDIBL REU deadline is February 14, 2020

The separate JAX fellowships (independent of INBRE) can be found

at: <https://www.jax.org/education-and-learning/high-school-students-and-undergraduates/learn-earn-and-explore>

The JAX deadline for 2020 is February 2.

Contact person: Helen Hess hhess@coa.edu

Farm Research and Training Opportunities at Peggy Rockefeller Farms

There are many year-round opportunities for students who want to study water quality, biodiversity and soils as influenced by agricultural practices, compare productivity and production between different breeds or varieties of crop plants, develop plans to set up a commercial enterprise with livestock or crops, investigate the history of land-use, and explore the potential and implementation of renewable energy projects. These studies could take place through Independent Study Projects or Senior Projects, with the approval of the farm manager.

Contact people: C.J. Walke cwalke@coa.edu, Kourtney Collum kcollum@coa.edu, and Suzanne Morse smorse@coa.edu

Summer Crew Internship and Research Opportunities at Beech Hill Farm

Beech Hill Farm offers four full-time summer crew positions. The position runs from June-September, includes housing and a one-week, un-paid vacation. Full-time summer crew members participate in all aspects of the farm, including seeding, transplanting, cultivating, harvesting, deliveries, animal care and sales.

In addition, BHF would be excited to host projects relating to methods of reduced tillage, seed saving, cover cropping, pest management, weed management, increasing and retaining fertility in the soils, improved water conservation techniques, and on-farm business plan development. There is also an opportunity for research in our new commercial kitchen - for interested students, there will be the possibility of research focusing on kitchen design, recipe creation and marketing.

Contact people: David Levinson dlevinson@coa.edu, Anna Davis adavis@coa.edu, Kourtney Collum kcollum@coa.edu, and Suzanne Morse smorse@coa.edu

Sustainable Food Systems Research Collaborative (SFSRC) Fellows Program

Through a grant from the U.S. Department of Agriculture (USDA), Dr. Kourtney Collum and a team of researchers at the University of Maine (UMaine) are completing a three-year study of the production and marketing challenges and opportunities for small- and medium-scale beekeepers and maple syrup producers. As part of the project, COA and UMaine students will collaborate with project stakeholders on research and extension activities through the Sustainable Food Systems Research Collaborative (SFSRC). SFSRC fellows will design their own research projects related to beekeeping or maple syrup production. Up to three COA students are eligible for the fellowships which will run for eight weeks from June through August 2020. Fellows will develop independent research projects that can involve social- or natural-science research methods. Fellows will be trained in mixed-methods research and knowledge-to-action practices to help benefit small and medium-sized agricultural producers. Students can combine the fellowship with a senior project or independent study. The fellowships will be awarded on a competitive basis and include a \$4,000 stipend for research and a small stipend to travel to present at conferences. For more information contact Kourtney Collum kcollum@coa.edu

The Fund for Maine Islands

The Fund for Maine Islands is a partnership between the college and the Island Institute in Rockland that provides support for collaborative work on a range of projects from a monster course in Samso on renewable energy and aquaculture research to funding the current Mapping Ocean Stories course. The collaboration has also invested in a major education initiative to help develop place-based experiential teaching expertise in island and coastal community schools. Ongoing farm to school work, oral history, seabird tagging, island agricultural research in Great Cranberry, community-based research, audio story-telling, and several other projects are part of the partnership. This fund

supports students in a variety of ways by providing new and unique learning opportunities through classes and projects. These projects are initiated by faculty in collaboration with Institute staff. If you want to know more about the Institute's work check out their website (<http://www.islandinstitute.org/>). Of particular interest may be the Island Fellows Program where folks spend two years working with Island communities on projects that are locally relevant (<http://www.islandinstitute.org/program/community-development/island-fellows>). Contact person: Todd Little-Siebold tlittle-siebold@coa.edu

Summer Energy Fellows

Summer Energy Fellows spend 10 weeks working in the Community Energy Center on various energy projects, and often earn internship credit for their work. This program is designed to give advanced students an opportunity to work with community members on a wide variety of local energy projects. Fellows have worked with community members to determine the feasibility of community solar arrays, electric vehicle charging infrastructure paired with photovoltaics, and have performed numerous free solar analyses for local small businesses and farms as part of our flagship Solar for Businesses and Farms (SBF) program. There are also opportunities to work on projects during the school year.

Contact people: Spencer Gray sgray@coa.edu

Computation and Mathematics

Students interested in computational or mathematical projects of any sort should contact Dave. He has begun some preliminary research looking at voting data and gerrymandering that students could contribute to.

Contact person: Dave Feldman dfeldman@coa.edu

Garden Club of America

The GCA funds fellowships and research awards for students in many plant-related fields, not just horticulture. Specific areas for funding include botany, medicinal plant research, plant conservation, pollinator conservation, native bird research, wetland studies, desert studies, ecological restoration, and landscape architecture. Check the eligibility on individual scholarships to see whether they are open to undergraduates. Most awards are in the \$1000-\$5000 range; some are for summer study and some are for the academic year. Once you have identified a grant that you are eligible for, Susan Letcher sletcher@coa.edu is happy to work with you in preparing an application.

From Susan Letcher:

I am seeking one motivated student to work on a project this spring on sex expression in striped maple (*Acer pensylvanicum*). This common understory tree produces separate male and female flowers, and an individual tree can be either male, female, or both in any given flowering season. As part of a larger regional study coordinated by Dr. Jennifer Blake-Mahmud at Colgate, I am studying three populations of striped maple on the island. Fieldwork involves measuring trees, determining the sex of flowers, and counting inflorescences. The timing of fieldwork varies depending on the weather, but is typically concentrated in weeks 8, 9 and 10 of spring term. This is a paid position (\$12/hr) with the possibility of continued employment in future years. Preference will be given to students who are certified to drive the e-car.

I am also seeking one or two student research interns for an ongoing project on forest restoration in Costa Rica in the first three weeks of December each year. (I have a student for this year, but I will be looking for people in 2020.) This project, established in 2009, is an investigation into the effectiveness of different reforestation strategies. I have been tracking woody plant abundance,

distributions, and diversity in the reforestation plots since 2011. Field days will be long, wet, muddy, buggy, and thorny, but you will have an opportunity to live on a farm in rural Costa Rica and contribute to a project with important ramifications for tropical conservation science. I am looking for people who are easy-going, flexible, and hard-working; you should be able to hike for 5-10 km carrying at least 25 lbs. Knowledge of Spanish is a plus. Students should plan to cover most of their own costs (airfare to Costa Rica and food/lodging at approximately \$50/day). Recommended sources of funding include GCA scholarships, Maine Space Grant, and expeditionary funds. If you're interested in working with me on either of these projects, please contact me ASAP sletcher@coa.edu.

General COA Island/Marine experiences

For more information on COA islands (MDR/GDI), Allied Whale, Island Research Center and general summer Osprey programming, students are invited to attend an evening recruitment session held by the Islands Committee (faculty contacts: Sean Todd stodd@coa.edu, John Anderson janderson@coa.edu, Dru Colbert dcolbert@coa.edu) that will be announced to the student body for late Fall term 2019. Students who cannot attend this meeting are welcome to contact any of the above faculty. Opportunities to be discussed will include the Allied Whale and Great Duck opportunities below:

Research Opportunities with Allied Whale: Internships and Volunteering

For the 2019 summer field season, we will offer five internship positions rotating between various research activities within Allied Whale and the Bar Harbor Whale Watch. Work aboard the whale watch will be as a research assistant and general deckhand and will be compensated. Research assistants will take data on all marine mammal encounters using digital SLR cameras and GPS. Within Allied Whale, duties will be split between stranding response (this is when we often get large whales to be necropsied), boat work using the R/V Borealis, M/V Osprey, and R/V Myrus (photo-identification and focal follow observation work), and research at Mount Desert Rock (MDR) Marine Field Station typically involving individual projects, tower watches, seal surveys and operations support for ongoing field classes. While at Mount Desert Rock, all food and board are paid for, and we train all crew members in basic station operations, maintenance, and seamanship/small boat handling. Allied Whale will also make onshore accommodations available for which rent will be the interns' responsibility. Compensated internships are highly competitive and are open to candidates external to the college, although this year we intend to reserve at least two positions for COA students. However, because of federal maritime regulations, compensated internship positions can only be held by U.S. citizens.

In addition to the internships, a number of six-week (minimum) volunteer opportunities will be available, particularly working on AW boats and out at MDR. Unpaid internships (configured for the COA degree requirement) are a definite possibility; often students taking this kind of internship elect to spend their entire time out at Mount Desert Rock as described above running a personal research project decided upon in advance. Such projects have frequently matured into opportunities for professional presentation and peer review. Unpaid internships do not carry the same citizenship restrictions. While at the station, room and board are paid by the Katona Chair. In the past, U.S. citizens have successfully applied for Maine Space Grant funding to support their stay at MDR. This year Allied Whale will also specifically seek to appoint students in compensated apprentice senior staff roles, including the position of Assistant Station Manager as well as Food Systems

Coordinator. Students with the appropriate experience that are explicitly interested in these latter management positions should contact Sean Todd (stodd@coa.edu) directly.

It is also possible to create a field experience on both islands (MDR and GDI) within the same season. In this model, a student would start on Great Duck Island in June immediately after Graduation, working at the Eno Field Station. Around the second week of July, the student would then transfer to Mount Desert Rock's Blair Field Station until August. Drs. John Anderson and Sean Todd would work with the student to create a project that could longitudinally examine the same ecological question on both islands (a number of plant species, sea birds and marine mammals are common to both sites). In this kind of opportunity, room and board at the stations again is included and supported by the Drury and Katona discretionary funds. Students should expect this experience to be island-intense! The application process starts in the late fall.

Contact people: Sean Todd stodd@coa.edu and John Anderson janderson@coa.edu

Research Assistant on Great Duck Island

There is an opportunity for 4-6 students to work on Great Duck Island this summer. They would get food and housing and the chance to engage in both original and collaborative research in field ecology. The bulk of our work is on the island's seabirds, we will also have vegetation & herbivore studies on Great Duck, and the impact of predation on a range of other islands. I will be putting out a call for field assistants in December & would like to have the team in place by March.

Contact person: John Anderson janderson@coa.edu

From Chris Petersen:

I'm looking for students interested in local marine ecology, fisheries, community, and policy research in both during the school year and over the summer. Some of this work is supported by grants, and some is done as part of workstudy, independent studies, or senior projects. One set of projects is focused in Bar Harbor and Frenchman Bay, with other projects more broadly looking at downeast Maine. Having access to a car makes this work much easier to do. This work can include work on marine species in Frenchman Bay, but also on species that are part of fisheries or aquaculture in downeast Maine. I am most interested in students that combine marine ecological research with work directly with harvesters and regulators or with non-profits. Over the past summers students have worked on rockweed biology, worm harvesting, crab ecology and parasites, clam biology, estuarine fishes, pH in estuarine and marine environments, bacterial contamination, and alewife migration with a variety of partners including Frenchman Bay Partners, Maine Center for Coastal Fisheries, Somes-Meynell Sanctuary, Downeast Fisheries Partnership, University of Maine, and the Schoodic Institute. For U.S. citizens that have project ideas I am interested in having them submit applications for Maine Space Grant Funds, but also plan on supplementing any grants with additional funds from my own grants.

I am happy to work with students by either placing them with organizations or having them do more independent work. Contact Chris Petersen: cpetersen@coa.edu

Research Assistant: Spotted Salamander Breeding

There is an opportunity for 3-4 students to work with Steve Ressel as field assistants in spring 2020 on an on-going project titled "Breeding by the Sea: Coastal Vernal Pools in Acadia National Park as Breeding Habitat for Spotted Salamanders (*Ambystoma maculatum*).” This project addresses several aspects of the physiology and breeding biology of Spotted Salamanders via field and some lab work.

Students who wish to participate should know that this project involves nightly field work during the first 2-3 weeks of the breeding season (usually corresponds with weeks 1-4 of spring term) and then daytime monitoring of breeding pools for the remainder of the term.

Contact person: Steve Ressel sressel@coa.edu.

Earth Sciences Opportunities

Sarah Hall often works with students that have taken classes with her and want to do more independent and advanced work in earth sciences including both surficial and bedrock mapping, water quality, watershed monitoring, landscape analysis using GIS technology, and other Earth Science projects on MDI, offshore islands and throughout Maine. Projects may include field work, laboratory work, GIS, and/or scientific writing. Current projects include:

- Stream monitoring in multiple MDI watersheds
- Water quality in local well water
- Dating and mapping local bedrock
- Monitoring coastal erosion in Downeast Maine

Contact person: Sarah Hall shall@coa.edu

From Reuben Hudson:

Students interested in any of the projects list below should contact Reuben rhudson@coa.edu.

Chemical Origins of Life: The origin of life remains one of science's greatest unresolved questions. Of the many environments proposed as potential hatcheries for the first living beings, alkaline hydrothermal vents stand out for providing a remarkable link between geology and biology. In a collaboration with researchers from NASA's Jet Propulsion Lab, and the Ludwig Maximilian University of Munich, we will build a microfluidic device that mimics, in a laboratory setting, the conditions of an early-Earth hydrothermal vent (high temperature, high pressure, and inclusion of the various gaseous and ionic solutes). This microfluidic device will connect directly to a mass spectrometer (MS) to analyze the production of organic compounds. If organic compounds are detected by MS, further characterization via Nuclear Magnetic Resonance (NMR) will be carried out at Colby College. Currently, this project can offer a paid internship through the Maine Space Grant Consortium at NASA's Jet Propulsion Laboratory (JPL) over the summer. The MSGC internship is open only to US citizens (their rules, not ours!). Reuben is also looking for people who can work on this project at COA (any citizenship!).

Green Chemistry: Reuben is always looking for students interested in research on Green Chemistry--finding more sustainable ways to carry out the processes and make the products that we need in a modern society. Specifically, we focus on the use of easily recoverable and recyclable catalysts to carry out a range of organic reactions, which could be used for the production of materials, textiles, or medicines. Reuben is looking for students who would be interested in independent study work on these projects during the academic year. We are applying for funding that would support summer research in this area at COA, and we always have opportunities for paid summer research with collaborators at McGill (Montreal, Canada) and Colby (Waterville, Maine). Students who conduct collaborative research at McGill or Colby would be able to continue this research during the academic year with Reuben.

Environmental Chemistry: Reuben has an ongoing project examining the uptake of a class of emerging pollutants (per/poly fluorinated alkyl substances: PFAS) in tree core samples near contaminated sites. This project is conducted in collaboration with researchers at the Swedish University of Agricultural Sciences in Uppsala. Unlike the Chemical Origins of Life project, and the

Green Chemistry Projects, we do not immediately have opportunities for paid research on this project. However, students interested in working on this as an independent study, should contact Reuben. The project goals from COA are to collect tree core samples, isolate annual growth rings, desiccate the samples, extract the compounds of interest, and ship the samples to Sweden for analysis. In the future, there may be opportunities for students to travel to Sweden to participate in the sample analysis.

Summer Research in Electronic Environmental Sensors and Robotics.

There are opportunities for two students to work on building, deploying and maintaining environmental sensors on Mount Desert Rock, Great Duck Island and around Mount Desert Island. Duties will include designing and building sensors to measure, temperature, light, water levels and other kinds of environmental data. There will be opportunities for programming and data analysis as well. These are paid positions for one month. Students who wish to apply for these positions must take and pass the Sensors, Microcontrollers and Robotics course in Spring of 2020.

Contact person: Daniel Gatti. dmgatti@coa.edu

Bioinformatics Programming.

There are a variety of projects that involve computational work to support ongoing research projects. These projects might involve working with the dog genome and improving ancestry determination, working on mouse genetics projects that support human disease research or working on image recognition projects. Taking and passing the Bioinformatics course in Winter of 2020 is required.

Contact person: Daniel Gatti. dmgatti@coa.edu

Data Analysis with the Penobscot Indian Nation Water Resources Program.

The Penobscot Indian Nation performs water monitoring for environmental health on its lands. They have been accumulating and analyzing data for several decades and are in need of an intern who can perform data cleaning, organization and analysis. This is a fabulous opportunity for a student to see how water quality monitoring is performed by a government organization.

Contact person: Daniel Gatti. dmgatti@coa.edu

GIS Laboratory Assistant

There are two types of GIS Lab Assistants: work study and non-work study. The work study position requires students to be enrolled in or have taken a GIS course. Students eligible for college work study may apply for this position during academic terms. Sometimes there are opportunities on breaks or over the summer for paid, non-work study work on funded projects.

Work study Lab Assistants typically work 8-10 hours per week. Work study Lab Assistants schedule several hours a week as drop in help time and make themselves available by appointment for the remainder of their hours. Primary work-study duties include assisting students and faculty with homework and class projects and conducting special training sessions. Some time is allocated to do research on tools and workflows in order to provide the necessary help that is needed.

Non-work study Lab Assistants may work as much as 30 hours per week during non-academic time periods. Non-work study Lab Assistant tasks might include meeting and working with outside organizations and their staff, digitizing maps, encoding databases, updating and editing data, developing maps and performing other tasks as required. Either position may be asked to perform maintenance tasks such as sweeping, wiping surfaces and monitors, etc. and keeping the lab clean and project materials organized.

Lab Assistants are required to keep records of the tasks they perform. This includes keeping project logs current and making regular backups of their work. Lab Assistants may also be asked to assist with and be responsive to other immediate needs that inevitably come up.

Contact person: Gordon Longworth glongsworth@coa.edu

Summer Museum Educator at COA's George B. Dorr Museum of Natural History

RESPONSIBILITIES: Greet and orient museum visitors, design and conduct interpretive programs, gift shop sales and inventory, maintenance and interpretation of marine observation tank, oversee special events. Saturday work required; Sundays and Mondays off.

QUALIFICATIONS: College graduate or currently enrolled student with knowledge of natural history, especially of coastal Maine; experience in informal education and effective communication skills; ability to work as part of an energetic and creative team; ability to use a ladder and lift 50 pounds. Experience in graphic design or retail sales is desirable but not required.

TERM: begins mid-June, continues through Labor Day.

To complete an application, you will have to send letter of interest, resume and three references.

Contact person: Carrie Graham cgraham@coa.edu

Summer Field Studies for Children

There are 7-8 positions available for students interested in experiential education, community, and working with children. Summer Field Studies (SFS) is a day camp program for young people entering first through ninth grades. Program leaders work with small groups of 10-12 children to foster an atmosphere of community and cooperation. The program runs for 10 weeks (two weeks of training and eight weeks of teaching) during the summer and can be considered as an internship. SFS program leaders design, plan, and implement curriculum to offer children the opportunity to explore and understand the ecology of MDI and nearby areas. The positions are salaried and some housing on campus is available.

Contact person: Renee Duncan sfs@coa.edu

Internships with local organizations:

Wild Gardens of Acadia

The Wild Gardens of Acadia, located at Sieur de Monts Spring, hires a student each summer to help care for the gardens which are visited by several thousand people annually. The Gardens contain plants that are native to this region, and the plants are displayed in habitats resembling those places in the park where visitors encounter them—habitats such as the mountain, pond, bog, deciduous, and coniferous woods. Some botanical experience is helpful but not essential. The intern must have strong interpersonal skills since one aspect of the job is explaining the various plants and their habitats to visitors.

Contact person: Anne Kozak akozak@coa.edu

Acadia National Park

Acadia National Park offers a range of possible internships that reflect the many different facets of the park's operations. Those internships could be in Resource Management, Interpretation and Education, or Visitor Services. In addition, Acadia often hires students through affiliated organizations such as Friends of Acadia for specific tasks such as their Technology Team, Cadillac Mountain Stewards, or other seasonal positions. Similarly, Schoodic Institute also hires student

interns in areas related to science communication, bird research, forest ecology, and intertidal ecology and education. These positions are extremely competitive; a strong interest in national parks and skills relevant to the position are required. To a large extent, placement will depend on park needs, the unique set of skills of the student, and faculty confidence in the student's ability and work habits. Over the past couple of years, COA has been working with the leaders of Acadia National Park to setup the Acadia Scholars Program for COA students interested in the Park Service and the conservation field. The centerpiece of the Acadia Scholars program is an 11-week paid internship with Acadia and related coursework or independent studies connected to that internship. Depending on funding, Acadia Scholars will receive a \$1500/month stipend during the internship. There is no housing provided for the Acadia National Park positions – the applicant is required to secure and pay for their own housing. Contact person: Ken Cline kcline@coa.edu

Schoodic Institute at Acadia National Park

The mission of Schoodic Institute is to advance ecosystem science and learning for all ages through a unique partnership with Acadia National Park. The Institute's science staff focus on bird ecology—with emphasis on migration; forest ecology—with emphasis on seedling and sapling survival in a changing climate; and intertidal ecology—with an emphasis on rockweed biology and intertidal biodiversity. Coupled with the content foci are the goals of connecting science and learning by engaging participants in citizen science and connecting science to conservation.

Schoodic Institute hires field technicians, offers research fellowship funding, including to undergraduates, partners with Acadia National Park on education internship opportunities, and could develop unique internship experiences.

More information is at www.schoodicinstitute.org, and position opportunities will be posted there, at facebook.com/schoodicinstitute, and through the Institute email newsletter. Housing may be available for interns.

The [Hurricane Island Center for Science and Leadership](http://www.hurricaneisland.net) is a transformative learning community on Hurricane Island in Penobscot Bay, Maine. Our mission is to integrate science education, applied research, and leadership development through year-round educational programs and a seasonal, environmentally sustainable island community. Through experiential education programs and research opportunities in STEM disciplines we aim to excite people about doing science and about being leaders in the next wave of scientific discovery and environmental conservation. Each year we offer 6-8 on Island internship opportunities from June-August. Opportunities include Research, Education, Sustainability, and Facilities internships. We will start advertising in December and interviewing in January/February. Check out the [Employment page](#) on our website to learn more about us and to stay informed of internship announcements. Feel free to send questions to info@hurricaneisland.net and thanks!

Friends of Taunton Bay and Frenchman Bay Conservancy

Friends of Taunton Bay, located in Sullivan, has periodically hired a student to work on a variety of tasks. In 2015 and 2018, a full-time intern was shared with Frenchman Bay Conservancy. For FTB, tasks have included a variety of marine ecological projects, from censuses of current populations of interest, like eelgrass and horseshoe crabs, to water quality monitoring, and comparing results with historical data, and teaching in an environmental education program for kids. The Frenchman Bay Conservancy part of the job has focused on conservation in the Frenchman Bay and Union River watersheds. This has included some outreach to towns, review of local ordinances regarding

shoreland zoning, visiting and monitoring FBC preserves, and other land-use planning. At this printing, we do not know if there will be an intern for 2020, but if interested, please contact: Ken Cline kcline@coa.edu or Chris Petersen cpetersen@coa.edu

More general college funds:

Some students have grandfathered Presidential Scholarships that they can use for funding research opportunities. All other students have \$1800 or some lower amount available at some point for opportunities, including internships they might find that require extensive travel. More information can be found on the Student expeditionary fund website: www.coa.edu/sef/

Maine Space Grant Consortium Student research grants:

Maine Space Grant Consortium (MSGC), a NASA (National Aeronautics and Space Administration) agency, has given the College \$21,000 to use for awards for students who are conducting research in science, technology, engineering, and mathematics (STEM). MSGC's grant to COA and is a testament to the excellent work that past students have done. This year we will be awarding funds in two rounds: one at the end of fall term and one during winter term.

The scope of MSGC awards is quite broad, and can include research or creative work in the arts, humanities, and social sciences that contains a STEM element. If you have any questions about whether or not your proposed project fits within MSGC's guidelines, please let me know. While the project needs to have a STEM component, it need not be focused on aerospace.

By NASA policy, only US citizens are eligible for these funds; permanent US residents are not eligible. Students must be in good academic standing and have a GPA (or equivalent narratives) of 3.0 or higher.

There are two categories of awards:

LARGE AWARDS. We anticipate giving multiple awards of between \$2000 and \$3000 each. These will be to provide a stipend or other support to a student engaging in a significant research experience under the guidance of a COA faculty member. Typically, this will involve full-time work over the course of several months, usually in the summer. Large awards require a fairly detailed and careful proposal.

SMALL AWARDS. We also anticipate awarding several smaller awards of approximately \$500 each. The funds can directly support research expenses or can be used as a stipend for the student. These projects are smaller in scale and may be more exploratory than the larger projects. A project funded by a smaller award is comparable in scope to an independent study. In contrast, a larger project is likely equivalent to an internship, residency, or final project.

If you wish to apply for these funds please submit an application to Dave Feldman by **Monday, November 11, 2019**. This will be the first of two calls for proposals. We will review another round of proposals in mid January. We expect to award about half of our funds this fall and the remainder of the funds by mid-February.

Proposals will be reviewed by Dave Feldman, Sarah Hall, and Steve Ressel. Awards will primarily be determined based on the quality of the project and the strength of the student's academic record. Secondly, we will also try to distribute the funds to students working in a number of different areas to encourage student-faculty research across the curriculum.

Your application must include the following:

1. A current CV.
2. A proposal, described below

3. A brief recommendation from the faculty supervisor.

Please submit all materials electronically as a pdf.

The proposal narrative should include the following elements:

A. A title for your proposal

B. Background, including previous work with references, if appropriate.

C. A brief discussion of past work (either coursework or research) that you have done that prepares you to carry out your project.

D. A statement of the goals of the research project and a reasonably detailed methodological discussion of the planned research, including a rough timeline.

E. Plan for disseminating the research, preferably via a presentation at a regional (or national) research meeting and/or a publication or technical report.

F. A discussion of the potential impact of work, both in terms of advancing knowledge in a particular area and in terms of the professional impact the research experience may have on the participants.

G. A listing of other support you or your collaborators have received for this project. Include support which is anticipated or pending.

Note: You do not need to include a budget with your proposal. In almost all cases, students receive the award from MSGC as a stipend that they use for living expenses or to help with tuition. However, if there are any significant additional expenses associated with your project toward which you'd like to use your MSGC funds, please mention this in your proposal.

Proposals for large awards should be three to six pages double-spaced. Proposals for short awards should be approximately two pages. You should develop your proposal in dialog with the faculty member who will oversee your research.

If you have any questions about the MSGC awards, please don't hesitate to contact Dave Feldman dfeldman@coa.edu.

These are a set of additional links for undergraduates that we have been given from the Institute for Broadening Participation (IBP). The note and the links are below. IBP's mission is to increase diversity in the Science, Technology, Engineering and Mathematics (STEM) workforce. We design and implement strategies to increase access to STEM education, funding, and careers, with special emphasis on reaching underserved communities and diverse underrepresented groups. www.PathwaysToScience.org makes it easy for faculty and administrators to access resources that can assist them in their efforts to reduce barriers to participation, create environments rich in the positive factors that support student success on the STEM pathway, and conduct outreach to underserved communities and underrepresented groups by implementing recruitment and retention strategies that broaden participation and increase diversity.

Paid Summer 2020 Undergraduate Research Placements:

Over 800 programs – REU, NASA and other paid summer research opportunities for undergrads <https://www.pathwaystoscience.org/undergrads.aspx>

For Financial Support in Graduate School:

Fellowships and graduate programs in a wide variety of STEM disciplines:

<https://www.pathwaystoscience.org/grad.aspx>

For NASA-supported internships, fellowships and scholarships:

<https://intern.nasa.gov/>

For tips on applying and associated resources:

<https://www.pathwaystoscience.org/toolbox.aspx>

For opportunities specifically in the Ocean Sciences:

<https://www.pathwaystoscience.org/oceanscience.aspx>

For opportunities specifically in Engineering:

<https://www.pathwaystoscience.org/engineering.aspx>

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Compiled by Chris Petersen with help from COA ES faculty and others.

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