



Meet some of our Research Mentors

We want to create the best possible match between interns and mentors, resulting in the most productive and enjoyable internship experience for all. Below you will find a list of potential research mentors who are in need of summer interns. Their research represents much of the diversity of ongoing research here at STRI.

Please read through this entire list of research mentors and their areas of expertise, choose the three whose research interests most closely match your own, and list them on your application. The information from your application, including your statement of interest, will help us place you with the appropriate research group. Additional research mentors whose research interests better match yours may become available later in the spring, in which case, we'll offer to match you with those scientists in addition to the potential research mentors you included from this list. It is not necessary to contact research mentors prior to applying for this program. Once we have selected program participants, we will put you directly in contact with your research mentor so that they can provide you with additional background information and insight into the projects you will be participating in over the summer.

Fernando Alba



I am an evolutionary biologist interested in describing the patterns and processes of genetic variation and speciation. Currently, I am studying freshwater fishes as a model to describe how historical geological and climatic changes have shaped current species distribution and population differentiation. In this context, scientific collections are of great importance as a source of information for taxonomic reference as well as molecular data.

I am looking for a summer intern to work at the Naos Molecular laboratory in the Neotropical Fish Collection. The candidate should be interested in learning the basic works carried out in a scientific collection, from sampling, sorting of specimens, morphological and molecular identification, and most importantly its applications for scientific research in biodiversity, conservation, and evolution. Students will be encouraged to discuss and propose other research topics depending on their specific interests.

Ivania Cerón-Souza



I am a biologist interested in evolution of plants, especially mangrove trees from neotropics. My current postdoctoral research work is focused on understanding how distinctive red mangrove species (i.e. *Rhizophora mangle* and *R. racemosa*) are genetically identifiable and coexist in sympatry in spite of evidence of ancient and ongoing introgressive hybridization between them. It has been hypothesized that *R. racemosa* is less tolerant of high salinity compared with *R. mangle* and that this eco-physiological difference could explain how these species maintain their morphological and genetic distinctiveness in a hybrid zone. Currently, I am testing this hypothesis using a combination of genetic, environmental, and eco-physiological information at broad and small scales, covering the geographic distribution of *Rhizophora* in Neotropics.

I am looking for a summer intern to work in the Naos Marine lab and who interested in improving her/his understanding of molecular markers techniques and physiological variables in the context of the role of hybridization in the evolution of plants. The intern will have the opportunity to learn different molecular techniques such as DNA extraction, PCR, and sequencing of both nuclear and chloroplast genomes. In addition, the intern will participate in field collection trips and in the maintenance and data collection of physiological and ecological variables in a controlled greenhouse experiment.

For more information about my research, please visit my website
http://www.stri.si.edu/english/scientific_staff/fellows/scientist.php?id=63

Rachel Collin



I am broadly interested in the evolution of marine invertebrate life histories, larval ecology, phylogeography, morphological integration through metamorphosis, and invertebrate systematics. My current research focuses on the evolutionary causes and consequences of mode of development in marine gastropods. Mode of development (planktonic vs. benthic, feeding vs. non-feeding, encapsulated vs. free-living) has important consequences for dispersal, gene flow, speciation rates, and extinction rates. However it is unclear what factors maintain the stunning diversity in mode of development that we observed in many groups of marine invertebrates. My research focuses on documenting the geographic and phylogenetic patterns in mode of development and combining these patterns with the results of laboratory experiments to test hypotheses about the factors driving its evolution.

For more information about my research, please visit my websites

http://www.stri.si.edu/english/scientific_staff/staff_scientist/scientist.php?id=4

<http://www.stri.si.edu/sites/collinlab>

Liza Comita



I study spatial patterns of seedling distributions and dynamics on Barro Colorado Island (BCI) in order to test hypotheses concerning species coexistence and the drivers of commonness and rarity in diverse tropical tree communities. In addition, I am interested in how water availability shapes species distributions on local and regional scales, and how shifts in rainfall patterns due to climate change will affect tropical forests. Interns working with me will have the opportunity to participate in a large scale census of seedlings on BCI and will be encouraged to design and carry out a related independent project.

For more information about my research, please visit my website

<http://lizacomita.weebly.com>

Stuart Dennis



I am an evolutionary biologist interested in how aquatic invertebrates cope with predation. My research combines field sampling and laboratory experiments to examine how chemical cues from predators cause changes in the life history, morphology, and behavior of prey species. The project I am working on examines the response of zooplankton (in particular the water flea, *Ceriodaphnia*) to fish and other predators in Lake Gatun. In more variable environments these zooplankton produce offspring with or without spikes on their body, depending on whether seasonal predators are around. Here in Lake Gatun, predators are always present and some individuals always have spikes, and some never do! Are zooplankton here capable of switching forms, i.e. phenotypically plastic, or has evolution begun to produce two different lineages?

I am looking for a summer intern to participate in sampling fish and zooplankton by boat from Lake Gatun and/or conducting bioassays in Gamboa. The study is designed to understand how *Ceriodaphnia* respond to the presence of predators and to document the range of strategies they may employ. Prospective students are encouraged to work with me to tailor a research project around mutual interests.

Catalina Estrada



My primary research goals are directed toward understanding the evolution of behaviors and the signaling mechanisms that underlie intra- and interspecific interactions. I am particularly interested in networks of interactions that include plants and phytophagous insects and in understanding the visual and chemical channels that connect them. Currently I am involved in two projects: First, I am studying the importance of plant fungal symbionts (endophytes) in mediating ecological interactions between tropical plants and their natural enemies. My goal is to identify the mechanisms responsible for the reduction of damage by leaf-cutting ants in plants with high loads of endophyte colonization. Second, I study sexual communication in butterflies. My main goal is to understand how sexual behaviors facilitate the evolution of mimicry among closely related species, and the subsequent effects that such phenotypic convergence has on their intraspecific communication.

I am looking for an intern interested in insect behavior, chemical ecology, and plant-microbial interactions to get involved in any of my current projects (above). This person would get experience in extracting and analyzing chemical samples using gas chromatography-mass spectrometry, performing electroantennograms and bioassays, and in basic mycological methodologies.

For more information about my research, please visit my website
<https://sites.google.com/site/1catalinaestrada>

Owen McMillan



I am an evolutionary biologist interested in the origins of biodiversity. Research in my lab typically combines molecular data with ecological and behavioral data to understand adaptation and speciation. Currently, I am doing a lot of work on *Heliconius*, a species-rich group of tropical butterflies characterized by dramatic variation in their vividly colored wing patterns.

I am looking for a summer intern to work in Gamboa and participate in a study of mating behavior in *Heliconius*. The study is designed to understand how mating preferences vary between sexes and between closely related species and is part of a larger research effort to understand the molecular basis of mating behavior and speciation. There is a lot of latitude in the internship and I encourage students to work with me to tailor a research project around their specific research interests. In addition to work in Gamboa, there will be opportunities for genetic work at the molecular facilities at NAOS and to explore Panama by participating in ongoing projects that need help collecting butterflies across the country.

For more information about my research, please visit my website
http://www.stri.si.edu/english/scientific_staff/staff_scientist/scientist.php?id=62

Matthew Miller



My research focuses on the diversification of Neotropical birds and the diseases they carry. I employ a variety of research methods, but the collection and use of museum voucher specimens is a central theme of my work.

The Neotropics harbor the greatest species diversity for most animal groups. Integrating the age-old specimen-based approach of the museum scientist with new tools that have emerged during the “Age of DNA” provides remarkably powerful tools for investigating the basic patterns in species richness in Neotropical bird communities, and also applied questions of global health.

For more information about my research, please visit my website
<http://www.mj-miller.net>

Aaron O’Dea



Research in my group uses the fossil record to tell us about long-term changes in marine biological communities. We are currently looking for an intern to work with us on a newly discovered fossiliferous site in Bocas del Toro that preserves a 2000 year old pristine reef community. This reef gives us an incredible window into the past to see what the condition of Caribbean reefs were like before the arrival of large scale human impacts in the region. As an intern in our group there are numerous sub-projects that you could focus on, from developing a collection of fossil shark and reef fish teeth to testing if corals grew faster and healthier under pristine conditions than they do today.

For more information about my research, please visit my website <https://sites.google.com/site/marinetimeseriesresearch>

Delicia Pino Garay



I am a tropical plant ecologist. Our research group (PI Bettina Engelbrecht) focuses on understanding the mechanisms that drive patterns of plant species distributions and diversity in tropical forests. I am particularly interested on how nutrients and drought influence species distributions. To investigate these effects I currently carry out common garden fertilization experiments in the forests in Panama to quantify species responses to nutrients. We assess seedling growth and mortality in the forest for a large number of species.

I am looking for an enthusiastic intern who would like to participate in this research based in Gamboa and who interested in learning about the ecology of tropical plants and how environmental factors affect species performance. Working in our research group, the intern will acquire a broad range of skills, primarily on plant species identification, seed germination, seedling nursing and field assessment, soil nutrient analysis as well as methodical and analytical skills. It will also provide the opportunity to visit different sites and national parks in Panama where our research group currently works. Lastly, there will be ample opportunities to interact with Spanish speakers and learn a new language.

For more information about research in our lab group, please visit the following websites: http://www.bayceer.uni-bayreuth.de/tropecol/en/mitarbeiter/mit/mitarbeiter_detail.php?id_obj=99527 <http://www.bayceer.uni-bayreuth.de/tropecol/index.php?lang=en>

Corinne Richards-Zawacki



I am broadly interested in the ecology, evolution, and conservation of amphibians. My work in Panama mainly focuses on speciation and the evolution of morphological diversity. Members of my research group ask questions about how the amazing color-pattern diversity seen among populations of the strawberry dart frog (*Dendrobates pumilio*) came to be, using a combination of molecular genetics, field studies, and behavioral experiments. Interns working with my lab group will have the opportunity to participate in field work and experiments aimed at teasing apart the roles of natural and/or sexual selection in driving color pattern diversification among *D. pumilio* color morphs. This work will take place in the Bocas del Toro Archipelago of Panama, near the border with Costa Rica.

For more information about my research, please visit my website <http://tulane.edu/sse/eebio/people/cori/index.cfm>

Stefan Schnitzer



The main research objectives of the Schnitzer Lab are to develop and test fundamental conceptual ecological theory pertaining to plant communities. We are focusing on understanding the mechanisms that regulate and maintain plant species diversity, the causes and consequences of plant diversity, the mechanisms that control plant abundance and distribution, and the causes and consequences of plant competition. Most of our research is conducted in tropical forests of Panama and we often use lianas as a model system to study plant ecology and to test these large conceptual ideas.

Currently, the Schnitzer Lab is conducting a number of large-scale, long-term National Science Foundation-sponsored research projects in Panama. We recently finished a full census of all of the lianas > 1 cm on the 50-ha plot on Barro Colorado Island, Panama. We have paired the BCI 50 ha plot study with a large-scale liana removal experiment on an adjacent mainland forest (Gigante Peninsula), which enables us to accurately quantify the effect of lianas on tree growth and mortality, as well as to quantify the role of lianas in ecosystem-level processes, such as forest carbon and nutrient storage and fluxes. Finally, we are investigating the mechanisms that control liana distribution across large-scale environmental and forest successional gradients in Panama.

For more information about our research, please visit our websites

<https://pantherfile.uwm.edu/s1/www/home.html>

<http://www.LianaEcologyProject.com>

Erin Spear



I am investigating how pathogens influence tree species composition in the forests spanning the Isthmus of Panama, characterized by a rainfall gradient. I hypothesize that elevated pathogen pressure in the wetter forests excludes some tree species by limiting seedling survival. Currently, my research is focused on fungal pathogen host specificity and host tree species susceptibility.

I am looking for a summer intern to help execute greenhouse-based inoculation experiments in Gamboa. Responsibilities will include: hiking to collect seeds, cleaning and germinating seeds, maintaining fungal cultures, inoculating seedlings, documenting seedling disease and mortality, and data entry. The ideal intern will have: a positive attitude about working in variable weather conditions, the ability to work independently and in small groups, an attention to detail, be self-motivated, and demonstrate a willingness to learn new skills. Interns are involved in all aspects of the project initially. However, there is ample work to be done and I am willing to accommodate proclivities for certain aspects of the project. Likewise, I strongly encourage associated independent research projects.

For more information about research in our lab group, please visit our website

<http://biologylabs.utah.edu/coley>

Jessica Stapley



I am an evolutionary biologist interested in the proximate and ultimate mechanisms of phenotypic variation. Much of my research has focussed on traits involved in sexual selection in lizards and makes use of a variety of molecular techniques and behavioural experiments in the field and in the laboratory. My current research is centered on understanding the evolution of dewlap colour pattern variation in a Panamanian anolis lizard. The dewlap, a flap of extendable skin on the throat of the lizard, is the most striking feature of anoles and varies enormously in colour, pattern, and size between species. Despite the dewlap's conspicuousness and the position of anoles as model species in evolutionary biology, the evolution of dewlap variation remains poorly understood. In the Panamanian anole *Anolis apletophallus* two dewlap colour pattern morphs exist, providing an ideal opportunity to investigate causes and consequences of dewlap variation and the processes governing them.

This summer I am looking for an intern to participate in studies investigating what factors determine male competitive success in *A. apletophallus*. The intern would work in Gamboa and conduct behavioural experiments in outdoor enclosures. The intern would also have the opportunity to assist with field surveys throughout central Panama and on islands in Lake Gatun. The intern would gain valuable experience in planning and conducting behavioural experiments, video data collection and analysis, lizard care and husbandry, anole field surveys and gain training in data analysis and statistics.

For more information about my research, please visit my website

<http://www.jessicastapley.com>

Mark Torchin



I am a marine ecologist interested in host parasite interactions and biological invasions. I focus on how parasites affect the demographics of their hosts and how community structure is altered by the presence of parasites. Introduced species provide a way to test predictions about the ecology and evolution of host-parasite interactions as well as the effect of parasites in natural communities. I am interested in understanding the extent to which parasites affect the demographic success of introduced species as well as exploring the impact of introduced parasites on native communities. I have also become increasingly interested more broadly in ecological and evolutionary implications of historical or “natural” invasions and how these can inform our understanding of contemporary human mediated invasions.

My lab works on biological invasions in Panama, the Canal, as well as elsewhere; developing a global perspective on factors driving invasions. We also maintain a strong focus on the ecology and evolution of parasites and diseases in marine and estuarine systems, principally within mangroves. Some of the critters we tend to work on include; fish, crabs, snails and their parasites as well as sessile marine invertebrate communities.

For more information about my research, please visit my website
http://www.stri.si.edu/english/scientific_staff/staff_scientist/scientist.php?id=39

William Wcislo



We study the organization of behavior in incipient social groups, using bees and other Hymenoptera, and their predators and parasites. The aim is to better understand how behavior— including learning and assessment mechanisms for decision-making— generates novel environments, which might promote or inhibit evolutionary change due to changes in natural selection. The evolutionary transitions we focus on involve solitary, social and parasitic behavior, and also from diurnal to nocturnal foraging. A longer-term goal to integrate psychology and brain studies with evolutionary biology.

Most of our work centers on sweat bees (family Halictidae) and ants, especially *Ectatomma* (Ponerinae) and the fungus-growing ants, Attini. Sweat bees are often small and inconspicuous, although some are brilliantly colored and shimmer in the sun like gems. There are at least several thousand species, and many remain to be discovered. Sweat bees can have solitary, social, or parasitic behavior, which is why they are so important for understanding how behavior evolves in response to variation in environmental and genetic factors. Fungus-growing ants are superb for addressing questions relating to the evolution of social complexity and disease ecology. *Ectatomma* ants display impressive cognitive abilities, and are excellent for understanding the ecological significance of learning and cognition.

For more information about our research, please visit my website
http://www.stri.si.edu/english/scientific_staff/staff_scientist/scientist.php?id=34

Brett Wolfe



My research focuses on plant-water relations. Using a comparative eco-physiological approach, I am studying the diverse mechanisms by which seedlings and saplings regulate their water status during drought. When soils dry, how do plants prevent desiccating and how much do they rely on water stored within their tissues to maintain their performance?

I am looking for a summer intern to participate in the field, shade house, and laboratory aspects of projects measuring gas exchange and hydraulic traits of juvenile trees. There is a lot flexibility in the internship for students to tailor their own research projects. Fieldwork will mainly be conducted in seasonally dry forests near Panama’s Pacific coast. Lab and shade-house work will be in Gamboa and on Barro Colorado Island.