



## Summer 2017

# GS-LSAMP Stipend Opportunities



<u>Name</u> <i>Department</i>	<u>Description</u>	<u>Position(s)</u> <u>available</u> <i>Subject to change</i>
<b>Research</b>	<b><i>Project description and lab requirements</i></b>	
<b>Dr. Frieder Jaekle</b> Department of Chemistry	Organic Electronics: Polyaromatic hydrocarbons (e.g. anthracene) will be functionalized with pyridine or pyrazine groups, followed by borylation of the products. The effect on the electronic and optical properties will be examined with a view at potential applications in optoelectronic devices. Supported Catalysts: New polymers with triarylborane functionalities will be synthesized. The ultimate goal is to explore supramolecular assembly and use these materials in catalysis such as hydrosilylation of ketones or imines.  *Course Requirement: Organic Chemistry Lecture + Lab (Preferred); interest in chemistry required	2
<b>Dr. Huixin He</b> Department of Chemistry	1. Using microwave chemistry (chemical reactions are heated up by microwave oven instead of traditional heating) to enable fast fabrication of metal nanoparticle/carbon hybrids for battery and heterogeneous catalysis applications. 2. Using microwave chemistry to fabricate graphene, and graphene/metal nanoparticles hybrids for heterogeneous catalysis applications. * Course Requirement: General chemistry (both lecture and lab courses)	3
<b>Dr. Michal Szostak</b> Department of Chemistry	The research project is in the <b>hot-topic</b> area of C-N activation of amides. The central theme of our research is synthetic organic and organometallic chemistry with a focus on the development of new synthetic methods based on transition metal catalysis and various aspects of transition metal mediated	1

	<p>free radical chemistry and their application to the synthesis of biologically active molecules.</p> <p>*Course Requirement: Organic Chemistry 1</p>	
<p><b>Dr. Eef Elzinga</b> <i>Earth &amp; Environmental Sciences</i></p>	<p>Study geochemical processes in submerged soils.</p>	<b>1</b>
<p><b>Dr. Lee Slater</b> <i>Earth &amp; Environmental Sciences</i></p>	<p>[1] Study non-invasive monitoring of hydrocarbon contaminants in the subsurface using geophysical and geochemical methods [2] Design and testing of instrumentation for imaging the electrical geophysical properties of soils</p>	<b>1</b>
<p><b>Dr. Yuan Gao</b> <i>Earth &amp; Environmental Science</i></p>	<p>Study atmospheric particles over the Arctic ocean and Antarctica. We will be testing all air samplers before shipping them to the fields, and we will also work on lab experiments to measure iron (Fe), a nutrient metal that is often found in particles suspended in the air.</p>	<b>2</b>
<p><b>Dr. Jessica Ware</b> <i>Department of Biological Sciences</i></p>	<p>[1] Students will study DNA extraction of Odonata (dragonflies) followed by PCR and sequencing and phylogenetic methodology [2] Changes in insect diversity after K-T boundary.</p>	<b>5+</b>
<p><b>Dr. Sara Ruane</b> <i>Department of Biological Sciences</i></p>	<p>Current research focuses on the phylogenetics of the Malagasy pseudoxyrhopiine snakes, which includes the use of molecular data in the form of next-generation sequencing and traditional Sanger-sequencing approaches, as well as ecological and morphological data to aid in understanding what factors promote speciation in these snakes.</p> <p>*Introductory biology course with B or higher in such courses. Students will need to take the REHS Laboratory Safety Training session prior to beginning and lab work and will need to take the IACUC animal handling course if they assist in any field work with live animals. Students cannot be afraid of snakes, or other reptiles or amphibians.</p>	<b>2</b>

<p><b>Dr. Tracy Tran</b> <i>Department of Biological Sciences</i></p>	<p>RNAi screen for novel semaphorin downstream effectors in regulating cortical neuron dendrite development. This project will involve the student to learn how to perform primary neuronal culture experiments and using RNAi technology to target specific gene families that may potentially be effectors in the Semaphorin 3A signaling pathway that regulates dendrite development in cortical neurons. Technique training: micro dissection of cortical neurons from embryonic mouse brains, cell culture, immunocytochemistry, and confocal microscopy.</p>	<p><b>2</b></p>
<p><b>Dr. Nan Gao</b> <i>Department of Biological Sciences</i></p>	<p>One of the cell biology enigmas is how cells achieve asymmetry to facilitate their directional migration, secretion, asymmetric division, and responding to extrinsic signals. We are interested in mammalian epithelial cell polarity mechanisms that are related to developmental and pathological processes, such as the morphogenesis and oncogenesis of the gastrointestinal epithelium, the glucose-directed insulin granule vesicular exocytosis in healthy and diabetic beta-cells. We derive and characterize genetically engineered mouse models, apply classic biochemistry and modern cell biology tools to explore the molecular mechanisms underlying the interfaces of cell polarity, development, stem cell and cancer.</p>	<p><b>2</b></p>
<p><b>Dr. Haesun A. Kim</b> Department of Biological Sciences</p>	<p>Investigate cellular and molecular mechanisms underlying brain dysfunction associated with traumatic brain injury. Specifically, my lab is interested in studying abnormalities in myelinated axon function following mild, concussive brain injury. Students will assist in conducting ultrastructural imaging analysis of brain tissue. The project also involves use of both animal and culture models for brain injury.</p>	<p><b>2</b></p>
<p><b>Dr. Karina Schafer</b> <i>Department of Biological Sciences</i></p>	<ol style="list-style-type: none"> <li>1. Sap flow of oak and pines are measured to assess water uptake and carbon dioxide intake in the NJ Pine Barrens</li> <li>2. the greenhouse gas flux exchange of carbon dioxide and methane in the NJ Meadowlands are assessed and to find ways to model these fluxes</li> </ol>	<p><b>2</b></p>

<p><b>Claus Holzapfel</b> <i>Department of Biological Sciences</i></p>	<p>The study is set up to address components of the natural history of <i>V. dilatatum</i> and <i>V. sieboldii</i>, specifically how they are distributed throughout local communities as well as on a regional scale. The goal is to understand habitat preferences as well as the mechanisms of how they spread. The students would assist me in the field collecting data for two invasive plant species, <i>Viburnum dilatatum</i> and <i>Viburnum sieboldii</i>, as well as working in the lab. The field component would involve going out to parks in NY, NJ, PA and collecting geospatial data (location), plant allometry data (size), and plant materials (fruit and leaves). The lab components would involve DNA extraction from <i>V. dilatatum</i> and <i>V. sieboldii</i> leaves and amplification of specific markers used to address genetic diversity of populations (AKA-microsatellites).</p>	<p><b>3</b></p>
<p><b>Dr. Catherine E. Myers</b> Department of Neurology and Neurosciences, Rutgers-New Jersey Medical School; VA New Jersey Health Care System</p>	<p>Study human learning and memory, with a particular focus on neuropsychiatric disorders that involve disruptions of learning and memory. Conduct studies examining relationships between individual differences (such as personality factors or demographic differences) and avoidance, assessed via simple computer “games” within participant with PTSD. Interns help develop new research projects, recruit and test subjects, collect and analyze data, and learn how to interpret the results in the context of existing literature and theory.</p>	<p><b>1</b></p>
<p><b>Dr. Mark Gluck</b> Center for Molecular and Behavioral Neuroscience</p>	<p>How can past learning and experiences inform future decisions? What do different brain systems contribute to learning and decision-making? Can a better characterization of brain systems for learning improve our ability to understand brain disorders and identify lifestyles that enhance brain health? These three questions, each addressing a different level of inquiry—cognitive processes, brain systems, and clinical applications—drive current research in our lab.</p> <p>The African-American Brain Health Initiative is open to taking on LSAMP students to be “<i>Newark Brain Health Scholars</i>” working with the CMBN and the OUCP, who are:</p>	<p><b>2+</b></p>

	<ul style="list-style-type: none"> <li>* RU-Newark undergraduates</li> <li>* Must have cumulative GPA of at least 3.5</li> <li>* Must commit a minimum 12-15 hours/week</li> <li>* (rising to be): sophomores or juniors</li> <li>* who grew up in or graduate high school in Greater Newark/Essex County.</li> <li>* Interested in careers in biological or behavioral sciences. Read more info here: <a href="http://www.gluck.edu/">http://www.gluck.edu/</a></li> </ul>	
<p><b>Dr. Michael Cole</b> Center for Molecular and Behavioral Neuroscience</p>	<p>The Cole lab's research focuses on discovering the cognitive and neural mechanisms that make human behavior flexible and intelligent.</p> <p>We achieve this using a variety of techniques, applying network science, computational modeling, and machine learning approaches to data collected from the living human brain (with fMRI, MEG, EEG, diffusion MRI, and behavioral measures).</p> <p>*Some experience with computers, ideally also computer programming (though not required). At least one biology course and ideally also a psychology course.</p>	<b>3</b>
<p><b>Dr. Miriam Rosenberg-Lee</b> Department of Psychology/Center for Molecular and Behavioral Neuroscience</p>	<p>Students will participate in cognitive psychology research project focused on understand why some individuals struggle with mathematics while others succeed easily. Students will have to opportunity to collect and analyzed behavioral data. Some students may also contribute to designing and programming experiments and analyzing brain imaging data.</p> <p>*Ideal if students had taken 21:830:301 STATISTICAL METHODS FOR THE COGNITIVE &amp; BEHAVIORAL SCIENCES, or had other statistics experience.</p>	<b>3</b>
<p><b>Dr. Patrick Shafto</b> Department of Mathematics and Computer Science</p>	<p><i>Causal reasoning project</i></p> <p>This is a study that investigates how adults and children reason about cause and effect in the context of a novel machine. In the experiment, the participants will be presented a machine that activates when "blickets" (a novel category of objects) are put on them. The experimenter then</p>	<b>2</b>

presented evidence that blocks of some colors activates the machine, and blocks of some other colors doesn't activate the machine. The way the experimenter sample the blocks vary across conditions. We are interested in how adults and children reason about what objects belong to the new category based on both the sample presented, and the sampling process.

*Parent-child interaction project*

In this study, we look for individual variations in the pedagogical questions (PQs) children hear during natural parent-child interactions, and associate that with how they explore a novel toy following an experimenter-asked PQ. This study will contain three phases: in the first phase (naturalistic observation) we will code parent-child interactions in a naturalistic setting (local museums and play centers) and record the number and quality of PQs and information-seeking questions (I-SQs) used by parents in a 5-minute time period. In the second phase, we solicit these families to participate in a follow-up study, and compare attrition to kinds and quality of parent-child question asking behavior from phase 1. In the final phase (experiment), an experimenter will present to the child a novel toy, in the same way as the in the PQ condition in Study 2. Our hypothesis are: 1) There are individual differences in parents' use of PQs and also differences in PQ use in learning contexts (museums) and open contexts (play centers). 2) Attrition may be most likely for families that engage in limited PQs between parents and children. 3) The frequency of parent's use of PQs should set up children's inferences about PQs—those children who hear more PQs should be more likely to explore when the experimenter ask them a PQ about a novel toy.

\*Applicable to students with programming experience languages used for mobile OS (e.g., Java for Android or Swift for iOS), and students need to be familiar with object-oriented programming. Students who's taken a mobile app dev course (e.g., GAT-WBM-35-13 from Rutgers or CPT373 from NJIT) would be

	ideal. Calculus, Differential Equations, Matlab (or any other coding language) preferred.	
<b>Dr. Farzan Nadim</b> <i>NJIT- Federated Department of Biological Sciences and, Department of Mathematical Sciences</i>	Study the cellular and synaptic mechanisms that underlie the generation and modification of oscillations in neural networks.	<b>1</b>
<b>Dr. Horacio Rotstein</b> <i>NJIT- Federated Department of Biological Sciences and, Department of Mathematical Sciences</i>	The goal of the project is to identify the mechanisms by which neurons and networks of neurons select the preferred frequencies at which they oscillate in response to periodic inputs. The activities involve mathematical modeling and numerical simulations of biophysical (conductance-based) neuronal networks using ordinary differential equations. Participants are required to have successfully passed a course in ordinary differential equations and to be familiar with matlab or any equivalent coding language.  *400 level math courses recommended for applicants.	<b>2 (may work as a group)</b>
<b>Dr. Daniel Murnick</b> Department of Physics	Current major research interests are in high sensitivity isotope analysis and ultraviolet light source production and applications. Major active projects are in: (i) Stable isotope analysis via laser optogalvanic spectroscopy (the electrical response to resonant optical stimulation) for biomedical and environmental applications, and (ii) Innovative ultraviolet light sources for photochemistry, germicidal and fluorescence applications. Research projects include experiments and modeling in a broad range of atomic, molecular and quantum electronic areas. Collaborative work includes industrial, interdepartmental and international research groups.	<b>3</b>
<b>Dr. Diane Jammula</b> Department of Physics	Research investigates how students negotiate their subjectivities to affiliate with or alienate from their perceptions of physics, and to understand how classroom experiences exacerbate differences in achievement, participation and feelings towards physics	<b>2</b>

<p><b>Pre College Internships</b>  Apply here directly for positions below:  <a href="https://secure.afc.rutgers.edu/work/">https://secure.afc.rutgers.edu/work/</a></p>		
<p><b>ASI (EOF Summer Program)</b>  <i>Academic Foundation Center</i></p>	<p>To provide mentoring and support services to incoming EOF students. Assist prospective students with a smooth transition from the high school atmosphere to that of a college one, as well as demonstrate proper academic and administrative skills to the professor and program-focused STEM activities.</p>	<p><b>5+</b></p>
<p><b>Rutgers Future Scholars Program</b>  <i>Academic Foundation Center</i></p>	<p>The Rutgers Future Scholars Program is a 5 year pre-college program that provides academic, social, and economic support for promising 1st generation college students. The program serves middle school and high school level youth. LSAMP students will serve as STEM tutors.</p>	<p><b>varies</b></p>
<p><b>Upward Bound Program</b>  <i>Academic Foundation Center</i></p>	<p>The Upward Bound Program at Rutgers University-Newark is a federally funded college preparation program for selected scholars from the East Orange Public School District. LSAMP students will serve as tutors or TA's for program.</p>	<p><b>varies</b></p>
<p><b>Cooperman Scholars Program</b>  <i>Academic Foundation Center</i></p>	<p>This program supports academically talented, highly motivated students from Essex County, NJ with financial need in their efforts to attain a four-year college degree. Participants of the program will benefit from a scholarship to attend college, as well as mentoring and other resources to ease the transition to college and support each Scholar's success. College mentors needed for a three-week residential college immersion experience for rising high school seniors. Residential mentors needed for entire program length. Food and housing covered.</p>	<p><b>2-4</b></p>
<p><b>Ambassador &amp; Mentor</b></p>		
<p><b>GS-LSAMP Ambassador</b>  <i>Academic Foundation Center, and Earth &amp; Environmental Sciences</i></p>	<p>Focus will be on LSAMP recruitment during on-campus events, classrooms and Paul Robeson Campus Center. Also, assist the LSAMP Coordinator in the LSAMP office with filing LSAMP student information, photocopies, answering phone calls,</p>	<p><b>2</b></p>

	responding to e-mail correspondence and planning LSAMP events. <b>*Must be a LSAMP Ambassador previously, or an active member for at least 1 semester. Must attend mandatory ambassador orientation on Monday April 17, 2017 at 11:30am in the LSAMP office.</b>	
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## Additional Paid & Volunteer Opportunities

### **Academic Foundations Center**

Learn about more tutoring, mentoring and clerical positions at the Academic Foundations Center in Bradley hall. Apply online here: <https://secure.afc.rutgers.edu/work/>

### **RaiderNet and CareerShift - Internship Opportunities**

As a Rutgers students, you *all* have access to RaiderNet, which is the online system the Career Development Center use to post volunteer and internship/job opportunities. All students should have received an e-mail regarding access to the system. In addition to RaiderNet, there is another internship/job search site embedded in the RaiderNet system called *CareerShift*. Both are great resources in the search process for internships! If you haven't accessed the site/aren't aware of your username/password, please feel free to contact Cheryl Egan and she will forward you the information:

*Cheryl Egan, Assistant Director / Intern Coordinator  
 Career Development Center, Hill Hall, Room 112  
[cegan@andromeda.rutgers.edu](mailto:cegan@andromeda.rutgers.edu)  
 Phone: 973-353-5312  
 Web site: <http://cdc.newark.rutgers.edu>*

### **ATTENTION: Management Information System majors**

If you find an unpaid internship/research opportunity in STEM (including new STEM majors: MIS & Quantitative Methods), the GS-LSAMP program may be able to provide you with a stipend. Please reach out to the LSAMP coordinator, Dominique Smart, at [dominique.smart@rutgers.edu](mailto:dominique.smart@rutgers.edu) to discuss further\*

### **Other things to keep in mind...**

RU interested in international research, or a travel stipend to conduct research outside of the United States, please reach out to the LSAMP coordinator, Dominique Smart, at [dominique.smart@rutgers.edu](mailto:dominique.smart@rutgers.edu) to discuss further **by April 7<sup>th</sup>**