2016 Richter Scholar Program Faculty Proposals

Project descriptions are arranged alphabetically by faculty last name within each Richter Option. Richters do not have to work on projects linked to their future intended major. Richters should choose projects that most interest them irrespective of future major.

RSCH 181: Independent Research Experience I
(This is Option I and it is the same length as Summer Session I)

1. Prof. Carla Arnell (English)
2. Prof. Glenn Adelson (Environmental Studies)
3. Prof. Sugata Banerji (Computer Science)
4. Prof. Catherine Besancon (Art History)
5. Prof. Jason Cody (Chemistry)
6. Prof. Shubhik DebBurman (Biology and Neuroscience)
7. Prof. Les Dlabay (Economics and Business)
8. Prof. Matt Kelley (Psychology and Neuroscience)
9. Prof. Robert Lemke (Economics and Business)
10. Prof. Susan Long (Psychology)
11. Prof. Jean-Marie Maddux (Psychology and Neuroscience)
12. & 13. Prof. James Marquardt (Politics and International Relations) TWO PROJECTS
14. Prof. Dustin Mengelkoch (English)
15. Prof. Desmond Odugu (Education)
16. Prof. Alexander Shingleton (Biology and Neuroscience)
17. Prof. Enrique Trevino (Math and Computer Science)
18. & 19. Prof. Naomi Wentworth (Psychology and Neuroscience) TWO PROJECTS
20. & 21. Prof. Dawn Wiser (Chemistry) TWO PROJECTS
22. Prof. Ben Zeller (Religion)

RSCH 182: Independent Research Experience II
(This is Option II and it is a ten-week Session that begins the same time as Summer Session I)

1. & 2. Prof. Carla Arnell (English) TWO PROJECTS
3. Prof. Sugata Banerji (Computer Science)
4. Prof. Jason Cody (Chemistry)
5. Prof. Shubhik DebBurman (Biology and Neuroscience)
6. & 7. Prof. Les Dlabay (Economics and Business) TWO PROJECTS
8. Prof. Sean Menke (Biology)
9. Prof. Donald C. Meyer (Music)
10. & 11. Prof. Desmond Odugu (Education) TWO PROJECTS
12. Prof. Alex Shingleton (Biology and Neuroscience)
13. Prof. Lynn Westley (Biology)
RSCH 181 (OPTION I, SUMMER SESSION ONE)

PROJECT 1

Professor Carla Arnell (English)
Carnegie Hall 109
Ext. 5272; email: arnell@lakeforest.edu

TITLE: Examining the Spiritual Gothic Tradition: The Quest of the Golden Stairs (1 student)

Arthur Edward Waite was a British poet, mystic, and occultist whose novel, The Quest of the Golden Stairs, is acclaimed as a major work in the literary realm of occultist fantasy. For this Richter project, one student will examine Waite’s The Quest of the Golden Stairs to determine how this work relates to the spiritual gothic tradition. The spiritual gothic genre encompasses works that have distinctly gothic as well as otherworldly or spiritual themes. By ascertaining the major themes of the novel, possible literary influences, and the role of this work in relation to the genre as a whole, one student will pursue a literary investigation that will shed light onto this popular occultist work and the spiritual gothic tradition.

PROJECT 2

Professor Glenn Adelson (Environmental Studies)
Ravine Lodge 104
Ext. 6281; email: gadelson@lakeforest.edu

TITLE: Species and Speciesism (3 students)

Speciesism, according to Peter Singer and other philosophers of the human/animal relationship, is a prejudice or bias in favor of the interests of members of one’s own species and against those of members of other species. These philosophers denounce it as morally untenable, using the parallel to racism and sexism. I want to explore this analogy, and in doing so look as carefully as a human can at what it means to be a member of another species. My working hypothesis is that all individuals of any one species are different from individuals of any other species, but I am interested in the particulars of those differences. This entails extensive research in ways that individuals of different species perceive both their worlds and their relationships to members of their own species and members of other species. My basic working premise is that every species has a unique combination of modes of perception. Therefore, every species is fair game for this investigation. My plan is for the Richter Scholar and me to decide which species that he or she would work on based upon the species I have already investigated by the start of the Richter semester, and based on his or her interests. Students who select this option can expect to engage in such research about a limited number (1–3) of species, and write a 5–15 page report on each of the species.
PROJECT 3

Professor Sugata Banerji (Computer Science)
Young Hall 218
Ext. 5156; email: banerjin@lakeforest.edu

TITLE: Introduction to Image Processing with MATLAB (3-4 students)

With the easy availability of digital cameras and high-speed Internet connections, billions of images are being shared every day over sites like Facebook, Instagram, Google Photos, and Flickr. The field of Computer Vision aims to search, understand and classify these vast image collections. Image processing is one of the first steps of Computer Vision and with the increased use of digital images; it is also a stand-alone field of study with diverse applications in various areas of research. With this short project, I wish to design a course to teach the fundamentals of Digital Image Processing using MATLAB. The course will discuss the basic operations that can be performed on digital images such as color transformation, contrast enhancement, resizing, rotation, erosion, dilation, filtering etc. and use MATLAB as the language to implement these operations. My supervision will consist of teaching the students the necessary course material, providing the assignments and making them familiar with the fundamental techniques and open problems of image processing. Basic programming knowledge (such as gained from CSCI 112) in any language is a prerequisite. The project will end with a presentation.

PROJECT 4

Professor Catherine Besancon (Art History)
Durand Art Institute 204
Ext. 6188; email: besancon@lakeforest.edu

TITLE: A New Art History Course on Depictions of Difference (1-3 students)

In the summer of 2016, I shall be devoting time to creating a new 200-level course provisionally entitled, “Making Monsters and Depicting Difference: The 'Other' in Western Art.” This course will explore the ways in which Western artists have depicted those they consider different from themselves, whether this difference is ethnic, cultural, religious, racial, etc. Focusing particularly on Early Modern and Modern Western art, this course seeks to expose the ways in which visual representations were utilized to support discourses of dominance and cultural superiority by Western societies as well as contemporary artists critiques of such discourses. As a new course and one for which a traditional textbook does not exist, I need to gather a collection of articles, book and images for use in my lectures and as course materials. I would like to have a research assistant or assistants help me find, summarize, and evaluate these articles and books. Working together, we shall also determine which readings are most suited to be assigned readings for the course, keeping in mind the general skill level of freshman and sophomore students, who most likely will be taking this class. The Richter Scholar(s) for this project will delve into a large and varied interdisciplinary scholarship and examine topics including (but not limited to) cultural difference and identity, colonialism, orientalism, and primitivism. The ideal Richter
Scholar for this project may have already taken some art history courses, but a student with an interest in visual art, communication, and sociology/anthropology, combined with good research skills would also be a viable candidate. This project can accommodate more than one student.

PROJECT 5

Professor Jason Cody (Chemistry)
Johnson Science Building A 305
Ext. 5093; email: cody@lakeforest.edu

TITLE: New Instruments for General Chemistry Laboratory (2 students)

The General Chemistry Laboratory two-semester sequence has been continually updated and improved since its inception. As new technologies become mainstream in chemical laboratories, we must incorporate them into our chemistry courses. New, small-scale, modular instrument packages have replaced more tedious, manual techniques for experiments that range from light absorbance to titrations. In order to incorporate these new technologies into our curriculum, we plan to update and re-work several of our current laboratory experiments. Students who select this option will work with me to develop, implement, and write instructions for up to four experiments from our introductory chemistry laboratory sequence. We must work together to create instructions for the next generation of chemistry students, keeping in mind their skill levels, ease of use of the instrumentation, and environmental impact of reducing the amount of materials used in the experiments. Specifically, we’ll use the Micro-Lab instrument package to incorporate for the first time the electrochemistry set-up, we’ll design concurrent titration experiments that use both the drop counter and pH meter, and we’ll use fiber-optic attachments for light analysis in two additional experiments.

PROJECT 6

Professor Shubhik DebBurman (Biology and Neuroscience)
Johnson Science Building A 201
Ext. 6040; email: debburman@lakeforest.edu

TITLE: Discovering Amino Acids in Alpha-Synuclein that Regulate its Toxicity in Parkinson’s Disease (2-4 students)

During summer 2016, the DebBurman lab seeks highly motivated hardworking undergraduates to form a collaborative team with a diverse group of three other upper-class peers that study how certain human disease-linked proteins misfold and if such folding errors can be suppressed or reversed. Proteins are the most diverse class of macromolecules in our cells and their unique functions hold the secret to life. To fold correctly, most proteins require chaperones, which are proteins that help other proteins fold into their proper shapes and maintain their shape. If proteins still misfold, they are targeted for destruction by well-known degradation systems. But some misfolded proteins that escape such quality control build-up in tissues and cause tragic...
incurable diseases. With the aid of national grants, we have focused on the protein folding mysteries underlying one such illness, Parkinson’s Disease (PD), which is caused by the misfolding of the protein, alpha-synuclein. This misfolding somehow selectively kills certain nerve cells that control our voluntary movement, which then lead to PD symptoms. Student researchers in my lab are currently testing several hypotheses that test what regulates the misfolding of alpha-synuclein in PD. For RSCH 181 (Independent Research Experience I), 24 students would create key gene mutations that tests how specific amino acids cause familial form of Parkinson's disease. You would learn to make these mutations on the gene and confirm the mutation by DNA sequencing. Next, you would learn to express these mutant genes in yeast models for PD developed in our lab, so that their protein properties can be test in the future. Last two summers, Option I Richters created carboxyl-terminal fragments with great success, and these tools are helping current fall and spring BIOL221 students design multi-week research projects in several new ways. I suspect the same benefits will arise from Option I success in new projects initiated this year. In addition to carrying out their research project, Richter students will learn to discuss and present the latest published discoveries through scientific journal clubs, and discuss data at weekly lab meetings. Many past Richters have continued working additional years in these projects, with some expanding them into senior theses, which they often present at national conferences. Over twenty students, including six Richters, have become co-authors in published articles or manuscripts currently in submission and preparation. All lab graduates have gone on to pursue PhD, MD, or other scientific or health professions degrees. Prerequisite: BIOL120, CHEM115, and CHEM116.

PROJECT 7

Professor Les Dlabay (Economics and Business)
Young Hall 304
Ext. 5145; email: dlabay@lakeforest.edu

TITLE: Impact Investing and Interest Rates: What is an Appropriate Social Return? (1 student)

Impact investing involves funding companies, organizations, and funds that desire to generate measurable social and environmental benefits along with a financial return. In contrast to philanthropy (no financial returns are expected) and socially responsible investing (negative impacts are avoided but positive impacts are not required), impact investing attempts to maximize social and environmental gains and will accept below-market returns. Successful impact investments requires collaboration among major companies, local entrepreneurs, non-governmental organizations (NGOs), development practitioners, government agencies, and financiers, that range from microfinance institutions (MFIs) to commercial investors. Social business initiatives can include the integration of small-scale producers into value chains, or providing health care or education in areas that lack these services. In addition to the social benefit, a major goal of impact investing is the sustainability and scalability of the enterprises created. Research students will review previous research, conduct library and online research, conduct e-mail interviews, and create a summary report on key performance indicators (KPIs), return on investment (ROI), and social return on investment (SROI) related to improvements of food, water, heath care, education, and business development in poverty-stricken areas of
Africa, Asia, and Latin America. Supervision will occur with meetings two or three times a week along with e-mail updates of daily and weekly progress.

**PROJECT 8**

*Professor Matt Kelley (Psychology and Neuroscience)*  
*Hotchkiss Hall 3*  
*Ext. 5262; email: kelley@lakeforest.edu*

**TITLE:** *The Dynamics of Human Memory Retrieval (23 students)*

Much of my recent research has explored two counterintuitive memory phenomena (i.e., part-set cuing inhibition and collaborative inhibition) that, despite their outward differences, might arise from the same causal mechanism. Part-set cuing inhibition refers to the finding that hints often impair memory, whereas collaborative inhibition refers to the finding that people remember less information when recalling as a collaborative group as compared to a nominal group (two individuals who recall separately, but then have their non-redundant performance combined). Researchers have suggested that both phenomena arise, at least in part, because of retrieval strategy disruption (RSD). In brief, RSD presumes that people have their own idiosyncratic strategy for encoding and retrieving information, so when they are given cues (either from the experimenter, in part-set cuing, or from their partner, in collaborative inhibition), these cues interfere with their desired strategy and impair memory performance. I’ve published four recent articles and have a few active lines of continuing research on these topics. During the 4-week program, I intend to introduce students to the general issues and methods in memory research. Then, we will work together to read and synthesize the recent literature on the aforementioned topics. I’ll teach them how to analyze memory data, using data from recent experiments in my lab. Finally, we will design and prepare (and possibly pilot) 2-3 studies that will be run in the fall when the Psy 110 participant pool returns to campus. With luck, the students will continue to be interested in this research and will join me in my lab in the fall as proper data collection commences.

**PROJECT 9**

*Professor Robert Lemke (Economics and Business)*  
*Young Hall 418*  
*Ext. 5143: email: lemke@lakeforest.edu*

**TITLE:** *Investigating Intervivos Transfers among High-Wealth Individuals with the Surveys of Consumer Finance (14 students)*

In contrast to bequests, which are exchanges of property (including financial property) when one dies to one’s heirs, inter vivos transfers are exchanges of property from one person to another while the giver is still alive. While the U.S. tax code tries to unify the tax treatment of bequests and transfers, there are differences that can be exploited, especially by the very wealthy. Long term, the general goal of this research is to shed light on whether inter vivos
transfers are largely due to tax-avoidance or tax-minimizing considerations or for altruistic purposes. The primary objectives of this project are to (1) download the data, codebooks, and source code of the 2013 Survey of Consumer Finances from the Board of Governors of the Federal Reserve System, (2) write Stata programs that properly define and label standard financial data measures of households (e.g., IRA holdings, bequests, inter vivos transfers, net worth, long-term capital loses), and (3) replicate the FED’s summary extract. If time permits, we will engage in regression analysis regarding the determinants and size of inter vivos transfers. An interest in the topic is all that is required. Experience with programming or working with large datasets would be helpful, but is not expected.

PROJECT 10

Professor Susan Long (Psychology)
Hotchkiss 013
Ext. 5247; email: long@lakeforest.edu

TITLE: Community Partners Ending Violence Against Women (2 students)

More media attention is focused on violence against women and the rates of domestic violence and sexual assault are on the decline (FBI, 2013). This is due to the large amount of time and research energy considering the most effective ways to prevent violence, working in partnership with social service agencies that provide aftercare for survivors. However, more work needs to be done. Among college age women, rates of rape, sexual assault, and attempted assault range from 24-35% (Bureau of Justice Statistics, 2014). This summer I will be continuing work with a local coalition (up2usQSI) of counselors, advocates, and interested parties who provide trainings to local organizations about gender stereotypes and sexual violence. My role on the coalition is to evaluate their programming. Richter Scholars will help process surveys and enter data, run basic analyses, and build tables and reports for the coalition. She or he will also help with the process of writing up results for publication. The student would conduct literary searches and begin processing those articles. An ideal Richter Scholar would have completed Introduction to Psychology and one course in the Women’s & Gender Studies or Social Justice Minors, but all students passionate about this topic are encouraged to apply. For more information about the coalition, visit www.up2usQSI.org.

PROJECT 11

Professor Jean-Marie Maddux (Psychology)
Hotchkiss Hall 013
Ext. 5257; email: maddux@lakeforest.edu

TITLE: Driven to Drink? The Influence of Environmental Factors and Conditioned Cues on Alcohol Consumption (2 students)

Research in my lab explores environmental, pharmacological, and neurobiological factors that influence alcohol consumption and responding to alcohol-associated cues. I approach addiction
research from a learning perspective, and also have a strong interest in reward-related learning
and memory involving natural, non-drug rewards, such as food and sucrose. Much of my
research utilizes Pavlovian conditioning paradigms. Pavlovian conditioning is a fundamental
learning process that enables organisms to connect salient motivational events (e.g., food,
drugs, sex) with environmental stimuli (e.g., a place, a scent, or more commonly in the lab, a
light or a tone) that reliably precede or accompany them. Pavlovian cues can come to exert
powerful control over behavior, which is ultimately what we aim to measure in my lab – in
some experiments, that behavior may be drinking (consummatory behavior); in others, it may
be physical approach to the location of reward or reward-related cues (appetitive behavior).
Conducting these types of experiments in the lab requires specialized equipment. As I am a new
faculty member here at Lake Forest College, students in my lab over the summer will gain first-
hand experience with setting up new equipment to be used for later experiments. At the same
time, I will introduce students to the primary literature of the field, providing a forum for us to
discuss and synthesize the broad issues, methods, and findings of associative learning and
addiction research. Finally, within the context of a home cage consumption experiment, I will
also teach students hands-on skills that are necessary in a behavioral neuroscience lab, such as
rat handling, weighing, and injections.

PROJECT 12

Professor James Marquardt (Politics and International Relations)
Young Hall 412
Ext. 5126: email: marquard@lakeforest.edu

TITLE: Transparency Politics in American Foreign Policy under Obama (1-4 students)

The politics of “environmental transparency” in contemporary US-China relations. The People’s
Republic of China (PRC) and the United States of America (USA) are the world’s two top
emitters of carbon dioxide and other greenhouse gases. These gases are widely believed to be
the cause of climate change. The roadblocks to an international agreement to limit and reduce
emissions are many, and a particularly vexing one has to do with information sharing among
countries about the current emissions levels and how reductions in emissions are measured
and reported. Efforts to negotiate a multinational treaty to cut emissions have been futile. The
focus now is on national-level initiatives. Yet the problem of measuring reductions and verifying
whether states have met their targets remains. The Obama administration is skeptical about
China’s ability to meet its ambitious reduction targets. It, moreover, lacks confidence that the
Chinese government will correctly report emissions data. Chinese officials object to the USA’s
criticisms, arguing that China’s ambitious plans to reduce emissions is credible and that the
Chinese government’s reporting of its emissions will be reliable. For China, the American
critique represents an unwarranted interference in China’s internal affairs because the USA is
seeking to impose an American-style transparency regime on China, which, for China, is a
violation of its sovereignty. The Richter Scholar will investigate the emissions reductions plans
of both countries, focusing on each plan’s transparency provisions. S/he will also trace the
political back-and-forth between Chinese and American officials, from the period of the Kyoto
Protocols and the failed Copenhagen Summit, through today, on the matter of emissions
transparency, by identifying, reading, and analyzing the primary and secondary literature on this topic and answering a set of politics-oriented research questions. I hypothesize that the politics of greenhouse gas reductions in relation to emissions transparency is emblematic of a struggle between the two countries to (re)define the general rules and norms of the 21st century world order, and to legitimate each side’s visions of what this order ought to look like (and, therefore, delegitimate the other’s vision). The American vision holds that the reporting mechanism for emissions reductions must be extensive and independently verifiable. Chinese officials argue otherwise, claiming that China’s reporting is beyond reproach – and that the USA’s insistence on an intrusive transparency regime is meant to diminish China’s standing in the world as a trusted and responsible emerging great power.

PROJECT 13

Professor James Marquardt (Politics and International Relations)
Young Hall 412
Ext. 5126; email: marquard@lakeforest.edu

TITLE: The Transparency Politics of the 2015 Iran Nuclear Deal (1 student)

This proposal is a study of the politics of the 2015 Iran nuclear deal. It is interested in the agreement’s unprecedented transparency provisions – that is, the information-sharing aspects of the agreement that require Iran to disclose information on a host of its nuclear activities and facilities, and allows the international community – the International Atomic Energy Agency specifically – to monitor these activities and sites and verify Iran’s compliance with the terms of the deal. The Iran nuclear deal is unprecedented. Since the dawn of the nuclear era, no country has willingly agreed to subject itself to such intrusive transparency provisions related to nuclear nonproliferation as those found in this agreement. The precursors of this regime are the Nuclear Non-Proliferation treaty, of which Iran is a signatory, and the inspection regime imposed on Iraq by the United States, other states, and the United Nations following the 1991 Persian Gulf War. The Richter Scholar assigned to this project will study the transparency provisions of this agreement. What are its provisions? How are they supposed to work? Are they working as intended? What is the diplomacy surrounding the negotiation of these provisions, both in relation to the G5+1 (United States, China, Russia, France, Britain, and Germany), and especially the US and Iran? What are the American and Iranian positions on transparency, and how are their respective views represented in the final agreement? What is the international politics surrounding transparency, both as they emerged during the deal’s negotiation and the initial stages of the agreement’s implementation since the fall of 2015?

PROJECT 14

Professor Dustin Mengelkoch (English)
Carnegie 205
Ext. 4275; email: mengelkoch@lakeforest.edu

TITLE: Renaissance Egyptology (1 student)
This summer I will begin research and writing on the Renaissance Egyptological writings of Giorgio Valla (1447-1500) found in a manuscript dated to the 1490s. Valla, a prominent, fifteenth-century Italian physician and scholar was interested in the interconnections between the many branches of knowledge and composed one of the first, printed Renaissance encyclopedias (De expetendis et fugiendis rebus opus, 1501). For this study, a Richter scholar will first read the Egyptological text that Valla had transcribed into his manuscript. Then he or she will survey critically a range of secondary literature on the evolution of Egyptology during the Renaissance. Finally, he or she will surmise, connect, and evaluate their findings to determine how Valla's transcription fits in, develops, or alters Renaissance Egyptology. Especially important to this research is the hands on aspect, thus a Richter scholar will also study the material product, that is the manuscript itself as well as other Renaissance Egyptological texts held at the Newberry Library and Special Collections Research Center at the University of Chicago. In the end, there are three goals for this project: One, that a Richter Scholar learns how to become an organized and discriminating analyst using secondary literature and the primary, material text as sources for research. Two, that from our collaboration we will have a better understanding of the challenges and potential outcomes of working on Valla's text. Three, that our new understanding will help us determine whether a longer study of Valla’s Egyptological interest is viable or desirable.

PROJECT 15

Professor Desmond Odugu (Education)
Buchanan 233
Ext. 5171; email: odugu@lakeforest.edu

TITLE: Achievement Gap and Relationship Dynamics among U.S. Black Students (3-4 students)

U.S. Black students in aggregate continue to encounter unique academic setbacks linked to historical and systemic factors. However, some research shows that a subset of U.S. Black students, mostly immigrants, perform at the highest levels of academic achievement. This summer, Richter students will join the second year of an investigation into the historical and sociological forces responsible for this achievement gap among Black students. One of those factors is the ways students’ historical literacy (i.e., what able to assist in putting Underhill’s work in a larger historical/cultural context by examining the other writers with whom she came into contact (Machen, Waite, Williams, etc.) and assessing the degree to which she was part of a larger “Anglo-Catholic” renaissance in spiritual fiction. What is the prehistory for such fiction in the late nineteenth century? To what extent did the writings of Machen, Waite and company shape hers? How does their understanding of mysticism differ? To what extent are they part of a unified movement of spiritual fiction within the English novel at the start of the twentieth century, with shared roots in the medieval literary and mystical traditions? Method of Supervision: Weekly Meetings, weekly research reports, an annotated bibliography, a final presentation.
PROJECT 16

Professor Alexander Shingleton (Biology and Neurosciences)
Johnson Science Building A 209
Ext. 6049; email: shingleton@lakeforest.edu

TITLE: The Importance of a Balanced Diet: The Effect of Protein-to-Carbohydrate Ratio on Metabolism (2 students)

Protein and carbohydrate are essential for organismal growth and development. While the negative effects of protein and carbohydrate deprivation on final body size have been well studied, what is less well understood is how the relative amount of protein to carbohydrate in a diet affects growth. Work conducted by Richter Scholars in the Shingleton Laboratory revealed a surprising interaction between the effects of protein and carbohydrates on growth. Using fruit flies (Drosophila melanogaster) as a model organism, they showed that flies reared on low protein diet become increasingly small as they are fed more and more carbohydrates. That is, high levels of carbohydrates actually inhibit growth when protein levels are low. The negative effects of a high carbohydrate diet on growth are reminiscent of Type 2 diabetes, which is also a consequence of excess dietary carbohydrates. Intriguingly, flies reared on a low carbohydrate diet become increasingly small as they are fed more and more proteins. We have no idea why this might be so. The goal of this Option 1 Richter project is to explore the effect of excess carbohydrates and proteins on key metabolic parameters in Drosophila. Last year, Richter Scholars successfully worked to develop quantitative PCR (a technique used to measure the levels at which genes are transcribed) as a method to assay different aspects of metabolism in Drosophila. This year, Richter Scholars will measure the metabolism of fly larvae reared on a variety of diets (low carbohydrate: high protein; high carbohydrate: low protein; low carbohydrate: low protein; and high carbohydrate: high protein). The research is well suited to students at the very beginning of their research career and will equip them with general skills in molecular biology and quantitative PCR as well as specific skills working with Drosophila, a major model organism. The project can be completed within a three-week time frame and does not require specific biological knowledge. However, in order to understand the rationale behind the research, students must have completed BIOL120 and a biological inquiry course before joining the lab. The project requires two students who will work together to complete the research. Students will be supervised by Dr. Shingleton but will work closely with other, more senior, members of the laboratory.

PROJECT 17

Professor Enrique Trevino (Mathematics)
Young Hall 105
Ext. 6187; email: trevino@lakeforest.edu

TITLE: Experimental Mathematics (2 students)
Recently with the rise of computing power, several mathematicians have worked on discovering formulas and patterns by using computers and numerical analysis. One of the relatively recent successes in experimental mathematics was the discovery by Borwein, Plouffe and Bailey of a formula for pi that can be used to find the digits of pi at any position without knowledge of the digits prior to that position. Experimental Mathematics yields itself as an easy way to jump into open problems without needing much background and yet can be very rewarding in terms of learning new things and discovering new theorems. In this project, I would give open challenges to a group of students. They would select which challenge they want to work with. An example of a possible challenge is an example involving chaotic maps. To attack these challenges I would teach them some useful algorithms. For example, the PSLQ algorithm is a very useful algorithm (used in the formula of pi mentioned above) that can be tailored to many kinds of problems. My goal would be to have the students learn that they can discover new things without needing to learn as much background. I would also like to have them learn of the usefulness of knowing how to write some computer programs. The programs for this project don’t require background in programming but it would be useful to have taken an introductory course. The students and I would meet 4 times a week and by the end of the program the students would have a project to present in the Symposium. For a better grasp of what the project entails, I recommend looking at the previous Experimental Mathematics Richter projects, which you can see in the following URLs:
http://campus.lakeforest.edu/trevino/ExperimentalMathPoster.pdf
http://campus.lakeforest.edu/trevino/Tupper_Poster.pdf

PROJECT 18

Professor Naomi Wentworth
Hotchkiss Hall 010
Ext. 5092; email: wentwort@lakeforest.edu

TITLE: Brain Waves and Mental Processes (2-3 students)

What can we tell about a person’s mental processes by measuring the electrical potentials that occur on the surface of the scalp? Students will first learn techniques to measure “brain waves”—the electrical potentials that are recorded on the scalp. We will read classic studies that have used cortical potentials to make inferences about the cognitive processes that underlie thought and behavior. We will then design tasks to test hypotheses about how different types of experience affect brain wave recordings. Students will be trained on how to use a BIOPAC system for recording EEGs. At the end of the session, I will guide students as they design pilot studies to test their hypotheses about the relationship between mental processes and brain waves.
PROJECT 19

Professor Naomi Wentworth
Hotchkiss Hall 010
Ext. 5092; email: wentwort@lakeforest.edu

TITLE: Eye Movements and Mental Processes (2-3 students)

Are the eyes windows into the mind? Students will first learn techniques to study where observers are looking and how they move their eyes. After that, students will design scenes and tasks that let them test hypotheses about the factors that are involved in how people inspect various types of scenes and remember content from those scenes. I will supervise students by first training them on how to use an ISCAN eye tracker (infrared videography). In addition, I will introduce students to classic studies in the field of cognitive neuroscience that have used eye movement measures to reveal how perception, cognition, memory, and emotion interact. At the end of the session, I will guide students as they design pilot studies to test their hypotheses about the relationship between mind and eye movements.

PROJECT 20

Professor Dawn Wiser (Chemistry)
Johnson Science Building A 301
Ext. 5092; email: wiser@lakeforest.edu

TITLE: Chemistry Applied to Art Conservation: Seeing through Paint with IR and UV Radiation. (2 students)

Painting conservators often use IR and UV radiation to view works of art and artifacts. Types of varnish or changes in varnished surfaces can often be detected by observing under UV light. In addition, conservators use infrared reflectography to detect under drawings in paintings. This summer I plan to develop course content (hands-on experiments and/or demonstrations) related to UV radiation and IR reflectography for use in a new General Education Science course on the Chemistry of Art. The goal of this project will be to create samples of painted and/or varnished surfaces and to determine if an inexpensive night vision or IR web camera and UV light can be used by the students in the course to analyze these samples. Questions to be addressed include, (1) Can inexpensive, readily available cameras and light sources be used to illustrate these techniques? (2) Are some pigments or varnishes more transparent to IR and UV light than others? (3) Does thickness or number of paint layers affect the ability to view underdrawings? (4) Does the composition of inks and pigments determine whether or not the ink will absorb IR radiation? The project will be suitable for students who have completed Chemistry 115 and Chemistry 116, or with AP credit in Chemistry 115 and a good laboratory background. Experience in art is not necessary, but students interested in both chemistry and art will find the project particularly appealing. This project can support 1 or 2 students working together. It will be an advantage to have two students working together since it requires design of experiments from basic concepts and a fair amount of experimental trouble-shooting.
Students with a strong interest in Museum Studies and minimal science background may be considered provided sufficient motivation to learn the relevant science and availability of a partner with two semesters of chemistry.

**PROJECT 21**

*Professor Dawn Wiser (Chemistry)*  
*Johnson Science Building A 301*  
*Ext. 5092; email: wiser@lakeforest.edu*

**TITLE:** Applications of Computers and Chemistry: Computational Modeling to Predict the Structures of Polymer (1 student)  
My research uses computer modeling to understand how the structure of a catalyst can affect the outcome of a catalytic reaction. One reaction of interest is the formation of polypropylene from a zirconium-containing catalyst called a zirconocene. Polypropylene can exist in a variety of different forms (called isomers), each with a unique set of properties and uses. It is well understood that the structure of the catalyst plays a key role in determining the type of isomer produced in the polymerization reaction. Computer modeling can be used to predict the preferred isomer. The goal of this research project is to develop a new computer modeling experiment related to polypropylene formation to use in the chemistry curriculum. Specifically, we will use the computer to predict the preferred isomer of polypropylene that will be formed from two different catalysts. We will explore several different computational methods to address this question. Based on the results, we will develop course handouts and laboratory procedures to accompany this new series of experiments. A Richter scholar participating in this project will be directed and closely supervised by me, and will gain valuable experience with computer modeling software as a tool to understand chemical reactivity. The student will gain valuable experience in understanding the relationship between molecular structure and the relative energy of these structures. The project is suitable for 1 student and will be of interest to students interested in the intersection of chemistry, computers, mathematics, and/or physics. Necessary prerequisite materials include Chemistry 115/116 and an interest in getting a head start in learning some fundamentals of Chemistry 220 (Organic Chemistry I). A willingness to use Mac, PC, and LINUX computers is also necessary.

**PROJECT 22**

*Professor Ben Zeller (Religion)*  
*Buchanan Hall 005*  
*Ext. 5175; email: zeller@lakeforest.edu*

**TITLE:** Digitizing a Church (4 students)  
Interested in history, computer graphics, religion, art, photography, or filmmaking? Then this is for you: an interdisciplinary project to create a virtual reality (VR) digital model of Lake Forest’s
First Presbyterian Church. During this project you will work closely with Prof. Zeller to create a VR model of the church, which will feature educational elements showing the history, religious background, and artistic/architectural of the church. Students will be involved in the entire process: historical research, high-resolution photography, web content development, programming, and production of the final digital product. Additionally, one student will be in charge of documenting the entire process and creating a “making of” film about the project and our work on it.

RSCH 182 (OPTION II, TEN-WEEK)

PROJECT 1

Professor Carlo Arnell (English)
Carnegie Hall 109
Ext. 5272; email: arnell@lakeforest.edu

TITLE: Arthur Edward Waite and Evelyn Underhill (1 student)

Arthur Edward Waite was an acclaimed British occultist novelist of the late-nineteenth and early-twentieth centuries. Evelyn Underhill was a British author active mainly during the early-twentieth century, writing several essays and novels on the subject of spiritualism, and more specifically, mysticism. Waite and Underhill are linked through their spiritual works and fall into the same literary genre of spiritual gothic fiction. However, the two authors also approach the topic of spiritually differently through their writings. What influences, literary and otherwise, caused this difference in the approach of spirituality? What commonalities are apparent in the two authors’ depictions of spirituality? How do the literary works of Underhill and Waite contribute to the genre of spiritual gothic fiction? For this project, one student will examine and compare the works of Arthur Edward Waite and Evelyn Underhill to determine the literary connections between the two authors, the similarities and differences of the representation of spiritualism, and to what extent their works pertain to the spiritual gothic genre and tradition. Student tasks may include bibliographic work, reading of primary texts, assessment of relevant secondary literature, regular research reports, weekly discussions, and a final research report.

PROJECT 2

Professor Carlo Arnell (English)
Carnegie Hall 109
Ext. 5272; email: arnell@lakeforest.edu

TITLE: Evelyn Underhill and Robert Hughes Benson (1 student)

Evelyn Underhill and Robert Hughes Benson were contemporaries and acquaintances who wrote fiction in England at the beginning of the twentieth century. Although Benson was a Roman Catholic priest and Underhill a mystic, amateur theologian, and historian of mysticism, both wrote fiction that belongs to the genre of spiritual gothic fiction. The extent to which each author is affiliated with the genre is based on how each works to include the components of the
genre (both spiritual and gothic) into their writing. The writings of Underhill and Benson are both distinctly gothic and spiritual; however, there has been little examination into how these components work together in the writings of the two authors. Who were the primary influences on Benson and Underhill? What other authors, if any, contributed to this spiritual gothic tradition? To what extent do social and religious environmental factors influence the writings of the two authors? Why are the spiritual and gothic components of these authors’ works discussed separately, rather than jointly, from a literary perspective? For this Richter project, one student will examine the fictional works of both Underhill and Benson in order to compare how the two authors use both gothic and spiritual influences and to determine how each author contributes to the larger context of the spiritual gothic genre. Student tasks will include bibliographic work, reading of primary texts, assessment of secondary literature, writing of weekly research reports, and public presentation of research at the end of the session.

PROJECT 3

Professor Sugata Banerji (Computer Science)
Young Hall 218
Ext. 5156: email: banerji@lakeforest.edu

TITLE: Convolutional Neural Networks and Scene Understanding (2 students)

My main research area is Computer Vision. In Computer Vision we write computer programs that try to understand, interpret and classify images. During my post-doctoral research at George Mason University, I worked with scene classification. Recently, Convolutional Neural Networks (CNNs) have become very popular with researchers for the task of scene classification and understanding. However, how the responses from the different layers of CNN correspond to different low-level and high-level features from the image is not completely understood. I propose to investigate the properties of these different layers further by using the features obtained from different layers for several Computer Vision tasks on some standard image datasets. This project requires some background knowledge about Image Processing, Computer Vision, Machine Learning and Artificial Intelligence, as well as some amount of programming skills. That is why I am proposing this as a ten-week program since I will have to teach the students the required material before they can use it for their experiments. There are a number of vision problems that could be solved with a better understanding and innovative application of the different layers of a Convolutional Neural Networks and I hope to get the students interested in at least a few of them so that we can find answers to some questions facing researchers in this field today. My supervision will consist of teaching them the necessary course material as well as meeting frequently to evaluate their progress and provide guidance to move forward. Fundamental programming knowledge (such as gained from CSCI 112) is a prerequisite. The project will end with a presentation.

PROJECT 4

Professor Jason Cody (Chemistry)
Johnson Science Building A 305
Ext. 5093; email: cody@lakeforest.edu

TITLE: New Materials from Ionic Liquids (1 or 2 students)
Often the first step toward technological solutions for persistent problems is the synthesis of new materials with unpredicted properties. As part of an ongoing collaboration between my
research group and colleagues in France and Germany, my students and I have developed a route to new materials in my lab. The search for new materials will be carried out through reactions in low-melting salts, known as ionic liquids, as solvent. This relatively new area of chemistry has received much attention recently because these solvents don’t boil, don’t burn, and can substitute for other more hard to handle liquids. Because some of the materials decompose in air, precautions must be taken with these materials to work with them under conditions where oxygen and water are excluded. Thus, we will use special laboratory techniques for handling such air-sensitive materials. Subsequently, we will study the structure of the products using X-ray diffraction. With this technique, we can learn the exact molecular structure. A new ion,[Co(Co(P3S8)2)2]4–, was recently prepared in my laboratory by a former Richter Scholar and submitted for publication. In the past four years, our lab has made six new compounds. The incoming Richter Scholar will participate in every aspect of this project, working with me to formulate goals and experiments. Careful record keeping, enjoyment from working with one’s hands, and imagination are keys to the success of this project. The project will conclude with a written summary of results and suggestions for future experiments. One year of college chemistry is a prerequisite.

PROJECT 5

Professor Shubhik DebBurman (Biology and Neuroscience)
Johnson Science Building A 201
Ext. 6040; email: debburman@lakeforest.edu

TITLE: Discovering Molecules & Mechanisms to Combat Parkinson’s Disease (2 students)

During summer 2016, the DebBurman lab seeks up to two highly motivated hardworking undergraduates to form a collaborative team with a diverse group of three other upper-class peers that study how certain human disease-linked proteins misfold and if such folding errors can be suppressed or reversed. Proteins are the most diverse class of macromolecules in our cells and their unique functions hold the secret to life. To fold correctly, most proteins require chaperones, which are proteins that help other proteins fold into their proper shapes and maintain their shape. If proteins still misfold, they are targeted for destruction by well-known degradation systems. But some misfolded proteins that escape quality control build up in tissues and cause tragic incurable diseases. With the aid of national grants, we have focused on the protein folding mysteries underlying one such illness, Parkinson’s Disease (PD), which is caused by the misfolding of the protein, alpha-synuclein. This misfolding somehow selectively kills certain nerve cells that control our voluntary movement, which then lead to PD symptoms. For RSCH 182 (Independent Research Experience II), Richers will join current student researchers in my lab who are testing several hypotheses that test what regulates the misfolding of alpha-synuclein in PD. Some students are focused on evaluating specific protein families that include (1) remodeling factors, (2) enzymes of the ubiquitin-proteasome pathway, (3) the lysosomal degradation pathway, (4) the oxidative damage pathway, and (5) the nitrate stress pathway. Other students are creating mutants of alpha-synuclein to evaluate whether specific portions/amino acids within the protein intrinsically control its misfolding and toxicity. To test each hypothesis, students work with two types of yeasts as model systems and they
utilize multiple complementary techniques that span molecular genetics, cell biology, and biochemistry. The Richter students can choose to work with any of the above hypothesis-driven projects, or propose new ones, and will enjoy significant control over experimental aims and design. In addition to carrying out their research project, Richter students will attend a prestigious scientific summer conference in Chicago in mid-June, learn to discuss and present the latest published discoveries through scientific journal clubs, and discuss data at weekly lab meetings. Many past Richters have continued working additional years in these projects, with some expanding them into senior theses, which they often present at national conferences. Over twenty students, including six Richters, have become co-authors in published articles or manuscripts currently in submission and preparation. All lab graduates have gone on to pursue PhD, MD, or other scientific or health professions degrees. Pre-requisite: BIOL120 and CHEM115, and CHEM116. Submission and preparation. All lab graduates have gone on to pursue PhD, MD, or other scientific or health professions degrees. Pre-requisite: BIOL120 and CHEM115, and CHEM116.

PROJECT 6

Professor Les Dlabay (Economics & Business)
Young Hall 304
Ext. 5145; email: dlabay@lakeforest.edu

TITLE: Business Models and Financial Services for Women’s Empowerment and Youth Enterprise (1-2 students)

Women and young people are two of the most vulnerable populations with regard to social and economic empowerment. Providing access to financial services, business training, and market opportunities can result in reduced poverty along with improved nutrition, health care, and education for both women and youth. Students will review previous research, conduct library and web research, conduct in-person and e-mail interviews, and create a summary document (table and report) comparing programs for women’s social and economic empowerment along with youth enterprise activities in Africa, Asia, and Latin America. Supervision will occur with meetings two or three times a week along with e-mail updates of daily and weekly progress.

PROJECT 7

Professor Les Dlabay (Economics & Business)
Young Hall 304
Ext. 5145; email: dlabay@lakeforest.edu

TITLE: Digital Finance: Mobile Phone Banking, Microinsurance, and Global Business Development (1 student)

Increased availability and use of technology in Africa, Asia, and Latin America is enhancing the financial infrastructure for previously underserved populations. Banking services are evolving from informal savings groups to digitally connected microfinance programs. Expanded linkages
between informal and formal financial service providers are resulting in improved food, water, health care, and education. Students will review and summarize existing research and programs related to varied digital finance models used by various financial service providers and global business development organizations, conduct in-person and e-mail interviews, and create a summary document (table and report) comparing digital finance activities. Supervision will occur with meetings two or three times a week along with e-mail updates of daily and weekly progress.

PROJECT 8

Professor Sean Menke (Biology)
Johnson 207
Ext. 6051; email: menke@lakeforest.edu

TITLE: Invasive Argentine Ant Ecology (2 students)

My research this summer will focus on understanding what impact the invasive Argentine ant has had on native ant communities by updating a 50-year record monitoring Argentine ant spread in central California. I am looking for two adventurous students to join me for four weeks in California surveying Argentine ants and collecting native ants, and then returning to Lake Forest to analyze our samples. Argentine ants are a fascinating system because they are a globally invasive species of economic importance and we have historic collection records from multiple locations so that we can study the effects of Argentine ant spread on changes in native community structure through time. This year, students working in my lab have a chance to work with faculty from University of California Davis and San Diego to answer questions about a globally problematic invasive ant species. You will learn how to design and perform field experiments and work in a collaborative setting. Researchers in my lab will spend extensive periods of time outside conducting experiments in riparian corridors between San Francisco and Sacramento California. You will also gain experience in taxonomy and data analysis using our collected samples with the goal of contributing to a presentation at a national conference. All students in my lab have the opportunity to participate in every project, including local projects in the Chicago area. Potential participants must have completed a biology or environmental studies course.

PROJECT 9

Professor Donald C. Meyer (Music)
Reid 207
Ext. 5171; email: meyer@lakeforest.edu

TITLE: Silent Film Score (1-2 students)

The Richter Scholar for this project will assist me in assembling a new score for an old film. In the movie theaters of a century ago, in the days before synchronized sound, most movies were
seen accompanied by live musicians. Some movie theaters just had a pianist or organist, but increasingly, the better theaters employed small orchestras. The music they played was usually selected by the theater’s music director, drawn from familiar classical and popular repertoire, but also from some stock music sources. The Richter Scholar will help me arrange the music for the film, synching it up to the movie and assisting with the creation of a notated score. This will result in a live performance during the 2016-17 school year.

PROJECT 10

Professor Desmond Odugu (Education)
Buchanan Hall 122
Ext. 5177; email: odugu@lakeforest.edu

TITLE: Language Practice, Historical Literacies and Social Change in Multilingual Africa (3-4 students)

Research on the relationship between education and development increasingly highlight the importance of language of instruction (LoI) in multilingual societies as a key factor for social and economic development. However, while we now know that linguistic diversity in education (especially when it builds on indigenous languages) has immense social benefits, we still do not clearly understand how language relates to other factors that shape development. In this research, Richter scholars will learn about and help to investigate how language practices (in and out of school) relates to historical literacies (i.e., what/how much people know about the history of their societies). The goal is to see whether language practices and historical literacies can help predict civic engagement, which is critical for social change in multilingual societies. Richter scholars will be working as part of a larger team of experts located in 7 African countries to collate research data on LoI in schools, public media language practices (including language use on radios, TV, and social media). Scholars will work to manage these data on the research website (www.inarels.com). They will also work with me in analyzing emerging patterns among these factors. This study is part of a longitudinal project in South Africa, Botswana, Kenya, Tanzania, Uganda, Ghana and Nigeria. Richter scholars will spend the first two weeks of the project familiarizing themselves with the field of research, relevant methodological skills, and the research materials developed during the first two years of the project.

Specific tasks include:
1. Reviewing and revising data collection instruments designed for collecting data on:
   a. undocumented historical traditions in local languages
   b. oral traditional folklores in local languages
   c. individual-level educational outcomes and specified public activities (including political, economic and cultural activities)
2. Pilot the instruments with a team of experts in some of the seven countries listed above
3. Update online databases for managing research data.

The scholars will have future opportunities for paid work as research assistants on these projects.
PROJECT 11

Professor Desmond Odugu (Education)
Buchanan Hall 122
Ext. 5177; email: odugu@lakeforest.edu

TITLE: New Paradigm for Language Planning in Education for Multilingual Societies (3 students)

For over half a century now, researchers have shown that multilingual education has far-reaching academic, social, psychological and cultural benefits, especially for societies previously colonized by European countries. Despite this knowledge, multilingual countries around the world continue to insist on foreign language (mostly English) education for their citizens. Researchers have demonstrated that this seemingly rational strategy in a globalizing world actually deny majority of students access to quality education and the potential opportunities for productive adult life as well as hinder socioeconomic development. One of the key challenges here is that researchers have not yet worked out an actionable model for transitioning from current monolingual or transitional multilingual education to the hallmark of mother language-based multilingual education (MLB-MLE). As a result, the outmoded paradigm of monolingualism and its associated myths about language persist. To address this need, Richter scholars will work with me to review this body of research and the various recommendations for policy and practice on multilingual education. We will use this information to create a new paradigm for linguistic diversity in education for multilingual societies. The new paradigm will also build on established research on culturally responsive pedagogy as well as new learning technologies that can solve the problem of creating multilingual textbooks and teacher training. Specifically, Richter scholars will conduct online and library searches for research on multilingual education, culturally responsive pedagogy and educational technologies. They will also create models that match particular language paradigms in education with corresponding historical, political, cultural, economic and ideological structures. The products of this project will lay the foundation for a monograph, which seeks to push the frontiers of research, policy and practice on language planning in education.

PROJECT 12

Professor Alexander Shingleton (Biology and Neurosciences)
Johnson Science Building A 209
Ext. 6049; email: shingleton@lakeforest.edu

TITLE: Breath control: Understanding the Effect of Oxygen Level on Body and Organ Growth (2 students)

In almost all animals, humans included, exposure to low levels of oxygen during development generates adults that are reduced in body and organ size. Despite the ubiquity of this phenomenon, however, we have a very poor understanding of how oxygen-level is sensed by a
growing animal, and how this information regulates growth rate and duration to control final body size. Work conducted in Singleton Laboratory, in part by Richter Scholars last year, made a remarkable and important discovery. Using the fruit fly (Drosophila melanogaster) as a model organism, they found that the effect of oxygen on growth rate was regulated systemically by a hormone, ecdysone. This is in contrast to the widely held view that the effects of oxygen on growth rate is regulated cell autonomously, by the effects of oxygen on cellular metabolism. The next step, and the goal of this research project, is to discover how oxygen is regulating ecdysone synthesis. This is an Option II Richter project suited to students with an interest in physiology and the biomedical sciences, and is part of a larger NSF-funded research project being conducted with Dr. Jon Harrison at Arizona State University. We have generated the transgenic flies necessary to conduct our experiments, but these flies have to be crossed with each other to experimentally manipulate ecdysone levels under different oxygen conditions. Further, their progeny need to be dissected and measured during and after their development to assay the effects of oxygen and ecdysone on their growth. The research is well suited to students at the beginning of their research careers and will equip them with the skills necessary to continue research in biology in general, and Drosophila developmental physiology in particular. Specific skills acquired will include: a working understanding of Mendelian genetics; dissection, microscopy, and image analysis; as well as basic methods in molecular biology. This is an open-ended project, but great progress can be made within a ten-week time frame. Participation does not require specific biological knowledge. However, in order to understand the rationale behind the research, students must have complete BIOL120 and a biological inquiry course before joining the lab.

PROJECT 13

Professor Lynn Westley (Biology)
Johnson Science Building A205
Ext. 6048; email: westley@lakeforest.edu

TITLE: Forest Responses to Emerald Ash Borer Disturbance in the Chicagoland Area (2 students)

The invasive emerald ash borer beetle is sweeping across the Midwest, resulting in widespread ash tree mortality. Many municipalities lack the basic information (i.e. species composition, forest structure, and extent of ash borer invasion) required to predict how their forests would respond to such a disturbance. Students will inventory forest and bird communities in forest preserves and other natural areas around Chicago and Lake County. They will gain familiarity with local park systems and learn how to identify trees, herbaceous plants, and birds. Students will also learn how to use GPS, manage data and conduct regional management plans. Results of this project will facilitate our understanding of how forests respond to pest outbreaks and will assist in the management of these forests. Opportunities may exist for students to pursue this work in the future, including possible thesis research and publication. Students will be supervised by Prof. Westley and collaborators from UIC and IL Natural History Survey, in addition to mentoring from a former Richter student. This work is supported, in part, by a grant from the Illinois Coastal Grants Program for Sustainable Coastal Planning.
PROJECT 14

Anne K Thomason (LIT Library)
Donnelley And Lee Library 016
Ext. 5064; email: thomason@lakeforest.edu

TITLE: Analyzing and Presenting the Edward Bennett Collection at Lake Forest College (1 student)

This project will involve rigorous analysis of the Edward Bennett Collection, a manuscript collection of materials created by two of the architects of the 1909 Plan for Chicago. Working with the College Archivist, the student will analyze and annotate the letters in the collection from Daniel Burnham to Edward Bennett, along with other correspondences. At the same time, the collection’s rich photographic material needs to be digitized and described. The project will involve helping the College Archivist create a website displaying the photographs and telling the stories revealed from the correspondence. The student will research in the College’s collections as well as other Chicago area archives that will present other facets of the lives and work of Burnham and Bennett. Students interested in history will have an opportunity to complete original research and create a professional level website. Students would benefit from having taken at least one college level history course and possibly a web design course.