6th Annual Undergraduate Research Day
May 6th • 9 to 5pm
Academic Core Building

Research Day is a celebration of undergraduate research and creative scholarship in all disciplines at York College.

Keynote Speaker
Ainissa Ramirez, Ph.D. is a science evangelist who is dedicated to making science fun for people of all ages. She co-authored Newton’s Football: The Science Behind America’s Game and authored Save Our Science: How to Inspire a New Generation of Scientists.
Proceedings of the 6th Annual Undergraduate Research Day at York College of The City University of New York

Office of Undergraduate Research
York College of The City University of New York

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These proceedings were prepared by the Office of Undergraduate Research at York College of The City University of New York.

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This report is available for download on the York College website at https://www.york.cuny.edu/academics/undergraduate-research.

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About York College

Mission

York College enriches lives and enables students to grow as passionate, engaged learners with the confidence to realize their intellectual and human potential as individuals and global citizens.

Vision

York College's hallmark academic programs in liberal arts and sciences will be recognized as centers of excellence within CUNY, attracting and graduating some of the best and most highly motivated students from New York City and the greater New York area. We will be the first choice for prospective CUNY students interested in the health professions, allied health sciences, and business, including aviation management. York College will also establish itself as a model for enabling first generation college students to earn an undergraduate degree, and will fulfill students' individual academic goals while preparing them for graduate education and the competitive marketplace. Students are at the center of their own learning at York College. We offer multiple opportunities for student engagement, inquiry and research-based scholarship, and experiential learning. York maintains a vibrant campus where students actively participate in extra-curricular programs and collaborate with faculty and academic peers whose backgrounds are distinctly different from their own. The College has a dynamic student life with athletic and visual/performing arts programs, special interest clubs and social organizations where students develop enduring relationships and refine interpersonal skills.

The College will enable faculty and students to pursue their highest goals and foster their development as individuals and professionals. York College will be an attractive place to work, which will draw highly qualified candidates for its academic, executive, professional and administrative positions. The multicultural nature of our sustainable academic and social environments enriches the collegiate experience for all students, faculty and staff.

York College will be a magnetizing institution within the Queens community where students and graduates are mobilized as advocates/participants in continuous civic engagement. Our strong alumni network supports our programs, serves as ambassadors and donates time, talent and capital to advance our mission. Our Continuing and Professional Education function attracts students, graduates, individuals and professionals in pursuit of continued personal and professional development. Our business outreach activities engage the business community to strengthen our town-grown relationships.
About the Office of Undergraduate Research

Program Mission

To promote and facilitate student engagement in research and other creative activities in order to demystify research, increase knowledge about its nature and methodologies, and secure competitive advantage for graduate and professional school and the workforce.

Getting Involved in Research

There are several ways to get involved with undergraduate research at York College. The York College Honors Program provides opportunities to enhance the intellectual development of motivated students. The Louis Stokes Alliance for Minority Participation (LSAMP) seeks to increase the number of underrepresented minority students in STEM. York College conducts a federally funded Summer Research Program. The CUNY Pipeline Program provides orientation to the academy through a six-week summer research institute at the Graduate Center and research projects conducted with a CUNY faculty member. The Systems Biology Center New York (SBCNY) Undergraduate Research Program offers summer research fellowships to City University of New York (CUNY) undergraduates who are planning to pursue PhD or MD/PhD degree programs after graduation and who are interested in incorporating systems biology approaches into the research that they pursue. The CUNY Summer Undergraduate Research Program (C-SURP) provides students with 10 weeks of hands-on research experience in a CUNY laboratory. Students are matched with a faculty mentor and research team based on their expressed interests. To find a mentor or program that suits you, contact the Office of Undergraduate Research at uresearch@york.cuny.edu. To contact the LSAMP program, e-mail Lyndon Haynes at lhaynes@york.cuny.edu. To contact the Honors Program coordinator, e-mail honors-program@york.cuny.edu. For scholarship opportunities and general announcements, follow us on Facebook© and Twitter©.

Student Research Day

Every April, York College students engaged in undergraduate research present their findings through poster and panel presentations. In 2011, the 2nd Annual Student Research Day involved more than 200 participants, including keynote speaker Staceyann Chin, performer and Co-writer of Russel Simmons Def Poetry Jam on Broadway, The Other Side Of Paradise. In 2012, the 3rd Annual Student Research Day involved more than 250 students, and featured award-winning novelist Hari Kunzru, author of "Gods Without Men." Participation continued to grow to nearly 300 students for our 4th Annual Research day, which featured Dr. Partha P. Mitra, Professor of Neuroscience and Theoretical Biology at Cold Spring Harbor Laboratory. In 2014, we celebrated our 5th year with Charles Duhigg, the Pulitzer Prize winning author of “The Power of Habit.”

Program History

The launch of a York College Undergraduate Research Program was first announced by Provost Ivelaw Lloyd Griffith at the CUNY Academic Council on January 6th, 2010. He subsequently named Dr. Rishi Nath, Assistant Professor in the Department of Mathematics and Computer Science at York College, as the first Director. The first annual Student Research Day was held on April 15th, 2010 with over 150 participants. The York College Office of Undergraduate Research, located in room AC-3E07b, was opened on September 30th, 2010. Dr. Robert O. Duncan, Assistant Professor of Behavioral Sciences, was appointed as the second director on July 1, 2013.
Keynote Speaker: Ainissa Ramirez

Ainissa G. Ramirez, Ph.D., is a science evangelist who is passionate about getting the general public excited about science. She co-authored *Newton’s Football: The Science Behind America’s Game* (Random House); and, authored *Save Our Science: How to Inspire a New Generation of Scientists* (TED Books).

Before taking on the call to improve the public’s understanding of science, she was an Associate Professor of Mechanical Engineering & Materials Science at Yale University. *Technology Review*, the magazine of the Massachusetts Institute of Technology (MIT), named her as one of the world’s 100 Top Young Innovators for her contributions to transforming technology. She has been profiled in *The New York Times*, *Fortune Magazine*, *CBS News, Inside Edition*, *Fox News, CNN, NPR, ESPN, Time Magazine* as well as scientific magazines (*Scientific American* and *Discover Magazine*).

Dr. Ramirez received her training in materials science and engineering from Brown University (Sc.B.) and Stanford University (Ph.D.). Prior to being on the faculty at Yale, she was a research scientist at Bell Laboratories, Lucent Technologies, in Murray Hill, New Jersey where she did award-winning research. She has authored more than 50 technical papers, holds six patents, and has presented her work worldwide.

She now focuses her energies on making science fun, and gave an impassioned call to action at TED on the importance of understanding science, technology, engineering, and math (STEM), which generated widespread enthusiasm. At Yale, she was the director of the award-winning science lecture series for children called *Science Saturdays* and hosted two popular-science video series called *Material Marvels* and *Science Xplained*.

She speaks internationally on the importance of making science fun and has served as a science advisor to the American Film Institute, WGBH/NOVA, the American Association for the Advancement of Science (AAAS) and several science museums. Currently, she is writing a book on the role of materials in history and co-hosts a science podcast called Science Underground.
Featured Students

Each year, members of the Advisory Council select a representative sample of excellent students from various disciplines at York College to tell their story. Students participate in a panel where they speak openly about how they became interested in research, their experiences with conducting original research, and future directions for their work and careers.

Zainab Almuhaisen is a recent graduate from York College. She now has a Bachelor’s of Arts degree in which she majored in psychology. She attended primary and secondary school in Queens, NY. At York College she was a part of the National Society of Leadership and Success where she served as a Student Networking Team Facilitator. Zainab also became a part of the York College Honors Program and this encouraged her to be more involved in research. Apart from being involved in the college, she also has been volunteering at Jamaica Hospital Medical Center for the past 4 years and is still serving there on a weekly basis. Zainab also takes time out on weekends to teach children multiple subjects at her local community center. She is now applying to masters programs for occupational therapy and hopes to continue to serve her community in the best possible way, empowering one individual at a time.

Alisher Mukhamedov was born in Tashkent, Uzbekistan. He moved to the United States at the age of nineteen. Although he is fluent in both the Uzbek and the Russian language, it was challenging for him in learning English during his first six month in the United States. Alisher comes from a family background consisting of professionals in the field of dentistry. His father is a practicing Dentist in Uzbekistan and in Russia. His parents wanted him to pursue a path in dentistry as well, but Alisher felt drawn to Accounting and Finance during his early age. Currently, Alisher is pursuing his Bachelor’s degree in Accounting with a minor in Economics. He has been on the Dean’s List for the past few years and has remained active throughout his time at York College by representing the Accounting and Finance department in Student Government. Alisher is also a member of the Leadershape Club and the Accounting Club in York College. He was also an active participant in the Volunteer Income Tax Assistant program under the guidance of the IRS (Internal Revenue Services). To continue to remain active, Alisher has taken part in new student orientations by acting as a mentor for the class of 2017. He is a member of AICPA (American Institute of Certified Public Accountants) and NYSSCPA (New York State Society of Certified Public Accountants). With his continuous involvement in York College, Alisher believes in remaining humble by giving back to the community, by means of providing a lending hand or, just simply, sparing your time for others. He has plans to pursue his Master’s degree in Finance, and he also hopes to become a Certified Public Accountant and a Certified Fraud Examiner.
Arban Nichols is a born Brooklyn native raised in Queens. After high school graduation, he enrolled into York College and performed very poorly, ending the school year under academic probation. Shortly afterward, Arban enlisted in the United States Air Force and served four years as an aircraft electrician. After receiving an honorary discharge, he re-enrolled in York College to pursue a bachelor’s degree in Computer Science. Since then he has raised his GPA from 1.8 to 3.2 and participated in a variety of on campus extracurricular activities to include a play at the Milton G. Bassin Performing Arts Theater, Math Club meetings, and undergraduate research projects. Some of the research projects he has worked on are “Localization of Mobile Devices Using Wi-Fi” with Dr. Ziquan Dong at the New York Institute of Technology and “Connecting the Disconnected through Geo-Social Networking” with Dr. Shweta Jain at York College. Arban also works as a college assistant at the classroom building computer lab on campus. He hopes to one day become a network administrator and contribute to the new research field, Software Defined Networking. He believes that even the most roguish of characters can become steadfast and reliable people if given the opportunity and encouragement to elevate.

Ariel Rosario is currently a junior at York College who has conducted research with both Drs. Duncan and Villegas from the department of Behavioral Sciences. In Dr. Duncan’s lab, Ariel uses fMRI to study the effects of glaucoma on the human brain. Ariel is using a rat model of Alzheimer’s Disease to study the relationship between diabetes and Alzheimer’s in Dr. Villegas’ lab. Ariel is also a research intern at the Psychiatry & Behavioral Sciences department at Memorial Sloan Kettering Cancer Center. Ariel is examining how breast cancer affects cognition. Ariel was recently accepted into the Yale University Summer Undergraduate Research Fellowship program. While At Yale, Ariel will be working with professor Marvin Chun and using fMRI to examine the effects of beauty and aesthetics on attention and short term memory. Ariel will be applying to graduate programs next year in cognitive psychology and hopes to continue his passion for research.

Soraya Williams is a senior at York College in the Department of Business and Economics at the School of Business and Information Systems Management. She majors in Business Administration, and her desire to make a difference in the community inspired her to specialize in Human Resources Management. Soraya has over 10 years working experience in the area of customer service, and she continues to be a role model for new hires in her organization. To improve access of disadvantage groups to corporate America, her research focuses on “Workforce Discrimination.” Soraya aspires to go to graduate school and become a Business Professor, where she will continue to volunteer her time to the community and mentor youth.
Awards

Each year, members of the faculty who participate in mentoring a significant number of students are recognized for their outstanding achievement. The Office of Undergraduate Research is proud of anyone who takes on the role of mentor, and we seek to broaden participation and quality of life for faculty mentors and those interested in becoming involved.

**President’s Award**
Awarded to mentors who support 15 or more research projects

- Deb N. Chakravarti
- Olajide Oladipo

**Provost’s Award**
Awarded to mentors who support 10 or more research projects

- Ian G. Hansen

**Dean’s Award**
Awarded to mentors who support 5 or more research projects

- Elizabeth Alter
- Laura Beaton
- Kristin Davies
- Ratan Dhar
- Chun-Pin Hsu
- Nazrul Khandaker
- Tania Levey
- Gerard McNeil
- Yolanda Small

**Special Recognition**
Lifetime mentor award

- Beth Rosenthal

**Director’s Award**
Awarded for excellence in service and support of undergraduate research

- Shereen Inayatulla
- Mychel Namphy
- Olayinka Oladipupo
- Taramati Shew
- Diana Sutherland
Program

Itinerary

8:00am    Registration Opens
9:00am – 5:00pm  Oral Presentations and Poster Presentations

Luncheon Session

11:30am    Lunch Service Commences
12:00pm    Opening Remarks
            *Robert Duncan, Program Director*
            *President Marcia Keizs*
            *Provost Panayaiotis Meleties*
12:10pm    Featured Student Panel
            *Moderators: Chun-Pin Hsu and Ian Hansen*
12:35pm    Musical Interlude
            “The Gods Love Nubia” from Aida
            by Elton John and Tim Rice
            *Director: Jonathan Quash*
            *Soloist: Miya Bass*
12:45pm    Introductory Remarks to the Keynote Address
            *Elizabeth Alter*
12:50pm    Keynote Address
            *Ainissa Ramirez*
1:45pm    Faculty Awards
            *Robert Duncan*
2:00pm    Concluding Remarks
            *Robert Duncan*
# Overview of Panel Sessions

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<th>Time</th>
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<tr>
<td></td>
<td><strong>Session 2</strong> Speak Me A Rebellion: Language, Politics, and Early Modern Feminisms</td>
<td>AC-2A15</td>
<td>Matthew Garley</td>
<td>Akshar Patel, Judea Hartley, Sarah Tattegrain, Zomayra Jack, Zohayra Castillo</td>
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<td>New York Avenue Records Press Conference</td>
<td>AC-3B04</td>
<td>Tom Zlabinger</td>
<td>Mark Arias</td>
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<td>2:30 – 3:45pm</td>
<td>Digital Shakespeare: A Modern “Merchant”</td>
<td>AC-3B04</td>
<td>Andie Silva</td>
<td>David Fasanya, Quan Chau, Saudia Haniff, Zohayra Castillo, Melinda Maharaj</td>
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<td><strong>Session 5</strong> So Black and Blue: The Psychological History of Slavery</td>
<td>AC-2A15</td>
<td>Linda Grasso</td>
<td>Sharon Vega, Tishena Sylvester, Jermaine Allison, Hina Zafar</td>
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<td>4:00 – 5:15pm</td>
<td>Science, Psych, Soil, and the Business of Joblessness: an Interdisciplinary Panel</td>
<td>AC-3B04</td>
<td>Kathariya Mokrue</td>
<td>Nicholas Weir, Rose Deng, Raisa Hasan, Belva Tatum, Fayeola Daniels</td>
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<td><strong>Session 7</strong> Autoethnography and “Emotional Tattoos”</td>
<td>AC-2A15</td>
<td>Shereen Inayatulla</td>
<td>Alea Nickoless, Jessica Bang, Andrew Heerah, Rachel Judge, Judea Hartley</td>
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# Overview of Poster Sessions

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<td>Aviation Management</td>
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Original Research

Original research is defined as an inquiry or investigation conducted by undergraduate students that makes an original intellectual or creative contribution to the field.

Accounting (BS)

ISLAMIC BANKING AND FINANCIAL INSTITUTIONS IN UNITED STATES
Alisher Mukhamedov
This study discusses prospects of Islamic banking and financial Institutions that offer mortgage and leases without interest in United States. It examines differences between Islamic banks and conventional banks, also it will examine some of the potential negative points of Islamic banks and financial institutions. The study will of talk about advantages of Islamic banking over conventional banking such as profit-loss sharing and affordable mortgage plans for less wealthy individuals. Besides, it will not only discuss about when Islamic banks and financial institutions introduced in United states, but it will also talk about current status of them and give an information of their geographic presence, structure, and products offered in the United States. This research will inform about main consumers of Islamic banks and financial institutions, and it will talk about future of Islamic financial entities in United States.

Aviation Management (BS)

AVIATION SECURITY BEFORE AND AFTER 9/11
Karen Cardona
The attack on America by terrorists using American planes was a wake up call for the aviation security practices. The attack caused an overhaul change on matters relating to the way the airlines conducts their business. There are increased safety and screening measures outlined all over the world something that was never taken to the detailed degree we now find in the airports. Prior to 9/11: The airlines used rudimental techniques accompanied by unskilled and poorly labour to do the frisking job for passengers before boarding the jets. The management of these airlines practiced total trust to their employees assuming the potential this action may pose to their businesses. People did not see terrorism as an aviation threat because the terrorist bombing prior to 9/11 never involved or affected the aviation industry directly. The industry was still in a naive status where all those visiting the airports were just their customers. After 9/11: The American 9/11 attack caught
everyone unawares, and many people including the airline companies became more sensitive to matters of aviation security. A new conspicuous change in the airports was heightened security measures and passenger screening. There have been increased usage of high tech technology security equipment and trained security professionals in all airports around the globe. It is crystal clear that the 9/11 attack did change the way we secure our aviation industry. It was the genesis of new practices and management.

AIRPORT EMERGENCY PLANNING 4-5 STEPS

Karen Cardona

Emergencies do not give a prior warning when they would take place. They can lead to severe distractions on property or human life when they strike. The level of preparedness in the subsequent minutes, however, will determine the survival of the victims and the property or their damage. The survival of the individual also depends on their level of preparedness. Better response plans can also help in minimizing or avoiding loss of property and human life even in extreme cases. In order for planning to be successful, intense research has to be done and the management of the airport companies need to have a forward thinking attitude. The first step in airport emergency planning is the issue of assessing the particular needs of the company. The next step is to have a policy that is clearly written down. The system should contain contents such as the company's intention and objectives. The third stage is on planning the different levels of response by training the staff in the specific areas they are to handle in case of an emergency. The fourth step is to offer adequate training to the personnel in the companies. The fifth and probably the last stage is to do the audits. Changes are bound to occur; therefore they should be well catered. The audits should be done at least once per year.

ACCIDENTS AND INCIDENTS IN AVIATION

Karen Cardona

There have been numerous accidents and other incidents in the Aviation industry over the years. One of the latest incidents in aviation is the Malaysia plane MH370 that went missing not to be located after a long period of search. There are other accidents involving airlines such as the TransAsia plane crash in the Taiwan river that also led to the untimely death of more than twenty-three people. The other recent accident was that of the Hawaiian Airlines Stowaway in April the year 2014. Many of the airplane crashes are caused by technical errors and a number of them by human mistakes. The technical errors include those of faulty engines that led to the failure of proper start off or loss of altitude by the pilots. The human error in this case mostly depends on the issue of judgement and decision making. Cases of fatigue and stress lead to momentary mental lapses that result in poor judgement and eventually poor decision making. Issues such as cognitive, moral, emotional, physiological and social elements are very likely to influence the process of decision making of the pilots and eventually poor judgement and uninformed decisions. The two principles of sound judgement are significant in order to avoid
many of the airplane accidents. The principles are that of perception and distinguish. The principles help the pilot to make informed decisions in case of a certain situation as an alternative option.

THE FUTURE OF QATAR AIRWAYS
Haroon Hasan
Qatar has over 140 destinations over six continents. They are the first airline to fly the new Airbus 350 XWB with an order of 80 A350's the 5 star airline will be looking at more opportunities to more destinations. In addition, they have also invested in the new Boeing 777X, with a 100 orders they will have the opportunity to fly more long range locations. They have 1 A320, 80 A320 Neo, 13 A380-800, 8 B777, 13 A330-Freighters, and 42 B787 waiting on delivery. These new aircraft's will help decrease the carbon footprint. New aircrafts means Qatar can compete with more flights to more destinations.

MARKETING IN AVIATION
James Jimenez
My topic is aviation marketing which focuses on how airlines market themselves to the public in order to gain there business. Marketing is a huge part of any service industry, especially aviation. Without proper marketing strategies and goals an airline would find it difficult to succeed in this industry. An Airline markets its destinations, there on board services, the ticket pricings and classifications and more importantly there reputation as an airliner. I will talk about how these marketing strategies are developed and how they are carried out especially in the US. Marketing is generally selling the final product without physically providing it. Displaying an opportunity that can take you to any part of the world depending if what you see convinces you to take the opportunity.

TSA’S PROCESS OF SCREENING PASSENGERS AND CARGO
Jennifer Kyrylyuk
The paper will report about TSA's screening practices and regulations in areas of passenger, checked baggage and air cargo. It will elaborate on use of technological advances, such as Advanced Imaging Technology (AIT) in passenger screening and its efficiency. It will review passengers' privacy and health concerns and its possible effects on the screening efficiency. Research focuses on importance of harmonization of the air cargo industry by switching to web-based documentation process and data sharing. By getting more countries to adapt same rules and regulations, shipping will become safer and faster process. Screening programs such as Air Cargo Advance Screening (ACAS) are introduced as a risk-based security approach in the industry. It will discuss the benefits of ACAS in the air cargo industry.
AVIATION MERGERS & ACQUISITIONS IN THE UNITED STATES AND ITS ECONOMIC EFFECTS

Priscila Saquipay
In this paper you will find the economic effects that mergers and acquisitions have had in the aviation industry. The changes that airlines have gone through and how those changes have affected its customers, the fare rates and also the service provided by such airlines. Also what will happen if the merging of legacy carriers continues.

AIRPORT EMERGENCY PLAN

Sabirah Siddiq
As we all know, safety is indeed one of the most vital elements of the Aviation Industry. Safety is what is needed in order to keep both passengers and employees happy and satisfied with their flight and business. However, in order to do this, there must be an Airport Emergency Plan. Without preparation for safety or security, there is total chaos, which means passengers are scared to fly. Thus, flights decrease, making airports and airlines lose business. This affects the airport socially, financially, and economically. Examples of these airport emergencies can range from anything such as hurricanes, tornadoes, tsunamis, terrorist attacks, and hijackers, fuel fires, etc. "Airports and communities that experience such disasters can pay a high price if they are not prepared. In addition to health and safety problems, social disruption, lawsuits, negative publicity, and psychological after-effects may result. While every contingency cannot be anticipated and prepared for, a strong emergency preparedness program can assist in limiting the negative impacts of these events, including liability and other post-emergency issues" AC 150/5200-31C Change 2).

HOW HAS EMERGENCY MANAGEMENT AND PLANNING CHANGED THROUGHOUT THE YEARS?

Evelyn Valentin
The aviation industry is extremely sensitive to outside factors and emergencies. Such emergencies like aircraft accidents, natural disasters, infectious and contagious diseases, civil protesting, terrorism, environmental emergencies, power outages, and fires have a radical effect on aviation operations and economy. This study will discuss the measures taken by airport and airline managers and directors to effectively plan, prevent and mitigate the effects of such emergencies and factors for the sake of their operations and the safety of their consumers. In my study I will also be discussing the different components of an Airport Emergency Plan and how they are carried out in the United States and internationally. I will be comparing how emergency planning was managed in the past since airline deregulation in 1978, and the legislation and federal agencies that have led to those changes. In addition I will be analyzing how security measures have changed since September 11.
Biology (BA-BS)

INVESTIGATING THE PHENOTYPIC DIFFERENCES BETWEEN LOWER CONGO RIVER ENDEMIC SPECIES MASTACEMBELUS BRICCHARDI AND MASTACEMBELUS BRACHYRHICUS

Bianca Brown

This project investigates the genetic changes that led to the distinct phenotypic characteristics of the lower Congo river (LCR) endemic spiny eel species Mastacembelus Brichardi and Mastacembelus Brachyrhinus. We have shown through phylogenetic analysis that the species M. brichardi and M. brachyrhinus share deep evolutionary roots. However, these two species are phenotypically distinct. M. brichardi is blind and depigmented while M. brachyrhinus has visible eyes and is pigmented. The phenomenon in which species have lost eyes and pigmentation is seen throughout the LCR. Example of blindness and depigmentation can be seen in species such as Lamprologus lethops and Caecobarbus geertsi (Robert and Stewart 1976). However blindness and depigmentation reflects the phenotypic characteristics that is normally associated with cave dwelling organism such as the Astyanax spp. Contrastingly, the environment of the LCR is distinctly different to that of the caves. This phenomenon has led to the investigation of the distinction within the genome of M. brichardi and M. brachyrhiunus using genes rhodopsin and Melanocortin 1 receptor (MC1R). Rhodopsin was chosen due to the different phenotypes for sight, and it is vital for species vision, especially in low light conditions. Melanocortin 1 receptor (MC1R) was chosen for its role as a pigmentation gene.

ASSESSING PATTERNS OF MICROORGANISMAL DIVERSITY USING METAGENOMICS TECHNIQUES IN NEW YORK CITY WATERWAYS

Sargil Hassan

Even though microbial community is imperative for ecosystem function and potentially for human health, no metagenomic surveys of microbial diversity in the marine environment in New York City have ever been conducted. Our study investigated the hypothesis that the bacterial species richness will be greater at sites farther from human pollution (sewer outfalls) which include Black bank, Little egg, Hawtree Basin, Silver Hole, Ocean Creek and Jones Beach compared to those sites closer to sewer outfalls (Coney Island Creek, Spring Creek, Gowanus Canal, Paerdagat Basin, Alley Creek and Brooklyn Bridge sites). The study was conducted at CSOs and as well as clean waterways. We conducted metagenomic(16s shotgun) analysis which bacteria DNA was extracted from marine sediment, and analyzed using QIIME and PICRUSt. The data indicates that the clean waterways show more microbial species compare to CSOs sites in support of our hypothesis. More research should be done to obtain adequate information on microbial community which can be used to preserve waterways and potentially learn more about human health.
ASSESSING PATTERNS OF MICROORGANISMS USING METAGENOMICS
TECHNIQUES IN WATERWAYS

Sasha Jorge

Combined Sewer Systems receive billions of polluted water that can cause it to exceed its capacity and overflow into nearby waterways. It can cause a decrease in biodiversity in our marine habitat due to excessive nutrients being spilled into our waterways. Excessive nutrients can cause eutrophication in bodies of water leading to a decrease in oxygen and impacting aquatic species, which can have an effect on the ecosystem. Sites near CSOs where sediment samples were collected were Coney Island Creek, Spring Creek, Gowanus Canal, Paerdagat Basin, Alley Creek, and Brooklyn Bridge. Additional sites away from CSOs were Black Bank, Little Egg, Hawtree Basin, Silver Hole, Ocean Creek, and Jones Beach. Metagenomics was used to analyze bacteria DNA extracted from soil and the DNA was analyzed using QIIME and PICRUST. R studios and Galaxy databases were used to interpret the DNA sequences that were extracted from each sample site. Even though microbial diversity is important for ecosystem function and potentially for human health we have very little idea of microbial diversity in New York City and no surveys of microbial diversity in marine environment in NYC of any kind. Our results demonstrate that biodiversity closer to CSOs are lower than biodiversity away from CSOs.

TESTING ENVIRONMENTAL DNA TECHNIQUES TO ASSESS AMERICAN EEL POPULATIONS IN THE BRONX RIVER

Jessica Miranda

Conservation of species is important as we have seen many go extinct in the last years. One way to preserve species is to use their environmental DNA (eDNA), DNA that is left behind from shedding skin, hair, fur, and secretions, to determine their habitat and population size. eDNA can be collected from water, soil, or feces, and analyzed using molecular techniques. Applications of eDNA have been tested in mesocosms, closed water systems, and detection of invasive species. To determine unknown habitats of species in open water systems using eDNA techniques, first a known habitat and species is used to find how water flow impacts eDNA. American eels in the Bronx River, an open water system, are used in this experiment. The habitats used are from a previous study by Richard DeMarte, "The Effects of Dams on Densities and Sizes of American Eels in the Bronx River". Water and sediment samples are taken from the known site, and from upstream and downstream. The use of PCR and qPCR on eel eDNA will help in determining the test sensitivity in detecting the presence and density of eels in the field and lab samples compared to the known presence and density, also in how long eDNA can persist in an open water system, and if more eDNA can be found in one type of sample over the other. If these eDNA molecular techniques prove to be useful, then these techniques may be applied to other species in other water systems, and help in the conservation of native species in other water systems.
PLANT ADAPTATION TO ACID PRECIPITATION

Jonathan Morrison & Shanee Wood

Plant damage due to acid precipitation has a significant effect on forest ecosystems and agricultural lands. The phenomenon of acid rain is primarily caused by human industrialization; namely the burning of fossil fuels. Increased soil acidity robs plants of vital nutrients while simultaneously increasing the concentration of harmful nutrients. In some regions where acid precipitation is prevalent, some species of plants have adapted to survive and thrive in the otherwise harmful conditions. Our experiment tested the ability of the species melilotus albus, which grows in regions that experience low acid rain and regions which experience high acid rain, to determine plants ability to quickly adapt to new pH levels.

EFFECT OF EXERCISE ON THE RESTORATION OF THE IMMUNE FUNCTION OF THE ELDERLY POPULATION FROM DIFFERENT ETHNIC BACKGROUNDS

Afua Osei, Tahidul Hossain, Nara Min, Elizabeth Noh (Williams College), Ray Marks, David Ajuluchukwu, Deb N. Chakravarti, Bulbul Chakravarti (York College and Bronx Community College)

Aging is a universal phenomenon and the ultimate fate of all living organisms. There is a well-documented age-associated decline in the function of different physiological systems, including the immune system. Recently, there have been multiple studies by different groups of investigators indicating the beneficial effects of exercise in restoring the decline in immune function associated with disease, as well with normal aging processes. However, the data is controversial regarding different immune functions that can be altered by exercise. Although many promising data are available demonstrating an improvement of immune functioning as a result of regular exercise, no information is yet available about whether ethnic background of the study population is a salient determinant of the effect of exercise on immune functioning. In this retrospective study, we have summarized recent studies (2008-2014) conducted on the elderly by different investigators on the effect of exercise on distinct immune parameters and have summarized the overall findings. Our goal is to determine what exercise protocol can be most successfully applied to improve the impact of exercise on the different immune parameters that commonly decline among aging populations. We will compare whether the same regimen of exercise can improve the immune functions of aging subjects from different ethnic backgrounds equitably, with particular emphasis on aging members of the minority population.

ENVIRONMENTAL STRAIN AND COMPETITION

Edward Purificati, Jenifer Resal & Laura Beaton

What causes a plant to survive in competitive and harsh environments? Our experiment focuses on how plants grow in strenuous environments. We took plants of different species, different genus of 3 different genera (Blanket Flower, Indian Blanket, Sand Coreopsis, Plain Coreopsis). We then put each individual plant into...
their own pots and watched them grow in strenuous conditions (acid, base, and neutral control). Watching the plants grow in these environments we saw a change in color and differences in size for all plants. Some plants died and were unable to survive in such conditions due to the pH of the soil and the over watering of plants which caused them to drown. The surviving plants were then made to compete against plants of the same genus. After we put the surviving plants to compete against one another, we then took the plants of different genus which are not similar in genetic structure and competed them against each other. Our objective was to see what plants can thrive better than others and why?

FINISHING HYBRID ASSEMBLY
**Edward Purificati & Gerard McNeil**
This project focuses on finishing low quality sequences for the Drosophila species (specifically biarmipes) in their dot chromosomes. Using hybrid assembly, which consists of data from Illumina and 454 pyrosequencing, I was able to fix minor issues in the genomic consensus. Specifically mononucleotide runs because of the homopolymer runs that are developed in 454 pyrosequencing. Low quality single nucleotide polymorphisms rarely occur because of the accuracy new generation sequencing contains. Finishing is necessary because when analyzing genomic data, you do not want to study data that is incorrect or faulty in some sort. Finishing fixes mistakes that occur when a gene is sequenced. Once finished with finishing the consensus data that was developed by phred and phrap (programs to determine low quality reads and decides what is the numerical value and accuracy of the nucleotide) the data can be revised and stored in the genomic data bases for further study which is known as annotation. The issue we were trying to solve is the confusion when analyzing the fourth chromosome of the Drosophila melanogaster. It has properties of both heterochromatin and euchromatin. The Drosophila melanogaster is the reference genome because it has been fully sequenced and finished. Finishing the Drosophila phylogenetic tree would allow us to be able to map out what regions changed over time through evolution. We can identify what parts of the genome sequence stands for what.

ENVIRONMENTAL STRAIN AND COMPETITION
**Jenifer Resal, Edward Purificati & Laura Beaton**
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MICROBIAL ADVERSE AND MUTUALISTIC EFFECTS IN THE ENVIRONMENT
Kwadwo Saka
Pollution effects have been attributed to many of the regular activities conducted by humans. On a daily basis lots of wastes are compiled in combined sewer systems which exceeds over capacity and flows directly into nearby waterways such as rivers and oceans. Unfortunately, aquatic species found in these environments are highly affected in numerous ways. The leading effects are accounted for by metagenomics which expands the insight to the functional ecology of microorganisms. Beyond the adverse effects of such conditions, eutrophication becomes a leading factor why specific species have variations and similarities among themselves. Conduction of our research consisted of collecting sediment samples from sites in close quarters of combined sewer overflows such as Coney Island Creek, Spring Creek, Gowanus Canal, Paerdegat Basin, Alley Creek, and Brooklyn Bridge. In addition, samples were also collected from sites distant from CSO such as Black Bank, Little Egg, Hawtree Basin, Silver Hole, Ocean Creek, and Jones Beach. Using a metagenomics approach, DNA samples extracted from the soil we collected from the sites were analyzed using QIIME and PICRUST. Additional tools such as R studious and Galaxy database were used to interpret the DNA sequence of each sample. Despite the adverse and mutualistic effects of microorganisms mainly strengthens the reasons why it is of essence to further observe the cause and effects of the daily functions of microbial.

Biotechnology (BS)

CONSESED IS A FINISHING PROGRAM, WHICH IS USED TO IMPROVE THE FINAL CONSENSUS SEQUENCE OF THE DISTAL REGION OF THE DOT CHROMOSOME OF THE DROSOPHILA BIARMIPES
Kalsang Chhosphel & Gerard McNeil
Drosophila is a great model organism and the fourth chromosome, dot chromosome in Drosophila consists of both heterochromatic and euchromatic regions. The sequence of dot chromosome of D. biarmipes was obtained from the Genomic Institute of Washington University at St. Louis, which is working in collaboration with the Biology Department of York College, CUNY. The sequencing has three main steps: primary sequencing, improvement of the primary sequence that is called Finishing, and lastly, annotating the sequence. The last two steps requires human intervention, thus the objective for our project was to finish the sequenced distal portion of the dot chromosome of the D. biarmipes, DBIA1495004, which was sequenced mainly by the hybrid assemblies, 454 and Illumina. The software program called Consed was used to view, edit and finish the
sequence that is assembled by phrap. Phred determines the quality of bases and the Phred value of above 30 indicates the high quality bases in the final sequenced consensus. The data anomalies such as high quality discrepancies, HQDs and low quality discrepancies, LQDs that are associated with the mononucleotide runs (MNRs), were examined and corrected when thought necessary. Furthermore, the additional data may be collected to close gaps and resolve the low quality regions in the given D biarmipes contig. The editing and tagging were done wherever required to obtain the final improved consensus sequence of D. biarmipes species.

IMPACT OF TRICLOCARBAN (3, 4, 4 - TRICHLOROCARBANILIDE, TCC) ON INTESTINAL MICROFLORA IN MODEL ORGANISM FUNDULUS HETEROCLITUS.
Iffah Chowdhury & Janet Long

Triclocarban (3, 4, 4-trichlorocarbanilide, TCC) is an antimicrobial agent found, along with Triclosan (5-chloro-2-(2, 4-dichlorophenoxy)-phenol, TCS), in a wide variety of commonly used personal care items (1) (2). Failure to be completely removed during wastewater treatment allows TCC to be leached to the environment through effluent wastewater or biosolids (2). This, in turn, leads to bioaccumulation in terrestrial and aquatic organisms and has been shown to have an effect on physiological and biological functions (3). This metagenomic study examines the impact of TCC exposure on the intestinal microbiota of Fundulus heteroclitus, a well-known estuarine fish used as a model organism in toxicology studies, compared to the intestinal microbiota of non-dosed F. heteroclitus specimen. A set of F. heteroclitus specimen were fed TCC laced flake food over the span of 7 days, then sacrificed and the intestine/stomach removed. Bacterial contents from the guts of TCC-dosed specimen and a set of control specimen were extracted using Mobio PowerSoil Extraction kit. Microbial sequencing was performed by Mr. DNA using a MiSeq Illumina method using 16s rRNA gene V4 variable region PCR primers 515/806. The results indicate that there is more bacterial variability within the TCC-dosed fish as opposed to the control group, and also a higher percentage of potentially pathogenic bacteria.

INVESTIGATING PHOSPHORYLATION SITES ON TRNASE Z
Taikchan Lildar, Pratik Rathod & Emmanuel Chang

tRNase Z is part of the metallo-β-lactamase family and is responsible for removing tRNA 3' trailer resulting in its maturation. It was first identified about twelve years ago and is believed arise from a tandem duplication of a shorter tRNase Z found in bacteria and Achaea. Recent studies on using X-ray crystallography revealed a flexible arm (FA) remote from the active site that binds tRNA. The region adjacent to flexible arm has phosphorylation sites that may be involved in regulation. Enzymic digestion and Mass spectrometry analysis revealed phosphorylation occurs at this site and enzyme existed in both phosphorylated and un-phosphorylated state. CDK were used to increase phosphorylation state of enzymes
to investigate potential regulation site and analyzed by protease digestion and mass spectrometry analysis.

DETECTING ULTRASTRUCTURAL DEFECTS IN THE BRAIN OF DROSOPHILA RUGOSE MUTANTS: AN ANIMAL MODEL OF AUTISM
Nicholas Weir, Rita A. Henry (Lehman College), Kelsang Chhosphel, Shao-Ying Hua & Anne Simon (Western Ontario University)

Autism Spectrum Disorder (ASD) is caused mainly by developmental defects in the central nervous system. The defects result in behavioral changes. To explain these developmental defects, biologists have identified several genetic alterations in ASD patients, including disruptions of the gene neurobeachin (Castermans et al., 2003). Neurobeachin is a mammalian protein involved in the regulation of neurotransmitter receptor trafficking in neurons. In Drosophila melanogaster, rugose is the homolog of neurobeachin in mammals including humans. Rugose (protein) is mostly found at the postsynaptic membrane and plays an important role in endo-membrane traffic in neurons. We used Drosophila rugose mutants to probe for any structural changes in the mutants' neuromuscular junctions and synapses in their brains (wild type as reference). Drosophila motor axon terminals are surrounded by subsynaptic reticulum (SSR), a specialized postsynaptic membrane where the sarcolemma is extensively invaginated. Given that autism is primarily associated with developmental changes in the brain, the finding of structural changes in the brain would aid in our understanding of the neuropathological mechanism underlying human autism spectrum disorders. We therefore aim to quantify the structural differences between the mutant and wild-type synapses in the central and peripheral nervous systems.

IMPROVED VISUALIZATION OF MULTIDIMENSIONAL MASS CYTOMETRY DATA
Nicholas Weir, Rawnok Rayeka & Robert O. Duncan

Multidimensional data sets are difficult to visualize and analyze. Visualization has proved challenging to the analysis of mass cytometry data. Mass cytometry is used to characterize cells and diagnose diseases. After cytometry data is obtained from tissue samples, the analysis of many parameters is required to characterize each cell. t-Distributed Stochastic Neighbor Embedding (t-SNE) is a robust multidimensional scaling algorithm for mapping higher-order datasets to lower-order dimensions.1 viSNE extends t-SNE to map high-dimensional cytometry data onto two dimensions while preserving the local geometry of the data.2 Analysis of 2-D or 3-D viSNE can be done in Matlab using cyt, a visualization tool. Interactivity and visualization of data in Matlab is limited. Consequently, we sought to build a bridge between Matlab and a popular game development engine, Unity3d (San Francisco, CA). Our software, tSNE Viewer, provides useful features for the analysis of high-order data sets. Data are imported into Matlab using a script (fcs2unity.m) that conducts t-SNE and prepares data for import to Unity3d. Unlike cyt, tSNE Viewer provides real-time interactivity with data including fast axial
rotation, cell type labeling, and returning expression values for individual cells using a mouse hover function. We are preparing this tool to accept any high-order data set, and we anticipate enhanced visualization will lead to improved data analysis.

FINISHING A SEGMENT OF THE DOT CHROMOSOME OF D. BIARMIPES
Kristin Williams & Gerard McNeil
Bioinformatics is a useful discipline in the sequencing and analysis of whole genomes. This can be done through a series of three steps which include preliminary sequencing, finishing and annotation. This project is dedicated to the finishing aspect of a segment of the genome of Drosophila biarmipes which was sequenced using Next Generation Sequencing using the Roche/454 and Illumina platforms. Drosophila is the most frequently used genus for genetic studies. In particular, the fourth chromosome referred to as the dot chromosome is of special interest because it is comprised of a variety of heterochromatic and euchromatic regions. Our class has partnered with the Biology Department at Washington University in St. Louis in order to characterize this region of the dot chromosome by first creating a high quality sequences from the raw data obtained. The editing tool consed was employed to undertake this task as it was used to finish the 100kb contig of D. biarmipes which was assigned. Consed using its base calling program phred which uses error probabilities to correct the sequence and its assembler phrap to create an improved sequence from the starting data. In order to finish the sequence areas which were thoroughly assessed include: high quality discrepant positions but only mononucleotide run regions were considered problematic for the purposes of this project, low quality of coverage areas were improved where necessary as well as possible gaps were assessed.

Business Administration (BS)

THE GOBAL FINANCIAL CRISIS
Tenzin Chemi
This paper reviews about the drastic changes; the financial crisis of 2008 has bought into the nation. It basically focuses on four specific aspects. The first part of the paper talks about, some of the major types of financial crisis? The paper explains each crisis in details and in sequence of when it happened Dutch bubble crisis, great depression of 1929, Mexican peso Crisis, Asian Financial crisis, and Russian Financial crisis. Second, it explains the causes of why the financial crisis came into existence and how each of the reason paved the way for the crisis. Third, it explains the impacts of the crisis and how it has affected the whole nation. And last, but not least, the paper talks about the solution of how the existing financial crisis can be reduced and how a crisis can be prevented or avoided. The paper concludes with a recommendation and a conclusion at the end.
NAFTA AND THE CANADIAN ECONOMY

Daniel De Castro

The research explored the effects of NAFTA on the Canadian economy in relation to the U.S. and Mexican economies. The focus of this research was on the effects of NAFTA on job creation, economic growth and cheaper and wider variety consumer products in Canada. The research paper has empirical evidence of comparison of the Canadian economy with the U.S. and Mexican economies. The research revealed that, since NAFTA was initiated, the Canadian economy was the only member country that has been impacted more positively than the U.S. and Mexican economies. For instance, evidence found that the Canadian economy has created millions of capital intensive jobs due to a large influx of investments within Canada because of its high educated and skilled work force. In addition, further evidence indicated that the economic growth of Canada has been growing at a faster rate than the U.S. and Mexican economies. This has allowed the Canadian economy to invest more into its economy, thereby creating a better standard and cost of living for the Canadians. Nevertheless, the research also discovered that the Canadian economy has benefited by having cheaper and a wider variety of consumer products than the U.S. and Mexican economies. This is a direct result of the capability of the Canadian workforce and Canada's high industrialized assets, infrastructure and methods. Hence, NAFTA has created a higher level of benefits for the Canadian economy than the U.S. and Mexican economies.

MAJOR LEAGUE BASEBALL CONTRACTS: SHOULD SALARIES KEEP RISING?

Leonel De Leon

Since Major League Baseball started way back in the late 1800's fans have paid to watch their favorite players play the best of the best every summer night in ballparks all around the nation. Since the inception of the Major League Baseball Players Union in the 1970's players salary has risen on average by about five million dollars per year. In this paper I hope to uncover the brutal strength of the strongest labor Union in the world. Back from the 1970's until the year 2014. I look to answer the question why do ball players get paid in the hundreds of millions of dollars and the police officer who puts their life on the line day after day gets paid a very small percentage of that. Should there be a cap on how much money a ball player can earn?

THE IMPACT OF MONETARY POLICY ON THE ECONOMY

Kathia Dedry

A monetary policy can be expansionary or contractionary and these policies have significant effects on the economy. The expansionary monetary policy increases the money supply and decreases federal funds interest rate while a contrationary policy decreases the money supply and increases federal funds interest rate. A monetary policy affects the inflation, output and employment.
CONFLICT RESOLUTION IN THE WORKPLACE. ADMONITION TO MANAGEMENT WORLDWIDE.

Britney Farley
In business organizations throughout the world, multitudes of varying factors strongly influence their success or failure. One factor that can have a lasting influence on whether an organization succeeds or fails is conflict. Unfortunately, conflict in the workplace is often overlooked. Many managers fail to take into consideration the seriousness of ways to control and/or seize conflict. However, it is important that managers realize conflict is unavoidable. It is inevitable that conflict will continuously develop in situations where more than one person is involved. Conflict, if not resolved, can be detrimental to the success of any organization, great or small. It causes division and distractions amongst employees. This leads to lower levels of productivity and efficiency, ultimately having a great effect on an organization's success and profitability. As a result, it is important that managers possess the appropriate skills, knowledge, and ability to properly execute conflict resolution practices. This paper will give an overview of conflict resolution in the workplace, the impact it has on business organizations, and conflict resolution practices that have proven successful in the past.

WHY IS DIVERSITY BENEFICIAL TO A BUSINESS?
Madaive Karim
Diversity is the understanding that every human their own individual differences. Our society is becoming more and more multicultural; therefore the awareness of diversity in the workplace is essential. Diversity is not just referred as to how many minorities a company hires but as the variety of differences of people in the working environment. Diversity is important in a business because a diverse population has different backgrounds, experiences, knowledge and understanding; it is a strategy to increase performance on the job and to attract new employees. Hence it is important for managers and professionals in a business to understand cultural, ethnic and gender differences as it will benefit the business by increasing communication, promote positive relationships and better teamwork. This research will go into further details to show the importance of diversity in the workplace, promotion of diversity, how to manage diversity, its benefits and the legal risks.

STARTING A SMALL BUSINESS
Keevin Mitchell
People start businesses for many reason. They may want to spend more time with family, and starting a business allows them to do that. Some find having a job is exhausting, dealing co-workers, meetings and interruptions. Some people hate answering to a boss all the time,- needing permission to take the day off when they're sick or have urgent matters to attend to. Some people are unmotivated by the security of a regular paycheck and prefer the challenge of the direct rewards or losses that entrepreneurs see from their efforts, like myself. In my paper I will be
talking about the steps of starting a small business and the obstacles, most Small Business face to get off the ground.

FINANCIAL CRISIS OF 2008: CAUSES AND EFFECTS ON THE ECONOMY
Shazad Mohamed
This paper explores the possible causes of the financial crisis of 2007-2008. It talks about the numerous events that occurred before, during and after the crisis hit the financial markets in the U.S. It also explains how the world economy was effected by this whole situation. Market instability was a major cause of the financial crisis. The instability was caused by many things such as a major change in the ability to create new credit. This dried up the money flow, halted the buying and selling of assets and slowed down economic growth. This affected big businesses and financial institutions in a negative way in that they were stuck with holding mortgage backed assets that had a major drop in value. And they weren't having the sufficient income of money needed to pay for the loans. This forced them to use up their reserve cash and it limited their credit and the ability to make new loans. Other factors that led to market instability included the low value of credit which made it easy for people to make investment decisions and buying houses based on their common knowledge alone. The low value credit created money in the system and people wanted to spend that money. Sadly, everybody wanted to buy the same thing which caused an increase in demand and this created inflation.

THE EFFECTIVENESS OF FINANCIAL REPORTING
Roseline Onyile
This research paper focuses on the effectiveness of financial reporting. Will the enhanced financial reporting system after the 2008 financial crisis protect the United States financial system? Will it be the same or are we heading for crisis worse than the one we have just experienced.

THE UNITED STATES HOUSING BUBBLE COLLAPSE
Vishwamitra Persaud
The purpose of my research project is to ascertain as to whether or not the U.S has truly recovered and to see if it will be possible for potential homeowners to get affordable housing and decent prices and rates. The project will also serve to show who the blame falls upon for the housing collapse and just how much of it falls upon the people, the banks and financial advisers. I will also go onto the specifics as to how and why the market collapsed in the first place and what measures were put in place to fix it and to prevent another collapse form happening again.

ARE MONEY GROWTH AND INFLATION STILL RELATED?
Elora Rahman
In this paper, I examine the relationship between money supply M1 and inflation rate by using time series associative forecasting model and historical U.S. data from 1970 to 2014. In particular, I examine the linear relationship between money
supply M1 and inflation rate. Also, I examine the other variables such as the economic indicators PPI and unemployment rates to see the direct relationship to inflation. There are many variables which causes inflation. Higher inflation leads to lower economic growth. Increase in money supply can be a cause of inflation. I examine data to determine the correlation and causality between money supply M1 and inflation. The relationship between money growth and inflation are linear.

THE BUSINESS CYCLE - EFFECTS AND IMPLICATIONS
Barat Ramlall
This paper talks about the business cycle of a nation’s economy. The decisions made by a country can have a positive or negative effect on the nation’s economy. This paper also compares the decisions made by the fastest growing nations to the United States and its effects and implications.

THE BEHAVIOR OF INTEREST RATES IN THE UNITED STATES
Starlin Seijas
This research looks at the behavior of interest rates in the United States, what causes it to fluctuate, weather it is to increase or decrease, and how it affects the economy and the supply and demand of financial resources. Weather it is as a fee for the borrower or income to the lender, interest rates have been present for longer than we may think. Other aspects that will be analyzed in this research are: The types of interest rates, the effect of inflation on interest rates, taxation of interest income, government intervention and its effects on short and long term interest rates, events that have had a big impact in the economy and therefore interest rates, as well as many other topics concerning interest rates in the United states.

REGULATIONS IN THE BANKING INDUSTRY
Natasha Singh
Regulations in the banking world are crucial to the success of any bank. Bank regulations protect its depositors and consumers; it, also, ensures financial and monetary stability. This paper aims to determine whether past and current regulations in the banking industry are sufficient enough to prevent a crisis. When regulations lag behind the innovative products of a bank, crisis will occur. For this purpose, the collapse of the Lehman Brothers Industry, along with the international Libor scandal, will be the foundation of illustrating the incorporation of weak regulations within the banking industry. In addition, domestic and global regulations will also be evaluated to determine whether a correlation exists. Bank failures can be prevented with the inclusion updated and reformed regulations. This is vital to growth of the economy; if banks fail, the economy fails.

DISCRIMINATION IN THE WORKFORCE
Soraya Williams
Research on workplace discrimination has clarified the importance of educating ourselves on how to identify discrimination and also what steps we would need to
take in the event we ourselves or someone we may know becomes a victim of this illegal act. We are now able to exercise our rights and feel safe and confident knowing that there are options for all situations. Previous studies have shown discrimination has been an ongoing issue for decades and still goes on today, especially in the workplace. Although there are federal laws that protects us from discrimination, thousands of victims choose to remain silent and as a result the continuance of discrimination goes on. It is not well understood why these acts take place, there are so many different elements connected to workplace discrimination. My research contributes to a better understanding of these acts by providing clarity of what discrimination is, who are being discriminated, where it is taking place and what steps we would need to take in order to proceed with a discrimination case. The EEOC is a federal agency responsible to enforce laws against workplace discrimination and continues to assist helpless victims. The analysis in my research reveals statistics of the top 4 states to report workplace discrimination. These numbers prove that this is a serious matter in which needs to be attended to and it starts with us. The findings suggests the importance of awareness, prevention and elimination of workplace discrimination.

THE GLOBAL FINANCIAL CRISIS: CAUSE, EFFECTS & SOLUTIONS
Donna Williams
This research focuses solely on the Financial Crisis of 2008. The causes that led up to the horrific events and what this means not only for the country but the world. This crisis not only effect the United States, but also conflicted with Europe and Asia's economy, digging a hole that seemed like it would take forever to get out of. Following the cause and effects of the stock market crash, there are many theories as to how the world will recover from such a catastrophic day in history. This research also provides an overlook on the role that banks played during the recession and the solutions that were found to get the U.S. economy back in order.

Chemistry (BA-BS)

ENTROPY OF CDK/CKS PHOSPHORYLATION SITES IN HIV-RT
Peter Conaty
The amino acid sequence of a protein dictates its ultimate 3D shape. Proteins that are in the same family will share many of the same 3D features, specifically in regions that are key to the function of the protein, and therefore the same amino acid sequences in those regions. In a protein that shows a high level of mutation, it is important to see how conservative these regions are in order to fully understand how they operate. The Human Immunodeficiency Virus Reverse Transcriptase (HIV-RT) is known to mutate at a fairly high rate making treatment difficult. One avenue being examined is the cyclin-dependent kinases (CDK) and the cyclin-dependent kinase regulatory subunit (CKS), which are phosphorylation sites in HIV-
RT. Knowing the conservation of these sites will allow new research to focus on blocking the CDK/CKS sites, stopping the virus from replicating.

Community Health Education (BS)

HEALTH KNOWLEDGE, ATTITUDES, BEHAVIORS AND PERCEIVED QUALITY OF CARE AMONG SEXUAL MINORITY WOMEN IN NEW YORK CITY

Malika Jones, Vicky Rajcoomar

Background: Sexual minority women (self-identified lesbian and bisexual women, same-sex attracted women and women who have sex with women) have long been underrepresented in the public health literature. Methods: Data for this study were collected via a street-intercept survey with a convenience sample of 203 SMW in New York City during pride events in the summer/fall of 2014. Results: Preliminary findings suggest that risk factors among SMW previously documented using secondary data may also exist in a similar sample of women in NYC using these primary data. These data included the following: Health Care Providers: Sixty percent reported receiving care from a primary care provider (PCP), while 18% reported not having seen a health provider in the past year. 18% percent of those not having received health care reported lack of health insurance as the reason. Sixty-two percent said their PCP knew of their sexual identity or behavior. Routine Health Care: Forty-four percent reported they rarely or never conducted a breast self-exam (BSE) and of those, 58% said they don't know how or they didn't know they were supposed to. 20% indicated they did not receive gynecologic care in the past year and of those, 75% reported they didn't have health insurance, didn't know where to go or thought they didn't need it. Conclusions: These data illustrate the need for further research on the health behaviors and health outcomes of SMW.

HEALTH KNOWLEDGE, ATTITUDES, BEHAVIORS AND PERCEIVED QUALITY OF CARE AMONG SEXUAL MINORITY WOMEN IN NEW YORK CITY

Vicky Rajcoomar & Malika Jones

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Computer Science (BS)

IMPLEMENTING REALISM WIRELESS SIMULATIONS
Mahmudul Hasan, Christian Barona (CCNY), Shweta Jain & Nicholas Madamopolous (CCNY)

In wireless network simulations statistical models are used to represent radio frequency (RF) propagation and impairment due to the indoor environment such as presence of obstacles and effect of multiple paths through which signal propagates. However, model based simulation fails to capture correlation of signal powers received at two receivers that are close to each other. Experiments have shown that co-moving receivers experience highly correlated RF impairment and hence received signal powers are more correlated compared to those who are away from each other. We observe that wireless networks simulators are lagging behind in the realism at the physical layer to avoid the computational complexity. We propose to start from first principles and build a simulator that uses an approximation of Ray-Tracing to construct the realistic signal-space characteristics of received signal envelope. Our technique, produces statistically similar results for single tx-rx settings, does not add much compute cycles in a simulator and yet comes close to reality by modeling spatiotemporal correlation of RF propagation in indoor environments.

TRAVERSING UNKNOWN AREAS WITH ARTIFICIAL INTELLIGENCE
Christopher Look & Deven Thiel

The research is to create an intelligent object to explore its environment to find a target. The intelligent object that can learn from its past movements to find goals more efficiently by its experience. The object will be limited, initially in movement to the four cardinal directions, and will have a user defined view range. It will then traverse an area that it has no data for, and will create a map of collected data on that area as it attempts to find a target. Based on its current data it will travel though known locations efficiently by the least number of steps then continuing on with the unexplored area. Currently, we are studying and implementing three algorithms the "Ant Colony system", "Fuzzy logic and Minimal risk method" and the "new genetic algorithm" (see reference for more details). Once we have successfully implemented all of these algorithms in the Cartesian plane, we would like to expand this idea into a more open world. This would involve removing the movement restrictions, allowing its movement to be modeled by vectors, and to choose a resolution for map approximation based on case and need. The
motivation for this research is to gain experience in successfully researching and solving a problem, as well as to address a genuine interest in this field. While our results may not be groundbreaking it will further our own abilities and experiences in a field with many real world applications, possibly leading to something great in the future.

CONNECTING THE DISCONNECTED THROUGH GEO-SOCIAL NETWORKING
Arban Nichols, Cuiyan Wang (Graduate Center), Khaiel Younis, Curtis David, Kesh Seeram, Harpreet Singh, Damian Lajara, Tomas Rondon, Jamar McDuffie, Nkemjika Alimole & Chris Look
Stable Internet connectivity to mobile devices is key to this day and age since 55% of online traffic is composed of smartphones and tablets along with their programs and applications. Current networking protocols are designed on the premise of a continuous connection between nodes. Such is not the case for mobile networks where intermittent connection is the norm. The constant latency in connection leads to less than optimal device performance and insufferable quality of service. This research is focused on creating smartphone applications on Android devices that work well under intermittent connections in the hope to inspire better application design for the future.

ANDROID APP USING WIFI DIRECT
Keshwar Seeram, Damian Lajara & Harpreet Singh
Overview: MobilityFirst is a novel clean slate redesign of Internet protocols Optimized for mobility and content All entities on the Internet have unique global names Names can be mapped to network addresses based on the point of attachments of the entities.

ENGAGING UNDERGRADUATES IN RESEARCH THAT SPEAKS THEIR LANGUAGE
Khaiel Younis & Curtis David
The basis of this research was to conduct research on connect mobile devices and tablets without the current infrastructure of the Internet, by using android applications. This was done by using the Mobility First API (application programming interface) which provided connectivity in disconnected areas. We did not accomplish the goal unfortunately, however we took a different approach to serve as proof of concept and application design. We created an android application called OnSight, which is designed to create and share content. The application is centered on content sharing. OnSight has four main functions. The first is to generate the GPS of the given device and print out the zip code and County on the bottom left and right of the main page. Secondly, the application used the zip code and county code integrated it into the naming convention of the image when it is saved. Thirdly, upon user request, upload the picture to dropbox into a shared folder that all the application users can access and share images. Finally if two users have Onsight on their devices, they could send pictures to one
another via Wi-Fi direct. There was only one drawback with using Wi-Fi-direct. Whoever initiates the sending can only send and will not be able to receive any images in return. Due to time constraints we could not fix this issue to send content multi-directional.

**Economics (BA)**

**POVERTY IN NEW YORK STATE (1970 - 2013)**

**Deoanand Deodat**

The purpose of this research is to analyze and identify why many citizens in New York State are poor and its contributing factors. With the help of online sources and data bases, this research provides background information on its chain of events and how its victims are affected. By understanding the problem, we can prevent a lack of education and compounding effects within the five boroughs from spreading. While many adults and children are undergoing such difficulties, it is recommended that government should fund new based programs and create new jobs to those who are in need.

**WHAT IS DRIVING THE CURRENT LOW INTEREST RATE IN THE US?**

**Sarah Stainback**

Interest rates control a multitude of things in our daily lives. Interest rates, as well as inflation, affect the cost of borrowing money for school, getting an automobile loan or securing a mortgage to buy a house. Interest rates and inflation also have an effect on prices. If interest rates rise, consumers are forced to pay more money for products. A rise in interest rates also have positive effects for some people. Savers are able to save more money since they will receive a higher return. However, people who invest money are less likely to put their money in the stock market, preferring to do something safer like putting their money in a Certificate of Deposit, since the stock market is risky. There are many determinants of interest rates. They include supply and demand, inflation, government, the type of loan and the time period (long vs. short term). All of these determinants affect the interest rate you pay and whether that rate will rise or fall. It is beneficial to know why interest rates are so important. Not only do interest rates dictate consumers' borrowing costs but they also impact capital flows. From history we know that in times of war and during Depressions/Recessions that interest rates remained low until the economy improved. With the determinants listed above, the fact that the United States still has troops overseas and is trying to recover from a Recession we will continue to see low interest rates in the United States in the forseeable future.

**IMPLICATIONS OF YOUTH UNEMPLOYMENT IN NEW YORK**

**Belva Tatum**

This research looks at the implications of youth unemployment in one of the world's major cities, New York City. It is centered around youth ages, 15-24 years
old, from 2004 - 2014. It examines current & past government policies to aid youth and discusses which policies have failed and which were successful. The results of this study can be used to improve the current crisis concerning youth unemployment in New York City.

**Environmental Health Science (BS)**

**COMPUTATION OF SPECTRAL AND SPATIAL ATTRIBUTES FROM HIGH RESOLUTION SATELLITE DATA**

*Leroy Brown*

The continuous growing of urban cities requires proper management of resources that demands spatial and spectral attributes which gives information about terrestrial target objects. The paper describes innovative methods of extracting target objects from worldview-2 MSS Dataset over the Bronx Borough in New York. Spatial and spectral attributes were computed to build algorithms that were used to extract different sets of target objects from the imagery. The algorithms were tested on a study area and the accuracy of the classification was estimated using the confusion matrix model. Results show that several target objects from urban areas such as the Bronx may be extracted in near-real time from satellite data. The approach described in the study may be applied to any geographic region that has similar characteristics to the Bronx.

**MICROBIAL MOBILIZATION FROM URBAN SOILS TO ADJACENT LAKES AND PONDS**

*Urmi Das & Oboerhiri Emofovwah*

Anthropogenic activities cause an increase of organic materials and nutrients and this poses a serious threat in urban environments. The densities of fecal indicator bacteria (FIBs) in the urban area exhibit a clear land-use dependency in the natural water and are often linked with nutrient inputs. Data from preliminary investigation indicated elevated FIBs in soil and water of a NYC lake even in the winter. Very few studies on mobilization of FIBs in natural water from surrounding soils were reported in NYC area. In an attempt to study temporal and spatial bio-geochemical dynamics of both fresh water lake and pond environments, the study was done in two fresh water lakes and two ponds that vary in terms of recreational activities and different environmental settings. This study focused on environmental research to improve understanding of FIBs transport processes in the environmental system which is a critical aspect of decision-making in risk assessment, and remediation strategies. Preliminary results were found to exceed the EPA permissible limit for FIBs with average counts of 714, 28 and 35 MPN/100mL for total Coliform, E. coli and Enterococci respectively. Soil microbes showed a wide range of counts from 800 to 80,200 counts/kg for total Coliform.
OPTIMIZATION OF A SPECTROPHOTOMETRIC METHOD TO DETERMINE AMMONIA IN GROUNDWATER TO UNDERSTAND THE ARSENIC AND MANGANESE OCCURRENCE IN AQUIFERS OF CHITTAGONG, A RAPIDLY EXPANDING COASTAL CITY OF BANGLADESH

Sasha Heralall

While serious health effects due to elevated arsenic (As) consumption have been documented in several South Asian countries, the source and mechanisms of As mobilization in aquifers remain poorly understood. In the study area of Chittagong, Bangladesh, the northern part of the city is a part of Anticline associated with Tertiary aquifers and the southern part of the city is plain land associated with Quaternary aquifers. Preliminary studies have reported elevated As and manganese (Mn) in those aquifers. However, as to date, no hydro-geochemical study has been conducted to understand the geochemical processes that control the As distribution in groundwater. This study reports the ammonia concentration in a set of 9(nine) groundwater samples collected from both and shallow aquifers of Chittagong area. The preliminary results showed high level of ammonia is associated with elevated level of As and Mn, suggests that reducing condition may control the As and Mn release in groundwater. The study is in progress to improve the understanding of detail geochemical processes.

TEMPORAL VARIATION IN GROUNDWATER CHEMISTRY OF UPPER GLACIAL AQUIFER

Michael Latif

Groundwater nutrient concentration in the urban areas to some extent can exceed the EPA permissible limit and thus pose a threat to public health. The Upper Glacial Aquifer of Long Island consists of a layer of stratified sediment, which underlies Kings, Queens and Nassau Counties. Previous pumping of water from this aquifer resulted in encroachment of salt water and other contaminants into the aquifer. In an attempt to study hydro-geochemical dynamic, the study aims to investigate temporal variation of physical and chemical properties of groundwater. The study utilizes data gathered in situ through two USGS well (N40o42'12", W73o47'36") located in the vicinity of York College, Jamaica, NY at the depth of 50 ft. Results showed the minimal fluctuation in groundwater level with an average hydraulic head of 24.8 ft. Physical parameter including temperature, pH, salinity, conductivity, and ORP (oxidation reduction potential) are 17.7°C; 6.44; 0.76 ppt; 1293 Î¼S/cm and 108 mV respectively. High level of nitrate (45.7 ± 9.5 ppm) with significant fluctuation compare to low nitrite (1.2 ± 1.0 ppm) and non-detectable ammonia is consistent with positive ORP value. The water is indeed limited by the phosphate and always below the detection limit of chemetrics Vacu-vial colorimetric method. The Study also investigated the presence of fecal indicative bacteria in the water to understand the surface water intrusion in the aquifer from sewage system during the storm.
BEACH SAND COMPOSITION: A COMPARATIVE STUDY BY USING PRE-AND-POST HURRICANE SANDY DEPOSITS, ROCKAWAY, QUEENS, NEW YORK CITY

Barbara Barnett

This study involves sedimentological and mineralogical investigation of representative beach sands collected from Rockaway beach, Queens, New York City in order to assess the difference in grain size and compositional variability due to the pre-and-post Hurricane Sandy-dominated environmental setting. Geologically, it is very significant to determine the grain size and composition of sands in order to trace their origin and establish the depositional environment as well. Preliminary conclusions based on grain size data from representative sand samples display an apparently anomalous grain-size frequency between the pre-and-post Hurricane Sandy influenced sand deposits. Pre-Sandy deposits are better sorted and moderately oxidized due to the prolonged shoreline depositional processes. Post-Sandy deposits are moderately to poorly sorted and very often display dominance of medium to coarse sand compared with pre-Sandy deposits. Detrital quartz associated with both pre-and- post Hurricane Sandy also displayed marked textural and weathering phenomena. Most of the representative samples obtained from pre-Hurricane Sandy had well-rounded quartz grains, whereas post-Hurricane Sandy had a greater proportion of mixed quartz fabric including subrounded to rounded grains and a preponderance of freshly broken shell assemblages. To draw a more conclusive and sedimentologically viable explanation, further mineralogical and geochemical investigations are underway.

ENVIRONMENTAL AND MINERALOGICAL VARIATION IN THE UPPER SILURIAN TO LOWER DEVONIAN FORMATIONS IN ROSENDALE, ULSTER COUNTY, NEW YORK.

Tenzin Choeying & Fayeola Daniels

The town of Rosendale area of southeastern New York is worldwide known as the home for the superior quality natural cement in North America where the North American natural cement industry sustained for over 150 years. The excellent bedrock exposures within the mines of the Rosendale region also attracted the attention of numerous nationwide geoscientists to explore the complex sedimentary structures and geochemistry of the different rock units. The formations in the Rosendale area range from Ordovician to Devonian in age. The Acadian and Taconic orogenies resulted in deformation of the units in this area. Dolostone from the Rosendale and Whiteport members of the Upper Silurian Rondout Formation was used in the production of natural cement. The oldest geologic unit exposed near Rosendale is the Middle Ordovician Martinsburg Formation, locally known as Hudson River shale and the youngest one is the Esopus shale formation. Each formation has its own unique characteristics and details that indicate the different depositional environment. The area had gone through two orogenies and is filled
with fault, fold, lineation. The thickness of the formation varied from place to place. The study aims to explore the elemental variation and mineralogy of the different units by using handheld XRF (x-ray Fluorescence spectrometer). Elements such as Ca, K, Sr, Rb, Zr and Fe can shed light on different paleo-environment under which the formations were formed.

IMPACTS OF URBANIZATION ON SOIL QUALITY AND SUBSURFACE ENVIRONMENT

Fayeola Daniels, Tenzin Choeying & Fatema Noor (Queens High School for Sciences)

The subsurface environment including soils have two basic functions: store and transmit water, and this means that it serves as a reservoir and a conduit system. In this study, we investigated both unsaturated sediment zone in upper glacial aquifer (up to 120 cm) and top soil zone (up to 45 cm) of various parks in Queens County of New York City, NY, USA. For monitoring properties of the upper glacial aquifer, augur samples with multiple sections were collected from two spots next to two of the three monitoring wells completed by USGS (United States Geological Survey) at in the far corners of the York College parking lot and for soil characterization, at least one 45 cm core with multiple sections were collected from New York City Parks including Corona Meadow park, Bowne Pond park, Oakland lake Park, Baisley Pond park, Idlewild pak. The 15 cm sections were dried and sieved for the grain size distribution to obtain the hydraulic conductivity. A portable field tension infiltrometer was also used to understand the soil hydraulic conductivity and infiltration rate. The preliminary data showed wide distribution of chemical elements in the samples. These physical and chemical properties of soils and subsurface materials are very critical to provide additional strength to existing environmental data and thus to help assessing and managing the current flooding problem and contaminant transport in south east Queens of New York City.

TRACE ELEMENTS DISTRIBUTIONS AND GEOCHEMICAL SIGNIFICANCE OF REPRESENTATIVE SOIL SAMPLES, NORTHERN GATEWAY NRA, NEW YORK CITY

Fayeola Daniels & Tenzin Choeying

As a continuation of this two year project that was initiated on The Gateway National Recreational Area (NRA) in May of 2014, new geochemical data became available to the authors and provided opportunity for refining some of the previous work. The Northern sites that are adjacent to the Pennsylvania Ave and Fountain Ave Landfills were sampled, monitored, and analyzed for heavy metal loading last year. The objective of changing the location is to cover all the surrounding parameters of a potential point source of heavy metal loading (if present) that have the capacity of contaminating the soil of one of New York's highly populated residential areas. Current sedimentological data reveal higher percentage of finer sediment size with no specific trend. Furthermore, heavy mineral separation data illustrates a ~15% increase of heavy materials within four different sites that follow
a uniform trend of depth 30-60 cm. XRF results of the soil samples shows large spatial variation (50 to 150%) in Cl, K, Ca, Fe, and Mn with average concentration of 1.3%, 2.1%, 1.7%, 3.4%, 1297 mg/kg respectively. Further analysis will include grain mounted thin section to closely quantify the mineralogical composition of the sediment and correlation to the previously obtained data.

**HEAVY MINERAL INVESTIGATIONS OF REPRESENTATIVE BEACH SAND, SANDY HOOK, NEW JERSEY**

*Timothy Fraser & Kyla Seereeram*

Sandy Hook is a 7 mile, 1,665 acre barrier island that is located between the Atlantic Ocean and the Raritan Bay along the Atlantic Coastal Plain. The barrier island has changed much since it was first formed. Since the last ice sheets covered North America, the New Jersey shore line has undergone approximately 80-90 miles of easterly movement. The research conducted by the investigators included sample collection and laboratory work at York College. Laboratory work included grain size analysis, heavy mineral separation, and identification of mineral grains. Twelve samples were collected for this research. The data was represented graphically and statistically. After the initial heavy mineral separation, it was determined that the minerals with low specific gravity, are composed predominantly of quartz and high specific gravity minerals were predominantly Magnetite, Tourmaline, Epidote, Zircon, Rutile and Garnet. The heavy minerals were aggregated on the surface of the beach when the samples were collected in March. This is due to wind blowing across the beach during the winter months. The sediments are composed mostly of medium grained sand and range between 0.4 and 0.2 mm. Sample sites 1 and 2, however, were mostly of pebble and gravel sized sediments. These two samples were closest to the water's edge. Preliminary sedimentological and compositional data suggest that collected samples were initially derived from reworked Cretaceous and Tertiary sediments.

**INVESTIGATION OF NUTRIENTS AND HEAVY METALS DYNAMICS DUE TO ABUNDANT POPULATION OF EARTHWORMS IN SOIL OF CENTRAL PARK, NY**

*Monia Salam*

Degradation of soil quality is one of the most serious and public health problems facing human society. Although it is true that earthworms are required to maintain the soil quality naturally. However, scientists in the Northeast are reporting a real problem with earthworms. The invasive worms are destroying the rich carpet of organic matter on the topsoil floor and may be causing a major shift in the delicate balance between the soil and the plants and the animals that need it to live. In recent years, abundant population of earthworms was found in Central Park (40.78°N; 73.97°W) area, New York. This study aims to understand the dynamics of soil quality in the topsoil horizon by investigating the nutrients level and heavy metals concentration in the soil. This preliminary results report the soil moister, organic contents, nutrients level and heavy metals in a set of top soil cores collected from seven locations of Central Park Area near the lake.
COMPOSITIONAL ASPECTS ASSOCIATED WITH BEACH SAND DEPOSITS:
ROBERT MOSES STATE PARK, LONG ISLAND, NEW YORK
Monia Salam
Preliminary sedimentological investigations involving grain size distribution, grain shape, mineral composition, and trace element concentrations associated with recent beach sand collected from Robert Moses State Park, Long Island, New York were carried out on several representative samples to characterize the sand and highlight depositional environments. Robert Moses State Park is located on the western end of Fire Island, outside of the boundaries of Fire Island National Seashore. Geologically, Robert State Moses Park is part of greater Fire Island coastal province. Fire Island is a narrow barrier island protecting the south central coast of Long Island from Atlantic storms. The barrier island stretches for 32 miles, bounded by Moriches Inlet to the east, and Fire Island Inlet to the west. Nowhere is the island wider than a mile. At some locations along its eastern and central portions the width can be as little as several hundred yards (USGS, 2014). Most of the analyzed sand samples displayed coarse to medium-grained and well-sorted population with dominance of well-rounded quartz particles. Apparently there is evidence of lateral fractionation of heavy minerals and shell materials due to longshore transport since most of the samples located distally are enriched in fragmented shell components and subrounded to angular detrital quartz grains.

STRUCTURE AND TECTONICS INTERPRETATION OF THE MID-PALEOZOIC ROCKS, ROSENDALE, ULSTER COUNTY, NEW YORK
Brian Velez
The Upper Silurian to Lower Devonian strata outcropping in the Town of Rosendale, N. Y. were significantly folded and faulted during the Acadian Orogeny (Ca. 416 to 359.2 million years ago). The deformed structure is characterized by highly asymmetrical to overturned anticlinal folds and imbricate thrust faulting. The folds plunge NNE. The Upper Silurian Shawangunk Conglomerate and the High Falls Shale unconformably overlie very thick deposits of Martinsburg Shale (locally known as Hudson River Shale). The Shawangunk Conglomerate, a very well indurated quartz pebble conglomerate, thins from south to north in the study area. In the northern part of the study area the Shawangunk Conglomerate does not outcrop and there the High Falls Shale is in direct, unconformable contact with the Martinsburg Shale. The authors have observed that the axis of the plunging anticline north of the northernmost extent of the Shawangunk Conglomerate is not parallel to the axes of the plunging anticlines in the southern part of the study area where the Shawangunk Conglomerate occurs. The authors have also observed rock units in the southern part of the axial area of this anticline that are younger than the rock units in the axial area of the northern part of this same anticline. Since the folds are plunging to the north, one would expect to see only older units as one looks farther south along the fold axis.
Music (BA)

LIBERTY AVENUE PRODUCTIONS PRESS CONFERENCE
Mark Arias, Daniel Civiline, Bayo Fayemi, Gabe Grassia, Kemba Lodescar, Steven Morris, Eric Normil-Mendez, Nick O'Brien, Marc Reddick, Jonathan Rodriguez, Fernanda Vilela & Nate Woart
Students from this spring’s Music Industry course will hold a press conference announcing the inaugural release by the newly-formed New York Avenue Records. The forthcoming compilation of new, original music by York College students includes styles of music ranging from jazz and R&B to hip-hop and metal. Excerpts of the compilation will be showcased and the musicians featured on the compilation will talk about their music and answer questions in preparation for their album release event on Tuesday, May 12th.

Nursing (BS)

INCIDENCE OF HYPERTENSION AMONGST COLLEGE STUDENT
Olayinka Oladipupo & Sadaf Ahmad
According to the World Health Organization (WHO) (2012) globally, nearly one billion people have hypertension/high blood pressure. The cost of hypertension/high blood pressure in the United States is about $47.5 billion each year. This total includes the cost of health care services, medications to treat hypertension/high blood pressure, and missed days of work (Mozaffarian et al, 2013). Hypertension/high blood pressure is an asymptomatic disease that is usually not easily detected. There have been several studies focusing on the incidence of high blood pressure in the adult population but few studies have focused on the young population. Several previous studies (Roberts et al. 1999, Steiner et al. 2003, Lee & Loke 2005, Desai et al. 2008) indicated that college students exhibit behavioral health risks, such as tobacco use, alcohol, substance abuse, improper diet, and physical activities, obesity and being overweight are also on the rise among college students. With this in mind this project will study the incidence of hypertension/high blood pressure amongst college students. The sample size will consists of randomly selected College students. A survey was made to provide information on such as age, gender, ethnicity, stress level, family history of hypertension/high blood pressure and other chronic diseases, dietary habits and restrictions, alcohol and tobacco usage. BMI values for each sample will be determined and correlations between risk factors will be analyzed.
DOES THE USE OF TECHNOLOGY HAVE AN EFFECT ON NCLEX PASS RATES IN GENERIC BACHELOR DEGREE NURSING PROGRAMS WITHIN THE CITY UNIVERSITY OF NEW YORK?

Padmanabha Rao, Nawrin Shabnaz, Liji Rajan & Carlos Velasquez

The passing of the nursing's National Council licensure Examination (NCLEX) is dependent on critical thinking, knowledge, utilization of skills and the ability to problem solve. To assist in the development of confidence, comprehension, and proficiencies in nursing students, some colleges have selected to incorporate the use of different technology modalities. The purpose of this study was to see if there is correlation between nursing National Council Licensure Examination pass rates and the use of selected technology modalities used in three bachelor's degree nursing programs within the City University of New York. Technology modality under review for this study includes adaptive learning systems and virtual reality simulations. The data collected for this study used a qualitative approach that involved interviewing the faculties of the three selected nursing programs.

Pharmaceutical Sciences (BS)

STUDIES ON HEPATIC PROTEIN MODIFICATION BY ADVANCED GLYCATION END PRODUCT IN TYPE 1 DIABETES IN MICE

Tahidul Hossain, Afua Osei, Nara Min, Elizabeth Noh (Williams College), Bulbul Chakravarti (York College and Bronx Community College) & Deb N. Chakravarti

Type 1 diabetes (T1D) is a chronic autoimmune disease which leads to gradual loss of functions of different vital organs of the body. Several T1D associated pathology have been observed in the liver. Advanced glycation end products (AGEs) are known to play an important role in pathophysiology associated with diabetes and other diseases. The purpose of the present study was to find out protein(s) modified by AGE in T1D with specific reference to differential AGE modification of protein(s) in the T1D liver compared to that in the non-diabetic liver of C57/BL6 male mice. Proteins from the liver of T1D and non-diabetic (C57/BL6 male) mice were separated using sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE) and electroblotted onto nitrocellulose membranes. Protein(s) undergoing AGE modification was identified by immunostaining (Western blot analysis) using anti-AGE antibody. On the SDS-PAGE gel, one protein band of approximate molecular weight 65 kDa was identified as the major protein that had undergone AGE modification. It was present in both T1D and non-diabetic (C57/BL6 male) mice. However, quantitative image analysis of this band showed that there was no significant statistical difference in the AGE modification of protein(s) present in the liver of T1D mice compared to that in non-diabetic mice. We thus conclude that AGEs may not play an important role in the pathophysiology of the liver associated with T1D.
Physics (BS)

KOM (KEEP OUT MOSQUITOES) PROJECT: ANTHROPO-PHILIC TERRAFORMING AND MANIPULATION OF LANDSCAPES FOR MOSQUITO VECTOR CONTROL IN MALARIA DISEASE MANAGEMENT AND ERADICATION
Salim Gnabode, Sangeeta Jadoonanan, Tahseen Tabassum (StonyBrook University) & Aerren Kublal

The ongoing KOM Project is researching how to construct affordable and sustainable mosquito-free zones, in malaria endemic sub-Saharan Africa and elsewhere. Mosquitoes are vectors for several diseases malaria, Chikungunya, dengue fever, lymphatic filariasis (elephantiasis), Ross River fever, West Nile virus disease and yellow fever. Isolating mosquitoes from hosts also breaks disease transmission. In summary, KOMKOM: Keep Out Mosquitoes = Keep Out Malaria KIMKIM: Keep In Mosquitoes = Keep In Malaria. So, one wants to re-engineer habitations as bio-zones on the landscape scale \( O(1) \text{ mile} \): Mosquito-free zones (MFZ), KOM enclosures; Mosquito-confinement-containment zones (MCZ), KIM enclaves. A KOM (KIM) enclosure is a mosquito-impenetrable wall surrounding an area, deployed permanently or seasonally in a rural or urban setting. The barrier is augmented with a distribution of BTK (bait-trap-kill) units. Mosquitoes can then be subjected to herding, destruction or entomological assessments. Currently, the Project is in the concept development stage, and is specifying and prototyping subsystems: KOM (KIM) walls, fringes: skirts and collars; BTK units; airlock technology for entry-exit ways; and automating vector destruction. The companion MedizDroids Project is researching UAVs, drones and multi-copters as mosquito control drones for vector control, that can exploited to eliminate mosquitoes from KOM (KIM) zones.

Political Science (BA)

PROTEST MUSIC AND EMERGING THEMES DURING THE CIVIL RIGHTS MOVEMENT
Judea Hartley & Robin Harper

I examine and research social upheavals that occured during the Civil Rights Movement. Furthermore, I dissect different definitions of protest music and create a correlation between the definition of protest music and what songs actually match my choosen definition.

WHAT FACILITATES OR LIMITS THE INTERNATIONAL TRAFFICKING OF WOMEN?
Judea Hartley & Michael Sharpe

I have researched the main elements involved in regards to the sexual expolitation of women, supply and demand, the under ground market, and the sectors within
immigration. I also examine how other countries are affected by immigration and the trafficking of women.

THE RISE OF NATIONALISM IN ASIA

Akshar Patel

In the age of globalization, the emerging markets of Asia have become a vital part of the world economy. The growing importance on the global markets of India, China, and Russia has placed on importance on the domestic politics of these nations. The research focuses on the role of nationalism in formulating national policies by examining the uses of symbolic politics in these three countries. The research examines how symbolic politics are used in order to further territorial, religious or, ideological agenda of these nations. These three states may not exhibit symptoms of traditional ethnic nationalism; however there are elements present that are vital in understanding their national agenda and its potential impact on the international system.

Psychology (BA)

THE ROLE OF GENDER AND ETHNICITY IN SELF-DISCLOSURE

Khursheda Alam & Kristin Davies

Studies have shown that men tend to avoid emotional closeness with their male friends and are more willing to disclose to strangers and acquaintances (Stokes, Fuehrer & Childs, 1980). In addition to this, a study conducted by Consedine, Sabag-Cohen & Krivoshekova (2007) found that young men and African Americans were the least likely to self-disclose due to the lack of trust felt for close friends especially, when they are from the low-income class. However, despite this, limited research has examined the role of ethnicity and perceived trust in self-disclosive behavior between genders. The goal of the current study is to investigate whether young adult men are more likely to self-disclose to close friends of the opposite or same gender depending on their friends' ethnic backgrounds. An online survey is currently in the subject pool from a four-year college in the New York City area. About 600 participants will be recruited for the survey. Data analysis is expected to show that gender and ethnicity are predictors of how much one discloses in a friendship. Men are expected to self-disclose the least regardless of gender and ethnicity of the friend, whereas the opposite is expected of women. Furthermore, these results may also predict the amount of trust one has for a specific friend. Through the results of this study, therapists, the general population, and other helping professionals can benefit from understanding the factors that influence comfort with self-disclosure.
WHEN REMINDED OF RELIGIOSITY, SUPPORT FOR OPPRESSION AND MILITARIZATION DECLINES

Abayomi Are, Ian Hansen, Valerie Jackson (California School of Professional Psychology at Alliant International University)

Since religiosity and authoritarianism are correlated (Altemeyer, 1988), does this imply that stimulation of either type of conservatism will inevitably have identical effects? 157 York College students completed measures of religiosity (R), authoritarianism (A) and support for oppression and militarization (OM).

Participants were randomly assigned to three question orderings: (1) R items first (then OM, then A), (2) A items first (then OM, then R) and (3) OM items first (then R, then A). There was a statistically significant experimental effect: participants supported OM most in the A first condition and least in the R first condition. Also, though R and A were correlated, they made opposing predictions of OM in the control condition. Results imply that religiosity and authoritarianism, despite their positive correlation, can have opposing effects on support for oppression and militarization.

HOW MORAL BEAUTY ENGAGEMENT BISECTS THE LIBERAL-LEFT VS. CONSERVATIVE-RIGHT DIVIDE

Gabriela Cedillo, Ian Hansen & Mirlinda King (Andrews University)

Analyzing data taken from a well-known political psychology survey website (yourmorals.org), we examined the political correlates of the Moral Beauty Engagement (MBE) subscale of Deissner et al’s (2008) Engagement with Beauty scale—an indicator of emotional responsiveness to moral excellence. Specifically, we correlated MBE to indices of religion, ideology (liberalism vs. conservatism), moral foundations (Graham et al, 2009), and the subscales of the Schwartz Value Scale (Schwartz, 1992), as well as selected "liberal" and "conservative" policy positions. MBE intersected idiosyncratically with ideology. High MBEs shared some values in common with both liberals and conservatives—specifically the values most central to the commonly-expressed moral worldviews of both. These findings suggest that narratives of people being either liberals or conservatives may underestimate the distinctive threat that high MBEs present to the current relations of power.

IMAGINING A BROADLY MORALISTIC VS. NON-MORAL DIVIDE CAN INCREASE AUTHORITARIANISM YET DECREASE SUPPORT FOR TORTURE

Nwenna Chisholm & Ian Hansen

Most research finds authoritarianism correlated with support for torture. Yet the same manipulation might stimulate authoritarianism while reducing support for torture. We randomly assigned 398 York College students to imagine one of two moral divides: (1) a broadly moralistic vs. non-moral divide (where people either simultaneously embraced Care, Fairness, Loyalty, Authority and Purity or none of these); or (2) a divide between a liberal moral-amoral mix vs. a conservative moral-amoral mix (Care-Fairness but not Loyalty-Authority-Purity vs. Loyalty-Authority-
Purity but not Care-Fairness). We then assessed a variety of measures, among them Right Wing Authoritarianism (RWA) and support for torture. There was greater authoritarianism and less support for torture among participants assigned to Divide #1 than participants assigned to Divide #2. RWA was uncorrelated with support for torture in this sample, but predicted this support when controlling for experimental condition.

THE EFFECTS OF SLEEP DURATION ON AGGRESSION AND IMPULSIVENESS
Rose Deng & Kathariya Mokrue
Insufficient sleep can lead to poor inhibition of aggression and impulsivity. Studies suggest that mood and emotions are also affected by quantity of sleep. The present study aims to investigate the effects of sleep on aggression, impulsivity, emotion, and negative mood regulation (NMR). It was predicted that these factors will vary according to the duration of sleep individuals got on average, as well as the night before the assessment. However, preliminary results suggest that there were no significant differences between sleep groups (e.g., participants who had less than six hours, or more than six hours of sleep the night before) on most factors, except a cognitive subscale of NMR. Contrary to the literature, findings indicate that participants’ aggression and impulsivity were not significantly affected by average duration of sleep. Literature suggest hours of sleep needed to maintain normal functioning varies by age and could explain why sleep loss did not affect participants’ aggression and impulsivity scores. Additionally, this study used participants’ subjective self-reports of aggression and impulsiveness rather than behavioral measures. Future studies should control for age and consider looking at both trait and state aggression and impulsiveness during behavioral task measures after sleep loss.

MONITORING BRAIN WAVES AND EYE GAZE DURING MIND WANDERING EPISODES
Rose Deng, Ariel Rosario, Jose Reyes & Francisco Villegas
The inability for an individual to remember recent events in their surroundings, as a result of spontaneous thoughts, is referred to as mind wandering. Studies have found that mind wandering can inhibit sustained attention, and decrease accuracy during performance task. However, the relationship between brain wave activity and eye tracking during task-unrelated thoughts are currently under-explored. To better understand the physiological changes associated with mind wandering, this study will use encephalography (EEG) to record brain wave activity, and Tobii eye-tracking software to monitor eye gaze during real-time mind wandering. We expect eye gaze and brain activity in participants to differ during task-unrelated thoughts when compared to baseline outputs. Results will contribute to the growing field of mind wandering research and provide insight on how attentional deficits affect task performance with respect to physiological changes.
HOW PSYCHOPATHY BISECTS THE LIBERAL-LEFT VS. CONSERVATIVE-RIGHT DIVIDE
Abraham Dickey & Ian Hansen, Marlinda King (Andrews University)
Analyzing data taken from a well-known political psychology survey website (yourmorals.org), we examined the relationship of subclinical psychopathy to indices of religion, ideology (liberalism vs. conservatism), moral foundations (Graham et al, 2009), and the subscales of the Schwartz Value Scale (Schwartz, 1992), as well as selected policy positions considered consistent with conservative vs. liberal views. Psychopathy, an indicator of insensitivity both to the rights of others and to normative rules generally, intersected idiosyncratically with ideology. Subclinical psychopaths shared some values in common with both liberals and conservatives—specifically the values least central to the commonly-expressed moral worldviews of both. These findings undermine the narrative of people being either liberals or conservatives (or "moderates"). This narrative underestimates the political role of the "moderate" psychopath—arguably a major beneficiary of the current relations of power.

RELATIONSHIP BETWEEN ANXIETY, MINDFUL AWARENESS AND EMOTIONAL REGULATION ON TOBACCO USE AMONG ETHNIC MINORITY COLLEGE STUDENTS
Raisa Hasan, Rose Deng & Kathariya Mokrue
Tobacco use amongst American college students is a grave public health concern. Previous studies suggest a greater use among Caucasian college students. Smoking has been shown to be linked to depression, life satisfaction and coping styles among this population. However, little is known about tobacco use among ethnic minorities. This study examines the relationship between anxiety, mindful awareness (MA) and emotional regulation (ER) on smoking habits in this understudied group. Undergraduate students (n=163) from predominantly ethnic minority backgrounds reported their cigarette use, Anxiety Sx, MA and ER. It is predicted that higher levels of anxiety and lower levels of MA will be associated with tobacco use. ER is expected to be associated with frequency of use. Results confirmed that anxiety is indeed, positively correlated with tobacco use, while MA and tobacco use were negatively correlated. However, no significant association between ER and tobacco use was found. Findings also indicate significant correlations among MA, ER and anxiety. Results suggest that varying levels of MA are associated with tobacco use. Future studies should examine the mechanisms and direction among anxiety, MA, and tobacco use.

Sarah Hoosein & Ian Hansen
Many political psychologists explain political divides in one dimensional terms: the liberal left vs. the conservative right. Yet ordinary people may intuitively resist one-
dimensional thinking. We exposed 138 York College students to Schwartz's famous set of core values (which Schwartz visually presents as a two-dimensional circumplex). The sample expressed a preference for a 2-dimensional over a 1-dimensional way of understanding their own values. They also categorized a number of social-political issues as either more about openness-to-change (OtC) vs. conservation (Con) or more about self-enhancement (SE) vs. self-transcendence (ST). Their preferences formed thematically coherent categories. Participants classed matters of religion, gender, sexuality, and aesthetics as OtC vs. Con issues, and classed matters of war, oppression, violence, poverty, and the environment as SE vs. ST issues.

WEIGHT, BODY IMAGE AND THE CULTURAL MEANING OF FOOD
Zoya Hyman
In this study, we analyzed the correlation between childhood eating habits and weight and adult eating habits and weight. Preliminary scales were constructed then used to identify childhood factors that contribute weight and body image as an adult. 390 participants were recruited from the York College research pool and completed a written questionnaire. We will present preliminary results based upon ongoing data analyses.

WORK-SCHOOL DEMANDS AND WELL-BEING AMONG LOW INCOME ETHNIC MINORITY
Kellieann Jatta, Zohayra Castillo & Kathariya Mokrue
Existing literature suggests ethnic minority college students are more likely to be employed compared to Caucasian college students due to familial and financial obligations. Although research primarily based on Caucasian college students suggests that the health of employed college students are not significantly affected, we are interested in examining whether low-income ethnic minority college students have a different experience. We hypothesize that maintaining a job while attending school can increase symptoms of anxiety, depression and lead to poorer perceived health and stress. Five hundred twenty five undergraduate students from an urban commuter college reported their perceived health, perceived stress, physical anxiety, depression and work status. Results indicated that the number of work hours was significantly and positively correlated to symptoms of depression, but not anxiety, after controlling for age and number of credits. In addition, work hours was positively correlated with perceived stress, but not perceived health. Implications for improving the health and psychological well-being of ethnic minority college students are discussed.

SELF-IDENTIFICATION OF MIXED BACKGROUNDS INFLUENCE INTERGROUP INTERACTIONS
Cara Knowles & Kristin Davies
Prior work in the area of ethnic identity suggests that the manner in which an individual feels about and self identifies with an ethnic background influences
interaction with others (Douglass, Yip & Shelton). Not much is known about the interactions of individuals of mixed ethnic background. Therefore, this current study will investigate the ethnic identity of individuals of mixed background and how this variable influences interactions and attitudes across groups. The way an individual identifies with, understands, and accepts their own mixed background will likely influence how they perceive others of a different background, mixed or not. The data will be drawn from a collection of responses from an online survey on SONA Research Pool Management Software, which has been administered to undergraduate York College students. The results are expected to reveal that individuals who strongly identify with and understand their mixed background would interact less with others from an out-group, mixed or not, because of their well-established, strong connection to their own, unique background. An alternative outcome to this may be that the individuals of a mixed background may be more open and accepting to interactions with others of dissimilar backgrounds. Explaining whether having a mixed background enhances or hinders interactions between out-groups may be helpful to those working on improving the relations in diverse areas where ethnicities of mixed backgrounds are common.

THE EFFECTS OF PERCEIVED PERSONALITY SIMILARITIES ON TIME SPENT TOGETHER

Juby Kurian & Kristin Davies

Similarity in personality is a variable that has been previously assessed in research in a number of contexts. Byrne, Griffitt & Stefaniak (1967) found that attraction was regulated by attitude similarity to the surveys they gave out in two experiments. Duck (1973) saw that having similar personalities had an influence on attraction when it came to subjects unfamiliar with each other, but having similar interests had the most influence on friendship selections. Linden-Andersen, Markiewicz & Doyle (2009) found that friendships where members perceived similar personalities led to assessing the friendships more positively. However, there is inadequate research investigating the relationship between having similar personalities and the amount of time spent performing activities together. Therefore, I predict that greater levels of perceived personality similarity will be significantly related to greater amounts of time spent with one another. To investigate the relationship between these two variables, an online questionnaire using the Sona online survey software has been posted for a subject pool of 600 undergraduate students from an urban college in the New York City area. It is anticipated that the results of a regression analysis will reveal that similar personality is a significant predictor of the amount of time spent together. This study may have implications for professionals and others working to improve interpersonal relationships.
RELIGIOSITY AND AUTHORITARIANISM HAVE OPPOSING RELATIONSHIPS TO SUPPORT FOR TORTURE

Nefertidi Linton & Ian Hansen

Previous research (e.g. Hansen & Norenzayan, 2006) has shown that religiosity can be distinguished from other aspects of conservatism in what attitudes and behavioral dispositions it predicts. Previous studies have found that religiosity predicts opposition to a human rights abuse (torture), while political conservatism predicts support for it, in spite of political conservatism being positively related to religiosity (Malka & Soto, 2011). Malka and Soto used a large dataset with measures of religiosity and conservatism that were not from validated scales. In the present study, we replicated Malka & Soto (2011) using validated scales: Intrinsic Religious Motivation (Hoge, 1972) and Right Wing Authoritarianism (Altemeyer, 1996) and found the same result. We also measured Social Dominance Orientation (Pratto et al, 1994). Social dominance orientation appeared to mediate this independent relationship. Thus egalitarian rejection of social dominance appears to be an active ingredient in religiosity that partially explains its negative relationship to support for torture.

THE RELATIONSHIP AMONG HEALTH BEHAVIOURS, PERSONALITY TRAITS AND PREMENSTRUAL SYMPTOMS

Reena Maharaj & Kathariya Mokrue

Severe premenstrual symptoms can impair daily functioning and although medications are routinely prescribed to treat symptoms, they can exacerbate symptoms and produce numerous intolerable side effects. Studies suggest that health compromising behaviours (cigarette smoking, alcohol and caffeine consumption) have been linked to greater frequency and severity of premenstrual symptoms; whilst health promoting behaviour (exercise) has been linked to fewer and less severe premenstrual symptoms. Moreover, women who are mindful or who exhibit certain personality traits have also reported less severe premenstrual symptoms. The proposed cross sectional study will investigate the relative contribution of health behaviours, mindfulness, personality trait and coping style on premenstrual symptoms in ethnic minority students. Participants will be recruited from an urban commuter college and asked to complete a questionnaire. It is predicted that the combined effects of mindfulness; personality trait (internal locus of control) and coping style (negative mood regulation) and health promoting behaviour will result in fewer and less severe premenstrual symptoms. Results from this study could be used as a foundation to stimulate further research into the development of a more comprehensive course of treatment for premenstrual symptoms that incorporates both psychological and behavioural interventions.
CONSERVATISM CONVERGENT AND DIVERGENT: PREDICTING SUPPORT FOR SOCIAL DOMINATION, MORALISTIC VIOLENCE, TORTURE, AND RELIGIOUS INTOLERANCE FROM RELIGIOSITY AND AUTHORITARIANISM

Rosaury Marte & Ian Hansen

Many political psychologists consider conservatism to be a coherent construct and yet its elements do not always work towards the same ends. 398 York College students completed measures of intrinsic religiosity and authoritarianism, as well as the following criterion measures of interest: Social Dominance Orientation (SDO), Support for Torture, Support for Moralistic Violence (killing "the wicked") as well as Religiously-Based Moral Antipathy and Political Intolerance. In contrast to previous studies (Hansen and Norenzayan, 2006) religiosity and authoritarianism were both independent positive predictors of Religiously-based Moral Antipathy and Political Intolerance. However, religiosity and authoritarianism were opposing predictors of SDO, Support for Torture, and Support for Moralistic Violence. We will discuss the implications for the theoretical and empirical coherence of the "conservatism vs. liberalism" construct.

PEOPLE SUPPORT TORTURE MORE TO PUNISH WRONGDOING THAN TO OBTAIN INFORMATION

Katherina Parks & Ian Hansen

In three studies, we replicated the finding by Callaghan and Hansen (2015) that when presented with two detainees with contrasting backgrounds, people support using more torture techniques on the detainee described as violent but unlikely to have life-saving information than on the detainee described as nonviolent but highly likely to have such information. One study counterbalanced the order in which detainee scenarios were presented and found that order did not impact the within-subjects preference for torturing the violent over the informed detainee, and that the within subjects preference for torturing the violent detainee was also found between subjects. Presentation order also affected overall support for torture. Those presented with the violent detainee first supported torturing both detainees more. We discuss the implications for understanding the motivations for supporting torture.

CULTURAL DIFFERENCES IN IDEOLOGY'S RELATIONSHIP TO ATROCITY

Prianka Parmar & Ian Hansen

We examined two theoretically independent dimensions of moral concern, "individualizing" and "binding" morality (Haidt, 2012) in relation to three scales measuring constructs considered relevant to conservatism (vs. liberalism): religiosity/spirituality, authoritarianism, and social dominance. We also examined how individualizing and binding morality and the three conservatism-related scales predicted support for a human rights atrocity: torture. We compared a York College sample to a large online sample gathered by the website yourmorals.org. In theyourmorals.org sample individualizing and binding morality were very weakly negatively correlated but in the York College sample they were strongly positively
correlated. Also, in the yourmorals.org sample, binding morality was positively related to support for torture and individualizing morality was negatively related, but in the York College sample, binding morality and individualizing morality were both unrelated to support for torture. In both samples, authoritarianism was a positive predictor of support for torture, while religiosity was a negative predictor. It appears that aspects of conservatism (religiosity) and liberalism (rejection of authoritarianism) both provide some motivation to oppose torture, regardless of sample. The strongest consistent predictor of support for torture was social dominance, which was also the variable that was most distant from both individualizing and binding morality.

CLOSENESS AND TRUST WITHIN CROSS-GROUP RELATIONSHIPS
Trisha Ramchargarran & Kristin Davies
Prior research investigating cross-group relationships has revealed that having a more intimate relationship was strongly related to outgroup trust (Taush, 2010). In addition, closeness within cross-group relationships was found to be associated with the amount of confusion errors participants made between themselves and an outgroup friend, implying that the friend had been included in one's own self-identity, and contributing to improved attitudes for the outgroup (McLaughlin-Volpe, 2006). In a recent experiment, White and African Americans couples were randomly assigned to have friendly interactions with cross-race or same-race couples; results imply that this experience improved intergroup attitudes for those interacting with an outgroup couple (Welker, 2014). Despite this work, research has not yet clarified whether having prior intergroup interactions encourages greater feelings of trust and closeness within a currently developing cross-group relationship. To investigate this, several hundred undergraduates from a college subject pool will be recruited to use the Sona online survey software, where we will administer the questionnaire. It is anticipated that the results of a regression analysis will reveal that having a history of previous interactions with outgroup member will indeed increase the level of trust and closeness for current outgroup contacts. This work will help to reveal how positive cross-group experiences encourage further intergroup interactions.

ONLINE CROSS-GROUP CONTACT, FRIENDSHIP RECIPROCITY, AND INTERGROUP ATTITUDES
Manuel Ramirez & Kristin Davies
The study seeks to investigate whether online interactions (i.e. chatting online, working on a project together online) and perceptions of friendship reciprocity (equal trust, self-disclosure & closeness) change an individual’s attitude towards outgroup members. Prior work has highlighted the importance of intimate interpersonal processes in encouraging harmonious offline intergroup relations (e.g. Davies et al., 2011). However, there is not nearly as much research on the topic of online cross-group interactions. In addition, little work exists on the importance of perceived reciprocity (i.e. perceptions of equal or mutual effort) in the development
of cross-group relationships. Therefore, the goal of the current work was to examine the roles of both 1) online cross-group exchanges and 2) perceived relationship reciprocity in the development of intergroup attitudes. A longitudinal study is currently collecting data via two online surveys (6 weeks apart) using Sona research pool software. Several hundred undergraduates will take part in the survey as part of a research pool requirement. A regression analysis is expected to reveal that more frequent online activities and perceptions of greater reciprocity will both relate to more positive feelings for the group of one's interaction partner. Because previous studies have not looked at the role of these factors on intergroup attitudes, the current study results may have implications for new ways to improve intergroup relations.

PERSONALITY SIMILARITY AND INTERGROUP RELATIONS
Christina Ramos & Kristin Davies
Previous work has found that those low in extroversion and agreeableness, are more likely to develop positive outgroup attitudes via formation of cross-group friendships more strongly than those with high levels of these traits (Turner, Dhont, Hewstone, Prestwich & Vonofakou, 2014). Past research has also found that those who have close cross-group friendships are less hesitant to identify stereotypical personality traits of their friend's group as self-descriptive, thus this inclusion of a friend's group in the self can improve future social interactions with outgroups (Page-Gould, Mendoza-Denton, Alegre & Siy, 2010). Despite this, past research has not investigated the potential role of the degree to which one perceives their cross-group friend as having a similar personality. Therefore the goal of the current study is to investigate, whether perceiving the personality of one's outgroup friend as being similar influences the degree to which one displays prejudice towards the outgroup overall. Surveys will be administered using Sona online survey software to about 600 undergraduates from a college subject pool. It is anticipated that the results of a regression analysis will reveal that perceiving similar personalities within a cross-group friendship is a significant predictor of positive attitudes towards a friend's group. Research on this topic can be valuable to those who are often in settings that require interaction with people from diverse and multiple backgrounds.

WRITING A COUNTERINTUITIVE STORY ABOUT VALUES TRANSITIONS INCREASES "LIBERALISM"
Tara Redden & Ian Hansen
133 York College students participated in a study that involved writing a story on values transitions. All participants were asked to write a story about transitioning between the ten main values of the Schwartz Value Scale (Schwartz, 1992). Participants were instructed to write about a hypothetical person shifting from one value to the next in the order the values were presented. In one "intuitive" condition, the values were ordered in accordance with Schwartz's empirical research findings about value relationships. In the other "counterintuitive"
condition, participants considered the values in a random order (randomly assigned in Excel). We then evaluated how condition impacted "liberalism" using ten different measures of the construct. There was a strong multivariate effect showing that participants expressed more "liberalism" in the counterintuitive story condition. Condition at least marginally significantly affected 8 out of 10 measures of liberalism. We discuss the implications for how imagining counterintuitive transitions between values might increase liberalism.

EVIDENCE OF DIMINISHED NEURONAL ACTIVITY IN THE LATERAL GENICULATE NUCLEUS OF PATIENTS WITH PRIMARY OPEN-ANGLE GLAUCOMA
Ariel Rosario & Robert O. Duncan
Primary open-angle glaucoma (POAG) is a neurodegenerative visual disorder that can result in blindness. Typically, increased intraocular pressure causes degeneration of retinal ganglion cells, which affects neurons in the lateral geniculate nucleus (LGN) and primary visual cortex (V1). Although the cause is unknown, POAG results in cell loss and shrinkage of tissue in the LGN. Despite this evidence, there are no studies demonstrating functional loss in the LGN. Consequently, this study measured functional activity in the LGN in POAG. Neuronal activity in ten subjects was inferred using functional magnetic resonance imaging (fMRI). Subjects participated up to 8 functional scans and one anatomical scan. Subjects were presented with flickering checkerboard stimuli alternating between the left and right visual fields or the superior and inferior visual fields. The fMRI signal for each voxel was correlated with the stimulus timing using a threshold of $p = 0.001$. Large clusters of significantly correlated activity were found in V1. However, similar activity could not be detected in the LGN. To confirm the sensitivity of our measure, one healthy control subject was analyzed. LGN could be localized using the same threshold parameters as for the POAG patients. Our study provides further evidence that the LGN degenerates in individuals with POAG.

EXENDIN-4 AS A TREATMENT IN PRESERVING SUSTAINED ATTENTION IN RAT MODELS OF SPORADIC ALZHEIMER'S DISEASE
Ariel Rosario, Juan Mosquera (Queensborough Community College), Jose Reyes, Rose Deng, Taramati Shew, Dionne Bandoo, Sade McIntosh & Francisco Villegas
The proposed study will examine the effects of Exendin-4 on sustained attention in rat models of sporadic Alzheimer's Disease (sAD). Exendin-4 was used as a treatment against hippocampal neural degeneration after intracerebroventricular injections of streptozotocin (icv-STZ). STZ will produce high oxidative stress, insulin resistance, cognitive deficits and behavioral abnormalities. The 5-Choice Serial Reaction Time Task was employed as a measurement of sustained attention. By using the cell-death marker fluoro-jade C, during immunohistochemistry and fluorescent microscopy, we will investigate the morphological effects of STZ and Exendin-4 treatment on hippocampal neurons. Additionally, Western blot analysis
WIKIPEDIA AND MAINSTREAM PSYCHOLOGY: THE DEVELOPMENT OF PSYCHOLOGY - RELATED WIKIPEDIA ARTICLES WITH NOTABLE AND RELIABLE SOURCES

Minyi Ruan & Ana Cortez
Wikipedia is an online encyclopedia that has developed into one of the most popular mediums of information that is available to the general public for free. Although Wikipedia consists of articles that cover a variety of topics, some of these articles are not consistent with the policies of Wikipedia. These articles may contain multiple problems, such as lack of references, improper citations, and unreliable sources to support a particular topic. The aim of this Independent Study is to collaborate with the Psychology WikiProject by assessing the quality of information for existing articles as well as gathering reliable sources to improve them. Students not only had the opportunity to edit existing articles, but also had the opportunity to develop their own article that is within the scope of Psychology. Students accomplished their research individually under Dr. Ashton's Independent Study program.

ACROSS ALL LEVELS OF AUTHORITARIANISM, RELIGIOSITY IS NEGATIVELY RELATED TO SOCIAL DOMINANCE ORIENTATION AND TORTURE

Karen Ruiz & Ian G. Hansen
Hansen (2012) found in various samples that when controlling for Right Wing Authoritarianism (RWA), religiosity is negatively related to Social Dominance Orientation (SDO). This finding is puzzling, however, because religiosity often has a positive zero-order correlation with SDO. Such suppression effects (a changed directionality of relationship when moving from zero-order measurement to measurement in regression) are sometimes the result of statistical artifacts. We therefore used a large dataset (Graham, 2011) to examine the zero-order correlation between religiosity and SDO at five different levels of RWA: 1 < RWA < 1.99; 2 < RWA < 2.99; 3 < RWA < 3.99; 4 < RWA < 4.99, and 5 < RWA < 6. No participant in the sample scored higher than 6 on a summary index of the RWA scale, with individual item choices ranging from 1 to 7. At each level of RWA, the zero-order correlations between religiosity and SDO were negative, and at least marginally significant. Religiosity was also significantly positively related to firm opposition to torture—a policy manifestation of social dominance—in 4 out of 5 RWA groups (and positively but non-significantly related in the fifth group). These results suggest that the negative independent relationship found between religiosity and SDO is not a statistical artifact, but is a robust independent relationship across various levels of authoritarianism.
THE IMPACT OF COMMUNICATION ON TRUST AND INTERGROUP ATTITUDES

Pomena Seekwar & Kristin Davies
Prior work has examined the link between group identity and intergroup communication. For example, Harwood and colleagues (2005) found that when group identity is salient for at least one conversation partner, communication about issues pertaining to the group occurs; individuals who can identify with their group membership (e.g., age, ethnicity, sexual orientations) are likely develop strong intergroup communication abilities. Beyond this work, less information currently exists concerning how cross-group communication may impact interpersonal variables and intergroup attitudes. The focus of this study was therefore to look at whether cross-group self-disclosure and communication have a positive impact on trust and feelings about an outgroup. A longitudinal study is currently collecting online survey data from hundreds of undergraduate students. We expect to find that increases in self-disclosure and intergroup communication will relate to increases in trust and positive regard for the friend's (out)group over a period of six weeks. Results may have implications for the development of strategies to improve intergroup relations.

IMAGINING A DETAINEE AS VIOLENT INCREASES SUPPORT FOR INFORMATION-SEEKING, BUT ONLY BY INCREASING SUPPORT FOR PUNISHMENT

Krista Smith & Ian Hansen
Do people claim an interest in getting information from detainees when they really just want to punish them? Three studies found that a detainee described as violent but uninformed elicited less support for seeking information from him, and more support for punishing him, than a detainee described as informed but nonviolent (within group comparison). However, the order in which we presented detainee scenarios (between groups) impacted both of these variables in a revealing way - there was generally a greater interest in both punishing and seeking information from detainees when the scenario of the violent detainee was presented first (before the scenario of the informed detainee). However, scenario presentation order affected punitiveness even when holding informational concern constant, but there was no effect of presentation order on informational concern when holding punitiveness constant. This suggests that the difference in informational concern between conditions was due entirely to a difference in punitiveness, and not vice versa.

IMAGINING A LIBERAL VS. CONSERVATIVE DIVIDE "DISAPPEARS" THE SOCIAL JUSTICE INCLINATIONS OF RELIGIOSITY

Denae Stallings, Ian Hansen & Abraham Dickey
In five studies, we randomly assigned York College participants to imagine one of two societies: one divided between those embracing five types of moral concern (care, fairness, loyalty, authority, purity) and those rejecting them; one divided
between those embracing care and fairness but not loyalty, authority and purity and those with the opposite preference. These societies might be considered "moral vs. amoral" and "liberal vs. conservative" respectively. We then ran multiple regressions in each condition predicting Social Dominance Orientation (SDO) - an anti-egalitarian measure - from these predictors: Intrinsic Religious Motivation (IRM) and Right Wing Authoritarianism (RWA). In the "moral vs. amoral" conditions RWA positively predicted and IRM negatively predicted SDO - a pattern commonly found in datasets that include all three variables (Hansen, 2012). In the "liberal vs. conservative" conditions, however, the negative relationship between IRM and SDO disappeared. We discuss the implications for whether liberal vs. conservative discourse obscures the social justice potential of religious witness.

TRUST WITHIN ONLINE CROSS-GROUP RELATIONSHIPS
Jessica Vargas & Kristin Davies
Prior work has investigated the link between trust and intergroup attitudes. For example, Munniksma and colleagues found that trust within friendships for an outgroup individual led to more positive attitudes towards the group of the friend (2013). Despite this, no work to date has examined whether trust developed online can also lead to improved intergroup attitudes. Therefore, it was hypothesized in the current study that increases in frequency of online interaction with an outgroup member over a six-week period would correlate with increased trust over the same period, as well as positive attitudes towards the outgroup. A longitudinal study is currently collecting data via two online surveys (6 weeks apart) using Sona research pool software. Several hundred undergraduates will take part in the survey as part of a research pool requirement. We anticipate that a regression analysis will reveal that increases in trust for an outgroup member will be associated with increases in how often interactions occurred with that outgroup member. In addition, we expect that increases in online interactions will relate to positive increases in feelings for the outgroup. Because previous studies have not looked at whether cross-group trust can develop online, the current study may provide information about whether the internet may serve as an additional mechanism for reducing intergroup conflict.

Sociology (BA)

PSYCHOLOGICAL EFFECTS OF BEING A SOCIAL OUTCAST AS AN ADOLESCENT
Regine Alexis
This study examines the relationship between being a social outcast as an adolescent and psychological outcomes in adulthood. Various studies have shown that adolescents who were ostracized or left out socially throughout their adolescent years were more prone to antisocial behavior characteristics and depression. Adolescence can be described as a period that is marked by tremendous social and physical transitions (Kwapil & Silvia, 2014). Teenagers
usually move from smaller schools to bigger schools where clique formation is more common. At this point in life, teenagers need more emotional support from their family and friends in order to be able to go through the transition in a psychologically healthy manner. This study is based on a quantitative research methodology using the survey method. The sample was chosen by using a convenience sample of college students in my classes, as well as a random sample of students on campus. The sample includes 20 completed surveys. The participants were asked 12 questions about their years as an adolescent and their current psychological state. Once the surveys were collected, they were analyzed using the statistical package SPSS to determine if social events that occurred during adolescence were associated with long standing psychological effects in adulthood.

CHILD REARING DIFFERENCES AMONG HISPANIC FAMILIES

Tatiana Lopez
This research investigates differences in child rearing between native-born Hispanics and Hispanic immigrant families. Even though Hispanics can be classified as one group, within that group there are differences depending on where people were raised. Many Hispanics still carry on their cultural disciplinary ways while other assimilate to the disciplinary ways to where they are currently residing. There are differences seen among native-born Hispanics and Hispanic immigrants because of personal beliefs and because the ways they were raised as well. To further understand the effects of culture on child rearing, I conducted qualitative semi-structured interviews with five native-born Hispanic parents and five Hispanic immigrants. Interview questions include: Does your child have any household chores or responsibilities, and if so, what are they? What is your opinion on spanking a child as a form of discipline? Suppose your child misbehaves in the presence of others, how would you go about this situation? Results of interviews will be presented. Implications for understandings of culture and child rearing will be discussed.

THE RELATIONSHIP BETWEEN SOCIAL ISOLATION AND SOCIAL SKILLS AMONG RELEASED INMATES

Darlene Parsons
This study will examine the relationship between social isolation and social skills among released inmates. There have been various studies in the past to determine whether social isolation causes psychological or physiological distress among inmates who are returning to society. This project will focus on the social skills that are influenced by social isolation, and how the individual's behavior changes once back into society. Method: Interviews were conducted to get a better understanding of the problem at hand. The sample consists of 5 participants whom have been released from a state correctional facility and are adjusting back to their normal environment. Findings from interviews reveal that individuals admit to having some psychological problems, which causes them to isolate themselves away from others. Preliminary conclusions suggest that inmates who experience social
isolation may have a higher risk of reduced social skills. Suggestions for post-prison programs will be discussed.

UNEMPLOYMENT AND CRIME AMONG YOUNG ADULTS  
**Suzanne Roundtree**  
This study examines the association of unemployment and attitudes towards criminal activity. Studies show that crime is on the rise among unemployed young adults, due to economic strain caused by unemployment, relative deprivation, and monetary dissatisfaction (Agnew, 2001). Unemployment may increase an individual's motivation to commit crime to overcome financial difficulties. Data was collected using the survey method from a sample of 26 unemployed young adults from the Queens's New York population during March 2015 (53.9 % male, 30.8 % female and 15.4% other). The questionnaire consists of 12 questions relating to various crimes, employment, and attitudes toward crime. Fourteen respondents (53.8%) are currently involved in criminal activities. Findings indicate that 16 participants (61.5%) believe crime pays more than employment. A cross-tabulation reveals that 61.5% of respondents who believe that crime pays more than employment have been involved with crime while unemployed, compared to 38.5% of the respondents who do not believe crime pays more than employment. Analyzing the relationship between unemployment and crime among young adults suggested that more males are likely to commit crime while unemployed. Policy implications of these findings will be discussed.

LIFE OUTSIDE THE GENDER BINARY  
**Clint Thierens**  
My research revolves around the effect of society's binary gender system on individuals with non-conforming or gender variant identities. I plan on conducting open-ended semi-structured interviews with 3-5 people using purposive sampling. I used this method in hopes that it would help to provide testimony from individuals who actually experience the effect this system has on everyday life. Interview questions include: what impact if any has your gender had on your personal relationships, such as family, friends, and love interest," and "what changes do you believe are necessary to better accommodate the need of people who do not fit into a traditional binary gender system." I hope in some way this research can help raise awareness of gender non-conformity, and generate thinking about the implications a gender binary system has on us socially and as a society.
Undeclared Major

SOFOSBUVIR VERSUS LIVER TRANSPLANT: A FINANCIAL REVIEW
Shraman Sen, Ping Zhang (Raritan Bay Medical Center) & Deb N. Chakravarti

Hepatitis C virus (HCV) affects 170 million people globally, infecting hepatocytes with the strong potential to cause advanced liver disease, cirrhosis and hepatocellular carcinoma. Despite efforts to develop antivirals directly blocking replication, treatment options are limited. Presently there is no vaccine; drug treatments are costly with poor efficacy and strong adverse effects. The recent introduction of Sovaldi, generically known as Sofosbuvir, a direct-acting antiviral agent that inhibits HCV NS5B RNA-dependent RNA polymerase essential for viral replication, has generated both enthusiasm and controversy. Approved by FDA in 2013, the 12 week treatment course of Sovaldi costs $84,000, drawing worldwide criticism and lawsuit against the manufacturer, Gilead Sciences, Inc. which holds the patent for this drug. Although efficacy has been proved by sustained virologic response (SVR), the drug is not free of adverse effects or drug interactions. These criticisms are offset by the medical and financial hurdles of a Liver transplant which is merely a palliative procedure due to universal infection of the graft after transplantation, often resulting in rapid fibrosis progression and subsequent graft failure. Further, the total financial burden of a liver transplant in US is estimated to be $577,100. The costs escalate further through immunosuppressive drugs required to sustain the graft. Comparative financial review of Sofosbuvir versus Liver Transplant treatment is discussed.
Classroom Projects

*Classroom projects are defined as original writing that satisfies a classroom assignment but does not necessarily make an original contribution to the field.*

Biology (BA-BS)

**HOW DOES TEMPERATURE AFFECT SEED GERMINATION**

*Trevor Bridgepaul & Kimberly Sukhnandan*

This experiment aims to test which temperature is best for seed germination. Two different locations were used to grow seeds, the green house and cold room because it provides a difference in the temperature. Four different seeds were used such as Securigera Varia, Helianthus Annuus, Poa Compressa and Lolium Perenne. Usually, the seeds are set in a phase of dormancy, where the life cycle is temporarily stopped. Seeds are living organisms held in a state of dormancy, which means a period in an organism’s life cycle is temporarily stopped. Germination can take place over a wide range of temperature and is specific to individual seeds. If the soil is too hot or too cold the plants may not germinate, every seed has an ideal temperature for germination. Each seed has a tiny plant with stored food covered by a seed coat. In each seed coat, the plant embryo has enough stored food to give the embryo enough energy to grow. The seed coat protects the embryo until it is time for it to grow. The seed coat will soften over time due to moisture and warmth, causing the embryo to grow bigger. In this lab experiment, four different species of plants will be observed in regards to seed germination. There are two control groups to see if the seeds will germinate in a cold or hot environment.

**THE EFFECT OF TEMPERATURE VARIATION ON SEED GERMINATION**

*Ameer Hassan, Walter Williams & Sargil Hassan*

Germination is the sprouting of a seedling from a seed that later develops into a plant. Seed germination depends on both internal and external conditions, especially temperature. Some seeds are dormant, and thus need time, or be subjected to specific environmental conditions before they will be able to germinate. During the winter, dormancy is a mechanism preventing germination during unsuitable ecological conditions, when the probability of seedling survival is low. Stratification is the procedure of treating stored seed prior to implantation to act as natural winter conditions that a seed must undergo before germination. Seeds of many species from temperate communities require stratification, which disrupts dormancy and synchronizes their germination process with changing environmental conditions. We predict that the control groups would remain in its
dormant stage or delay in germination due to no stratification. On the other hand, treatment groups would germinate because of the exposure to various temperatures. In our experiment, we had two controls and three experimental groups. The control groups remained at a constant temperature while the experimental groups were alternating between different temperatures. The results collected from this experiment validate our hypothesis. After the experiment, it showed that the 21 days treatment group had the highest number of germinated seeds due to its better stimulation of the natural winter conditions found in nature.

LATITUDINAL GRADIENTS IN HERBIVORY DEFENSES
Noman Hossain, Fatema Ali & Magno Mazzi
The current, proposed hypothesis, regarding herbivory resistance is that defenses increase as we progress towards lower latitudes. The tropics, in particular, harbor plants with greater defenses than those found in temperate areas. In studying the effect of latitudinal gradients on herbivory resistance, species from different latitudes were analyzed. This experiment evaluates the various defenses that plants have developed in response to herbivore attacks. Sunflowers (Helianthus annuus) from two different latitudes were utilized for this study. After obtaining four distinctive groups of sunflowers, two from the higher latitudes, and two from lower latitudes; the herbivory effect was simulated by spraying the sunflowers with jasmonic acid. The acid was used to measure induced resistance. Constitutive resistance, which is continually expressed, was measured by feeding tissues from the plants of each population to corn earworms (Helicoverpa zea). By assessing the degree of herbivore resistance, we found that plants from lower latitudes had developed greater herbivore defenses. The growth of the corn earworm was used to compare the plants constitutive resistance and induced resistance.

ACCLIMATION TO COMPETITION
Larissa Jean, Doranie Dalliphcharnd & Larissa Jean
In nature, most organisms develop mechanisms to adapt to the changes in the environment. Acclimation to adaptation is the process in which an organism adjusts itself to the presence of a competitor. In our experiment, we studied two different plant species, the Cichorium intybus, our focus plant, and the Zea Mays, the competitor, and their interaction. We hypothesized that the C. intybus (also chicory) would grow better and faster with a competitor and would outperform another chicory plant grown by itself. We tested our hypothesis by growing the chicory by itself, with another chicory plant and with the Z. mays (corn). Then, we transplanted the chicory in each three groups to a pot of corn plant and a pot of chicory plant. After being grown for about six weeks, we started measuring the height of each chicory. Our results prove the hypothesis right, so acclimation to competition, in the case of our experiment, did push our focus plant to grow better than when alone.
UTILIZING A FINISHING COMPUTER PROGRAM CALLED CONSED TO IMPROVE THE DNA SEQUENCE QUALITY OF THE DISTAL REGION IN THE FOURTH CHROMOSOME OF THE DROSOPHILA BIARMIPES

Haneef Khan & Gerard P. McNeil

Genomic sequences data can be analyzed by using bioinformatics. Bioinformatics utilizes computer technology and applies it to the management of biological data. Genomic sequence data is analyzed by preliminary sequencing, then by finishing or improving the quality of the sequence by using Consed, and lastly annotating the sequence. Here I will evaluate the DNA sequence of D. biarmipes distal region on the fourth chromosome by using next generation sequencing data from Illumunia and Roche/454. This region mainly seems to be heterochromatic but the distal region of 1.2 million base pairs looks euchromatic. By comparing the sequence data of the distal region in the fourth chromosome to other Drosophila species may provide evidence for this region to appear as a euchromatic region. Additionally, we can gain an understanding of the effects of epigenetics within this region. I will use a hybrid assembly which consists of Illumunia and Roche/454 read data to improve the quality of the consensus sequences for D. biarmipes. I will use Consed to analyze discrepancies within the consensus sequence data, resolve high quality discrepancies (HQD) with mononucleotide runs, resolve low quality region with mononucleotide runs, and close gaps in the assembly. My goal is to improve and ensure that consensus sequence is high quality and close gaps for my project, DBIA2377005, which consist of a 100kb region of the fourth chromosome for D. biarmipes.

SEED SIZE AND ALLELOPATHY AFFECTING THE GERMINATION OF LETTUCE

Carlos Leon, Minerva Tavares & Camilo Iribarren

During the course of our experiment, we had to use different seeds to see how their allelopathy affects lettuce seeds. Lettuce seeds were the organisms of interest, plated separate groups of seeds in 40 Petri dishes and poured 5 mL of water. We wanted to see how lettuce seeds were affected using different seeds of different sizes. We have noticed that larger seeds compared to the smaller lettuce seeds let out certain chemicals that aid the germination of lettuce. The smaller seeds were inhibiting the germination because they needed resources more than the lettuce. There have been some lettuce seeds that grew extremely larger than other lettuce seeds when certain types of seeds were introduced to the Petri dish with the lettuce seed.
Biotechnology (BS)

DROSOPHILA BIRMIPES PROJECT
Mandiola lika
Drosophila Melanogaster has four Chromosomes. The fourth chromosome of Drosophila Melanogaster is known as dot chromosome that has drawn a special attention from the science community. This Chromosome exhibits heterochromatin and euchromatin properties. Dot chromosome has very high repetitive elements and also has a very high density of genes. Research shows that most of these genes can be expressed in heterochromatin environment that is unusual. The genes in dot chromosome make up 3.5% of the drosophila genetic material. They are concentrated in the distal arm. Due to these unusual properties the two sequencing strategies such as that of Ilumina and Roche/454, generate raw sequence data in the distal region of dot chromosome. The Bioinformatics class at York College is a research class that is in a partnership with the Genomic Center at Washington University, St. Louis under the name Genomic Education Partnership. This collaboration is a research project were raw consensus sequences of the dot chromosome are being improved. Each student was assigned a Drosophila species-Biarmipes. In an attempt to improve the consensus sequence of the assigned Drosophila species all the Ilumina data and 454 were displayed in a program called Consed, creating a Hybrid Assembly. The basic objectives of the project included: solving MNR (Mono Nucleotide Regions), correction Low consensus Quality.

Business Administration (BS)

EFFECTS OF CYBERCRIME ON BUSINESSES
Melissa Ramoo
Cybercrime affects numerous businesses and individuals all over the globe. Cybercrime costs businesses and individuals billions of dollars each year. The effects of cybercrime are abundant for individuals as well as businesses. Although the numbers of cybercrime cases are growing annually, there are measures that can be taken to reduce that number. For the purpose of this research paper, there will be a focus on the online piracy, and cyber attacks on corporations parts of cybercrime.
Chemistry (BA-BS)

A GAUSSIAN APPROACH TO PARTICLE-IN-A-BOX
Jennifer Michel, Emad Hanna, Gurinder Kaur, Mahbuba Rahman, Shavan Ramdial
& Yolanda A. Small
In quantum mechanics the particle in a box model describes a particle moving freely in a region of space with impenetrable barriers. Particle in a box model aids in the process of understanding spectroscopy involving electronic transitions. It can be used to explain the absorption spectra of various compounds and molecules. Quantum mechanics can be used to predict the allowed set of energy levels for an atom or molecule. The particle in a box can also be used to predict the energy levels of electrons responsible for UV or Visible wavelength transitions. By utilizing the Gaussian 09 program, we illustrate an example calculation of butadiene, a conjugated system.

AS CERTAIN AS DAY TURNS TO NIGHT
Abbas Nazir, Arifa Parveen, Eunice Udensi, Manjeet Kaur, Vikita Patel & Yolanda A. Small
The position and momentum of a quantum particle cannot be measured simultaneously with high precision. There is always an inherent uncertainty associated with these two measurements. The logical explanation for uncertainty lies in the quantum mechanical probabilistic description of light and not the method nor the instruments used in the experiment. This revolutionary notion, introduced by Heisenberg, challenged the established understanding of light and matter and their interaction. This poster explains the theory behind the uncertainty principle and attempts to highlight the mathematics behind it. Related opinions of other contemporary scholars will be discussed, like that of golden era Erwin Schrödinger in his thought experiment known as 'Schrödinger's Cat.'

Computer Science (BS)

GENESIS OF ROBOTICS
David Chan, Richard Deodutt
This research is to build an autonomous intelligent vehicle. The vehicle has no prior knowledge about its current surroundings and makes its own "smart" choices. In specific, the vehicle traverses through unknown territories and has the capability of creating its own knowledge. The knowledge will enable it to find a solution by using methods of backtracking or forwarding checking. Finally, the vehicle delivers a payload to its destination without interruption and in time. For example, the vehicle can start at the lobby inside York College, just before the atrium and have it delivery a small package to the Computer Science Department avoiding people, obstacles, and any other unknowns in a timely fashion. We are in the process of
building the vehicle from scratch, and it comprises of various components, ie Arduino Uno, AdaFruit Motor/servo shield, Ultrasonic Ranging Modules, chassis which includes wheels and a caster, 5-6 volt servo motor, battery pack and random motors and gears. The code is written in Arduino/C and is tested and produced within the development kit. The software will also includes various sets of sketches, these can be uploaded on to the micro-controller with immediate execution. In order to create a intelligent robot we will need to invest and develop various algorithms to find the shortest and efficient pathways to reach it's destination.

English (BA)

ECHOES OF SLAVERY IN THE WORKS OF KARA WALKER AND FREDERICK DOUGLASS
Jermaine Allison
Many individuals have always found ways of sharing their direct or vicarious experiences with others in order to enlighten them about such experiences, as well as to evoke certain emotions towards their subject matter. By doing so, these individuals are able to preserve and pass on important elements of culture to generations long after their generation has passed. The true essence of such experiences is often preserved in visual art and in written works, and it can be said that these two media often evoke positive as well as negative emotions within the producer's audience. The thematic concerns of many visual art pieces and written works are often very similar and may be interpreted in various ways. Contemporary African-American artist Kara Walker and former American Slave Frederick Douglass are two such individuals who present their vicarious and direct experiences using visual art and a written slave Narrative respectively. Although each piece was produced in two different eras, Kara Walker's art piece "Excavated from the Black Heart of a Negress" and Frederick Douglass' "Narrative of the Life of Frederick Douglass" are inextricably linked as they both present the atrocities faced by enslaved blacks during slavery.

THE COST OF MACHO-NESS
Jessica Bang
In "The Boy Kings of Texas" by Domingo Martinez, the distinct stages of childhood and adulthood are blurred by oftentimes violent and self-deprecating gendered expectations.

REIMAGINING SHAKESPEARE AS POP CULTURE
David Fasanya, Zohayra Castillo, Melinda Maharaj, Saudia Haniff & Quan Chau
Merging the worlds of pop culture and academia is an exciting premise. One would be hard-pressed to find a student uninfluenced by popular culture, even as they move studiously through their scholarship. A common disconnect in students is the feeling that what they are studying is irrelevant to the culture at large. The
Shakespeare pop culture edition attempts to bridge that gap. One of the plays the edition focuses on is "The Merchant of Venice." "Reimagining Shakespeare as Modern Pop Culture" explores ways in which pop culture media are either influenced by or bear similar themes to those in "The Merchant of Venice" and many of his other plays. In place of academic journals, the sources cited become film, music, and modern literature.

DOMINGO MARTINEZ'S GENDER CONCENTRATION CAMP

Andrew Heerah

In Domingo Martinez's memoir "The Boy Kings Of Texas", Martinez, as a young adult, finds himself able to connect with the tragic stories of war soldiers and holocaust survivors. Martinez is no doubt a broken man that was shaped by an upsetting childhood of sexual, physical and emotional abuse. Yet, in my essay, I say that these are the underlining effects from a much broader theme. It is the society based definition of male gender roles in the barrio that constrained Martinez and his family to the feeling of living in an "emotional concentration camp". This flawed concept limits children like Martinez by stereotyping them to an idea of the male gender that is more animalistic than humane. Forcing children to conform to these definitions is nothing more than oppressing them of their true capabilities. Instead of being labeled by our genders, our humanity should be judged by the extent of our moral decisions.

THE EFFECT OF TEXTING ON MODERN DAY ENGLISH

Zomayra Jack

The presentation will cover the effects of texting on Modern Day English. I will look at claims made in the media about texting, texting shorthands, and its effects on literacy, and vocabulary learning. A comparison will be made between the pre-texting era and current texting era. The question of whether or not texting benefits the English language will be answered as well. The issue will also be addressed from a sociolinguistic perspective. Examples of texting language also known as textese, chatspeak, txt-speak, etc. will be provided.

JUDGE ME NOT BY THE COLOR OF MY SKIN

Tishena Sylvester

In an effort to relate art, history, and 19th century American literature, I researched and analyzed the 1993 artwork, entitled Rumble Young Man Rumble, of the contemporary artist, Glenn Ligon, and juxtaposed it with a poem "On the Subway" by Sharon Olds. Both artists confront issues of racism and slavery in their writing to speak to the labels, stereotypes, prejudices, and conditions of the Black and White races in American society. My research addresses the long standing effects of slavery in America and how institutionalized associations of black and white color help fuel racism that hinders equality in society.
INDIGENOUS DIALECTIC INFLUENCES ON AUSTRALIAN AND NEW ZEALAND ENGLISH

Sarah Tattegrain
This study is showing how "inferior indigenous languages" can have a strong impact on modern English in the Australian continent. Most linguistic features and changes of New Zealand English and Australian English strongly reflect the influences of these groups, known as the Maori people and the Australian Aborigines. This study will also analyze different arguments made by researchers. The history of the both Englishes will be explored, which includes the linguistic features, derivatives, and how they have evolved. The findings will show that non-standard dialects are necessary components in constructing a standardized English in any community.

GROWTH BEYOND THE PHYSICAL IN EIGHTEENTH-CENTURY AMERICAN SLAVE NARRATIVES

Sharon Vega
I would like to discuss the physical spaces in Harriet Wilson's Incidents in the Life of a Slave Girl and Frederick Douglass's Narrative of the Life of Frederick Douglass An American Slave. I will argue that these physical spaces are where Wilson and Douglass grew emotionally and intellectually. The growth that took place in the physical spaces that I will discuss was helpful and necessary to their journeys from slavery to freedom.

Nursing (BS)

GLOBAL SERVICE EXPERIENCES OF YORK COLLEGE

Poroma Babu, Donnika Clarke, Annakay Rhule, Michelle Muyibi & Solange Wilson
This poster presentation aims to highlight the experiences of several York College Department of Nursing Students' experiences during the on the ground service learning in various areas of Haiti. Students participated in Nursing 450: Assessment of Health Needs in a Global, Underserved Community, an elective course offered in the nursing curriculum. This experience provided the opportunity for service learning, to contribute to delivery of health care and to put in place a sanitation related intervention project with school age children in an underserved community.

INNOVATIONS IN THE FIELD OF PAIN ASSESSMENT: A STATE OF SCIENCE

Md Kamruzzaman, Damilola Ibrahim, Fabiola Adrien & Malali Noori
The aim of this project was to identify key innovations in the filed of pain assessment in the last decade that will impact future nursing practice. With the growth of technology in health sciences it is imperative that future nurses are aware of the utilization of technical devices in daily clinical practice. A literature review
was conducted to identify newer innovations in the field of pain assessment. The findings suggest major new innovations that will change the current nursing practice. Newer devices identified include, Pain Mouse, Pain Gauge, RestoreSensor Neurostimulator, Operant Orofacial pain assessment device, and mobile electronic device with Graphical User Interface (GUI). This poster will present information on the functioning of these devices, its utilization in clinical practice and its effectiveness. In addition, the poster will also demonstrate a comparison between current pain assessment techniques and the predictable future techniques. The findings indicate the possibility of changing traditional view of pain assessment as being subjective to an objective assessment, impacting the overall pain management strategies.

COLLABORATIVE SERVICE LEARNING PROJECT TO BRING THEORY INTO PRACTICE IN CAP HAITIAN, HAITI

Sandy Nelzy, Diana Mejia & Linda Thomas
This poster presentation is based partly on an elective course taken at York College in the Department of Nursing during the summer of 2014. Nursing students were invited to attend the Third Annual Haitian Kennedy Fellows Conference in Cap Haitian, Haiti. The Kennedy Fellows were from various regional public universities throughout Haiti. We worked as a group on a hygiene related project with elementary school children, body mechanic and cataract prevention education with local farmers. Overall this collaboration closed with an opportunity for each of us to plant trees on the farm. We had the opportunity to work together and learn from each other, even when a language barrier existed.

Pharmaceutical Sciences (BS)

REPACKING AND RELABELING OF DRUG PRODUCTS
Shawwal Akbar & Deb N. Chakravarti
Repackaging and relabeling is defined as the process in which a drug product obtained in bulk from the manufacturer is repackaged and relabeled in smaller quantities, for distribution usually to a wholesaler or retail outlet. In general, drug manufacturers have more information about the quality and storage of the drug products than the repackers. For this reason, it is essential that the repackers undertake special efforts to assure the quality of the drug products being repackaged. The process of repackaging and relabeling may inadvertently increase the risks associated with alteration of the identity, strength, potency, and expiration date of the drug products. Because of such possibilities, the U.S. Food and Drug Administration (FDA) wants repackers to treat incoming drug products at par as those required for drug "components" in the current Good Manufacturing Practice (cGMP) regulations. It is critical to understand the precautions that need to be taken in order to ensure the validity of the drug products throughout the standard operating procedures of repacking and relabeling. In addition, it has to be
recognized that repackers, in general, have limited laboratory facilities for drug testing or may not have qualified analysts. This presentation will focus on how to assure the quality of repackaged and relabeled drug products.

COPAXONE: FIRST GENERIC VERSION TO TREAT MULTIPLE SCLEROSIS
Avinash Chatoo & Deb N. Chakravarti
Recently, on April 16, 2015 the U.S. Food and Drug Administration (FDA) approved the first generic version of Copaxone (glatiramer acetate) which is used to treat patients with relapsing episodes of multiple sclerosis (MS). Sandoz, the generic pharmaceutical division of Novartis and a worldwide leader in generics obtained approval from the FDA to market the drug as a daily dose of injection (20 mg/ml). Copaxone is a synthetic random copolymer of four amino acids. It is an immunomodulator, which is intended to work by preventing the immune system from attacking the nerves located in the brain and the spinal cord. The drug is administered as a subcutaneous injection once daily. Copaxone is stored away from moisture, light and heat. It is usually refrigerated in prefilled vials or syringes. This project aims to examine Copaxone in the treatment of multiple sclerosis. The goal is to discuss the chemical structure of the active ingredient, the mechanism of action, its dosage forms, side effects, its interactions with other drugs and leading medications used for treating multiple sclerosis. Copaxone is not a cure for multiple sclerosis, but can slow down the progress of the disease and delay the ensuing disability. This project will also focus on the advantages and shortcomings that Copaxone brings to multiple sclerosis patients.

THE JOYS OF OPERATORS AND THE RESTRICTIONS OF POTENTIALS
Kadidia Diallo, Bineta Diop, Amidou Nabi, Marium Akter & Yolanda A. Small
Operators and Eigen functions play an essential role in quantum mechanics. For each measurable parameter in a physical system there is a compatible quantum mechanical operator. The operator associated with a systems' total energy is called the Hamiltonian operator. The Schrodinger Equation is an eigenvalue problem by construction. Therefore, using the Hamiltonian operator on a wavefunction representing the electronic state of the system, produces the energy of that state as the resulting eigenvalue. Observing the wave behavior of a system, the probability of locating an electron in a particular location becomes more precise. When the atom is in an excited state due to absorption of energy, the electron can drop from the higher energy level to a lower energy level. As a result of this transition, the atom emits a photon corresponding to the energy difference between the two levels. With quantum Mechanical operators, we are then able to calculate specific energy levels of desired physical systems. By solving the particle in a box model for a given system we are then capable of finding discrete, quantized, electronic energy levels. The energy levels are derived from the boundary conditions of the system imposed by the model. The particle in a box model can be applied to conjugated systems that absorb UV-Visible light. The pi-electrons of the conjugated system, 1, 6-diphenyl-3, 5-hexatriene will be discussed.
FDA REQUIREMENTS FOR ACTIVE PHARMACEUTICAL INGREDIENTS

Christian Franco & Deb N. Chakravarti

According to the U.S. Code of Federal Regulations (21CFR314.3), U.S. Food and Drug Administration (US FDA) defines a drug product as the finished dosage form, for example, tablet, capsule, or solution, that contains a drug substance, generally, but not necessarily in association with other active or inactive ingredients. The term drug substance means an active ingredient that is intended to furnish pharmacological activity or other direct effects in the diagnosis, cure, mitigation, treatment, or prevention of disease or to affect the structure or any function of the human body, but does not include intermediates used in the synthesis of such ingredient. All drug products contain such substance or mixture of substances known as Active Pharmaceutical Ingredients (API). The process from the raw materials to the final form of the API is often a difficult but essential process that requires manufacturer’s compliance with the current Good Manufacturing Practices (cGMPs) as well as any other regulations that might be in effect. This presentation explains the different FDA requirements for API to be safe, pure and of high quality. We will document how the FDA offers guidance through cGMP so that all manufacturing operations related to API production, such as receipt of materials, the chemical or biological processes involved, packaging, labeling, quality control, release and storage are carried out under highest levels of quality conditions.

BIOLOGICS AND BIOSIMILARS

Harpreet Kaur & Deb N. Chakravarti

The U.S. Food and Drug Administration (FDA) defines Biological Products or Biologics as medical products used for therapeutic or preventive or diagnostic purposes. In contradistinction to most chemically synthesized drugs with known structures, biologics may be complex mixtures that may not be easily characterized. Biological products include biopharmaceuticals manufactured by biotechnology. These are usually protein or nucleic acid based pharmaceutical substances. In contrast to small molecule drugs, these are in general large molecules, usually proteins that are derived using recombinant DNA technology, such as human blood clotting Factor IX used for treating haemophiliacs, which is produced in animal cells using bioprocessing. The Patient Protection and Affordable Care Act signed into law by President Obama on March 23, 2010, amends the Public Health Service Act to create an abbreviated licensing pathway for biological products that are demonstrated to be "biosimilar" to or "interchangeable" with an FDA-licensed biological product. This part of the law known as the Biologics Price Competition and Innovation Act states that a biological product may be demonstrated to be "biosimilar" if data show that, among other things, the product is "highly similar" to an already-approved biological product. An "interchangeable" biological product is biosimilar to an FDA-approved reference product. This presentation is focused on explaining biologics and biosimilars.
STERILE PHARMACEUTICAL PRODUCTS: OPHTHALMIC PREPARATIONS

Kavita Khadar & Deb N. Chakravarti

In general, pharmaceutical products are required to be sterile to prevent microbial degradation of the product as well as to avoid the possibility of infections arising from their use. Such products include injections, ophthalmic preparations, irrigation solutions, dialysis solutions, inhaler solutions, dressings, implants, sutures, ligatures and instruments necessary for their use or administration. Since, sterile products must be free of viable microorganisms; these should be manufactured under clean conditions to provide low microbial content or bioburden to assure sterility. All ophthalmic preparations should be sterile to avoid eye infections that might occur, especially when treating eyes with abrasion or damage to the corneal surface. Sterile ophthalmic medications include eye-drops, eye lotions, and eye ointments. Contact lens solutions are a separate type of sterile ophthalmic product that include, wetting solutions, cleaning solutions, and soaking solutions. In this presentation, we will discuss these different types of ophthalmic preparations. We will also include some examples of excipients used in these formulations, the reasons for their inclusion and the importance of excipient sterility in the manufacturing process of sterile ophthalmic preparations. In addition, examples for recalls of these products arising from microbial contamination will be included.

CLEANING-IN-PLACE (CIP) USING ENZYMES: ADVANTAGES IN MILK PROCESSING OPERATIONS

Misfa Khanam & Deb N. Chakravarti

Cleaning-in-Place (CIP) is a widely used technology to clean processing equipment without dismantling them and is an automated procedure. CIP may enable the production process to operate while another part of it is cleaned. CIP has largely replaced hand cleaning operations in industries, such as, food, beverage, dairy, cosmetic, pharmaceutical, etc. In dairy industry, effective cleaning of processing equipment, such as, heat exchangers, tanks, pipes, centrifuges, evaporators, filters, etc. requires removal of residues of milk or burnt milk. CIP is very important for maintaining microbial safety as well as for retaining heat transfer and pressure drop characteristics of the equipment. For cleaning milk fouling deposits, CIP usually involves the use of harsh cleaning chemicals, such as sodium hydroxide, caustic formulated detergent solutions and acid at high temperatures. Large quantity of water and energy are also required for the process. Use of strong chemicals in CIP techniques also have safety issues, and may have adverse effects on human health and environment. However, CIP techniques using suitable enzymes are environment friendly, hygienic, safe, low cost as well as effective and can be carried out at lower temperatures. Enzymes, such as, proteases, lipases, keratinases, amylases have been found to be very efficient in cleaning milk plants. This review will discuss the use of enzymes and their importance in CIP technology in the dairy industry.
INTERNSHIP PROGRAM - UNIQUE OPPORTUNITY FOR FUTURE PHARMACEUTICAL AND REGULATORY SCIENTISTS; SAFETY OF FOOD PRODUCTS: DETECTION OF MICROBIAL CONTAMINATION AND PESTICIDE RESIDUES

Fatema Khaton, Shawwal Akbar, Misfa Khanam, Ariña Parveen & Deb N. Chakravarti

The Northeast Regional Laboratory of the US Food and Drug Administration (NRL FDA) located on the campus of York College is one of the major US government laboratories involved in protecting the health of the public. This is done by assuring the safety and efficacy, as applicable, of human and veterinary drugs, biological products, the nation's food supply, cosmetics, etc. Ongoing research and testing by FDA scientists play a very important role in the process. The Internship Program as part of the York College FDA Partnership, ongoing for fifteen years, provides a unique training opportunity for future scientists looking forward to pursue a career in regulatory science in academia, government and industry. The NRL FDA routinely investigates imported food products from around the world as well as from the US. In this presentation we will describe two representative internship experiences relating to work done in the Microbiological Sciences Branch and the Food Chemistry Branch. Some of the microbial pathogens routinely tested in food products in the Microbiological Branch include strains of Salmonella, Shigella, Staphylococcus, Escherichia coli, etc. On the other hand pesticide residues in foods are routinely tested in the Food Chemistry Branch. This presentation will focus on detection of common food borne microbial pathogens as well as residual pesticides in foods.

THE MATHEMATICAL LINK BETWEEN QUANTUM MECHANICS AND GENETICS

Fatema Khaton, Hammed Giwa & Yolanda A. Small

Our objective is to use mathematical tools to help describe and understand quantum mechanics. Two mathematical tools used to describe quantum mechanical properties are complex numbers and probability. While wavefunctions in quantum mechanics use complex numbers to describe behavior of electrons in a system, they are also useful in the field of quantum computing as we will describe. Similarly, probability as used in quantum chemistry to solve for experimentally observable parameters but also in other real-world applicatons. For instance, complex numbers help scientists and engineers to understand digital-signal processing. Probability and statistics help scientists to analyze genetics and the probability of segregation of alleles in fertilization processes.

FOOD SAFETY: THE RARE BUT DEADLY LISTERIA OUTBREAK

Yanzi Lama & Deb N. Chakravarti

The United States Food and Drug Administration (FDA), an agency within the U.S. Department of Health and Human Services, protects public health by assuring that foods consumed in the U.S. are safe, wholesome, sanitary and properly labeled.
Food and related products regulated by the U.S. FDA include dietary supplements, bottled water, food additives, infant formulas and other food products. However, the U.S. Department of Agriculture (USDA) plays a lead role in regulating aspects of some meat, poultry, and egg products. In addition to foods produced domestically, FDA is also charged with the oversight of imported foodstuff. Hazard Analysis and Critical Control Points (HACCP) is a management system in which food safety is addressed through the analysis and control of biological, chemical, and physical hazards. Improper handling of food products may cause contamination with microbes, such as bacteria and other pathogens, which can cause food borne infections. Thus, food products are routinely analyzed for microbial pathogens by the FDA. The bacterium Listeria monocytogenes is a common food-borne pathogen that can cause severe infections in humans known as listeriosis. Serotype 4b strains are the major cause of human listeriosis outbreaks. In 2011, one of the largest listeriosis outbreaks ever to take place in the U.S. was associated with cantaloupe from a single farm. Detection of L. monocytogenes in contaminated food products is the focus of this presentation.

STERILIZATION PROCESSES IN PHARMACEUTICAL MANUFACTURING:
VALIDATION AND QUALITY ASSURANCE

Nara Min & Deb N. Chakravarti

Sterilization involves killing or removal of all microorganisms, including resistant bacterial spores, whereas disinfection is the killing or removal of many but not all microorganisms. Disinfection involves reduction in the number of contaminating microorganisms to a level that cannot cause infection, although some bacterial spores and organisms may survive. There are many complications that arise due to the processes of sterilization such as the combination of two sterilized articles under aseptic processing. Pharmaceutical products must meet strict microbiological specifications. However, from time to time, few products with an unacceptable level and type of contamination will arise. The consequences of such contamination may be serious and widespread, especially if contaminants have multiplied to higher levels. Spoilage and waste of batches result in major financial issues for the manufacturer as well as unwanted publicity of recalls that may affect the reputation of the company. The safety and efficacy of the product may be severely compromised leading to potential health hazards to patients and even outbreaks of medicament-related infections. In pharmaceutical manufacturing, validation and quality assurance of the sterilization processes are used in conjunction to reduce the risk of contamination and to ensure the safety of the product.

CONTRACTING AND OUTSOURCING IN PHARMACEUTICAL INDUSTRY

Arifa Parveen & Deb N. Chakravarti

Introductions of new medicines as well as a surge in use of existing medicines lead to increased demands on production of pharmaceuticals. The daunting task for delivering drug products to the market within a given timeframe is a big challenge
for pharmaceutical and biotech companies. To achieve drug production targets, many pharmaceutical companies contract and outsource the production of their products. This enables them to meet the deadlines for delivering drug products to the market in a timely manner. Thus contracting and outsourcing relieves the companies from the stress of meeting deadlines. Applicable certifications, facilities, environment and quality of work are some key points that a company should take into account when choosing a contractor. For example, if the company is contracting a manufacturing facility, it is the company's responsibility to verify the contractor's reputation, work quality, certification, the number of existing clients as well as any facility related risk. This presentation explains the key steps from choosing a contractor to the signing of the agreement. The importance of maintaining effective communication with contractors and monitoring their work will be discussed. By following these guidelines, pharmaceutical companies could avoid delays, stay alert about uncertified contractors and avoid violation notifications from the U.S Food and Drug Administration for noncompliance with current Good Manufacturing Practices.

VALIDATION OF PHARMACEUTICAL WATER SYSTEM
Vikitaben Patel & Deb N. Chakravarti
Water of appropriate quality is one of the most important utilities used in pharmaceutical manufacturing. Pharmaceutical quality water production, storage and distribution systems should be designed, installed, commissioned, qualified, validated, and maintained to ensure reliable production of water of the required quality. Validation of this process is necessary to ensure that the water generated, stored and distributed meets its specifications and capacity requirement. Water plays a major role in pharmaceutical manufacturing, from excipient preparation to cooling and heating equipment. Thus, validation is intended to be a process where a pharmaceutical manufacturing company demonstrates and documents the function of each step or equipment. Validation steps include design of the total system, the purification units and documentation. In general, the quality of water has to meet the minimum standards required for either USP purified water or WFI (water for injections) or highly purified water, as appropriate. A basic reference used for the validation of high purity water system is the Parenteral Drug Association Technical Report No.4 entitled, "Design Concepts for the Validation of a Water for Injection System". An overview of the design criteria and management of such system is considered. Validations seek experimentally obtained answers, justification of choices made and presentation of proper documentation.

EBOLA VIRUS DISEASE: TREATMENT AND MANAGEMENT
Samentha Petit-Frere & Deb N. Chakravarti
Filoviruses belong to the Filoviridae virus family and can cause severe hemorrhagic fever in humans and nonhuman primates. Up to now, only three members of this virus family have been documented: Cuevavirus, Marburgvirus and Ebolavirus. Ebola virus disease (EVD) was identified as an archetype of pathological
haemorrhagic fever which causes serious and often fatal illness in humans. According to the CDC, the first Filovirus was recognized in 1967 when several laboratory workers in Germany and the former Yugoslavia handling tissues from green monkeys developed hemorrhagic fever. The causative agent was found to be the Marburg virus. However, in 1976, Ebolavirus was discovered in two simultaneous outbreaks, one in Nzara, Sudan, and the other in Yambuku, Democratic Republic of Congo in a village near the Ebola River, from which the disease takes its name. Since then Ebola outbreaks have periodically appeared in Africa. The virus has recently found its way to other countries outside of Africa, mostly from returning healthcare workers who has been helping during Ebola epidemics in Africa. Ebola virus contagions are characterized by immune suppression and a systemic inflammatory response that cause impairment of the vascular, coagulation, and immune systems, leading to multi-organ failure and shock, which somewhat resembles septic shock.

FDA’S PERSPECTIVE: ARE COSMETIC COMPANIES PROMISING TOO MUCH?  
Mahbuba Rahman & Deb N. Chakravarti
With the recent boom of social media in a health conscious world today, Americans, in general, are obsessed with drugs and cosmetics that will enhance their appearance. Because of this social demand for products that enhance consumers’ images, cosmetic companies have jumped into the bandwagon of marketing products that would not only cover flaws and blemishes, but somehow eliminate or reduce their underlying causes. With more cosmetic products in the market having drug claims, it is no wonder the government is concerned about protecting the public. The U.S. Food and Drug Administration (FDA) does not regulate the cosmetic industry as tightly as food and drug products. However, the FDA has limited enforcement powers to regulate cosmetics under the Federal Food, Drug, and Cosmetic Act (FDCA, 1938) and the Fair Packaging and Labeling Act (FPLA, 1967). This study is focused on how the FDA classifies claims made in cosmetic advertisements. Marketing gimmicks, though profitable for the manufacturers and largely convincing to consumers are usually deceptive. To bypass stricter regulations, cosmetic companies are going overboard in marketing their products with drug claims while being labeled as cosmetics. Consumers should be more aware of this practice and cosmetic companies must properly follow labeling guidelines. Currently there is a bill with bipartisan support in the U.S. Congress that proposes to give the FDA more power to regulate cosmetics.

UNDERSTANDING FTIR SPECTROSCOPY WITH THE HARMONIC OSCILLATOR MODEL  
Eric Sasu, Nina Oll-Adikankwu, Mohamed Osman & Yolanda A. Small
The rigid rotator model and harmonic oscillator model provide great insight into the conformational behavior of diatomic molecules. The rigid rotor model describes the rotational motion between atoms, while the harmonic oscillator system describes the vibrational motion between atoms. Both models are examined
in this research and several real world applications will be discussed. One application includes a mass connected to a string with a rigid boundary that demonstrates the vibrational motion in the harmonic oscillator system and also an experiment with FTIR (Fourier-Transform Infrared) spectroscopy and structural orientation of water. The mathematics used to formulate the two models will also be examined.

TRULICITY (DULAGLUTIDE): ELI LILLY’S ONCE-WEEKLY THERAPY FOR ADULTS WITH TYPE 2 DIABETES
Andriele Silva & Deb N. Chakravarti
On September 18, 2014, the U.S. Food and Drug administration (FDA) gave the approval for Eli Lilly and Company's treatment option for adults with type 2 diabetes. Diabetes mellitus type 2 (also known as noninsulin-dependent diabetes mellitus or adult-onset diabetes) is a metabolic disorder that is characterized by hyperglycemia (high blood sugar) in the context of insulin resistance and relative lack of insulin. This disease makes up about 90% of cases of diabetes. Obesity is usually thought to be the primary cause of type 2 diabetes in people who are genetically predisposed to the disease. Trulicity is a glucagon-like peptide-1 (GLP-1) receptor agonist, which means it acts like GLP-1, a natural hormone. It helps type 2 diabetics since once a week injection allows the body to release its own insulin when patients ingest food. However, it is strongly recommended that Trulicity should be taken in combination with diet and exercise. The single-dose pen does not require mixing nor measuring, and comes with a "no-see", "no-handle" needle. It can be taken at any time of the day, with or without meals, and should be injected subcutaneously in the abdomen, thigh or upper arm. Trulicity comes in two doses - one with a yellow label (0.75 mg) and the other with a blue label (1.5 mg). Some of the most common side effects of Trulicity include: diarrhea, stomach discomfort and belching.

A NEW THEORY IS DEVELOPED BY BREAKING THE OLD TRADITIONS: HOW QUANTUM MECHANICS CHANGES OUR MODERN WORLD
Andriele Silva, Avinash Chatoo, Sharmini Khalikaprasad, Yanzi Lama, Cynthia Ly, Andriele Silva & Dr. Yolanda A. Small
The birth of quantum mechanics is directly associated with the failures of classical physics. Around the nineteenth century, all the laws of physics were built on Newton's Gravitation law, Maxwell's equations for Magnetism and Electricity and Statistical Mechanics. Chemistry, around the time was also well understood, therefore the organization of the periodic table and thermodynamics were already comprehended. All the equations and laws of physics at the time were correct and functioned well, however not under all conditions. By the late 19th and early 20th centuries, many physicists realized that those theories and equations were not able to explain many problems, both in the microscopic domain (Validity of classical physics ceases at microscopic levels) and in the relativistic domain (Newtonian mechanics ceases at very high speeds). Those problems included the blackbody
radiation experiment, the photoelectric effect experiment, theory of the hydrogen atom and the wave-particle duality. Quantum mechanics was not only able to solve each one of these problems but also to give real life applications to them. Thanks to quantum mechanics, numerous technological devices exist and they facilitate everyone's life. The photo-cell will be discussed, for example, and is based on the principle of the photoelectric effect. It can be found in solar panels, automatic doors, and intrusion alarms.

Psychology (BA)

LUSTFUL IMPRISONMENT
Zohayra Castillo
During William Shakespeare's time, chastity was a must for women. In order to be considered a respectable and honorable woman, another man should not be able to touch the woman before marriage. However, although it was the social norm, suppression was not enough to prevent sexual encounters based on lust and physical attraction. William Shakespeare, being a famous author of his time and still today, indirectly targeted the early modern audience through his writing. My research paper focuses on the second half of his sonnets, which is the lustful connection between the speaker and his mistress, and his first poem "Venus and Adonis" in order to emphasize Shakespeare's belief in lust. He was a feminist, and through those specific works, he demonstrated that women can also feel sexual desire for a man, and attempt to seduce a man without needing to become the man's wife.

ALIENATION FROM SOCIETY THROUGH THE FEMALE PERSPECTIVE
Rachel Judge
Marjane Satrapi and Jhumpa Lahiri explore the influence of societal values on foreigners in their works Persepolis and The Namesake. Persepolis is the autobiography of Marjane Satrapi as she experiences childhood during the Islamic Revolution in Iran. On the other hand, Lahiri's The Namesake follows the Gangulis as they depart from India to the U.S to start their family. Throughout the course of both novels, the Satrapi and the Ganguli families experience a shift in their societal values. However, both families experience these changes differently. While the Satrapis experience a change in political regime, thereby becoming foreigners in their own country, the Gangulis move from their homeland to a different cultural setting entirely. I believe the underlying purpose of both pieces of literature is to illustrate the alienation one faces when adapting to different society values. However, both authors seem to illustrate this concept through the female perspective. Therefore, we can go one step further and argue that both novels convey the message that women and girls are more negatively affected by alienation from society.
DIFFERENT VISUAL MODELS OF VALUES AFFECT HOW PEOPLE PUT THEIR VALUES TOGETHER

Zuhra Ullah
What affects the way people align their values? We randomly assigned 138 York College students to three different ways of visually organizing values, all values adapted from the Schwartz Value Scale. Participants either put all values on a line (one dimensional, or 1-D), put them on a two-dimensional grid (2-D) or put them into empty slices of a pie chart (circumplex 2-D). They also assessed how much they endorsed these values (these scores were centered around the average scale mean). Principle components analysis of the centered values yielded two factors, the first running from benevolent-conformist-security values to power-hedonism-stimulation values; the second running from achievement-self-direction-hedonism values to universalist-traditionalist values. These two factors were positively correlated in the 1-D condition, orthogonal in the 2-D condition, and inversely correlated in the circumplex 2-D condition. The correlations differed significantly by condition.

Spanish (BA)

THE DEPICTION OF RULERS AND WAR THROUGH ART

Lisbeth Lora
This project involves identifying relationships between artwork, rulers, war and time periods. Through art, individuals are able to express themselves and their views on different topics such as war and politics. Each painter is a representation of his time and also the presentation of the historical actions. Of course, not all painters or artists follow the status quo of their time period. Francisco Goya and Diego Rivera both lived through historical events that changed their artwork in one way or another. In 1779, Goya became the painter of the royal court while on a modern twist Rivera in 1914-15, became a muralist demonstrating the working class and native people of Mexico. Each painting has a connection one way or another although painted by different individuals. Each artist reflected the turbulence of their times and the struggles for freedom in their countries. Their artwork provides an additional perspective on these events. With the use of Rivera and Goya’s paintings I will compare and contrast taking into consideration their style of art, their time of life and whom they painted.

Undeclared major

THE LUXURIES OF PARENTING

Alea Nickoles
It is important for a mother to prepare her child for the harsh realities of life all while making sure that the child is granted the right to a childhood not entirely interrupted by the harshness of adulthood. The dynamics of parenting proves to be
one that greatly varies on one's economic situation. The role that economic structure plays in parenting can be witnessed in both Marjane Satrapi's "Persepolis" and bell hooks' "The Homeplace". The two authors clearly display two different approaches on parenting that are heavily influenced by either wealth or the lack thereof. One can gather that wealth makes it easier for a mother to be present in the household and provide a nurturing experience for her child. Wealth can also aid a mother in creating an escape for her child in times of war and struggle. The lesson that one can take away from both writings is that being a mother is much easier when one has the aid of wealth.

LIGON AND DOUGLASS - THE CONNECTION THROUGH RACE

Hina Zafar

The topic of race and anything related to it is one that can stir up many types of arguments and controversies. Throughout history, many works of literature and art have been presented in which this issue has been addressed. Contemporary artist Glenn Ligon and activist Frederick Douglass are examples of two artists who raised the issue of race and slavery and racial prejudice in their work of art and work of literature respectively. Through Ligon's "Narratives" series and Douglass's "Narrative of the Life of Frederick Douglass," the reader is presented the element of racism and its continuance throughout the American history even in the passing of over 100 years.
## General Statistics

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## Projects by Discipline

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2. Performing Arts Center
   94-45 Guy R. Brewer Boulevard
3. Health and Physical Education Building
   160-02 Liberty Avenue
4. Science Building
5. Classroom Building
6. Athletic Field
7. FDA Building
8. East Parking Lot
9. Site for Future Development
10. Child Care Center
    94-20 160th Street

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B. Jamaica Center Bus Terminal
C. Jamaica LIRR Station
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