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Division of **M**athematics & **N**atural **S**ciences
Faculty **A**chievement **I**n **R**esearch

Posters, Talks, Videos Presented
Friday April 8, 2011

Online at:
http://people.qc.cuny.edu/faculty/Larry.Liebovitch/documents/DMNSFAIR.pdf

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Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Zahra Zakeri, Professor

MY DEPARTMENT: Biology

SOMETHING INTERESTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):
As an immigrant to this country, I feel deeply committed to helping others. Because of this, by branching from an international society that for which I serve as president, and organize meetings all over the world, I have also built an organization named "Scientists Without Borders," which teaches in 3rd-World countries and am active in organizations promoting women in science.

MY RESEARCH (IN LAY TERMS):
I study many things. Most of my research has examined something that may seem surprising—how cells die—but which has become a very important medical issue. Cells almost never die by accident. They usually commit suicide under very controlled conditions. Many cancers become a problem not because the cells multiply too much but because they fail to die on schedule, and patients with diseases such as Alzheimer's and even heart attacks can be helped if we can prevent cells from dying. My research lab has found that there are very specific signals that cause a cell to die by eating itself (autophagy) or by destroying vital components (apoptosis). Our findings will help clinicians to adjust treatments to get better responses to treatments.
These studies led us to another very interesting line of research. Viruses grow within cells, and they consequently work hard to prevent cells from committing suicide before they have reproduced, while the cell tries to commit suicide to rid the body of the virus. We have found the mechanism by which a deadly flu virus and dengue virus fight to keep cells alive. If we interfere with that mechanism, the virus is much less successful at reproducing, producing less than 1% the expected number of virus particles. Thus our research suggests new mechanisms of fighting viruses.
Finally, while thinking about diseases that affect one sex more than another, we realized that the most common explanations for these differences, the sex hormones, did not explain why the disease was just as severe, though less frequent, in one sex. We went back to the drawing board and looked at cells taken from mouse embryos before they even had a defined sex. We found that cells from genetically male and genetically female mice were different even before there were hormones. This novel finding opens the question of whether some diseases should be treated differently in men and women.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):
When and how a cell dies is important to understanding birth defects, autoimmune disease, cancer, viral disease, and neurodegeneration.

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Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Chuixiang Yi

MY DEPARTMENT: SEES

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

My research overall is to determine what are the most important controls of the net flow of carbon into or out of ecosystems. My research approach is modeling based on field observation. We found that temperature is the most important control of the carbon flow in high latitudes, while water is the most important control of the carbon flow in low latitudes. We predict that the carbon flow from atmosphere into ecosystems will be enhanced in high latitudes from global warming effects and will be prohibited in low latitudes in the 21st century.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

How climate changes modify land-atmosphere carbon exchanges in 21st century.

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Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Scott Wilson

MY DEPARTMENT: Mathematics

SOMETHING INTERESTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

My research.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

I am interested in shapes, and structures that can be used to study these shapes and the world around us.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

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Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Daniel C. Weinstein

MY DEPARTMENT: Biology

SOMETHING INTERESTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):
I am (remarkably? pathetically?) a native New Yorker.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):
My research interests have long been centered in developmental biology, which is concerned with the means by which the single cell of the fertilized egg gives rise to the organized distribution of the hundreds of cell types in the adult organism.

One project in our laboratory aims to establish the processes by which cells of the early embryo receive and interpret signals that guide the formation of muscle, brain, and spinal cord. We also perform studies to understand the mechanisms by which the embryo *prevents* inappropriate tissue formation during development. Finally, we use mammalian stem cells in attempts to translate our studies of embryonic development (performed primarily in African clawed frog tadpoles) into recipes for generating tissues and organs for eventual use in the clinic.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):
I study the intracellular signaling networks that regulate germ layer formation and suppression during early vertebrate development.

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Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: John Waldman

MY DEPARTMENT: Biology

Diet Composition Of Double-crested Cormorants, *Phalacrocorax auritus*, in New York Harbor: Preliminary Results

Colin Grubel, CUNY Graduate Center and John Waldman, Queens College

Abstract: Research into the diet of the New York Harbor Double-crested Cormorant population began in spring 2006. A total of 434 Boli and 88 pellets were collected from colonies on Hoffman, South Brother and Swinburne Islands. The samples were analyzed in the lab and identified to the lowest taxonomic level. Thirty-nine fish and 4 crustacean species were identified in the bolus samples including both freshwater and marine species. The most common species found were black seabass, *Centropristis striata*, and scup, *Stenotomus chrysops*. The composition of the diet in 2008 differed markedly from previous years in the abundance of black seabass and searobins, *Prionotus sp.*, and a relative scarcity of cunner, *Tautogolabrus adspersus*. Overall the results indicate a diverse diet with species of concern to fishermen making up a small percentage.

John Waldman's research focuses on aquatic conservation biology on local, national, and international scales, with an emphasis on diadromous fishes.

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Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Dr. Justin Storbeck

MY DEPARTMENT: Psychology

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

"Let's not forget that the little emotions are the great captains of our lives and we obey them without realizing it." ~Vincent Van Gogh, 1889

Emotions have a powerful effect on our lives, however, the common belief is that emotions are detrimental to thinking and decision making. Our research does find that at times, emotions can compete with cognition to impair thinking and decision making, but we also find that emotions can enhance cognition to improve thinking and decision making. The working hypothesis is that affect provides information about how to process incoming information. Specifically, positive affective cues, feelings that are often associated with a happy mood state, promote verbal cognitive abilities, whereas negative affective cues, feelings that are often associated with a sad mood state, promote spatial cognitive abilities. In testing this hypothesis, we found that positive mood inductions improve verbal cognitive abilities, but decrease spatial cognitive abilities. Conversely, we found that negative mood inductions increase spatial cognitive abilities, but decrease verbal cognitive abilities. Therefore, predicting cognitive performance depends on the interaction of emotional states one is in, and the task one is asked to engage in. In addition to this finding, we also found that when people are in a positive affective state and asked to engage in a verbal task this task requires less effort than if they were asked to engage in a spatial task. Likewise, people in negative affective states who engage in a spatial task use less effort completing the task then when completing a verbal task. Therefore, when emotion and cognition are aligned, we see that cognitive performance is increased and the effort required is minimized. In sum, the findings reveal that predicting behavior requires models of emotion and cognition interdependence rather than models of emotion and cognition independence.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

Emotion serves to regulate cognition, such that positive affect enhances verbal cognition, whereas negative affect enhances spatial cognition.

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Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Cathy Savage-Dunn

MY DEPARTMENT: Biology

SOMETHING INTERESTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

On July 17 every year, my mom calls to wish me a happy Yellow Pig Day.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

I am interested in signal transduction, the process by which cells communicate using chemical signals. Cell-cell communication is indispensable for multicellular organisms to form and to function properly. When cells ignore or misinterpret the signals they receive, the result may be birth defects, cancer or other diseases. My primary area of expertise is the large and multifunctional TGFβ family of cell signals. To understand how cells respond appropriately to TGFβ signals, I take a genetic approach using the model organism *C. elegans,* a simple microscopic worm whose basic biology has proven to be an excellent model for human biology. A major function of TGFβ signaling in this organism is the regulation of growth and body size. Using this system in my postdoctoral work, I codiscovered the Smad proteins, which are critical, highly conserved, intracellular signal transducers for the TGFβ superfamily. The human counterparts of these genes, when disrupted, contribute to cancer and other diseases.

At Queens College, my lab has identified additional signal transducers and initiated studies of how this pathway regulates gene expression. We used DNA microarray analysis to identify transcriptional targets of the pathway. Two categories of genes identified were prioritized as possible growth-regulating factors: cuticle collagens and fat metabolism regulators. We are addressing two major questions regarding these genes: (1) How is their expression regulated at the molecular level? (2) How do these genes contribute to the regulation of growth and body size? Recent results suggest an interaction between TGFβ and insulin signaling that may provide insight into how fat metabolism and growth are coordinately regulated.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

TGFβ signals regulate many aspects of cell function. Using *C. elegans* genetics, we have found conserved signaling components and mechanisms.

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Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Uri Samuni

MY DEPARTMENT: Chemistry and Biochemistry

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

One of my hobbies was Israeli and International folk dancing.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

I am interested in applying physical and chemical methods to biological and biomedical problems. For example, we are exploring the protective effect of a unique class of antioxidants called nitroxides, which act in a catalytic manner – i.e. unlike traditional antioxidants, they are not being used up. Other projects we work on involve a method called: Solgel encapsulation. In this method we can trap proteins and other biomolecules of interest in an inert solid and thus study their properties when they are intact and functional yet under very crowded conditions. We employ laser spectroscopic methods such a Resonance Raman spectroscopy that can selectively probe proteins and follow changes in their structure as they function.
Currently we are expanding our sol-gel "trapping" platform to the fabrication of sol-gel based nanoparticles, termed nanogels. By trapping proteins and metal nanoparticles within these nanogels and tagging their surface we aim to generate multifunctional nanogels for targeted drug delivery.

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Queens College, City University of New York
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Faculty Achievement In Research

MY NAME: Sajan Saini

MY DEPARTMENT: Physics

SOMETHING INTERESTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

I'm an amateur astronomer and like to observe celestial objects with a replica of the telescope used by Galileo.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

My research investigates "green photonics" applications of nanocrystal materials and photonic crystal devices, for improving the performance of solar cells. Nanocrystals are nanometer scale (10^{-9} m) structures, whose large surface-to-volume ratio result in optical properties for visible light (wavelength on the order of 10^{-7} m) that are distinctly different from the bulk material. Nanocrystals of silicon (Si) have been shown to absorb ultraviolet (UV) light, when formed within silicon nitride host materials. My work explores the physical origins of this absorption process in both Si and germanium (Ge) nanocrystals, along with mechanisms for electrical conduction in the host silicon nitride, in order to absorb UV and near infra red light for enhancement of photocurrent to a co-integrated Si solar cell. Photonic crystals are periodic pattern in materials, formed on length scales below 10^{-7} m, resulting in interference effects that prohibit or guide the flow of light, for select wavelengths. My work explores the application of one- and two-dimensional periodic structures to enhance the coupling of visible light into a Si solar cell, thereby increasing photocurrent generation from absorbed sunlight.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

Exploring nanometer sized materials or patterns to manipulate the absorption or flow of light, for improved solar cell device performance.

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Queens College, City University of New York
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Faculty Achievement In Research

MY NAME: Rahul Sahajpal

MY DEPARTMENT: School of Earth and Environmental Sciences, Queens College.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

Regional climate-driven hydrological changes are accompanied by salinity changes in closed basin lakes. We have investigated geochemical proxies of salinity in lake sediments in the Mono Basin, California. Acid leachable Li, along with other leachable ions includine Mg, Ca and Sr were investigated. All the elements in the acid leachable suite show a strong correlation with paleo-lake level estimates based on physical and stratigraphic evidence. The $CaCO_3$ content of lake sediments, which has been shown to be a reliable proxy for lake level changes in Mono Basin and the adjoining Owens Lake basin, corresponds well with our acid-leachable proxy data.

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Queens College, City University of New York
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Faculty Achievement In Research

MY NAME: Ashaki A. Rouff

MY DEPARTMENT: Earth and Environmental Sciences

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

I want to understand how metals dissolved in natural water “sorb” to the minerals that constitute rocks, to predict how contaminants are transported in soils and groundwater. This is important because if a dissolved metal likes to attach to a certain mineral, when the two meet the metal will be removed from water, limiting its mobility. In such instances, the metal will also be less bioavailable to organisms, including humans, and therefore less harmful.

In my lab we determine how water composition, e.g. pH and other dissolved substances, affect the amount of metal removed by a specific mineral. I then use x-rays at the National Synchrotron Light Source at Brookhaven National Laboratory to identify the metal location in or on the mineral. This tells us about potential mobility because a metal that prefers to sit inside the mineral structure is much less likely to be transported compared to a metal that is sitting at the surface.

This research can be applied to any setting where metals may come into contact with solids. For example, to identify sorbent materials for clean-up of contaminated industrial water, or even to understand how metals interact with minerals in bones and teeth in our bodies. One of my current projects focuses on a phosphate mineral that forms in animal and human wastewater, and that may be recyclable as fertilizer. Because some of these wastes can contain high levels of toxic metals, we want to be aware of any potential interactions. Right now we are trying to determine if and how metals such as arsenic and chromium associate with this mineral.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

I am a Geochemist researching sorption of metals with minerals so as to predict contaminant mobility in the environment.

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Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Susan A. Rotenberg

MY DEPARTMENT:

SOMETHING INTERESTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):
I have no middle name, just an initial "A". I also have an identical twin sister (named Gail) whose middle initial is "B".

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):
My lab studies the process that drives cancer cell metastasis (spreading of cancer cells throughout the body). We are also interested in developing drugs that interrupt this process.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):
Involved in the process of cancer metastasis is an enzyme called Protein Kinase C (PKC) that carries out a chemical reaction (phosphorylation) with its substrates. Interaction with one or more substrates propagates an intracellular signal throughout the cell that instructs the cell to move (akin to metastasis), decrease its rate of proliferation, and undergo a change in shape. My lab is focused on identifying substrates of PKC that also alter these cellular attributes and therefore convey the relevant signal. For example, we recently showed that α-tubulin is a substrate that, upon its phosphorylation by PKC, engenders movement of non-motile human breasts cells. Site-specific mutagenesis of α-tubulin was performed at a site (Ser-165) that should be recognized by PKC. A mutant of α-tubulin that simulates phosphorylation (pseudo-phosphorylated) and a mutant that is phosphorylation-resistant were developed. These mutants were used to demonstrate that 1) Ser-165 is indeed the site phosphorylated by PKC that is relevant to motility since expression of the pseudo-phosphorylated mutant engendered motility in non-motile human breast cells (previously attributed to PKC); and 2) that the phosphorylation-resistant mutant inhibited the movement (by 50-70%) of highly motile metastatic human breast cells.

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Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Andrew Rosenberg

MY DEPARTMENT: Computer Science

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

I research how computers can understand and produce speech and language. This includes speech recognition and speech synthesis. Also, there is a lot of information contained in speech beyond the words that are spoken. This is known as "tone-of-voice", intonation, or prosody. The question of understanding intonation with computers has been the center of my research for the last 5 years. The importance of this information to understanding human speech is most obvious in cases where the meaning is radically different as in the statement "John speaks French." and the question "John speaks French?" While most obvious in situations like this, the influence of intonation on meaning is pervasive and often goes unnoticed. Recently, I have been investigating how intonation is similar and different across languages, and also across native and non-native speakers of English.

Over the last eighteen months, I worked with a team of IBM Researchers responsible for generating speech for Watson during the IBM Jeopardy! Grand Challenge.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

I work to understand what people mean when they speak…with computers.

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Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Mihaela Robila

MY DEPARTMENT: Family, Nutrition and Exercise Sciences

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

My research is on the impact of economic pressure and migration on children and families in Eastern Europe. For example, due to parental economic migration, in Moldova about 30% of children live without one or both parents.

I am also doing research on Eastern European immigrants in the United States. About 10% of legal immigrants to the United States are from Eastern Europe. We interviewed Russians, Romanians and Armenians about how international migration impacted their families.

Another area of my work is family policies in international perspectives, looking at how social policies affect families (directly and indirectly) in different countries.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

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Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Edward Rice

MY DEPARTMENT: Earth and Environmental Sciences

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

I am interested in the impact of climate change on urban estuarine ecosystems. Estuaries are highly variable systems, with large shifts in salinity and temperature over an annual cycle. Estuaries near urban centers also experience overfishing and higher loadings of nutrients and pollutants. These are all potential drivers of ecosystem change, hence one might expect that it would be very difficult to see a signal of climate change in such a system. However, I have found significant changes in a heavily eutrophied estuary – Long Island Sound - that cannot be directly attributed to nutrients, pollution, or overfishing. My research is thus focused on determining whether temperature change underlies these changes via large-scale surveys, statistical analysis, and lab-based experiments.

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Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Carolyn Pytte

MY DEPARTMENT: Psychology

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

I'm a certified dolphin trainer.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

I study how new neurons become incorporated into existing circuits in the mature brain without disrupting the information stored in those circuits. While reading this, you are producing thousands of new neurons which will be incorporated primarily into your hippocampus. Unfortunately, we don't produce or distribute enough new neurons to compensate for neurodegenerative diseases or cell death due to trauma or stroke. My lab addresses basic questions about the behavior of newly formed neurons in their natural environment in the adult brain with the aim of identifying factors that alter neuronal lifespan and influence the replacement of dying cells with new cells.

My most recent project challenges the current dogma that the sole function of new neurons is to provide a plastic substrate for learning novel information. This idea underlies the prevailing assumption that new neurons necessarily destabilize existing information when they insert themselves into previously established circuits. On the contrary, we have recently demonstrated that new neurons may be added to brain regions that store long term memories, while at the same time increasing the stability of information storage rather than destabilizing the system. This has positive implications for therapies of brain repair using stem cell transplants and endogenous neurogenesis.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

Functional analyses of adult neurogenesis in relation to learning, memory and behavior.

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Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Stephen Pekar

MY DEPARTMENT: SEES

SOMETHING INTERESTING ABOUT ME:

I am a Queens native, growing up in the Rockaways and attending Queens College, where I first studied 20th century music composition and then received a BA in Education. I have traveled to over 40 countries, working in six of them ranging from archeology in France, grape picking in Germany, movie extra in China, to house pianist in a restaurant in Israel. I have been to Antarctica four times. As this continent is the most remote, coldest, and harshest place on Earth, conducting research there is the closest I will ever get to going to another planet.

MY RESEARCH:

As a geologist, I have been investigating past climate and oceanographic changes during last time (50 - 16 million years ago, Ma) that atmospheric CO_2 was as high as what is predicted for this century (500-1000 ppm). As CO_2 is rising rapidly today, which has the effect of putting our climate on a "hot plate", exploring these past times is like "*Looking Back to Our Future".*

To investigate climate and oceanographic change*s* of the past, I look at sediments, microfossils, and geochemical data obtained from long sedimentary cores (penetrating up to 1,000 meters below the sea floor) obtained from near-shore to deep-sea locations ranging from the tropics to Antarctica. My research has taken me on expeditions around the world, including four to Antarctica, one of which I was project leader. This past January, I was selected to be an on board scientist on the research vessel called the JOIDES Resolution, the flag ship of the International Ocean Drilling Program Expedition, on a scientific expedition to Wilkes Land, which is located along the coast of east Antarctica. The goal of this expedition was to drill and recover sediments up to 1,000 meters below the sea floor that were deposited when Antarctica was changing from a greenhouse world, a time when forests covered the continent instead of ice sheets to the icehouse world, when the first continental sized ice sheets expanded across Antarctica. Past Antarctic climate is still the biggest unknown in understanding past global change, therefore, understanding past climate change in Antarctica has become the last piece to be put into place in figuring out the climate puzzle.

Currently, I am working on Antarctic projects that include: finding the source of icebergs, which can help identify which of the large ice streams were the most active during the start of the icehouse world (34-23 Ma); the discovery of a warming event along the Antarctic margin during a time when it has been believed that the continent's climate was cold and stable; and an ultra high resolution (five-year resolution) climate record from sediments that have annual layers and are for geologists like tree rings from the bottom of the ocean near Antarctica.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

I study past climate changes during time intervals (50-16 Ma) when atmospheric CO_2 levels were as high as what they predict for this century.

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Queens College, City University of New York
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Faculty Achievement In Research

MY NAME: Greg O'Mullan

MY DEPARTMENT: Earth and Environmental Sciences

MY RESEARCH:

My lab studies the role of microbes within aquatic environments. Some of the microbes that we study are helpful, meaning that they perform a useful function in the environment, such as helping to clean up pollution or recycle nutrients. Other microbes that we study can be harmful, such as pathogenic bacteria in drinking water or recreational water that may pose a threat to public health.

We study these microbes by collecting samples from the field and transporting them back to the lab for analysis. Once in the lab we cultivate the microbes or analyze DNA from the microbes to learn more about their diversity and metabolism. Through these steps we can count the number of bacteria in a sample, characterize the different types of bacteria that are present and learn about their function in the environment. For example, we may want to determine how many and what kind of pathogens are present in a drinking water sample and understand what sources of pollution are contaminating the water supply. In other studies, we want to understand the types of microbes that help to remove pollution from water contaminated with excessive nutrients from sewage or fertilizer runoff into rivers or estuaries.

My lab currently has four major research directions:

1) **water quality sampling in the Hudson River to investigate sewage contamination and the persistence of pathogens in the estuary;**
2) **investigation of the microbes remediating nitrogen pollution in the Cape Fear Estuary of North Carolina and Hudson River marshes;**
3) **investigation of microbial aerosols and the connection between water quality and air quality along the urban waterfront;**
4) **subsurface carbon sequestration experiments (the pumping CO_2 into saline aquifers) and investigation of the impact of acidification (decreased pH) on the types of metals and microbes found in aquifer water.**

MY RESEARCH IN 140 CHARACTERS:
I am an environmental microbiologist studying water quality issues including nutrient pollution, pathogens in the environment, and aquifer acidification.

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Queens College, City University of New York
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Faculty Achievement In Research

MY NAME: Yoko Nomura

MY DEPARTMENT: Psychology (Neuropsychology)

SOMETHING INTERESTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

Looking for collaborators from the biology department. Interested in fetal origin of developmental psychopathology.

MY RESEARCH:

Overview:

My research investigates the fetal origin of childhood disruptive disorders and fear and inhibition by examining both the environmental and genetic risks of disrupted central nervous system development. I am particularly interested in uncovering the adverse effects of gene and environment interplay, namely epigenetics mechanism, in changing the course of development. I use an optimal longitudinal statistical approach to address how "fetal programming" underlies mental health development and look to see what modifiable risk factors can be addressed earlier in life to help individuals with mental disorders and their families.

Study Purpose:

Low birth weight and preterm birth are associated with disruptive behavioral disorders in childhood. Our study, named *Stress in Pregnancy (SIP) Study*, will allow us to examine the actual causes of low birth weight and preterm birth, including stress, infection, maternal risk behavior (smoking, drug use etc) and medical problems (diabetes, hypertension). This will help us to clarify the ways in which childhood disruptive behavioral disorders and emotional disorders. The children's genetic and epigenetic information will be examined to identify how they moderate these pathways.

Study Subjects:

Subjects are drawn from the New York Hospital Medical Center of Queens Ob/Gyn Clinic in Fresh Meadows and Mt. Sinai School of Medicine. Participants receive all their care at the clinic and have delivered or will deliver their babies at the clinic (either NYHQ or MSSM).

Study Procedure (four parts):

1. During the **second trimester**, participants complete seven short questionnaires. In addition, when the doctor orders blood drawn for the patient's routine care, the participants will give an extra three tubes of blood for maternal DNA, RNA, serum factors and cotinine.
2. During the **third trimester**, we conduct a semi-structured clinical interview to ascertain psychiatric diagnoses and their partner's psychopathology.
3. During the **birth**, the research team will sample the placenta and some of the cord blood for the baby's DNA, RNA, and serum factors. In addition, the baby's first stool will be sampled for toxicology.
4. The **postpartum** assessment will take place when the baby is three months old. We assess baby's temperament and mothers' depression and PTSD symptoms.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

Interested in learning the underlying mechanisms of gene and environment interaction on optimal/suboptimal neurodevelopment in humans.

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Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Lev Murokh

MY DEPARTMENT: Physics

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

Graduated from the same Department as former Russian Vice-Premier Minister Boris Nemtsov.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

I pursue two main directions in my research: (i) transport and optical properties of semiconductor nanostructures and (ii) interplay of electrical, optical, and mechanical degrees of freedom in biological objects at the nanoscale.

Current through semiconductor nanostructures shows well-pronounced quantum behavior. It is still unclear if it is good or bad for the performance of nanoscale electronic devices, but definitely important from a fundamental point of view. In particular, in collaboration with experimental group at the University at Buffalo, I study short constrictions called quantum point contacts exhibiting phenomenology not explained for more than 15 years.

Energy supplied to living objects by food (high-energetic electrons) or light is finally converted to more stable chemical forms but most of actual mechanisms of subsequent energy transformations are still illusive. To reveal them, in particular, we study processes in mitochondria membranes of the living cells using method of condensed matter physics.

Recently, I became also interested in studying artificial photosynthetic complexes.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

Surprisingly, quantum equations are able to describe various aspects of the living objects behavior.

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Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME:
Andrea Mosenson

MY DEPARTMENT:
Family, Nutrition, and Exercise Sciences

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

My friends call me Martha Stewart because I have a background in horticulture and home economics, but I have a cleaner record. ☺

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

My research focuses on training teachers to use technology in their classroom in a manner that students are engaged consumers and producers of technology. In other words, students are the ones using technology to learn new information and create new technology products, like Digital Stories. Digital storytelling is the 21st century method of combining multimedia technology with written pieces of work to create compelling, memorable stories. It is a process that allows students to manipulate digital images, voices, text, and sound to create vivid stories that can be shared both locally and around the world.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

My research focuses on training teachers to use technology in a manner that students are engaged consumers and producers of technology.

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME:
Patricia Miner

MY DEPARTMENT:
Family, Nutrition, and Exercise Sciences

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):
I cook only because I love to eat.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

My research investigates which brain chemicals and which brain areas are involved in the control of food intake.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Alicia Meléndez, Ph.D.

MY DEPARTMENT: Biology

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

Autophagy is a key process by which cellular components are degraded and recycled and this process plays important roles during organismal development and aging. It acts like a vacuum cleaner for the cell. For instance, we, and others, have recently shown that autophagy is turned on in several *C. elegans* mutants with an extended lifespan. Intriguingly, the extension of lifespan in such mutants requires autophagy genes, e.g. *bec-1* (Melendez *et al*., Science, 2003). These findings demonstrate that autophagy is crucial for a long and healthy life in worms. Since most biological processes are conserved between worms and humans, our findings are likely for higher organisms such as humans.

Animals that lack germ cells due to a mutation in the *Notch/glp-1* gene, also have an extended lifespan. We have recently found that autophagy is induced and is required for the long lifespan of the germline-less *glp-1* mutants. Germline-less animals require a lipase, an enzyme that catalyzes the digestion and processing of lipids, to live long. Lifespan extension by the overexpression of this lipase also requires autophagy (LaPierre et al., submitted Current Biology). As autophagy was recently shown to directly regulate fat metabolism, we have proposed that autophagy is required for fat metabolism and longevity in germline-less *glp-1* mutants. Understanding the molecular mechanisms by which animals co-regulate autophagy and fat metabolism to live long could provide important new insights not only into organismal aging but might also help develop treatments for age-related diseases.

In a separate project, we have found that BEC -1, a key regulator of the autophagic machinery, also is important for endosome function, another mechanism that cells use for recycling. Endosomes are vesicles that transport different substances within the cell. For example, we have found that BEC-1 acts in retrograde transport of signaling molecules from endosomes to the Golgi network (Ruck et al., Autophagy, 2011). The golgi network acts like a post office as it labels and packages different molecules to be sent to different parts of the cell. Signaling molecules are normally recycled from endosomes to the Golgi through the action of the retromer complex. Thus, it appears as if the BEC-1 protein is an important component of different cellular recycling pathways, including autophagy and retrograde transport.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

I study autophagy, a process that cells use to rid themselves of deleterious materials that accumulate during aging and cancer or neurodegenerative diseases.

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Steven Markowitz MD

MY DEPARTMENT:

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

My interests enter on the health impacts of deleterious occupational exposures, including those incurred in nuclear weapons manufacture, World Trade Center clean-up, and the emerging nanotechnology industry.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Allan Ludman
MY DEPARTMENT: SEES

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS): I have devoted 45 years to deciphering the geologic history of the Northern Appalachian mountain system, mostly in Maine with some work in adjacent New Brunswick. A large part of my research has been doing primary geologic mapping – a four-dimensional exercise requiring field studies to determine what types of rock are present, how they are related to one another spatially, the processes by which they were formed and deformed, and the timing of events over the hundreds of millions of years over which the mountain-building processes were active.

Anomalously in an age of increasing specialization, my field studies are supplemented by a wide range of analytical methods from the disciplines of mineralogy, igneous, sedimentary, and metamorphic petrology, geochemistry, geophysics, and paleontology. These have provided fertile ground for undergraduate, Masters and Doctoral student research and for journal articles, guidebooks, Geological Society of America Memoirs. And for geological and environmental consulting.

Accomplishments include: a comprehensive model for one of the three principal mountain-building events in Northern Appalachian history; fossil-based evidence for the ages of rocks in a large part of New England; recognition and geodynamic analysis of an ancient fault zone that rivals the San Andreas in terms of length and exceeds it in terms of longevity; and last, but not least, detailed geologic maps of nearly 6,500 mi^2 in central and eastern Maine that have stimulated other researchers and provided valuable information to public health departments and local corporations.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):
Unraveling the evolution of the Northern Appalachians in Maine and New Brunswick by field mapping and geochemical and geophysical analyses.

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Elizabeth D. Lowe

MY DEPARTMENT: Family, Nutrition, and Exercise Sciences

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

I have a Golden Retriever, two cats, two fish tanks, and I feed the wild birds.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

I do research on the meaning of fashion and textiles in history and social structure.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Jianbo Liu

MY DEPARTMENT: Chemistry and Biochemistry

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

Our research focuses on using mass spectrometry and ion-molecule reaction techniques to probe biologically relevant processes in a spectrum of systems ranging from isolated biomolecules and biomolecular ions, through micelles and aerosol droplets of biomolecules, to biomolecule solution. One of such research efforts is directed toward probing the mechanisms by which biomolecules are changed by reactive oxygen species – a biological process associated with aging, disease and photodynamic therapy for cancer. We are also interested in discovering and developing new analytical approaches and nano-materials.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Alexander Lisyansky

MY DEPARTMENT: Physics

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

I am working in the field of photonic crystals – artificially created periodic structures. Photonic crystals are the leading contenders in the race to replace "slow" electronic by "fast" photonic elements in optoelectronic circuits.

We demonstrated that by modifying the surface of a photonic crystal one can tailor its optical properties. For example, a narrow window of transparency can be created at the region where the crystal is not transparent. Moreover, the position of this window can be adjusted by the magnetic field. Another example is a giant (50 times greater than at “normal” systems) rotation of the polarization plane of incident light. The change of the optical response of the photonic crystal occurs due to the appearance of special states localized near the surface of the crystal. Such states for electronic crystals were predicted seventy years ago by Igor Tamm. However, exceptionally strict requirements to the quality of the crystal surface make it impossible to realize Tamm states in regular crystals. We predicted theoretically and realized experimentally these states at the interface between two photonic crystals or a photonic crystal and a material with negative dielectric permeability. Using optical Tamm states opens up possibilities of creating light modulators, optical diods, phase rotators, and other photonic elements.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Larry S. Liebovitch

MY DEPARTMENT: DMNS & Physics

SOMETHING INTERSTING ABOUT ME: (OPTIONAL, MAY BE LEFT BLANK)
I used to go to Burger King after Yoga.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

What constitutes a good therapeutic relationship in psychotherapy?

We're studying a mathematical model of how the emotional state of a therapist and client changes over time.

The emotional state of each one depends on how they feel when they're alone, how they felt a few minutes ago, and how they respond to each other.

We found that:
1) The person who is most responsive to the other achieves the most positive state. So, a successful therapist should be calm and not too reactive.
2) Both people will go through emotional ups and downs during the course of the therapy.
3) A therapist that starts with a negative emotional state is bad, very bad, for the client.

(Two articles, one psych, one math, are currently under review for publication.)

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK)
Surprisingly, important aspects of psychotherapy can be captured by a simple mathematical dynamical model.

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: David Lahti

MY DEPARTMENT: Biology

SOMETHING INTERESTING ABOUT ME:

One thing that is interesting about me is that I don't want to write anything here because I am uncomfortable stating that I think that everyone should find anything in particular interesting about me.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

I am interested in why organisms look and act the way they do. *How and why do particular traits evolve, and how is this related to the role those traits play in the lifestyle of an organism in its environment?* I would consider this the central question of evolutionary ecology, a field which has been at the heart of biology ever since Darwin raised the question and proposed natural selection as a general answer. In much of my research I start addressing this question by looking at specific cases, often in birds. Sometimes the initial questions can be very basic: How do swamp sparrows learn their songs? How does an African weaverbird defend itself against a cuckoo that lays eggs in its nest? Why do some birds lay blue eggs? In order to answer such questions I use a variety of methods including field observations and experiments, molecular genetic analyses, examination of museum specimens, and laboratory studies of captive birds. I then use the results of these studies to test general hypotheses about the evolutionary process, with the goal of developing and refining theory. Usually the results lead to as many further questions and hypotheses as they do conclusions and insights.

Most of the projects currently underway in my laboratory involve learned behavior and how this develops and evolves and interacts with the environment. For instance, we are just beginning a project to trace the genetic, cultural (song), and geographical divergence of house finches since they were introduced to New York in the 1940s. This might lend insights into how learned behavior changes and spreads more generally, including in humans.

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Igor L Kuskovsky

MY DEPARTMENT: Physics

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

I collect coins.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

I study very small (less than 1/1000 of the size of human hair) semiconductor systems that can find their use in several potentially breakthrough technologies as well as give us a deeper understanding of the nature. These systems can easily be manipulated by light, magnetic and electric fields due to their unique material arrangement.

For example, we are working on using these structures to control light with potential application in quantum computation, which, in turn, can solve certain problems much faster than any classical computer now can. At the same time, this work focuses on some very fundamental aspects of nature, which are still not completely understood, and are not found in “conventional” everyday life. For this we perform experiments under conditions that are close to those in the outer space and apply magnetic fields that can easily erase one’s credit cards.

We also are working on modifying these materials with the goal of fabricating ultra-high efficient solar cells, which still suffer from relatively low efficiencies and high cost. For this we utilize the properties of the structures that allow us to harvest more solar energy without compromising voltage created by the cell.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Krzysztof Klosin

MY DEPARTMENT: Mathematics

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

The population of the country of whole numbers is infinite. But there is no equality among the members of this bizarre establishment. The majority of them can be descended from other, smaller whole number, like 24 is for example obtained from multiplying 6 and 4. However, there is a small, but prominent group of them who pride themselves on not being descended from any other numbers. These are the prime numbers, like 2, 3, 7 or 104729. By any human measurement this last group is a sect. Its list of members is not completely known, but we at least know that they too are infinite in number. They seem to occur randomly among other members of the society of whole numbers – there is perhaps some pattern but 2000 years of investigation has not revealed one. Some of them occur in pairs of consecutive odd numbers (like 3 and 5, like 17 and 19, like 29 and 31), but it is not known if infinitely many primes occur in such pairs. They cannot be ignored, because while they themselves are not descended from any other numbers, all other numbers descend from them (i.e., can be written as a product of them, e.g., 24= 2x2x3x3). In the mathematics of whole number they play a similar role to the one played by elementary particles in physics.

My research is in number theory which deals with studying whole numbers, prime numbers and their (higher-dimensional) analogues. One of the major problems in the theory is the Riemann hypothesis, which claims that the prime numbers are distributed in a certain way among the whole numbers. This problem is widely open, 152 years old and is one of the Clay Institute million dollar problems. Another major challenge is the Bloch-Kato conjecture saying that some of the properties of prime numbers are hidden in certain mysterious functions called L-functions. We don't understand these functions very well either, but to prove that they are linked to the notorious prime numbers would be a major bust for the sect. Besides, the list of suspects does not end with the "simple" primes. Elliptic curves and modular forms, some bizarre structures with almost impossible symmetries, behave a lot like primes in their respective societies, but their social structure seems to be one step more sophisticated. They too have their L-functions, that allegedly hold the key to their secrets, although there is very little we can prove with the evidence we currently have. One of the aspects of my research is to provide such proofs.

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Ashima Kant
MY DEPARTMENT: FNES

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

My area of research is broadly defined as nutritional epidemiology. I study diet and its relationship with health and disease in large population groups. In particular, I study overall quality of the diet and its relationship with longevity, and other diet or meal characteristics that contribute to increased likelihood of weight gain. I also study the nature of changes in diet and meal patterns of American children, adolescents, and adults over the past 40 years and whether these changes parallel trends in body weight, and other chronic disease risk factors. I am especially interested in understanding the contribution of dietary behaviors to risk of poor health outcomes in relation to ethnicity and socio-economic status in the US population. These studies increase our understanding of dietary behaviors that predict good health so that we can take steps to promote these healthy diet behaviors.

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Emily A. Jones

MY DEPARTMENT: Psychology

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

Behavior analytic interventions have made a significant impact on the lives of individuals with developmental disabilities, improving cognition, communication, and social development, and reducing problem behavior. In the area of autism there has been considerable research and many children readily access behavior analytic interventions. As researchers have identified the earliest characteristics or core deficits of autism, interventions can be developed that are tailored to address those early deficits. Intervention tailored to address those specific impairments may significantly improve outcomes, minimize secondary impairments, and return development on a more typical path. In my lab we are developing and examining intervention for children with autism that specifically address early core deficits in the area of social-communication including joint attention and spontaneous language. Current projects include the examination of the choice of materials with which to address early deficits in joint attention in children with autism and teaching the coordination of eye gaze and smiling during joint attention interventions. We are also exploring ways to more efficiently address joint attention deficits by breaking up early social-communication skills into smaller steps.

Other developmental disabilities, for example Down syndrome, also present with characteristic areas of deficit as well as relative strengths (a behavioral phenotype). Despite the extensive intervention research in the field of autism, there is considerably less research into the development and examination of interventions to address the deficits that are now being demonstrated for other disorders. Unfortunately, outcomes remain poor. In my lab we are also developing and examining behavior analytic interventions to address characteristic deficits to children with Down syndrome. Current projects with young children with Down syndrome include examination of interventions to address early communication impairments and object exploration.

In much of our research we train parents and other caregivers to implement interventions in children's homes, communities, schools. Other family members, especially siblings, also play a significant role in the lives of individuals with developmental disabilities. I am involved in the development and evaluation of a program providing support and training to siblings of children with developmental disabilities. This is a unique program in which undergraduate and graduate students across disciplines volunteer, receive training, and then work with the children. We are evaluating the effects of this program on the children with developmental disabilities, their siblings, their interaction and relationship, and the student volunteers.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Heng Ji

MY DEPARTMENT:

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

My research interests focus on Natural Language Processing (NLP), namely to use computers to understand human languages. In particular, I focus on Cross-document Cross-lingual Cross-domain Information Extraction (IE), which addresses the following various questions: how to identify important facts (entities, relations and events) from web-scale texts and speech, how to track the various events involving important entities in temporal and spatial dimensions, how to translate the extracted facts into another language accurately, and how to adapt the methods from one particular domain to the other.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Sunitha Jasti

MY DEPARTMENT: Family, Nutrition & Exercise Sciences

SOMETHING INTERESTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

My research is on the nutritional behaviors of ethnic minority and immigrant populations in the U.S. I am interested in learning about the use of nutritional tools available such as food labels in these populations. I also look at the healthfulness of diets of immigrants. I study aspects of dietary changes that occur during their stay in the U.S and if and how those changes affect their health. Another area of my research is the study of nutritional behaviors related to iron deficiency anemia, for example, use of multivitamin supplements during pregnancy.

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Ya Ching Hung

MY DEPARTMENT: Family, Nutrition and Exercise Sciences

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

My area of research is movement control and learning. I am interested in movement control issues for children with cerebral palsy and the effect of treatment to improve their function. The hand function and gait were evaluated with 3-D kinematic system before and after treatment to assess their improvement.

I am also doing research on changes of movement control after learning. Joint control is evaluated over practice sessions to understand the progress of movement learning.

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Matt Huenerfauth

MY DEPARTMENT: Computer Science

SOMETHING INTERSTING ABOUT ME:

I first became interested in the idea of computers being able to speak and understand language from watching the Transformers cartoon on TV when I was growing up. It wasn't until I learned more about computational linguistics that I understood just how difficult it is to design computer software that can understand and produce human language that well. I still have some of my old Transformers toys that I keep on a shelf in my office as a reminder of what first sparked my excitement about computers and technology. Of course, I never saw the Transformers performing sign language!

MY RESEARCH:

I study how to design computer programs that can benefit people with disabilities, in particular people with difficulty reading English text. One project at my lab focuses on how to design software that can automatically detect how difficult a website or news article would be for someone with an intellectual disability (low IQ) to read. In another project at my lab, we study how to produce computer animations of a virtual human (like those in video games) that performs sign language. Sign language animations would be useful for people who are deaf because many of them have difficulty reading English text. English and American Sign Language (ASL) are different languages; so, there are many deaf people who are fluent in ASL but find English text challenging to read. My lab studies how to get all of the details of these animations correct so that they are understandable for people who are deaf. If the timing isn't quite right or the way in which the hands move doesn't match how people usually move, then the animations can be difficult to understand. At my lab, we use special equipment to record the 3D movements of people performing sign language, and we study the details of how humans move. Next, we build mathematical equations that explain the movements of people, and then we use these equations to guide how our virtual human moves in our ASL animations. We also conduct many experiments at the lab in which people who are deaf watch our ASL animations and evaluate their quality and understandability.

MY RESEARCH IN 140 CHARACTERS:

Assistive technology for people with disabilities, computational linguistics, automatic readability detection, animations of American Sign Language.

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Nathalia Glickman Holtzman

MY DEPARTMENT: Biology

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

This is my 6th year at QC. I love working with the students both in class and in the lab.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

One in ten still born babies and one in a hundred live births have congenital heart defects. Understanding the molecular regulation of early heart formation is a crucial first step in understanding the basis of these devastating conditions. In this proposal we plan to examine interactions between two of the layers of the heart, the myocardium and the endocardium. We believe that these interactions play a key role in regulating myocardial cell movement and that understanding them will help to defining the molecular control of cell movement and ultimately proper heart formation. In a second project in the lab we are studying the formation of the epicardium, the outermost layer of the heart. This layer acts as a stem cell population and is responsible for healing the heart after cardiac injury such as a heart attack. Very little is known about where these cells come from and how they go about covering the heart.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

In the Holtzman lab, we study how the heart forms in a developing embryo. We want to know how the cells move and how they know what to do to make this beautiful beating structure.

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Mike Hickerson

MY DEPARTMENT: Biology

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

I play slide banjo

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

My interdisciplinary research uses genetic, spatial-environmental and species-occurrence data to find out why species are where they are and how entire communities of species have responded to past climatic and geographic changes such as mountain building, sea level changes and recurrent glacial advances and retreats. This involves developing computational models that can uncover how single species or whole communities shifted geographically and/or adapted to climatic and geological changes as well as investigate how such changes can act as generate biodiversity by formation of new species. Field-based research involves genetically sampling a wide range of species to obtain genetic signatures of demographic histories and to find novel biodiversity hotspots in threatened areas. Currently we are using next-generation DNA sequencing to collect genetic data from non-model species at an unprecedented scale (hundreds of genes per individual) and look forward to making use of such powerful new tools as they arise.

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Nancy Hemmes

MY DEPARTMENT: Psychology

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

This is my 40th year at Queens College.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

DETERMINANTS OF TIME PERCEPTION IN ANIMAL AND HUMAN SUBJECTS.

- **For example, I could ask you how long you've just spent reading about my research?**
- **How can you tell how long it's been?**
- **What factors influence this perception?**
- **Does time fly when you are having fun?**
- **Does time perception change with age or disease processes?**
- **Can we use time perception as an index of mental or emotional processes?**
- **Can we use time perception as an index of neural changes?**

APPLICATION OF LEARNING PRINCIPLES TO HUMAN BEHAVIOR:

- **Overeating**
- **Under-eating**
- **Learning in college courses**
- **Learning to dance**
- **Learning to deceive**
- **Following instructions**

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Christopher Hanusa

MY DEPARTMENT: Mathematics

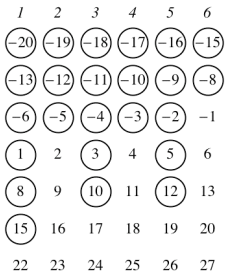
SOMETHING INTERESTING ABOUT ME:

When I create a list of examples, I must have either one or at least three, never two. Moreover, I enjoy typesetting. Also, I learned how to juggle in college.

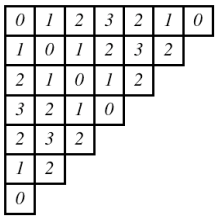
MY RESEARCH:

My primary research interest is in a field of mathematics called **algebraic combinatorics**. Combinatorics is the study of counting, intelligently. For example, a simplified version of my doctoral thesis would ask **"In how many ways are there to tile a chessboard with 32 non-overlapping dominoes?"**

The answer to this question is **12,988,816**. While this number is the **correct** answer, it does not give any insight into the problem or how one would solve a more general version of the problem. In fact, one can use methods of graph theory and linear algebra to find this number as the determinant of a matrix; exploring further allows for calculation of a formula for the number of tilings of an *mxn* board.



My current research has an algebraic flavor; I am working to develop the theory of certain combinatorial objects called *core partitions* and *abacus diagrams,* which would give researchers in Algebra who study Coxeter groups a better way to understand the elements of these groups.



A secondary interest is **multidisciplinary research**. I have worked in theoretical chemistry studying Madelung constants (with QC's Dave Baker), in political science studying voting theory as well as the game theory of autocratic rulers, and I have a planned project in risk management (with QC's Diane Coogan).

If you plan to implement a mathematical model or need a mathematical collaborator, keep me in mind.

MY RESEARCH IN 140 CHARACTERS:

My research is in algebraic combinatorics, exploring discrete objects to solve questions from algebra. Also: multidisciplinary projects!!!!
(verified on twitter)

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Jeffrey Halperin

MY DEPARTMENT: Psychology

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

My research focuses on neural and environmental factors that influence outcomes for children with attention-deficit/hyperactivity disorder (ADHD) and other related neurodevelopmental disorders. I am particularly interested in the factors that make some children get better, while many to not. To accomplish these goals, my laboratory conducts longitudinal studies that evaluate and then follow children over time using a range of clinical, behavioral, neuropsychological and neuroimaging techniques. We are currently following two samples; one that was recruited when they were 3 – 4 years-old and are now in the 7 – 10 year-old age-range, and other that was recruited as children in the early to mid 1990's and are now young adults. Based on our findings from these longitudinal studies, we have begun to develop and test a novel non-pharmacological intervention for children with ADHD.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Azriel Genack

MY DEPARTMENT: Physics

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

Our group has demonstrated that the transmission of waves through random systems can be presented in two new ways:
(1) as a sum of resonances of pure tones of the oscillations of the wave inside the medium.
(2) as a sum of transmission channels. The transmission in the channel with highest transmission can be nearly unity even in opaque samples.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Daniel M. Fienup

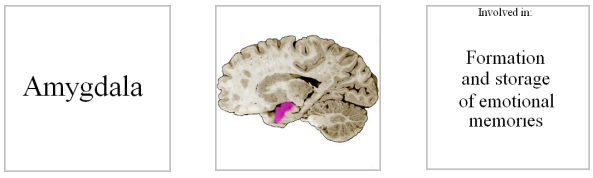
MY DEPARTMENT: Psychology (Learning Processes and Behavior Analysis)

SOMETHING INTERESTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

My research on instructional design with college students examines the utility of the stimulus equivalence paradigm in designing instruction. Stimulus equivalence is a behavioral conceptualization of concept learning. Stimulus equivalence occurs when an individual associates two or more facts or stimuli that have never been directly paired, but have been paired with a mutual stimulus. The classic example is that if one learns that A=B and B=C, without further training, A=C can be derived. In this case, A and C were never directly paired, but were both associated with B, the mutual stimulus. Thus, a relation between A and C was derived, and emerged in the absence of direct training. Applications of this technology have emerged in the last several years to teach concepts of algebra (Ninness et al., 2006, 2009), statistical interactions (Fields et al., 2009), inferential statistics (Fienup & Critchfield, 2010; Critchfield & Fienup, 2010), neuroanatomy (Fienup et al., 2010), and disability categorization (Walker & Rehfeldt, 2011).

The stimulus equivalence paradigm shows promise because of the built in efficiency: more learning occurs than was directly taught. I am interested in further examining this paradigm in two distinct ways. First, I am interested in developing new applications involving an expanded range of academic content. This paradigm can be applied to a variety of content areas that involve learning about how physically different stimuli are thematically related. For instance, when learning about brain structures in a neuroanatomy course, there are a variety of thematically related representations of a given structure, including the name of the structure, a picture of the structure, and the function of the structure:



Second, I am interested in further developing the technology of stimulus equivalence. Currently, there are several researchers in this area who all use variations of the technology (e.g., different mastery criteria, different training structures, etc.) to accomplish concept formation. I am interested in comparing the technology variations to determine best practices in programming for derived relations.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Paul Fardy

MY DEPARTMENT:

SOMETHING INTEReSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

My general area of research interest is improvement of health behaviors and reduction of heart disease risk factors in adolescents. Of particular interest is reducing obesity.

Data from our school-based program (PATH) show that 50% of teenagers already possess at least one of the five major modifiable risk factors for heart disease. Obesity and physical inactivity are the two most prevalent risk factors in this age group.

Data from our intervention program show that significant improvements were observed in obesity, blood pressure, heart health knowledge and eating habits following a 12 week program of exercise and health education for high school boys and girls. Data have been widely published and presented nationally and internationally.

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Timothy T. Eaton

MY DEPARTMENT: School of Earth and Environmental Science

SOMETHING INTERESTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

Interested in Mandarin Chinese language

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

My research interest has to do with water: how it flows underground in aquifers, on the surface in streams and estuaries, and in the air as water vapor where it affects the carbon cycle. The quantity of flow in these three areas depends on mathematical equations and subsequently affects the environment because the more flow, the lower the concentrations of pollution. In urban areas, this is important because much of our wastewater flows into the nearby harbor and Long Island Sound. Mixing processes between stormwater, freshwater and saltwater determine the environmental quality of our surroundings in the New York City area.
My current projects focus on determining the amounts of fresh, brackish and stormwater/sewage flowing into Flushing Bay and more recently in the wetlands in Alley Pond Park. Comparing the two settings is useful because Alley Pond now looks more like Flushing Meadows Park used to look a century ago. I use field instrumentation to make measurements of flow and mathematical models to try to reproduce my measurements. As our environment evolves due to sea-level rise and global climate change, it is important to be able to predict what might happen to the current balance between the three sources of flow to these coastal settings.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

I work to understand water flow on land and underground, how seawater mixes with freshwater and stormwater runoff, and affects water quality

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Harry Gafney

MY DEPARTMENT: Chemistry

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

Photoinduced reduction of CO_2 by H_2O, an eight electron, four proton process, occurs in nanoporous Vycor glass doped with tungsten oxides derived from physisorbed $W(CO)_6$. In polished forms of Vycor, 312-nm photolysis yields monoclinic WO_3 and its absorption spectrum limits light absorption and photocatalytic activity to $\leq$350-nm light. In unpolished Vycor, however, 312-nm excitation of physisorbed $W(CO)_6$ yields photochromic tungsten oxide and/or bronze, which exhibit lower energy absorptions, and excitation of these lower energy transitions with $\geq$437-nm light drives the conversion. The photochromic catalyzes the conversion of a formic acid-like species derived from the chemisorption of CO_2 onto the silica surface. The dependence of methane yield on surface pH, excitation intensity, and the energetics of the conversion challenge the current band-gap model, where a single photon promotes a single electron, which is thought to diffuse to a removed reaction site. Instead, we propose thye conversion occurs by an excited-state acid-base process. Unlike the band-gap model, excitation of the photochromic changes local acidity and basicity thereby allowing the reduction of chemisorbed CO_2 and oxidation of chemisorbed H_2O to occur exergonically. The photochromic metal oxide is not the source of reducing equivalents *per se*, but by changing the local acidity and basicity, a conduit of electrons and protons between two exergonic processes.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

Artificial Photosynthesis. How to accomplish it with one photon of visible light.

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME:
Lev Deych
MY DEPARTMENT:
Physics
SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

My research is concerned with understanding capabilities of light to move small material objects such as dust particles, viruses, bacteria, atoms. I am interested in understanding fundamental physics of these phenomena and in developing such potential applications as optical mass and size sensors.

Another direction of my research is concerned with possibilities to use confinement of light in small regions of space in order to enhance effects of magnetic field on its characteristics. Using effect of total internal reflection in order to keep light propagating along the perimeter of a circular disk, I study how magnetic field changes its polarization properties.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Clare Consiglio

MY DEPARTMENT: Family, Nutrition and Exercise Science

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

I like to plant, grow, nurture, cook, eat, teach about and compost food.
I have 5 children.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

I created a FNES Herb & Vegetable Garden outside Remsen Hall. This example of a sustainable food system supplies herbs and vegetables to my food lab classes (FNES 101, 203 and 104). Our dietetic students get to experience food from the garden to the table.

I would like to get involved in research. I'd like to compare the nutrient value of freshly grown vs. store bought vegetables

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Sung-Eun Choi

MY DEPARTMENT: Family, Nutrition and Exercise Sciences

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

I am a hockey mom.
I love to watch “Iron Chef” and “Chopped” on Food Network.
You can enjoy “Cupcake Wars” and the sushi in my 307W class.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

I am a food scientist and registered dietitian with expertise in food sensory science. My research interest includes the effects of taste perception on health, optimization of food recipes using sensory evaluation and immigrant nutrition. My recent research topic is the relationship of taste perceptions to eating patterns and risks of obesity among African-Americans and Asian Americans, two rapidly-growing ethnic groups with very different sets of health risk factors. In the project, the genetic taste sensitivity, the sensations to basic tastes and food acceptances are examined to explore the taste perceptions.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Professor Fred J. Cadieu

MY DEPARTMENT: Physics

SOMETHING INTERSTING ABOUT ME : On occasion I can be seen on campus looking up at the Sun, the Moon, the Planets, and Stars.

MY RESEARCH : Silicon devices are the biggest game in town and are the basis of the computer industry. It is challenging to put films onto Silicon because many materials won't stick and tend to peel away. One aspect of this research is devoted to putting films of magnetic materials onto Silicon device wafers. Boundary layers of other materials such as tantalum oxide are required to get the magnetic films to stick and bind to the silicon device wafers. The properties and thicknesses of the deposited films are measured by X-Ray diffraction, and their compositions are measured by X-Ray fluorescence. Nondestructive methods have been developed for measuring magnetic film thicknesses in the micron range, 10^{-6}meter, and the thicknesses of tantalum oxide in the nanometer range, 10^{-9} meter. The ultimate goal of this research makes use of these basic films to make Si devices talk to the outside world. The goal here is to transfer Si logic signals to other parts of a device or computer. Ideally the best way to transfer signals off chip is some sort of fast optical signal into a fiber optic connecting cable. One sought after solution is to build a light generator or laser directly onto the Si chip. The problem with this is that although Si devices are good for processing logic signals, Si devices generally do not emit light to make a laser. This seems to require then that some sort of light generator be attached to the Si devices. One scheme that we have been involved in makes use of magnetic islands deposited onto Si to attract and attach indium phosphide microdots, a good light emitter, to the Si wafers. By a process that we call magnetically assisted self assembly, MASA, entire arrays of light emitters can be attached to the Si wafers. But we have also began to construct much simpler devices that make use of magnetic films to rapidly switch optical signals for interfacing Si logic signals off chip.

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Joshua C. Brumberg

MY DEPARTMENT: Psychology

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

Have done live public addressing announcing at 2 olympic trials, and 5 national championships covering 3 sports.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

The function of an electronic device such as a transistor radio can be explained based on its identifiable circuit elements; resistors, capacitors and transistors. Similarly, understanding the individual elements of a cortical circuit and how they interact brings us a step closer to understanding the function of the circuit as a whole and ultimately its behavior in response to environmental stimuli. While the analogy applies to the neocortex, deciphering the cortical microcircuit is much more difficult due to the diversity of components and the numbers of interconnections between the different elements. The focus of the Brumberg's lab research is to characterize development and the neurons of the rodent barrel cortex with a dual emphasis on the interactions between the sensory and motor systems that govern the animals whisking behavior and the role that sensory experience has in shaping cortical circuits. In a new line of research, further work focuses on the interaction between the neural and vascular systems

Our results have shown that neurons participating in different pathways (eg. callosal – connecting the two hemispheres versus cortical feedback to an important midbrain nucleus the thalamus) have distinct intrinsic anatomical and physiological properties suggesting that they are adapted to their unique processing roles.

In response to sensory deprivation we demonstrated that not only do neuronal structures change, but also glial components are impacted.

Anatomical studies have revealed that specific phenotypes of neurons are more likely to be found in close proximity to blood vessels. These neurons will be targeted for physiological studies to determine what role they may have in responding to changes in vascular diameter.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

Utilizing physiological, anatomical and computational techniques to characterize the embedded circuits of neurons and glia in the rodent somatosensory cortex.

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Claudia C. Brumbaugh

MY DEPARTMENT: Psychology

SOMETHING INTERESTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

I was in an all-girl rock band in graduate school.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

How do people experience stability in their relationships, even from one relationship to the next? How can some individuals say exactly what they're looking for in a romantic partner, yet date people who don't match their stated standards? My research is generally aimed at answering these types of questions by trying to understand the role of unconscious processes in relationship formation and choice, as well as the sacrifices we sometimes might make when choosing partners.

A portion of my work centers on how experiences in past relationships influence experiences in new and ongoing relationships. Accordingly, I have examined how individuals use working models of attachment relationships to guide their perceptions of new people (Brumbaugh & Fraley, 2004; 2007). Interestingly, I have found that even when new individuals bear no resemblance to past partners, existing representations of past partners continue to impact how novel people are experienced. These results suggest that working models may guide the interpretation of new people, regardless of the actual qualities of those people.

Another focus of my research is aimed at determining how partners are selected and at uncovering individual differences in the ability to detect undesirable features in others (Brumbaugh & Fraley, 2010). Prior research has found that overall, both secure and insecure people explicitly report the strongest attraction to secure partners. My current work is driven by the following question: if people tend to report being most attracted to partners who are secure, why do a sizeable number of people nevertheless end up with partners who are insecure and make them unhappy?

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

I am an adult attachment relationship researcher. My work also touches on social-cognition, personality, person perception, and evolutionary theory.

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Bruce L. Brown

MY DEPARTMENT: Psychology

SOMETHING INTERESTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

I have still not stopped trying to improve my French. Very interesting to me.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

One of the most robust findings in the area of animal learning is the role of delay to reinforcement—learning is slower and poorer with longer delays to reinforcement in both instrumental and Pavlovian conditioning. What is interesting about this well-known phenomenon is that the effect depends upon the *relative*, not absolute, delay—that's a relatively newer finding. For example, a 10-s delay in Pavlovian conditioning will produce very little conditioned responding if it is embedded in an intertrial interval (ITI) of 10 s, but it will produce rapidly learned and prodigious responding with a 100-s ITI. The implication is that animals perceive and code these intervals (delay and ITI), and that their behavior is governed by ratio comparisons between them. That inference is also supported by the observation of timescale invariance—animals and people exhibit the same pattern of 'expectancy' behavior following the same proportion of elapsed time (ask me). My research has investigated the following aspects of timing behavior in rats, pigeons, and humans: (1) the properties of working memory for time in animals (temporal memory decays exponentially), (2) the role of time in 'behaviorially silent' learning (timing itself indexes learning) , (3) the effect of interference (dual tasks) in time perception (the effect can outlast the interfering event, (4) the role of emotion in governing time estimation and underlying clock mechanisms (fear lengthens time estimation by affecting attention, not clock speed), (5) the neural and psychopharmacological bases of timing behavior (what is/are the role(s) of the basal ganglia and related circuits in timing), (6) the effect of neural degeneration in a Huntington's Disease rat model on the deterioration in temporal processing, and its rescue by environmental enrichment (can we identify environmental treatment for HD?), and (7) human-animal analogs of temporal processing procedures (can we ask humans and animals the same questions?.
OK, maybe more than one bus ride.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Stephane Boissinot

MY DEPARTMENT: Biology

SOMETHING INTERESTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

I am homozygous for an allele at the SNAP-25 gene associated with lower non-verbal I.Q. performances.

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

My laboratory is interested in the process of evolution at the molecular level. More specifically we are investigating two fundamental evolutionary questions:

1- Why does the size of genomes vary so much among vertebrates?
The amount of genetic material in a cell is not correlated to the complexity of organisms. In fact, differences in genome size are caused by the differential accumulation of mobile genetic elements called transposable elements or “jumping genes”. Although most transposable elements impose a genetic load on their host they can also be a rich source of evolutionary novelties. However, it is unknown why some species like human have more than 3 millions of these elements whereas most fish carry less than a few 1,000 copies. To address this question we are using a combination of computational and population genetics approaches in several species that differ in their profile of transposable element abundance and diversity.

2- Why do organisms respond differently to viral infection?
Why do some individuals get sick, while others remain healthy or mildly affected by viral infection? Among other factors, the genetic background of individuals influences significantly the outcome of viral infection. One of the major players in the defense against viral infection is the oligo-adenylate synthetase (OAS) pathway. Studies in human and mouse strongly suggest that genetic variation at the OAS genes could be influencing host susceptibility to viral infection. However, little is known about the polymorphism of OAS genes and, more importantly, about the selective forces that have shaped their evolution. This is an important issue since patterns of molecular evolution can in turn provide valuable information about the mechanism of resistance to viral infection. We are addressing this issue using a combination of evolutionary, molecular and cellular approaches.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Robert Bittman

MY DEPARTMENT: Chemistry and Biochemistry

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

We synthesize bioactive lipids by using organic synthetic methodology and study their properties. For example, some of the compounds can stimulate cell growth whereas others can induce cell death or interfere with cell signaling behavior; some are immunostimulatory and some are immunosuppressive. Some have anticancer properties and some are inhibitors of specific enzymes involved in lipid metabolism.

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

DMNS FAIR

Queens College, City University of New York
Division of Mathematics and Natural Sciences
Faculty Achievement In Research

MY NAME: Jeffrey Bird, Assistant Professor

MY DEPARTMENT: School of Earth and Environmental Sciences

SOMETHING INTERSTING ABOUT ME (OPTIONAL, MAY BE LEFT BLANK):

MY RESEARCH (IN SIMPLE WORDS THAT CAN BE UNDERSTOOD BY ANYONE ON THE Q64 BUS):

Professor Bird's biogeochemistry lab is focused on belowground carbon, nitrogen and sulfur cycling in terrestrial ecosystems. Soils are critical controllers on the flow of matter and energy in the environment and are considered especially important in the Earth's response to Global Change. Soils act as both a significant source of atmospheric greenhouse gases (i.e., carbon dioxide, methane and nitrous oxide) and as a sizable stable sink for plant C and N inputs.

Our research group investigates how soil microbial communities, plants, climate and mineralogy interact to control the turnover, loss or stabilization of soil C and N in temperate and tropical ecosystems.

The Bird lab uses stable isotopic tracers (^{13}C and ^{15}N) to follow C and N among plants, soil microbes, and mineral surfaces to better understand how soils support ecological productivity and environmental quality.

Lab website: http://qcpages.qc.cuny.edu/~jbird/index.htm

MY RESEARCH IN 140 CHARACTERS (OPTIONAL, MAY BE LEFT BLANK):

Ecosystem ecology/terrestrial biogeochemistry with a focus on the role of soils in enhancing environmental quality and sustainability.