



11.19.2020

12:30-4:00 pm

Online ZOOM Conference

<https://zoom.us/j/6986910931?pwd=TUhkMFAvNkY0c1pQ0Q0dmTis2WkQwdz09>

Meeting ID: 698 691 0931

Passcode: Poster

A Showcase
of City Tech
Faculty and
Students'
Research and
Publications

18th ANNUAL

POSTER SESSION

**BIOLOGY AND
HEALTH SCIENCES**

BUSINESS

CHEMISTRY

**COMPUTER
ENGINEERING AND
INFORMATION
SYSTEM TECHNOLOGY**

EDUCATION

**ENGINEERING
AND ARCHITECTURAL
TECHNOLOGY**

**HOSPITALITY
MANAGEMENT**

**HUMANITIES,
SOCIAL SCIENCES
AND ENGLISH**

INTERDISCIPLINARY

**LAW AND
PARALEGAL**

LIBRARY

MATHEMATICS

PHYSICS

WELCOME AND GREETINGS

Online ZOOM Conference

<https://zoom.us/j/6986910931?pwd=TUhkM-FAvNkY0c1pQQ0dmTis2WkQwdz09>

Meeting ID: 698 691 0931

Passcode: Poster

1:00 pm-1:20 pm

Dr. Russell Hotzler

President

Dr. Pamela Brown

Interim Provost

Dr. Justin Vazquez-Poritz

Dean, School of Arts & Sciences

Dr. Gerarda Shields

Dean, School of Technology & Design

Dr. David Smith

Dean, School of Professional Studies

1:20 pm-2:00 pm

One-minute Poster Presentation by Faculty

The program is organized by topics rather than by departments. Frequently the presentations are cross-disciplinary or difficult to assign to the discipline represented by the department with which the presenter is affiliated.

POSTER SESSION

Online ZOOM Conference

Posters are accessible online starting
November 19, 2020

[https://openlab.citytech.cuny.edu/
postersession2020/](https://openlab.citytech.cuny.edu/postersession2020/)

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- 2 Laura Andreescu. Application of LEAN IT Systems in Dental Laboratory Technology.
- 3 Laura Andreescu, and Renata Budny. Impact of Pandemic on Departmental Culture and Teaching.
- 4 Christopher Blair, Robert W. Bryson, Jr., Uri O. García-Vázquez, Adrián Nieto-Montes de Oca, David Lazcano, John E. McCormack, and John Klicka. Genomic Data from Alligator Lizards Help Clarify Their Evolutionary History and Support the Recognition of a New Genus.
- 5 Subhendra Sarkar. Morphologic MRI Features of Brain Glioblastoma: Predictive Statistical Model for Heterogeneity and Spread.

BUSINESS

- 6 Joseph Foy, Vijay Sampath, Rachel Raskin, Frimette Kass-Shraibman, Pradeep Gopalakrishna. Taken for Suckers: Causal Attributions of the Consequences of Overcharging Sales Tax in Daily Deal Transactions.
- 7 Alyssa D. Adomaitis, Diana Saki, Kim. K. P. Johnson, Rafi Sarkar. Relationships Between Dress and Gender in a Context of Cultural Change.
- 8 Denise H. Sutton. From Feed Sacks to Dresses: Upcycling Consumer Goods Packaging During the Depression in the United States.
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- 25 Giovanni Ossola, and Ray D. Sameshima.** The Multi-dimensional Realm of Feynman Integrals.
- 26 Anastasia Spiridonova, and Roman Ya. Kezerashvili.** Rydberg Excitons in Novel Two-dimensional Materials: TMDCs and Xenes.
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Understanding Job Classifications in Dental Laboratory Settings

Renata Budny / Restorative Dentistry

In recent years, the dental laboratory industry experienced a remarkable transformation triggered by the implementation of new digital platforms and business models. Consequently, the dental laboratory workforce is required to be much more knowledgeable, conversant, and experienced in fundamentals, latest materials, equipment, and techniques, as well as in the new healthcare and business models to fulfill growing needs of operating a compliant and successful dental laboratory. Yet, according to the Bureau of Labor Statistics (BLS) and Occupational Information Network (O*NET), the minimum entry requirement for this highly skilled profession remains a high school diploma or its equivalent.

The research examines the background, scope and relationship of Bureau of Labor Statistics (BLS) and Dictionary of Occupational Titles (DOT) & O*NET classifications to the dental laboratory technology profession including the evolution of job categories, as well as the advantages, disadvantages, and consequences of altering job classifications.

Application of LEAN IT Systems in Dental Laboratory Technology

Laura Andreescu / Restorative Dentistry

The advances in dental technologies open the doors to new types of manufacturing processes and as a result the industry is transitioning from the traditional methods to digital design and manufacturing of dental appliances. During this transitional period, many dental laboratories are still using both methods of manufacturing, having a negative impact on their revenues. To reduce waste and increase production value, it is important to apply the LEAN Manufacturing and LEAN Services concepts, which were first developed and implemented in the 1990's by the Toyota Production System. Today, these principles are extended to include LEAN systems to Information Technology, creating the LEAN IT systems. In recent years, due to the increased demands of implementing digital dentistry, the LEAN IT technology presents a viable solution for dental laboratories to increase their profits.

This presentation describes the different applications of LEAN IT Technologies in dental laboratory technology and the resources for adding production value during the transition from traditional methods to Computer Assisted Design and Computer Assisted Manufacturing production of dental appliances.

Impact of Pandemic on Departmental Culture and Teaching

Laura Andreescu and Renata Budny / Restorative Dentistry

As the COVID-19 pandemic disrupted global economies and higher education, NYCCT mobilized and modified its offerings for its students, faculty and staff to successfully transition to an online modality. As a result, the innovative pedagogies,

and best practices in distance learning, including departmental team building, initiatives homogenizing teaching and learning delivery, and students' preparation for online instruction were developed.

The importance of integrating the online instructional methodologies with City Tech's cultural values, which "nurture an atmosphere of inclusion, respect, and open-mindedness in which all members can flourish," created an even stronger institutional community fostering greater student success during such unprecedented times.

This presentation shares the effects of the COVID-19 pandemic on the clinical setting, how the challenges were addressed, and what lessons were learned to help others replicate, enhance, or transfer this innovative approach to similar situations in their local environments.

Genomic Data from Alligator Lizards Help Clarify Their Evolutionary History and Support the Recognition of a New Genus

Christopher Blair, Robert W. Bryson, Jr., Uri O. García-Vázquez, Adrián Nieto-Montes de Oca, David Lazcano, John E. McCormack, and John Klicka / Department of Biological Sciences

Genomic data can now be used to understand spatial and temporal patterns of biological diversification. However, the increasing quantity of data comes with analytical and computational challenges. In this study we use thousands of genomic markers in ultraconserved regions of the genome to understand the evolutionary history of alligator lizards (*Gerrhonotus*) throughout Mexico. Concatenated and coalescent-based phylogenetic analyses provide similar species tree estimates, with most nodes strongly supported.

A recently described species, *Gerrhonotus mccoysi*, was nested within a *G. infernalis* clade, rendering the latter paraphyletic. Similarly, the two sampled *Mesaspis* species did not form a clade. The phylogenetic position of *G. lugoi* was ambiguous, but all results indicate that it is highly divergent from its congeners. We therefore describe a new genus, *Desertum* **gen. nov.** to adequately represent this unknown diversity. Divergence times for alligator lizards fell within the Miocene, suggesting that Neogene vicariance and/or global climate change during the mid-Miocene led to speciation. In sum, these results further highlight the utility of genomic data for evolutionary inference and indicate high levels of cryptic diversity throughout the Mexican Transition Zone.

Morphologic MRI Features of Brain Glioblastoma: Predictive Statistical Model for Heterogeneity and Spread

Subhendra Sarkar / Department of Radiologic Technology

Brain Glioblastomas (GBM) have poor prognosis. The anatomic changes with time are not predictable. In this project we are working to statistically model the shape and intensity fluctuations that may offer additional insight into the direction or extent of spread of cancer cellularity. If the cancer growth model can be correlated with the tissue signal heterogeneity then radiation planning may be more effective. Based on a group of patient GBM features post imaging analysis are being performed with key morphologic feature extraction. This work compares geometrical features of GBM for several patients utilizing intensity fluctuations from MR imaging with contrast, morphology of abnormal perfusion in various lesions and utility of heterogeneity within lesions as reflected in statistical changes with serial treatment. [Student researchers: Ruth Zeron/BSRS-Rad-Tech, Richie Zhang/Undeclared]

Taken for Suckers: Causal Attributions of the Consequences of Overcharging Sales Tax in Daily Deal Transactions

Joseph Foy¹, Vijay Sampath², Rachel Raskin³, Frimette Kass-Shraibman⁴, Pradeep Gopalakrishna⁵

¹City University of New York at The School of Professional Studies

²Fairleigh Dickinson University

³Department of Business

⁴City University of New York at Brooklyn College

⁵Pace University

In an experimental setting, we examine consumer participant reactions when daily deal operators provide additional discounts beyond that originally agreed to with the merchants. These discounts could result in sales tax overcharges to consumers. We argue that, under these circumstances, consumers would feel cheated and seek to hold the party most responsible for their feelings. Drawing on attribution theory, we posit that the lower status of the merchants as compared to the daily deal operators will result in consumers ascribing cause to the merchants. We examine the main and moderating effects of the overcharges on the behavioral intentions of consumers to repurchase from merchants. We find support for all hypotheses suggesting that even minor ethical violations come with consequences. Implications of these findings for daily deal participants and tax accountants are discussed.

Relationships Between Dress and Gender in a Context of Cultural Change

Alyssa D. Adomaitis¹, Diana Saki², Kim. K. P. Johnson³, Rafi Sarkar⁴

¹Department of Business

²Ball State University

³University of Minnesota

⁴Emerging Scholar, Department of Business

As societies move towards modernity and experience evolution, there can be confusion over the concepts of gender identity and gender expression. The American Psychological Association defines gender identity as, "A person's deeply-felt, inherent sense of being a boy, a man, or a male; a girl, a woman, or a female; or an alternative gender (e.g., genderqueer, gender nonconforming, gender neutral) that may or may not correspond to a person's sex assigned at birth or to a person's primary or secondary sex characteristics" (American Psychological Association, 2015, p. 834). The concept is further delineated by the roles assumed and acted upon based on socially accepted environmental factors (American Psychological Association, 2015). According to Polderman et al., (2018), gender identities can be divided into two broad classifications. These classifications are cisgender, where a person's gender is assigned at birth as determined by the presence of genitalia, and transgender, where a person's assumed gender is different from the one assigned at birth.

Gender expression, in contrast, is manifested through dress, appearances, and mannerisms, which may or may not observe socially established norms (Koene, 2017). Gender identity is different from gender expression. For example, an individual might identify as a transgender male but the dress, appearance, and mannerisms of this individual may signal to others that individual is a female (Lowry et al., 2018).

Individuals always engage in some form of dress when participating in the public sphere (Entwistle, 2015). Dress consists of body modifications (e.g., tattoos, piercings) and supplements (e.g., hats, scarves, clothing) added to the body (Roach-Higgins & Eicher, 1992). When gender was a simple binary distinction, one means by which an individual's gender was rather successfully signaled and inferred by others was through dress and appearance cues (Barnes & Eicher, 1997). Indeed, specific body supplements and body modifications, including their color, style and details, have traditionally been viewed as masculine or feminine and consequently, in some cases, worn almost exclusively by men or women (Workman & Johnson, 1993). When individuals appeared wearing these forms of dress, inferences of gender were easily made and often accurate. With the recognition of 31 different genders by the NYC Commission of Human Rights, dress may no longer be effective at communicating gender identities. Thus, the purpose of this research was to investigate the use of dress and other appearance cues to establish and communicate gender identities with individuals representing a range of genders other than cisgender. Specific research questions were addressed with individuals that self-identified as members of the LGBTQ community. These questions included (1) what types of dress are used to communicate gender identity? (2) how is dress used for communicating gender identity? (3) what barriers exist to effective use of dress to express one's gender?

From Feed Sacks to Dresses: Upcycling Consumer Goods Packaging During the Depression in the United States

Denise H. Sutton / Department of Business

About 100 years before the Great Depression in the United States, a change in the way that certain goods were transported—from wooden barrels to cloth sacks—had an unexpected impact on women's fashion. During the Great Depression in the U.S., the unemployment rate exceeded 20 percent and nearly half of U.S. banks failed. Facing economic hardship, women found creative ways to use the humble feed sack (sacks filled with corn meal, flour, or other grains) to make clothes for themselves and their families. Companies that sold their products in these cotton sacks observed customers using the sack fabric for clothing and responded by changing their packaging to fabrics with bright colors and prints to attract women to their brand. In addition to this new marketing strategy, companies also began to print their sack logos with water-soluble ink, removing the stigma attached to using commercial packaging materials to make clothes. Eventually, national sewing contests were organized by trade organizations to demonstrate women's skills and ingenuity fashioning feed sacks as well as the creative marketing strategies of bag manufacturers and their customers who were mainly flour and feed mills.

Shared Provenance: Investigating Safavid-Mughal Cultural Exchange Through Luxury Silk Production During the Sixteenth and Seventeenth Centuries

Nazanin Hedayat Munroe
Business Department / Business & Technology of Fashion

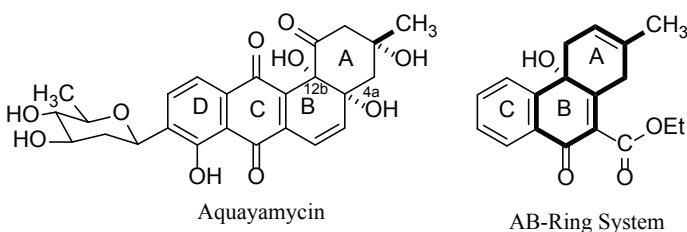
This study examines a group of figural silk garments attributed to Safavid Iran (1550-1650). The paper poses an important recontextualization of silk production in Asia through the migration of weavers and artists during the early modern period. Examining expressions of identity through a group of silks depicting scenes from Persian-language poetry of the *Khamsa*, this study hypothesizes that some silks previously believed to be of Safavid provenance may have been produced by weavers who had immigrated to the Mughal court from Iran. The silks are analyzed with regard to iconographic details, weaving techniques including velvet and lampas, and textual evidence supporting the Mughal interest in Persian literature. The connection between the two cultures is evident in courtly circles: rulers share many of the same ideas, images, and even family connections, creating a broad cultural overlap. Lastly, the study poses questions as to the determination of provenance itself with regard to immigrant labor, and how scholars assign labels to objects made by people from one country who are creating objects for patrons or consumers in another.

CHEMISTRY

A Synthetic Pathway to Medicinal Natural Products

Tony E Nicolas, Xiaolan Wu, Abdullah Alaoa,
Matthew Henning / Chemistry Department

The Angucyclines, a class of natural products, display a broad spectrum of biological activity including antibiotic properties. They constitute a potential well for new antibiotics to meet the challenge posed by drug resistant strains of bacteria. In addition to their antibacterial properties the Angucyclines further exhibit antitumor and antiviral activities. The most challenging task in a total synthesis of the more complex 4a and 12b oxygenated Angucyclines, such as Aquayamicin, lies in the construction of the AB ring system, a structural motif which exhibits a marked propensity towards skeletal rearrangements under basic, acidic, and photochemical conditions.



We have developed an efficient synthetic path to the AB ring system. Our approach is based on a three-step installation of the BC ring with all the carbons and functionalities required for a ring-closing metathesis to finalize ring A.

Strategies for the Photoreduction of TC-99 Pertechnetate to Low-Valent TC by Keggin Polyoxometalates

Ivana Radivojevic Jovanovic¹, Colleen M.B. Gallagher², Ramsey Salcedo², Wayne W. Lukens Jr.⁴, Benjamin P. Burton-Pye³, Donna McGregor³ and Lynn C. Francesconi²

¹Department of Chemistry, New York City College of Technology, CUNY

²Department of Chemistry, Hunter College, CUNY

³Department of Chemistry, Lehman College, CUNY

⁴Chemical Sciences Division, Lawrence Berkeley National Laboratory, Berkeley

Technetium-99 (half-life of 2.1×10^5 yrs) is a hazardous radiological contaminant, which in its predominant form of pertechnetate (TcO_4^-) is highly mobile in the environment. Most strategies for the removal of pertechnetate from the environment involve uptake and/or absorption of pertechnetate using resins, clays, cationic metal-organic frameworks and even Thorium Borate ceramic like materials. Alternative approaches have involved the reduction and subsequent sequestration of lower valent technetium species using iron, sulfides or iron sulfides. We explored this strategy using the lacunary alpha-2 Wells-Dawson polyoxometalate ($\alpha_2\text{-[P}_2\text{W}_{17}\text{O}_{61}]^{10-}$) to both reduce and sequester lower valent technetium, and we have reported on the ligand features that stabilize the reduced species. In this work we investigate the potential of "plenary" Keggin POMs ($\text{XW}_{12}\text{O}_{40}^{n-}$) ($\text{X} = \text{P}, \text{Si}, \text{Al}$, $n = 3, 4, 5$, respectively) to both reduce TcO_4^- and stabilize the reduced Tc species. Specifically, we report on the mechanism by which the reduction of technetium occurs and find that PW_{12} , SiW_{12} and AlW_{12} promote the reduction of TcO_4^- to lower valent states. XAS was used to confirm a combination of Tc(IV) and Tc(V), which is subsequently complexed into a POM defect as a $\text{Tc}^{\text{V}}=\text{O}$ species.

COMPUTER ENGINEERING
AND INFORMATION
SYSTEM TECHNOLOGY

Comparing Performance of Malware Classification on Automated Stacking

Yu-Wen Chen / Computer Systems Technology

Stacking in machine learning allows multiple classification or regression algorithms to work together with a goal to enhance performance. To understand the risky properties of malware contamination in a system, it is important to accurately classify malware type first. Malware classification is the procedure of labeling the families of malware. In this paper, we automate stacking with 7 machine learning algorithms and 3 boosting algorithms. The experimental results show a 99.2% accuracy is achieved from a multilayer perceptron network with AdaBoost classifier, which outperforms other models on the malware API call dataset.

Motion UI for Android apps

Marcos Pinto / CST Department

Adding animations to an Android application is like adding salt to a tasteless meal. This paper implements motion user interface to an application using Google's new class MotionLayout, a very complex tool to implement a series of animations that can be incorporated into any Android application.

Infusing Ethics in the Data Science Curriculum

Elizabeth Milonas / Computer Systems Technology Department

Intelligent technology is being woven into the fabric of everyday life and is an integral part of society. Developing intelligent systems requires technical expertise such as knowledge of natural language processing or machine learning and a deep awareness and understanding of ethics and societal impact. Mastering knowledge of ethics and societal impact falls on the shoulders of Data Science professionals and programmers responsible for designing and implementing the decision-making aspects of intelligent systems. Preparing computer students to meet intelligent technology implementation demands requires incorporating and reinforcing ethical and societal impact topics throughout the Data Science curriculum beginning with the introductory courses and continuing to the advanced courses. This study includes a close examination of the importance of infusing Data Science-related ethical concepts throughout the computer curriculum. The study contains an analysis of the issues related to computer technology education and ethics. The study also encompasses an analysis of the best practices for incorporating topics related to ethics and societal impact and the strengths and weaknesses of these practices. Further, the study outlines and discusses a proposed framework for implementing ethical issues in an introductory Data Science course. Also discussed are next steps and future directions.

Ethical Hacking of Public Network

Zakia Ben Yous Gironde and Aparicio Carranza / Computer Engineering Technology

Restaurants, malls and coffee areas provide free WiFi access to attract customers due to its flexibility and feasibility. These types of networks have been popular among the public in recent years; however, it is understood that they create a major threat. User's Personal information on the network can easily be targeted by hackers. Our objective is to assess the weakness of the public network. The objective will be achieved by creating a sniffer packet from a primary Linux based device. We will then use the primary device to hack information from our secondary device connected within the same network. The Python Programming Language will be used, along with some popular beginner libraries such as an SCAPY, IMPACKET and LIBNMAP.

Offline Voice Recognition Module Using Raspberry pi

Mohammed Shakil, Sarah Jessica Gal-Ed and Aparicio Carranza / Computer Engineering Technology

A growing number of smart devices are being connected to the Internet, and that poses a privacy threat. An offline voice recognition system could minimize or eliminate such privacy concerns by boosting security. Voice recognition is a software solution that turns spoken language into text that can be recognized by computers. The Raspberry Pi has voice recognition functional capabilities to convert voice into text.

The text can be transmitted using the serial communication protocol to a micro-controller. Our goal is to build a voice recognition module that will be used within a more complex system. For example, if a smart car needs voice recognition system, we can connect this module with three wires only, to achieve the car's voice recognition capability. We are going to use Rhasspy (*an Open-Source fully offline voice assistant toolkit that works well with Home Assistant*), Hass.io (*an OS that takes care of installing and updating Home Assistant*), and Node-RED (*a programming tool for wiring together hardware devices*).

Object Recognition with Augmented Reality

Juan Estrella, Aleksei Takshaitov and Aparicio Carranza / Computer Engineering Technology

Machine Learning and Deep Learning are sub-fields of Artificial Intelligence and have been implemented in applications that can detect and label objects and figures such as a chair, a person or even some kinds of animals. We have developed an application that makes use of Augmented Reality and Object Recognition. The capability of this app is to label detected objects with tags and relay the information to people who are visually impaired. These combined technologies can benefit individuals in public places by helping them reach their destination safely. The app will guide the individuals in need to prevent colliding with objects and also by recognizing other useful subsets of objects such as stop signs.



EDUCATION

Online Student Support through Peer-Led Online Math Study Groups

Ariane M. Masuda & Nadia S. Kennedy / Mathematics Department

Universities have faced considerable academic challenge since the recent transition to remote teaching during the Covid-19 pandemic. One of the challenges has been and still is to provide adequate support to undergraduate students. This presentation focuses on a modification of the Peer-Led Team Learning (PLTL) model—*Peer-Led Online Math Study Groups*—designed to support students in online undergraduate math courses. The groups meet online and are led by peer leaders who are Math Education students or graduates. The poster describes the structure of the student support groups and benefits for the participating undergraduate mathematics students.

ENGINEERING AND ARCHITECTURAL TECHNOLOGY

Roebling, Before the Bridge. The Early Work of John Augustus Roebling

Paul C. King / Architectural Technology

This presentation will focus on the early work of John A. Roebling, the engineer of the Brooklyn Bridge. Through a review of his early projects, this presentation traces the development of his ideas and methods that made him the most successful American civil engineer of the 1800's. His work paralleled the evolution of transportation in America from horse-drawn carriages, to the heyday of commercial barges pulled along canals, to the introduction of railway systems with steam locomotives powered by coal, to the evolution of commuter rail systems. A cross section of the original Brooklyn Bridge shows the integration a railway system that travelled back and forth from Brooklyn to New York City, pulled by an endless wire rope powered by stationary steam engines located on the Brooklyn side.

"Roebling, *Before the Bridge*" looks closely at the evolution of all of Roebling's built work from his first bridges in Pittsburg, to his suspension aqueducts for the Delaware & Hudson Canal System, to the first Railroad Suspension Bridge to span the Niagara Gorge, to the Cincinnati-Covington Bridge – his first bridge to use large masonry towers, a direct predecessor to his final work the Brooklyn Bridge. Along the way, Roebling refined techniques in the manufacture of wire rope, conducted experiments in materials science and patented bridge building methods that changed how bridges were built.

As the manuscript nears publication, it has taken clear graphic and written form. The poster will include the display of materials from the book layout and an excerpt from the introduction.

Accessibility Compliance and Assessments for Gateway Websites in Life Sciences: Toward Inclusive Design

Noreen Whysel¹, Shari Thurow², and Bev Corwin³

¹Communication Design, Co-Founder, Information Architecture Gateway

²Information Architect, Omni Marketing Inc, Co-Founder, Information Architecture Gateway

³Co-Founder, Technology Director, Information Architecture Gateway

One main purpose of information architecture and site navigation is to enhance the effectiveness of user interfaces (UIs) by supporting and enabling task completion, accessibility, and sustainability. This is of particular importance for science gateways given the complexity of information on portal sites. We examined the accessibility of 50 randomly selected gateway websites in the Life Sciences category in the Science Gateways Community Institute (SGCI) catalog, using both manual and automated methodologies. None of these sites produced an accessible website as per W3C, WCAG 2.1, and Section 508 standards. The most common accessibility success in these websites was URL structure, which enables web browsers and search engines to access content.

HOSPITALITY MANAGEMENT

Consuming Poppy Cannon

Claire Stewart / Hospitality Management Department

Poppy Cannon was a best-selling food writer prominent in post-World War II America. Within the pages of her many books and syndicated food columns, she positioned the use of processed foods as uniquely innovative. Cannon's recipes, featuring packaged and frozen foods, were written for an audience eager to exhibit their modernity by harnessing the increasingly accessible food supply paired with the use of newly manufactured kitchen gadgets.

Cannon, once a household name, is now mostly forgotten. Her recipes now act as amusing internet fodder; held up as kitschy examples of bad 1950s food (not the balm to harried housewives that they actually were).

The Vassar-educated Cannon held her own in a cutthroat publishing world while raising three children from three different fathers. She married four times, her last marriage in 1949 to Walter White, the African-American NAACP executive and civil rights leader. Cannon battled social norms and scratched out a career in a rampantly sexist and racist environment.

In the forthcoming *Consumption and the Literary Cookbook* (edited by Harde & Wasselius, published by Taylor & Francis) I have written a chapter about Poppy Cannon. In this work, I seek to reconstruct Cannon's reputation and to establish her rightful legacy.

HUMANITIES, SOCIAL SCIENCES AND ENGLISH

Category Learning in a Transitive Inference Paradigm

Tina Kao¹, Greg Jensen², Vincent Ferrera³, Herbert Terrace²

¹New York City College of Technology, Department of Social Science (Psychology)

²Columbia University, Department of Psychology

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The implied order of a ranked set of visual images can be learned by transitive inference (TI), without reliance on stimulus features that explicitly signal their order. Such learning is difficult to explain by associative mechanisms but can be accounted for by cognitive representations and processes such as transitive inference. Our study seeks to determine if those processes are also applied to categories of images. Specifically, we asked whether participants can (a) infer that images being

presented belonged to familiar categories, even when every image presented during every trial is unique, and (b) perform transitive inferences about the ordering of those categories. Despite receiving minimal instruction, participants learned the implied order of lists of fixed stimuli and lists of ordered categories, using trial-unique exemplars. However, participants who were presented with category exemplars did not display a symbolic distance effect, unlike participants whose TI training used fixed stimuli. These findings suggest that differing cognitive processes may underpin serial learning when learning about specific stimuli as opposed to stimulus categories.

The Economics of Power Generation from Renewable and Non-Renewable Energy Sources

Unurjargal Nyambu / Social Science Department

An empirical analysis of trends in supplies, costs and prices connected with energy production indicate that low-cost and low-carbon intensive fuels, shale gas being a prominent example, as well as the development of solar and wind energy, will greatly contribute to the transition to a low-carbon economy. We have observed a significant decline in natural gas prices that is associated with a surge in production. The current research presented here studies the behavior of the production and cost of different fossil fuels, as well as renewable sources of electricity generation. Costs are incorporated in a theoretical dynamic-optimization model. Due to the continuous decline in costs of clean energy production, global electricity capacity has accelerated, especially solar and wind capacities. Investments in renewable energy have increased significantly in recent years. Numerical solutions of the dynamic non-linear model in our research suggest that promoting renewable energy would contribute to efforts to reduce carbon emissions.

The Construction of an Online Learning Diagnostic Test

Julian Thomas Costa / Department of Humanities

Over the past twenty years, online learning has gained immense popularity at colleges across the globe. As technology has become more sophisticated, the amount of technology being integrated into these courses has increased. In many cases, students are expected to navigate more than one learning management system, use productivity tools, and create multimedia, and it is usually assumed that the students already know how to perform all of these tasks. The reality is that not all students are familiar with online learning tools prior to enrolling in an online course, and therefore, much time and energy is lost at the beginning of the semester to troubleshooting. In an effort to familiarize students with the tools, terminology, and processes needed to navigate their online course, a task-oriented assessment was designed that provided students with an "orientation" to the learning management system, basic document formatting, email, and file management.

1956 Hungarian Revolution: Lasting Impacts from a Violent Backlash Against Foreign Oppression

Lisa Pope Fischer / Social Science Department

This poster presents the third chapter in my new book, *Chorus of Experiences Capturing Moments in Time: From the Siege of Budapest to Goulash Populism*, that uses oral histories of senior Hungarian women to explore the past and the present. The 1956 Revolution in Hungary can be seen as a populist movement in response to the harsh Rákosi Era, and a response against the foreign occupation of the Russian Communists. I use both Ada and Zsófia's stories to set up the

cultural context of the period. Whereas Ada tells a powerful emotional story of loss, Zsófia more methodically outlines the series of events that occurred. These two stories are followed by the perspectives of others to more fully contextualize the experience and look at how the 1956 revolution fits a general pattern of populism as an expression of backlash against a foreign presence and as a means to regain control.

INTERDISCIPLINARY

Blood-brain Barrier Permeability and AChE Inhibition of Ionophoric Polyphenols

Alberto Martinez¹, Mai Zahran², Miguel Gomez¹, Johnny Guevara² and Rosemary Pichardo-Bueno²

¹ Department of Chemistry

² Department of Biological Sciences

Alzheimer's disease (AD) is the most common form of dementia and affects more than 40 million people around the world. The incidence is expected to rapidly increase due to the lack of any effective treatment. In previous work we synthesized a family of five ionophoric polyphenols (compounds 1-5) that targeted important aspects related to AD. Here, in order to gain insights into their potential therapeutic value, we have tested the ability of compounds 1-5 to cross the blood brain barrier (BBB), and to inhibit acetylcholinesterase (AChE), an enzyme that is reported to be involved in the progression of the disease. We performed BBB permeability and efflux mechanisms studies by means of the *in vitro* parallel artificial membrane permeability assay (PAMPA-BBB), as well as several *in silico* methods. AChE inhibition was spectrophotometrically studied. All compounds were found permeable to the BBB and moderate AChE inhibitors. Additionally, they displayed the ability to interact with several residues of the active site of the enzyme as revealed by docking and molecular dynamics simulations. Overall, our results suggest that these compounds could effectively cross the BBB to exert their anti-AD activity, including AChE inhibition.

Study of Lanthanide Complexes in a Model Ionic and Photosynthesis Environment by Near-infrared, MRI and X-ray Imaging

Subhendra Sarker¹, Chen Xu² and Zoya Vinokur³

¹ Dept of Radiologic Technology

² Dept of Computer Engineering Technology

³ Dept of Radiologic Technology

This work explores the diffusivity of a lanthanide Gadolinium complex, Eovist (Gadolinium-Ethoxy Benzyl Diethylenetriamine pentaacetate) that is stable in neutral media but not in acidic environment. An acidic fruit model like pineapple that is rich in transition metals was tested using x-ray and MR imaging. Another goal of this work was to perturb the photosynthesis systems that pineapple

has maintained for millions of years during the evolution of circadian genes for efficient water conservation using dark photosynthesis. To detect such photosynthesis Near infrared reflection spectroscopy was used for pineapple samples to test if added lanthanide complex and pre-existing transition metals in pineapple can affect such photosynthesis processes. This is an ongoing project with potential medical and agricultural implications as well as impact on new solar cells and Lanthanide influenced bone regeneration. [Student researchers: Tetiana Soloviova, Amina Shahbaz, Aldona Gjoni/AAS-Rad tech]

Monitoring the Transport of Minerals and Nutrients in a Plant

Subhendra Sarkar¹, Chen Xu² and Zoya Vinokur³

¹Dept of Radiologic Technology

²Dept of Computer Engineering Technology

³Dept of Radiologic Technology

This work analyzes various experimental results of nanoparticle (NP) transport in the matrix of a complex nutrient bed of various plant systems that seem to be measurable by x-ray imaging and near infra-red spectroscopy. Nanoparticles like metal oxide-induced phyto-toxicity is very important and is widely studied to understand the interactions between plants and environmental NPs, however NP from and lanthanide complexes are not yet been studied in such systems. Hence, we are working to understand the uptake and translocation as well as abiotic transformation and redox conversions.

[Student researchers: Tetiana Soloviova, Amina Shahbaz, Aldona Gjoni/AAS-Rad Tech, Little Azeez/BS-MET]

Protein Instability in Medicinal Applications of Gadolinium Complexes

Subhendra Sarkar¹ and Boris Gelman²

¹Dept of Radiologic Technology

²Dept of Physics

Lanthanides like Gadolinium are useful in medicinal and radiological chemistry. They can be used to eliminate free radicals and act as antioxidants in vivo. However, this affinity for reactive oxygen species also creates competitive binding of lanthanides to proteins. This alters biologically important electron transfer pathways, for example in bones and in brain and renal tissues and could cause toxicity. We have been working on the molecular interaction of Gadolinium with egg proteins. In order to understand experimental results molecular modeling is being performed for long range dispersive forces that are attractive at large ionic distances but have attractive nature at short range. It is interesting that some Gadolinium complexes can break down the 3D protein structures faster depending on ligands. Hence it is necessary to revisit the hydrogen bonding and other weak molecular interactions in such systems. [Student researchers: Daniela Costin/BSRS-Rad Tech, Little Azeez/BS-MET, Aldona Gjoni/AAS-Rad Tech]

LAW AND PARALEGAL

All Rise: Suiting Up for the Practice of Law in the COVID-19 Virtual Legal Environment

Marissa J. Moran, Esq. / Law & Paralegal Studies Department

The age-old advice, "No matter how you feel, get up, dress up, and show up!" may be worth remembering as more legal professionals participate in virtual legal environments due to the COVID-19 mandated court closures. In the United States, "a court's authority to regulate an attorney's dress is partially based on statutory rules of conduct and ethics." Customs and tradition are woven into the fabric, in particular the apparel-long black robes worn by judges/justices as they take the bench and preside over legal matters. In the new virtual court environment reports of attorneys' lax dress code and lapses in judgment have been commented upon by both the court and the public, who regularly login to view virtual court sessions. Imagine attorneys seated in their home or dining room offices as the hearing begins. What do they do when the bailiff proclaims, "All rise," and they are wearing shorts? *Suiting Up* for the legal professional in essence is donning a legal cloak of armor, the respected, expected, and required clothing worn when protecting and defending the rights of clients, whether hearings are conducted in-person or in the new virtual setting.

LIBRARY

Sailors: The Iconography of an All-American Homoerotic Icon

Kel R. Karpinski / Library

Through a new critical reading and analysis of images found in the magazines *Young Physique* and *Physique Pictorial*, I examine how the sailor has become a homoerotic icon. Looking at these magazines in the post-World War II and pre-Stonewall period, I'm specifically interested in how sailors in the popular imagination are viewed as the epitome of all things American and yet simultaneously occupy a distinctly queer space of desire. Sailors are a gay icon in the mythology of American culture and an object of gay fetishization and fantasy. For queer men, who were seen as outside of mainstream culture or on the fringe, what does it mean for their object of desire to be such a patriotic symbol of masculinity? What are the implications or race and class inherent in these depictions of sailors in the medium of physique magazines?

Bibliodiversity at the Center: Decolonizing Open Access

Monica Berger / Library

The promise of open access for the less developed countries of the global South has not been fully met. Publishing is dominated by Northern publishers who disadvantage Southern authors through platform capitalism and open access models requiring article processing charges to publish. The South can reclaim and decolonize open access, nurturing scholarly communities, by employing bibliodiversity, a sustainable, anticolonial ethos and practice developed in Latin America. Self-determination and locality are at the core of bibliodiversity, which rejects the domination of international, English-language journal publishing. As articulated by the Jussieu Call, varied scholarly community-based, non-profit, and sustainable models for open access are integral to bibliodiversity as is reform of research evaluation systems. We must foster open access models that better serve all.

MATHEMATICS

Rédei Permutations with Cycles of The Same Length

Ariane M. Masuda / Department of Mathematics

Let F_q be a finite field of odd characteristic. We study Rédei functions that induce permutations over $P^1(F_q)$ with 1- and p -cycles for a prime p . First, we determine all cycle decompositions that are admissible; in particular, this gives the possible number of fixed points. Then we completely describe Rédei permutations consisting of 1- and p -cycles, and determine their total number. For an odd p , we show that there exists a Rédei permutation over $P^1(F_q)$ with 1- and p -cycles if and only if $q-1$ or $q+1$ has a prime factor of the form $pk+1$ or is divisible by p^2 . We also present explicit formulas for Rédei involutions based on the number of fixed points, and procedures to construct Rédei permutations with a prescribed number of fixed points and j -cycles for $j=3,4$ or 5 . This is joint work with Juliane Capaverde and Virgínia M. Rodrigues.

A Sinusoidal Twist with Exponential Tendencies

Satyanand Singh / Department of Mathematics

We show that the total distance traveled by an under-damped oscillating spring mass system with sinusoidal displacement results in a nice, closed-form expression.

Birational Products

Hans Schoutens / Mathematics

Two algebro-geometric objects (aka *varieties*) are called *birationally equal* if “for the most part” they are the same. Although the class of varieties is closed under Cartesian products, the product of two birationally equal varieties will therefore be “twice” as big. Is there a way to refine the product so that the result is again a birationally equal variety? That is the problem of *birational products*, and I will explain in this poster how this can be done.

PHYSICS

The Multi-Dimensional Realm of Feynman Integrals

Giovanni Ossola and Ray D. Sameshima / Physics Department

The understanding of our Universe at the smallest scales, and the interaction among fundamental particles that populate them, relies on the understanding of their symmetries. The mathematical language that we use to describe such interactions should indeed reflect the same structures.

Within this framework, the study of Feynman integrals allows us to go beyond its traditional role of the standard computational technique in perturbation theory and becomes an extraordinary tool to explore the symmetries of our particle physics models.

In our poster, we discuss various parametrizations of Feynman Integrals and their specific features. By choosing different parametrizations, we do not simply choose different variables to represent the same multi-dimensional integrals, but we explore different facets of the underlying mathematical structures of scattering amplitudes.

Rydberg Excitons in Novel Two-Dimensional Materials: TMDCs and Xenes

Spiridonova and R. Ya. Kezerashvili / New York City College of Technology, The City University of New York; The Graduate School and University Center, The City University of New York

We study direct and indirect magnetoexcitons in novel two-dimensional materials such as transition-metal dichalcogenides (TMDCs) and Xenes, which are encapsulated or spatially separated by h-BN monolayers. The formation of magnetoexcitons in TMDC monolayer or heterostructure occur in the presence of the magnetic field which is perpendicular to the layer. The formation of magnetoexcitons in Xenes monolayer and heterostructure are studied in the presence of both perpendicular magnetic and electric fields. Our calculations use as inputs the effective electron and hole masses obtained in the framework of the density functional theory. We calculate the binding energies of magnetoexcitons by numerically solving the Schrödinger equation and using both the Rytova-Keldysh and Coulomb potentials for the description of electron-hole interaction. The energy contribution from the

magnetic field to the binding energy of the magnetoexcitons and the diamagnetic coefficients of the Rydberg $1s$, $2s$, $3s$, and $4s$ states are presented. We find that the binding energies of magnetoexcitons can be tuned by the magnetic field, and magnetoexcitons dissociate at smaller values of the magnetic field compared to the results previously reported in the literature. It is demonstrated that the binding energies of the magnetoexcitons of the Rydberg $1s$, $2s$, $3s$, and $4s$ states in the Xenon monolayer and heterostructure could be tuned by changing both the external magnetic and electric fields. The calculations of the binding energies of magnetoexcitons and diamagnetic coefficients in TMDC heterostructures and Xenon monolayers and heterostructure are reported for the first time.

Strain Induced Quantum Hall Phenomena of Excitons in Graphene

Oleg L. Berman¹, Roman Ya. Kezerashvili¹, Yurii E. Lozovik² and Klaus G. Ziegler³

¹Physics Department, New York City College of Technology, CUNY

²Institute of Spectroscopy, Troitsk

³University of Augsburg, Augsburg

We predict quantum Hall phenomena for excitons such as the Integer and Fractional Quantum Hall effects, and the state of composite fermions at $\nu = 1/2$ in a mono and double layer of gapped graphene under strain-induced gauge pseudomagnetic field. When electrons and holes are excited only in one valley of the honeycomb lattice of gapped graphene, the strain induced pseudomagnetic field acts on electrons and holes the same way. The latter leads to the formation of single pseudomagnetoexcitons (PMEs), whose properties are cardinally different from those of magnetoexcitons. Wave functions and the energy spectrum of direct and indirect PME in a mono and double layer of gapped graphene are obtained. The valley Hall flows of direct and indirect PME, similar to Hall currents of charged particles, can be excited in a mono or double layer of gapped graphene, respectively. The predicted quantum Hall phenomena for the PME are important, since they imply that the quantum Hall physics and valleytronics phenomena can be observed in the novel system of neutral bosons without magnetic field.

Dipolariton Propagation in Van der Waals TMDC with Ψ -shaped Channel Guides

Patrick Serafin and German Kolmakov / Physics

Using a computational approach based on the driven diffusion equation for a dipolariton wave packet, we simulate the diffusive dynamics of dipolaritons in an optical microcavity embedded with a transition metal dichalcogenide (TMDC) heterogeneous bilayer encompassing a Ψ -shaped channel. By considering exciton-dipolaritons, which are a three way superposition of direct excitons, indirect excitons and cavity photons, we are able to drive the dipolaritons in our system by the use of an electric voltage and investigate their diffusive properties. More precisely, we study the propagation of dipolaritons present in a MoSe_2 - WS_2 heterostructure, where the dipolariton propagation is guided by a Ψ -shaped channel. By our consideration of a geometrically novel dipolariton channel guide, we are able to replicate the dipolariton redistribution efficiencies of previously proposed polaritronic applications as well introduce novel designs for optical routers at room temperature.

Quasi-Phase States of Molecular Systems

Vasilii Znamenskiy / Physics Department

Molecular Dynamics and Quantum Chemistry studies for ionic systems [1], water [2], and biological macromolecules [3] revealed numerous quasi-equilibrium quasi-phase states. For example, macroscopic phase transitions are chaotic numerous jumps of nanoscale clusters between numerous quasi-phase states.

The concept of quasi-phase states, which depend on the system configuration and boundary conditions, is useful to describe nanoscale and surface phenomena. At temperatures of the bulk liquid phase, these quasi-phase states can have properties of solids, and vice versa, as in the contact-melting phenomenon. Nanoscale biological phenomena, as mechanisms of ion channels, can be explained in terms of quasi-phases. Further research should be aimed at identifying specific quasi-phase states of various systems. For example, the penetration of virus molecules through cell membranes can be studied as membrane quasi-melting in the place of penetration.

1. Molecular Dynamics Study of Ionic Melts Resulting from Contact Melting. E. A. Goncharenko, Inorganic Materials, Vol. 36, No. 10, 2000, pp. 1056–1059.
2. Quantum Calculations On Hydrogen Bonds In Certain Water Clusters Show Cooperative Effects. Znamenskiy VS, Green ME. J Chem Theory Comput. 2007 Jan;3(1):103-114.
3. Quantum mechanical calculations of charge effects on gating the KcsA channel. Kariev AM, ... Biochim Biophys Acta. 2007 May;1768(5):1218-29.

Tidal Locking and the Gravitational Fold Catastrophe

Andrea Ferrogliola and Miguel Fiolhais / Physics Department City Tech and BMCC

The purpose of this work is to study the phenomenon of tidal locking in a pedagogical framework by analyzing the effective gravitational potential of a two-body system with two spinning objects. It is shown that the effective potential of such a system is an example of a fold catastrophe. In fact, the existence of a local minimum and saddle point, corresponding to tidally-locked circular orbits, is regulated by a single dimensionless control parameter which depends on the properties of the two bodies and on the total angular momentum of the system. The method described in this work results in compact expressions for the radius of the circular orbit and the tidally-locked spin/orbital frequency. The limiting case in which one of the two orbiting objects is point-like is studied in detail. An analysis of the effective potential, which in this limit depends on only two parameters, allows one to clearly visualize the properties of the system. The notorious case of Phobos, the moon of Mars, is presented as an example of a satellite that is past the no-return point and, therefore, will not reach a stable or unstable tidally-locked orbit.

ORGANIZING COMMITTEE

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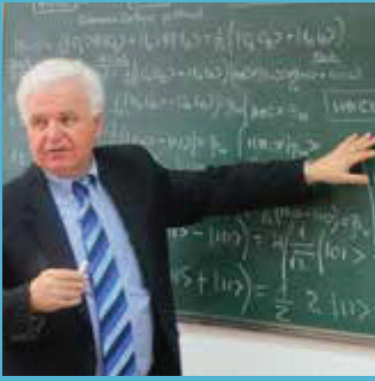
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First row l to r:
Roman Kezerashvili,
Candido Cabo



Second row l to r:
Andrea Ferrogli
Alberto Martinez

Third row l to r:
Anna Matthews
Alexander Rozenblyum



Fourth row l to r:
Hans Schoutens
Stephen Soiffer
Mai Zahran

