CSI UNDERGRADUATE CONFERENCE ON RESEARCH, SCHOLARSHIP, AND PERFORMANCE

THURSDAY, APRIL 30, 2009
CSI UNDERGRADUATE CONFERENCE ON RESEARCH, SCHOLARSHIP, AND PERFORMANCE*

April 30, 2009
Center for the Arts, 1P-Atrium
1:30pm – 4:00pm

*Sponsored by the Division of Academic Affairs with funding from the CSI Student Government Academic and Curricular Affairs Commissions, and the CSI Foundation
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noon to 1:30pm</td>
<td>Authors and Mentors Lunch</td>
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</tr>
<tr>
<td>1:25pm</td>
<td>Opening Remarks by President Morales</td>
<td>1P - Atrium</td>
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<tr>
<td>12:30pm-1:25pm</td>
<td>CSI Rock Music Club</td>
<td>Williamson Theatre</td>
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<tr>
<td>1:30pm-4:00pm</td>
<td>Poster Presentations</td>
<td>1P - Atrium</td>
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<tr>
<td>1:30pm-2:25pm</td>
<td>CSI Dance Program</td>
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<td></td>
<td>The Training of a Dancer</td>
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<td>Dance Studio, 1P-220</td>
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<tr>
<td>1:30pm-2:25pm</td>
<td>CSI Music Program Recital</td>
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<td>Recital Hall, 1P-120</td>
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<tr>
<td>1:30pm-4:30pm</td>
<td>The Spring Arts Festival Group Exhibition</td>
<td>CSI Student Art Gallery, 1P-118B</td>
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<tr>
<td>2:00pm</td>
<td>Reception - Student Art Gallery, 1P-118B</td>
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<td>2:30pm</td>
<td>Drama Production</td>
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<td>Lab Theatre, 1P-110</td>
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<tr>
<td>3:00pm</td>
<td>Poetry and Art – Student Art Gallery, 1P-118B</td>
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<tr>
<td>2:45pm-3:30pm</td>
<td>CSI Small Jazz Ensembles</td>
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<td></td>
<td>Williamson Theatre</td>
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<tr>
<td>3:30pm-4:30pm</td>
<td>CSI Guitar Ensemble</td>
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<td>Recital Hall, 1P-120</td>
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<td>8:00pm</td>
<td>Drama Production</td>
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<td>Lab Theatre, 1P-110</td>
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CSI Undergraduate Conference on Research, Scholarship, and Performance

Message from the President

It is my pleasure to welcome you to the 8th Annual Undergraduate Conference on Research, Scholarship, and Performance.

The work presented by our students under the conference theme of “Your Passport to Knowledge,” certainly personifies the CSI tagline “World Class, Right here!” These projects represent a depth and breadth of work rarely seen among undergraduates. This conference highlights both the intellect and talent of CSI students, as well as the commitment of our faculty to provide a world-class education for our students. It is through the guidance of, and the collaboration with, CSI faculty that our students are able to produce research, scholarship, and performance of the outstanding caliber that you will enjoy today.

This year we have a record number of participants in the conference representing an extensive range of disciplines within the College. Today, you will enjoy complex musical and dance performances, gain exposure to rigorous analyses of social scientific and literary ideas and theories, and observe meticulous scientific investigations and inquiries. I would like to acknowledge our Library faculty and staff, and Dr. Alan Benimoff—all have again assisted our student participants by providing workshops and technical assistance that enabled them to enhance the visual components of their presentations.

It is important to note that 17 of our students’ research projects were supported through CSI Undergraduate Research Awards sponsored by the CSI Foundation. In addition, we are extremely grateful to the CSI Student Government, Academic and Curricular Affairs Commission, for their financial support. I am indeed proud that this conference represents a true collaboration of the College community and I appreciate the many roles played by all in presenting this conference.

I welcome the students and faculty from the area high schools and encourage you to meet our students and faculty, talk with them, make connections, and spend some time immersing yourselves in the critical research and experimentation that define the college experience. And, know that you are always welcome on the CSI campus.

Congratulations to each and every one of today’s participants!

Sincerely,

Tomás D. Morales, PhD
President
The Department of Performing and Creative Arts

Presents

An Art, Dance, Drama, and Music Exposition

at

The Eighth Annual CSI Undergraduate Conference on Research, Scholarship, and Performance

Recital Hall,
Williamson Theatre,
Dance Studio, Lab Theatre,
and Student Art Gallery
Center for the Arts
Thursday, April 30, 2009
CSI ROCK MUSIC CLUB
12:30pm–1:25pm

An eclectic assortment of Rock standards from the ‘60s to today

Dominick Trancredi, Faculty Advisor

ALAN AURELIA, ELECTRIC BASS • JENNA CALDERON, GUITAR
MIGUEL COMMISSIONG, GUITAR • JOSEPH GIUNTO, DRUMS
MARGARET HAMPTON, VOCALS • ERIC ROCES, DRUMS

CSI SMALL JAZZ ENSEMBLES
2:45pm-3:30pm

A set of Jazz standards featuring CSI’s most accomplished jazz soloists

Michael Morreale, Director

PROGRAM TO INCLUDE

LEMONCELLO ................................................................. BOBBY WATSON
GOOD BAIT .......................................................................... TADD DAMERON
ALTER EGO ........................................................................ JAMES WILLIAMS
QUESTION AND ANSWER .................................................... PAT METHENY
THE BEST THING FOR YOU IS ME ........................................ IRVING BERLIN

CHARLES BUTERA/BRIAN LEONARD - PIANO • ALAN AURELIA/PADRAIC LYNCH – BASS
PAUL BUSCHMANN - DRUMS

DANCE STUDIO (1P-220)

CSI DANCE PROGRAM
1:30pm–2:25pm

The Training of a Dancer
A lecture/demonstration focusing on dance curriculum including excerpts from the upcoming Spring Dance Recital featuring students of the CSI Dance Department and members of the CSI Dance Club

Niambi Keyes, Lecturer

DANCE STUDENTS
KEISHA BENNETT • SANIA BHATTI • KAITLYN CANTONI • EUGENIA CAFFREY
ANTHONY CASTELAO • KATRINA CIRILLO • SHANNON HOOD • DANA JAGUSIAK
GLORIVEE LOPEZ • TIFFANY MCDANIEL • AUDRA MORALES • GABRIELA SANTIAGO
RENA TAN SKVIRSK • JUAN SOLOMON • TAMARA ST. PRIX • NELIDA TOLENTINO

DANCE CLUB
NEFERTITI AMEKER • RHAGINA CHISHOLM • DORIS JOHNSON
WANNIE JOHNSON • JUSTINA MCCHIE • JESSICA SILVA • MONDRY TORE • KEEDA WILLIAMS
THE SPRING ARTS FESTIVAL GROUP EXHIBITION
1:30pm–4:30pm
The Student Art Gallery of the Performing and Creative Arts Department will present an exhibition of work by art majors from all of the areas of study: drawing, painting, photography, printmaking, and sculpture. The exhibition is curated by Iman-Ayeesha Platt, Meg Rowan, and Matt Scarpa whose participation is representative of each of the three main branches of the art major: photography, studio art, and art history.
Siona Wilson, Faculty Advisor
Reception at 2:30pm
Poetry and Art at 3:00pm
Kathryn Fazio will read original poetry of war, passion, and social significance that has influenced her paintings and interaction with the world.

RECIITAL HALL (1P-120)

CSI MUSIC PROGRAM RECITAL
1:30pm–2:25pm
A showcase of chamber music featuring faculty and students of the CSI Music Program.
William Bauer, Performance Coordinator

PROGRAM
MIAhI ................................................................. GÉRARD MONTREUIL (1927-1991)
GERRY GALLARDO, VIOLIN • DANIEL MUCcio, GUITAR
PRELUDE IN A MAJOR, OP. 28, NO. 17 .......................... FRÉDÉRIC CHOPIN (1810-1849)
DIANA CREUTZ, PIANO
INTERMEZZO IN A MAJOR, OP. 118, NO. 2 ............ JOHANNES BRAHMS (1833-1897)
DAVID GLORioso, PIANO
DOWN BY THE SALLIE GARDENS ................................ IRISH TRADITIONAL
MASAFUMI TOYODA, COUNTERTENOR • EDWARD BROWN, GUITAR
LAGRIMA ........................................................... FRANCISCO TARREGA (1852-1909)
ALEXANDER ADELMAN, ACOUSTIC GUITAR
PAVANE ............................................................. GABRIEL FAURE (1845-1924)
AMANDA SIUZDAK, FLUTE • ALEXANDER ADELMAN, ACOUSTIC GUITAR
GRETCHEN AM SPINNRADE .................................. FRANZ SCHUBERT (1797 -1828)
SARAH COHEN, SOPRANO • ELONA MIGIROV, PIANO
CSI GUITAR ENSEMBLE
3:30pm–4:30pm
A concert of diverse music for multiple guitars featuring works from the upcoming CSI Guitar Ensemble concert.
Edward Brown, Director

CSI GUITAR ENSEMBLE
TIMOTHY ADORNO • JENNY BROWN • MATTHEW BURNS • JENNA CALDERON
SARAH COHEN • ARIELLA CRISANO • ALBERT DEROSA • MAXIMILLIAN DOBSON
CHRISTOPHER GEORGE • ANTHONY GONZALEZ • MARGARET HAMPTON
BRYAN KARUNDENG • MARYANNE KORDAZAKIS • DANNY MUCCIO
ANTHONY PARASCANDOLA • STEVEN RADCHENKO • ERIC ROCES • MUHAMMAD SHERWANI
MICHAEL SIMANOVSKY • CHRIS SPINELLI • MASAFUMI TOYODA
MAX TSIRING • IGOR ZASLAVSKY

PROGRAM
A LITTLE SPANISH WALTZ ................................................................. BOB POWER
NOW, O NOW, I NEEDS MUST PART (THE “FROG” GALLIARD) ..................... JOHN DOWLAND
MASAFUMI TOYODA, TENOR
NOTA BENE .......................................................................................... LUC LEVESQUE
MARCH (FROM MARCH OF THE GUITAR BRIGADE) ................................. JOSEPH PARISI
SECRET AGENT MAN ................................................................. P.F. SLOAN/S.BARRI
ANTHONY GONZALEZ, MUHAMMAD SHERWANI, GUITARS
MICHAEL SIMANOVSKY, SAXOPHONE
I HAD A LITTLE DREAM, BARNEY BOY ................................................... J.C.MACEY
MARGARET HAMPTON, JENNA CALDERON, SOPRANOS
SEVENTH HEAVEN ........................................................................ DEREK HASTED
ANDANTE (FROM CONCERTO IN G MAJOR) ........................................... ANTONIO VIVALDI
ANTHONY PARASCANDOLA, ARIELLA CRISANO, MANDOLINS
JULIA .................................................................................................... J. LENNON/P. MCCARTNEY
AY! AY! AY! ....................................................................................... DEREK HASTED
LAB THEATRE (1P-110)

DRAMA PRODUCTION: The Well of Horniness
By Holly Hughes
2:30pm (excerpts)
8:00pm (full production)
Robert Mahoney, Director
Holly Hughes, Writer
Maurya Wickstrom, Faculty Mentor

CAST
NARRATOR ................................................................. JESSICA SOCOL
LOUISE/GARNET MCCLIT ........................................... DANIELLE HERNANDEZ
HAROLD/AL DENTE .................................................... GREG MCGOVERN
GEORGETTE .............................................................. TAWANA DANIELS
VICKI ................................................................. ALISON LANGLEIBEN
ROD ................................................................. ALI SATTAR
BABS ............................................................... MARISSA MURRAY

ENSEMBLE
NICOLE CATALANO • JERAMIAH JURKEWITZ • MATTHEW MARTUCCI
KRISTEN MONIORD • KATIE SELUGA

PRODUCTION STAFF
DIRECTOR .......................................................... ROBERT MAHONEY
FACULTY SUPERVISOR ........................................... MAURYA WICKSTROM
SET DESIGNER .................................................. ROCCO LACAPRIA
COSTUME DESIGN ........................................ NICOLE CATALANO
CARPENTER ...................................................... BOB ELIA
TECHNICAL DIRECTOR ...................................... JENNIFER STRANIERE
SCENIC ARTISTS ................................................ DAN JOHNSON, ROCCO LACAPRIA
Research Poster Presentations

Center for the Arts
Atrium
1:30pm - 4:00pm
Poster 1
Morphologic Constructions and Analysis of Electrocardiogram Using Synthetic and MIT Databases
Chin Ming Hui
Faculty Mentor: Dr. Natacha Gueorguieva
Department of Computer Science

Poster 2
Design Issues in Building a Library Information System
Leo Lei
Faculty Mentor: Dr. Natacha Gueorguieva
Department of Computer Science

Poster 3
Pattern Classifiers Using Kernels
Sergey Ivanushkin
Faculty Mentor: Dr. Natacha Gueorguieva
Department of Computer Science

Poster 4
Effect of Alzheimer-like Tau on Microtubule Dynamics
Sherry J. Browne, Joseph Merola, Christopher Corbo, William L’Amoreaux, and Alejandra Alonso
Faculty Mentor: Dr. Alejandra Alonso
Department of Biology

Poster 5
Footedness in Infancy
Marierose Polis
Faculty Mentor: Dr. Sarah Berger
Department of Psychology

Poster 6
The Emergence of Social Coordination and Communication among Twins
Vanda Melendez, Naomi J. Aldrich, Patricia J. Brooks, and Sonia Ragir
Faculty Mentors: Dr. Patricia Brooks, and Dr. Sonia Ragir
Department of Psychology

Poster 7
Individual Differences in Adult Foreign Language Learning
Annmarie Donachie, Rosemarie Marronaro, Urooj Syed, Jessica Lee, Iroshe Pathirage, Manuel Garcia, Nicola Brown, Ching Yu, Kristina Cumberbatch, and Dorothy Creighton
Faculty Mentor: Dr. Patricia Brooks
Department of Psychology

Poster 8
Sweet Clicked Curry
Saadyah Averick
Faculty Mentor: Dr. Krishnaswami Raja
Department of Chemistry

Poster 9
Simulating Communication Processes between Brain Neurons
Devorah Walker
Faculty Mentor: Dr. Natacha Gueorguieva
Department of Computer Science

Poster 10
Abnormal Length-Force Curves in Spastic Muscles after Spinal Cord Injury
Jimmy Domdeth
Faculty Mentor: Dr. Zaghoul Ahmed
Department of Physical Therapy

Poster 11
Simulating the Brain Information Processing
Vyacheslav Glukh
Faculty Mentor: Dr. Natacha Gueorguieva
Department of Computer Science

Poster 12
Effects of Exercise on Depression Symptoms after Spinal Cord Injury
Jimmy Domdeth
Faculty Mentor: Dr. Dan McCloskey
Department of Psychology

Poster 13
CSI: Second Life
Edwin Fong
Faculty Mentor: Dr. Michael Kress
Department of Computer Science and Vice President for Information Systems

Poster 14
Efficacy of Curriculum in Eliminating Cancer Cells
Alexandra Berliner
Faculty Mentor: Dr. Probal Banerjee
Department of Chemistry

Poster 15
Biosynthesis of Truncated Ste2p: A G-Protein Coupled Receptor from Yeast that May Be Suitable for Crystallization
Grigoriy Gelfand
Faculty Mentor: Dr. Fred Naider
Department of Chemistry

Poster 16
Phase Diagrams of Grafted Molecules under External Fields: A Mean Field Model
Akihisa Yoshida
Faculty Mentor: Dr. Chwen – Yang Shew
Department of Chemistry
Poster 17
Synthesis of Copolymer-templated 2D Hexagonal Silicas and Organosilicas with Very Large Mesopores
Benedette Adewale
Faculty Mentor: Dr. Michael Kruk
Department of Chemistry

Poster 18
Synthesis of Click Discotic Liquid Crystals
Eric Rios-Doria
Faculty Mentor: Dr. Krishnaswami Raja
Department of Chemistry

Poster 19
Religion in the Works of Miguel Angel Asturias
Dorothy Caldone
Faculty Mentor: Dr. Sarah Pollack
Department of Modern Languages

Poster 20
Effects of Prosody in Children Diagnosed with Autism
Seir Nehorah
Faculty Mentors: Dr. Patricia Brooks and Dr. Bertram Ploog
Department of Psychology

Poster 21
Inducible Expression of Hyperphosphorylated Tau in PC-12 Cells: A Neurodegeneration Model
Joseph Merola, Sherry Brown, Lucille Cunsolo, Christopher Corbo, William L’Amoreaux, and Alejandra Alonso
Faculty Mentor: Dr. Alejandra Alonso
Department of Biology

Poster 22
Tau-interactions with Nucleotides, Self-assembly and Impact in Neurodegeneration
Kalpita Abhyankar, Regina Miller, Christopher Corbo, and Alejandra Alonso
Faculty Mentor: Dr. Alejandra Alonso
Department of Biology

Poster 23
Changes to Inhibitory Innervation of the Hippocampus in Two Models of Epilepsy
Eman Tabbara, Nicole Lukovsky, and Azar Latif
Faculty Mentor: Dr. Dan McCloskey
Department of Psychology

Poster 24
Use of Zebra Fish as a Model of Neurodegeneration
Yelena Solovyeva, Lucille Cunsolo, and Christopher Corbo
Faculty Mentor: Dr. Alejandra Alonso
Department of Biology

Poster 25
The Expression and Purification of the Cytosolic Tail of the Ste2p Î±-Factor Receptor
Mohammed H. Bhuiyan
Faculty Mentor: Dr. Fred Naider
Department of Chemistry

Poster 26
Histone Acetylation at the Yeast 1N01 Promoter, the Transcriptional Activator, and Gen5p and Esa1p
Michelle Esposito and Paulina Konarzewska
Faculty Mentor: Dr. Chang-Hui Shen
Department of Biology

Poster 27
Art, Poetry, and Inspiration: One Woman’s Personal Journey
Kathryn Fazio
Faculty Mentor: Prof. Patricia Passlof
Department of Performing and Creative Arts

Poster 28
Why Physics Isn’t Appealing in our American High Schools
Jonathan Colangelo
Faculty Mentor: Dr. Charles Liu
Department of Engineering Science and Physics

Poster 29
Wireless Smart Car
Philip Ciaccio and Roy Hopkins
Faculty Mentor: Dr. Xin Jiang
Department of Engineering Science and Physics

Poster 30
Does Stress Mediate the Relationship between SES and Distress among College Students?
Cory Giannina
Faculty Mentor: Dr. John Lawrence
Department of Psychology

Poster 31
Mechanisms of Neural Injury during Brain Edema
Brian Iskra and Lorenz Neuwirth
Faculty Mentors: Dr. Abdeslem El Idrissi and Dr. James Olson, Wright State University
Department of Biology

Poster 32
Altered Paired Pulse Facilitation in the Fragile X Mouse Brain: Implication for Learning Memory
Brian Iskra, Alexandra Marsillo, Luisa Otalora, and Lorenz Neuwirth
Faculty Mentor: Dr. Abdeslem El Idrissi
Department of Biology
Poster 33
Sodium Hydrogen Exchanger-1 (NEH-1) Function Regulates Mammary Gland Branching
Surendar Ravindran
Faculty Mentor: Dr. Jimmie E. Fata
Department of Biology

Poster 34
Female Teachers and Their Relationships with Students: What Can the Media Tell Us?
Samantha Balestriere
Faculty Mentor: Dr. Darryl Hill
Department of Psychology

Poster 35
Girl Scouting in Detention Centers: Empowering Girls in OCFS to Open Doors
Sonia Levin
Faculty Mentor: Dr. Kathleen Cumiskey
Department of Psychology and the Women’s Studies Program

Poster 36
Language Shift
Kristina Niesi
Faculty Mentor: Dr. Sarah Benesch
Department of English

Poster 37
The Sexuality and Gender of Nontraditional Men: “He’s a Little Bit Effeminate, But He’s Cute”
Peter Buratti
Faculty Mentor: Dr. Darryl Hill
Department of Psychology

Poster 38
Drama Production: The Well of Horniness
By Holly Hughes
Robert Mahoney
Faculty Mentor: Dr. Maurya Wickstrom
Department of Performing and Creative Arts

Poster 39
Biofilm Formation in Candida Albicans
Kathleen Van Manen
Faculty Mentor: Dr. Elena McCoy
Department of Biology

Poster 40
Mammary Carcinogen Screening Model
Alexander Perelman
Faculty Mentor: Dr. Jimmie E. Fata
Department of Biology

Poster 41
The Development of Breast Epithelial Culture Assay that Tests the Effects of Exposure to 1-Nitropyrene
Goldie Lazarus
Faculty Mentor: Dr. Jimmie E. Fata
Department of Biology

Poster 42
Development and Testing of Curcumin Derivatives as Promising Drugs against Breast Cancer
Ashley Mathai
Faculty Mentor: Dr. Jimmie E. Fata
Department of Biology

Poster 43
Does Cumulative Stress Mediate the Relationship Between SES and Academic Achievement?
Jason DeGenaro
Faculty Mentor: Dr. John Lawrence
Department of Psychology

Poster 44
Multi-Purpose Tracking Robot
Tsui Siu Lun Ben
Faculty Mentor: Professor James Hladek
Department of Engineering Science and Physics

Poster 45
Theoretical Studies of an Enneadic Particle System Confined onto a Spherical Surface: Monte Carlo Simulation
Fatima Z. Rafique
Faculty Mentor: Dr. Chwen-Yang Shew
Department of Chemistry

Poster 46
Transition Metal-Catalyzed Addition Reactions of Arylboronic Acids with Aromatic Aldehydes
Matthew Israel, Yuan-Xi Liao, and Qiao-Sheng Hu
Faculty Mentor: Dr. Qiao-Sheng Hu
Department of Chemistry

Poster 47
Effects of Urbanization of Locally Breeding Landbirds of the New York City Area: Estimating Demographic Parameters in Urban Woodlots
Allison Baranski
Faculty Mentor: Dr. Shaibal Mitra
Department of Biology

Poster 48
Development of Optically Active Spiroindanediol-Containing Polymers for Organic Synthesis
Jaclynn Ng, Alexandra Levashvile, Chun-Hui Xing, Tao-Ping Liu, and Qiao-Sheng Hu
Faculty Mentor: Dr. Qiao-Sheng Hu
Department of Chemistry
| Poster 49 | Effects of Butanol on Filamentation and Phosphatase Activity in Candida Albicans  
Natalia Gozias  
Faculty Mentor: Dr. Elena McCoy  
Department of Biology |
|---|---|
| Poster 50 | Preterm Babies and Attention Regulation at School Age  
Sharmila Mohammed  
Faculty Mentor: Dr. Comfort Asanbe  
Department of Psychology |
| Poster 51 | Characterization of Post Epileptic Hilar Neurons Receiving Inhibitory Input  
Azar Latif, Eman Tabbara, and Nicole Lukovsky  
Faculty Mentor: Dr. Dan McCloskey  
Department of Psychology |
| Poster 52 | Collaborating to Create Change SC3  
Elizabeth Belnavis  
Faculty Mentor: Dr. Judit Kerekes  
Department of Education |
| Poster 53 | Studying Parallel Computation of 2D Turbulence  
Jonathan Maltz  
Faculty Mentor: Dr. Andrew Poje  
Department of Mathematics |
| Poster 54 | Classification of Brain Tissue from Magnetic Resonance Images  
Troy Johnson and Ed Wah Chen  
Faculty Mentor: Dr. Lihong (Connie) Li  
Department of Engineering Science and Physics |
| Poster 55 | A Plug-in for Visualizing MS Lesions  
Philip Koshy and Nirav Thakkar  
Faculty Mentor: Dr. Deborah Sturm  
Department of Computer Science |
| Poster 56 | Implementation and Performance Testing of the SQUASH RFID Authentication Protocol  
Philip Koshy and Justin Valentini  
Faculty Mentor: Dr. Xiaowen Zhang  
Department of Computer Science |
| Poster 57 | Optimization of Drifter's Launch Location with a Genetic Algorithm  
Ismael Yacoubou Djima  
Faculty Mentor: Dr. Andrew Poje  
Department of Mathematics |
| Poster 58 | Estimation of Trade Impact on Wage Inequality in the United States  
Ismael Yacoubou Djima  
Faculty Mentor: Dr. Alexandru Voicu  
Department of Political Science, Economics and Philosophy |
| Poster 59 | Uncovering the Magic behind Walt Disney World  
Lauren LoPrimo  
Faculty Mentor: Dr. Susan Holak  
Department of Business and the Office of Academic Affairs |
| Poster 60 | The Music SILOH Project: Documenting Music Making Activities on Staten Island with Digital Media  
Timothy Mullen and Linda Soria  
Faculty Mentor: Dr. William Bauer  
Department of Performing and Creative Arts |
| Poster 61 | George Melies, A Cinematic Revolution  
Jeffery Man  
Faculty Mentor: Dr. Matthew Solomon  
Department of Media Culture |
| Poster 62 | ASME Mars Rocks Team  
John P. Barricella  
Faculty Mentor: Dr. Xin Jiang  
Department of Engineering Science and Physics |
| Poster 63 | Neuro Imaging Supports Critical Period Hypothesis  
Barbara Fiume  
Faculty Mentor: Dr. Sarah Benesch  
Department of English |
| Poster 64 | Pharmacogenetics and Pain Management  
Steven Decarlo  
Faculty Mentor: Dr. Mary Ellen McMorrow  
Department of Nursing |
| Poster 65 | The Rise of Counterfeit Drugs  
Sonia Bairak  
Faculty Mentor: Dr. Alan Zimmerman  
Department of Business |
| Poster 66 | Physiology and Metabolism of the Single-Celled Green Algae: Chlorella Kessleri  
Michael Jean  
Faculty Mentor: Dr. Robert E. Corin  
Department of Biology |
Poster 67
Exercise Mediated Effects of Hippocampal-dependent Spatial Memory Task Performance in the Rat Perinatal Hypoxia Model of Epilepsy
Nicole Lukovsky
Faculty Mentor: Dr. Dan McCloskey
Department of Psychology

Poster 68
Stress and Coping Mechanisms among College Students: A Cross-Cultural Study
Krista Suprino
Faculty Mentor: Dr. Comfort Asanbe
Department of Psychology

Poster 69
Green Intelligent Parking Lot Control System (AKA GIP’s)
Alexander Nwanekah
Faculty Mentor: Dr. Charles Liu
Department of Engineering Science and Physics

Poster 70
Synthesis of Novel Curcumin-derived Environmentally Friendly Plasticizers
Jose Saltos
Faculty Mentor: Dr. Krishnaswami Raja
Department of Chemistry

Poster 71
Globalization: Challenges in Africa
Rachel Affi
Faculty Mentor: Dr. Alan Zimmerman
Department of Business
**POSTER 1**

**Morphologic Constructions and Analysis of Electrocardiogram Using Synthetic and MIT Databases**

Chin Ming Hui  
Faculty Mentor: Dr. Natacha Gueorguieva  
Department of Computer Science

The electrocardiogram (ECG) comprises a recording of the heart’s electrical activities that occur over time, where an atrial depolarization wave (P wave), a ventricular depolarization wave (QRS complex) and a ventricular depolarization wave (T wave) are recorded for each cardiac cycle. The electrocardiographic morphology deals with interpretation of the shape (amplitude, width and contour) of the electrocardiographic signals.

The origin of ECG morphology can be explained by the dipole-vector theory, which states that the ECG is an expression of the electro-ionic changes generated during myocardial depolarization and repolarization. A pair of electrical charges, termed a dipole (expressed as a vector), is formed during both depolarization and repolarization processes. To ascertain the direction of a wavefront, the ECG is recorded from different sites, called leads.

In this research we mainly focus on peak separation and identification based upon the morphologic constructions and analysis of electrocardiogram. Biologically, it is related to the functioning of the heart, and microscopically, related to contractions and relaxations of each muscle fiber or the polarization and depolarization.

QT interval as well as PR interval, ST segment, and RR interval are extremely important for diagnosis of cardiovascular problems, such as PVC but the determination of its different features with the needed accuracy is still the most difficult challenge faced by the researchers. In order to analyze different parameters, we propose an approach based on deviation method and multiple integration techniques. Here we use frequency (dependent variable) vs. time (independent variable) and handle the data as a continuous case, because the discrete case is time consuming.

**POSTER 2**

**Design Issues in Building a Library Information System**

Leo Lei  
Faculty Mentor: Dr. Natacha Gueorguieva  
Department of Computer Science

The term *information system* refers to information technology that is used by people to accomplish a specified organizational or individual objective. The technology may be used in the gathering, processing, storing, and/or dissemination of information, and the users are trained in the use of that technology, as well as in the procedures to be followed in doing so. The specific technologies that collectively comprise information technology are computer technology and data communications technology. Computers provide most of the storage and processing capabilities, while data communications, specifically networks, provide the means for dissemination and remote access of information.

The goal of this research is to design a Library Information System that stores information about borrowers, books, the status of lending books, and the location of each book in our two-story library. In order to reduce the bookkeeping, we impose an additional requirement to the system as keeping track of borrower transactions (i.e., lending books, returning books, etc. and reporting information to borrowers and librarians). The proposed friendly graphical user interface (GUI) written in C++ facilitates the system implementation. We included the following Book Attributes: Title, Author (first name, last name), Subject (a category that the book fits under as computer networking, computer programming etc.), Call Number (a unique nine-digit number assigned to each book where different copies of the same book will have different call numbers ), Publisher, Publishing Date, Location, Status (Out, Available, Hold, Maintenance), Due Date, Fine Per Day Overdue, Circulation Period, and Cost of the Book. Borrower Attributes include Name, Phone Number, ID, Currently Borrowed, and Balance of Fees. All the information is stored into the proposed structure of SQL database, which provides the necessary relationships between different tables and interaction between them and the GUI.
Pattern Classifiers Using Kernels
Sergey Ivanushkin
Faculty Mentor: Dr. Natacha Gueorguieva
Department of Computer Science
Support Vector Machines (SVMs) are a set of related supervised learning methods, for which solving classification and regression tasks is formulated as quadratic programming (QP) problems. Supervised learning is a machine learning technique for learning a function from data consisting of pairs of vectors and desired regression. Input data of \( n \) vectors in an \( n \)-dimensional space will construct a line separating hyper planes in that space, one which maximizes the margin between the two or more vectors. A good separation line is the one that has the largest distance to the neighboring vectors of \( n \) classes. Therefore SVMs may be defined as a classification method that determines that maximum-margin hyper plane.

The original optimal hyper plane algorithm proposed by Vladimir Vapnik in 1963 was a linear classifier. However, in 1992, Bernhard Boser, Isabelle Guyon and Vapnik suggested a way to create non-linear classifiers by using the kernel trick invented by Aizerman to maximize margin between vectors. The resulting algorithm, replaces every dot product by a non-linear kernel function.

The goal of this research is to extend the number of kernels currently offered in the package LIBSVM (http://www.csie.ntu.edu.tw/~cjlin/libsvm/), which includes only Radial Basis Function (RBF) Gaussian kernel with the following: Linear, Polynomial, RBF exponential, Sigmoid/MLP, Multiquadric, Inverse multiquadric, and Thin plate splines. This application implements those algorithms and visually represents them. Machine types are C-SVC, nu-SVC, one class SVM, epsilon SVR, nu-SVR. The proposed GUI allows visualization of five different two-dimensional classes where patterns can be loaded from a file or picked up by mouse with the registration of their coordinates. There is a visualization of the separation boundaries together with different statistics in order to choose the most appropriate kernel for different applications.

Effect of Alzheimer-like Tau on Microtubule Dynamics
Sherry J. Browne, Joseph Merolla, Christopher Corbo, William L’Amoreaux, and Alejandra Alonso
Faculty Mentor: Dr. Alejandra Alonso
Department of Biology
Accumulation of hyperphosphorylated tau and the disruption of microtubules is correlated with synaptic loss and pathology in neurodegenerative diseases, such as Alzheimer’s Disease (AD). One hallmark lesion of AD is the initial appearance of neurofibrillary tangles within the neurons. These tangles are composed mainly of hyperphosphorylated tau, a microtubule-associated protein (MAP), polymerized into filaments. We have previously shown that the cytosolic Alzheimer hyperphosphorylated inhibition of microtubule assembly and disruption of microtubules. We will study the effects of pseudophosphorylated tau (Ps-tau) at Thr212, Thr231, and Ser262, in porcine kidney epithelial cells (LLCPK) stable line expressing EB1-GFP, the microtubule cap protein. By using live cell time-lapse fluorescent microscopy, we will analyze microtubule dynamics. We will be able to record the movement and the stability of the microtubules in the transfected versus the non-transfected cells. These findings will lead to a better understanding of the role P-tau plays in microtubule dynamics.
**Poster 5**

**Footedness in Infancy**

Marierose Polis

Faculty Mentor: Dr. Sarah Berger
Department of Psychology

Handedness is the tendency to use one hand over the other to perform activities. Similarly, footedness is the tendency to prefer one foot over the other for “leading out,” in first steps (Peters, 1988). Hand preference for goal-directed reaching becomes predictable between seven and thirteen months (Michel et al., 2006), but infants shift their hand preference several times before acquiring a stable, preferred hand (Corbetta & Thelen, 1996, 1999; Fagard, 1998). In adults, both preferences are more strongly correlated than any other lateralizations (Peters, 1988), however very little is known about the development of footedness or its relationship to handedness in infancy. The aims of this study were to view footedness in an infant locomotor task and examine the relationship between footedness and handedness in crawling or walking and reaching.

Forty-four 13-month-old crawlers or walkers traversed a path several times towards a goal. Each trial, we measured infants’ lead-out foot preference and hand preference as they reached for the goal. Crawlers and walkers showed side preferences significantly more often than chance at the start of each trial respectively, but did not differ from each other. Walkers reached with both hands significantly more often than crawlers did. Although foot preferences were stable, they did not yet seem to be related to hand preference. This may be because 13-month-old walkers are at the early onset of independent walking, when they tend to couple their arms (Corbetta, 1996). Future research will examine whether infants’ preferences were momentary, fluctuating with the acquisition of new locomotor milestones (Corbetta et al., 2006), or whether infants’ side preferences were an early sign of footedness.

**Poster 6**

**The Emergence of Social Coordination and Communication among Twins**

Vanda Melendez, Naomi J. Aldrich, Patricia J. Brooks, and Sonia Ragir

Faculty Mentors: Dr. Patricia Brooks, and Dr. Sonia Ragir
Department of Psychology

Research suggests that joint attention reflects vital aspects of psychological development, such as the emergence of the mental and behavioral processes essential to cognitive development and language acquisition. Integral to this relationship are the roles of non-verbal communication and an infant’s readiness to imitate and reciprocate another’s actions. While researchers have shown that twins use more non-verbal communicative exchanges than familiar same-age peers, they debate whether or not there are delays in twins’ language development. Early work comparing twins to singletons indicates that twins are more likely to exhibit language deficits, but more recent studies suggest that delays that occur may be attributed to biological factors (e.g., low birth weight), rather than to being a twin. Moreover, some have suggested that developmental delays may be worse for at-risk singletons than for twins. The present study explores the expression of social coordination, imitation, and reciprocity in twins. Twin dyads were videotaped during a ten-minute free play session at 7-months (n = 10) and 10-months (n = 10) (ages adjusted for prematurity). Each sibling’s behavior was coded for the expression of joint attention, non-verbal social coordination, play patterns, communicative gestures, and early language. Results are discussed in relation to preliminary findings of the beneficial effects of constant social stimulation, such that a twin at risk for developmental delay may have a better prognosis than a comparable high-risk singleton. The confirmation of such benefits has important implications for the design of early intervention programs encountering increasing numbers of at-risk premature multiple gestation births.
**POSTER 7**

**Individual Differences in Adult Foreign Language Learning**

Annemarie Donachie, Rosemarie Marronaro, Urooj Syed, Jessica Lee, Irosha Pathirage, Manuel Garcia, and Nicola Brown

Faculty Mentor: Dr. Patricia Brooks
Department of Psychology

How individuals learn a language remains a mystery. Our study investigates the psychological processes involved in adult foreign language acquisition, using Russian as the language to be learned. Saffran (2003) has argued that language acquisition depends on learning mechanisms that extract statistical regularities (such as recurrent sequences or patterns) to determine the locations of word boundaries and syntactic structures. Our experiment tests the hypothesis that measures of statistical learning (in particular the artificial grammar learning task) will be predictive of success in adult foreign language learning. Participants were 76 CSI undergraduates, 51 females and 25 males, ages 18-42, with no prior experience learning Russian. Participants were given different tests and questionnaires that assessed verbal working memory capacity, statistical learning of sequences, pattern identification, speech perception, prior exposure to foreign language and musical abilities. Participants also received six 35-minute language-learning sessions during which they listened to and repeated Russian phrases and answered comprehension and production probes to assess learning. In the final session, participants completed a generalization test examining their ability to generate Russian phrases different from the ones used in the training sessions (i.e., to say things in Russian that they had never heard before). Our poster examines correlations among the verbal working memory and statistical learning tasks, as the language learning data has not yet been tabulated.

**POSTER 8**

**Sweet Clicked Curry**

Saadyah Averick

Faculty Mentor: Dr. Krishnaswami Raja
Department of Chemistry

Curcumin is a powerful broad-spectrum anti-oxidant, anti-cancer, and anti-Alzheimer's small molecule. In its unmodified state the usage of curcumin as a drug presents several important issues. Curcumin's hydrophobicity greatly limits its bioavailability. Another potential issue of curcumin's applicability is that at relatively high concentrations curcumin is cytotoxic. Therefore a water-soluble derivative of curcumin, whose desired biological actions remain intact, is highly desirable. Through the conjugation of a sugar molecule via a phenolic moiety of curcumin, an asymmetric water-soluble derivative of curcumin was created, with the proposed name sweet clicked curry (SCC). SCC shows far superior capabilities, compared to the parent molecule, of dissolving amyloid fibrils, has greater anti-oxidant potential, and has prevention of apoptosis capabilities.
**Poster 9**

**Simulating Communication Processes Between Brain Neurons**

Devorah Walker  
Faculty Mentor: Dr. Natacha Gueorguieva  
Department of Computer Science

Understanding the functional model of the human brain could open up a large quantity of information. Not only would we be able to treat diseases such as depression and Alzheimer’s much more efficiently, but we would also be able to make significant changes to the field of computer science. It is clear that computer simulations are an absolute necessity in understanding the functioning of the brain. The vast majority of nerve cells generate a series of brief voltage pulses in response to vigorous inputs. These pulses, also referred to as action potentials or spikes, originate at or close to the cell body and propagate down the axon at constant velocity and amplitude.

The goal of this research is to study and simulate biological neuron structure, the resting potentials and how they are affected by things such as potassium, sodium and ion concentrations. We used the package HHsim which is a simulation environment and includes graphical visualization of cell membranes using the Hodgkin-Huxley equations. It respectively provides full control over the parameters of mathematical equations and additional control on the membrane parameters, stimulus parameters, and ion concentrations. We conducted the following experiments:

- Simulation of equilibrium potential of a cell with a single channel type and effect of cutting in half the external sodium concentration.
- Simulation of membrane potential with only passive channels (no voltage-gated sodium or potassium channels) and manipulate the resting potential Vr by changing the ion concentrations.
- Simulation of sodium channel, which consists of an activation gate and an inactivation gate.
- Experiments using different Voltage-Gated Channel Parameters and how they affect the Fast Sodium channel.

**Poster 10**

**Abnormal Length-Force Curves in Spastic Muscles after Spinal Cord Injury**

Jimmy Domdeth  
Faculty Mentor: Dr. Zaghloul Ahmed  
Department of Physical Therapy

The main objective of this project is to study the length-force relationship in the spastic muscle following spinal cord injury (SCI). We hypothesize that the average of the length-force relationship of the spastic muscle following SCI will be shifted to the left (in the bell-shaped curve) in comparison to the normal gastrocnemius muscle. This finding will support the idea that spastic muscle following SCI is intrinsically sensitive to stretch receptors. To test this, we will compare spastic and normal muscles using the following procedures: 1) inducing SCI to express spasticity in muscles of the hind limbs in mice and 2) recording of muscle twitch force using a myograph. We expect the results to show that as we increase the length (in millimeters) of the spastic muscle, the force (in grams) will increase quicker versus the normal muscle.
**Poster 11**

**Simulating the Brain Information Processing**

Vyacheslav Glukh
Faculty Mentor: Dr. Natacha Gueorguieva
Department of Computer Science

Information processing in the brain results from the spread and interaction of electrical and chemical signals within and among neurons. The mathematical model involves nonlinear equations that describe brain mechanisms in general and which do not have analytical solutions. The recent expansion in the use of simulation tools in the field of neuroscience has been encouraged by the rapid growth of quantitative observations that both stimulate and constrain the formulation of new hypotheses of neuronal function.

In our research, we use the NEURON simulation environment as it is capable of efficient discrete event simulations of networks of “artificial” (integrate and fire) spiking neurons, as well as hybrid simulations of nets whose elements include both artificial neurons and neuron models with membrane currents governed by voltage-gated ionic conductances. NEURON has special features that accommodate the complex geometry and nonlinearities of biologically realistic models, without interfering with its ability to handle more specific models that involve a high degree of abstraction. Our goal is to study and simulate biological neurons: structure, processing information, pyramidal neurons, membrane potential bistability. The performed simulations include the following major steps:

- **Establish model topology:** We model the following anatomical features with their respective existence and spatial relationship: a cell body (soma), dendrites, and axons.
- **Assign anatomical and biophysical properties:** Next we set the anatomical and biophysical properties of each section as the basic building block from which model cells are constructed. Each section has its own segmentation, length, and diameter parameters, so it is necessary to indicate which section is being referenced.
- **Attach stimulating electrodes:** This code emulates the use of an electrode to inject a stimulating current into the soma by placing a current pulse stimulus in the middle of the soma section.
- **Control simulation time course:** At this point all model parameters have been specified. All that remains is to define the simulation parameters, which govern the time course of the simulations.

**Poster 12**

**Effects of Exercise on Depression Symptoms after Spinal Cord Injury**

Jimmy Domdeth
Faculty Mentor: Dr. Dan McCloskey
Department of Psychology

Spinal cord injury (SCI) has been shown to be comorbid with anxiety and depression. The main objective of this study is to determine whether voluntary exercise can reduce anxiety and depression-like symptoms associated with SCI in mice. Male and female CD-1 mice received compression of the spinal cord near thoracic vertebrae 9/10, an injury that does not cause paralysis. Animals in the exercise condition received daily exposure to running wheels, along with motor skill activities requiring climbing and traversing complex obstacles (e.g. ropes, ladders, and marbles) for approximately 30 days. We hypothesize that physical activity will reduce anxiety and depression-like symptoms in SCI. To measure anxiety and depression, the following battery of tests will be performed: 1. swim test, 2. sucrose preference test, 3. elevated plus maze, and 4. a comparison of adrenal weight. We expect to find support for the role exercise in the psychological rehabilitation of mice with SCI.
CSI: Second Life

Edwin Fong
Faculty Mentor: Dr. Michael Kress
Department of Computer Science and Vice President for Technology

CSI: Second Life is a resource available online to anyone interested in stimulating their ingenuity. Second Life is a virtual environment which can be molded and designed to represent the visions of the people who use it. This virtual space emulates the real world in real-time, here avatars communicate through voice or text chat, and are given all the characteristics and motions of real life, without any of its perceivable boundaries. CSI: Second Life makes use of this digital society, providing visitors with information about the College, areas in which to socialize and a building space or sandbox for experiments. It provides a landmark of innovation and inspiration which allows visitors to experience the sense of reality when limited only by imagination.

In this project we are developing and advancing the CSI: Second Life beachfront. Through the use of scripting and 3D modeling, we create constructs inspired by the accomplishments of our students and faculty which showcase CSI. Various objects will be created on the CSI: Second Life beachfront to interact with avatars. These interactions will be tracked for statistical analysis of the visits. Additionally, visitors can develop and explore on their own and appreciate their own resourcefulness. Through this project we are able to see coding and modeling fuse together to instill life within ideas and visions.

Efficacy of Curcumin in Eliminating Cancer Cells

Alexandra Berliner
Faculty Mentor: Dr. Probal Banerjee
Department of Chemistry

The various types of cancer that invade human tissue have diverse etiologies of formation, but the common factor among all of them is the state of uncontrolled cell division that yields the tumors. Traditional medicines have been used with some success for some forms of cancer. Yet for many other types of cancers, such as brain tumors, very little success has been obtained using such therapies. The most common therapeutic strategy uses antimetabolites, which target and block uncontrolled division of cancer cells. However, such antimetabolites also have pronounced, detrimental side effects on normal cells. The other strategies, such as the use of agents that block angiogenesis (blood vessel formation) in tumors have not yet come to the therapeutic level. This emphasizes the need for investigations on the application of natural agents that have been used earlier to treat tumors for many years with little or no side effects. Our preliminary data have shown that the spice component, curcumin, results in caspase-3 induction in oligodendroglioma (HOG), neuroblastoma (N18), mixed glioma (GL261), and melanoma (B16F10) cells. This is also concomitant with decreased MTT activity, which demonstrates increased cell death. Furthermore, we have observed that curcumin crosses the blood-brain-barrier in mice and prevents tumor formation in mice injected with the potent tumor cells B16F10 but does not affect the normal brain cells. Further studies focus on analyzing the mechanism by which curcumin causes selective elimination of cancer cells from the brain. To this end, cultured brain slices will be obtained from mice injected in the front brain with B16F10 and GL261 cells. Curcumin treatment of such cultured slices under carefully designed conditions will elucidate the mechanistic details of its anti-tumor activity and lay the foundation for its efficacious use as a potent anti-tumor agent in in vivo studies.
Biosynthesis of Truncated Ste2p: A G-Protein Coupled Receptor from Yeast that May Be Suitable for Crystallization

Grigoriy Gelfand
Faculty Mentor: Dr. Fred Naider
Department of Chemistry

G-protein coupled receptors (GPCRs) are heptahelical integral membrane proteins (IMPs) that induce an intracellular signaling cascade and are used as the targets for a wide range of pharmaceuticals. GPCRs have been linked to regulation of behavior and mood and have been associated with inflammatory responses.

In order to design agonists or antagonists that bind to GPCRs and create drugs with better efficacies, it is essential to understand their three dimensional structures. At present, the three dimensional structures of only a handful of GPCRs are known. We are investigating Ste2p, a GPCR that is found in Saccharomyces cerevisiae. Crystallization of IMPs is hampered by their inherent flexibility. We are engineering Ste2p to limit its molecular movements and increase its propensity to crystallize. We are constructing plasmids that will code for expression of analogs of Ste2p that 1) have a truncated cytoplasmic tail (CT); 2) have a truncated CT and lack the first 10 residues at the N-terminus; and 3) have a truncated CT and lack the first 10 residues at the N-terminus and are missing a portion of the first extracellular loop. The above constructs will also be engineered with mutations that will favor the ground and excited states of Ste2p and which are constrained by a disulfide bond. The goal of these constructs is to express a shorter less flexible molecule that will form crystals for X-ray analysis.

The STE2 gene has been amplified by PCR and ligated into a pET vector, which is used in E.coli expression systems. Clones coding for the desired construct have been isolated and identified by DNA sequencing. We are in the early stages of transforming the expression plasmids into E.coli strains BL21-AI and BL21(DE3)pLysS. Expression will be optimized and SDS-PAGE, Western Blot and mass spectroscopy will be used to identify the correct protein.

Phase Diagrams of Grafted Molecules under External Fields: A Mean Field Model

Akihisa Yoshida
Faculty Mentor: Dr. Chwen-Yang Shew
Department of Chemistry

A mean field theory is extended to investigate the phase behavior of grafted molecules under external fields. In the model, each grafted molecule contains two states, similar to the Ising model, and the applied field interacts with only one of the two states. The free energy of this model is formulated as a function of composition, field strength, and a parameter to account for the intermolecular interactions of neighboring molecules. Our calculations show that uniform fields exhibit no significant effect on phase diagrams. In contrast, linear gradient fields affect critical temperature but show no direct effect on critical composition. Under external fields with quadratic spatial gradient, both critical constants become sensitive to field direction and strength. Moreover, an analysis of field dependent critical constants suggests that quadratic fields affect miscibility and critical temperature. A brief comparison of the current model and the Ising model is also given.
**POSTER 17**

**Synthesis of Copolymer-templated 2-D Hexagonal Silicas and Organosilicas with very Large Mesopores**

Benedette Adewale  
Faculty Mentor: Dr. Michal Kruk  
Department of Chemistry

The low temperature (12°-15° C) synthesis of ordered nano-porous silicas with large diameter (10-22 nm) cylindrical pores was studied. Silica framework was formed from silicon alcoxide precursor using micelles of block copolymer as templates. Hydrophobic swelling agents (1,3,5-triisopropylbenzene) (TIPB) and cyclohexane (C6H12) were used to swell the micelles of the block copolymer, thus increasing their diameter and effectively enlarging the pores of the templated silica. While the characterization of the obtained silica materials is still in progress, the present results show that when TIPB is used, the pore diameter tends to increase with the increase in the amount of the silica precursor used. This behavior, which has not been observed earlier, suggests that the increase in the relative amount of the silica precursor promotes the expansion of micelles by the swelling agent. The pore diameters of some silicas with cylindrical pores obtained in the present study are beyond the pore size range documented so far in the scientific literature by other research groups. It was also shown that cyclohexane (C6H12) can promote the formation of silicas with large cylindrical pores even when its mass ratio to the block copolymer surfactant is about 1:10.

**POSTER 18**

**Synthesis of Click Discotic Liquid Crystals**

Eric Rios-Doria  
Faculty Mentor: Dr. Krishnaswami Raja  
Department of Chemistry

Liquid crystals are an intermediate phase between solid and liquid that is synthesized from rufigallol by the utilization of “Click Chemistry” conditions. This final product of discotic liquid crystals is achieved through synthesis by etherifying rufigallol using excess propargyl bromide. Pure rufigallol is obtained by a series of reactions and purifications starting from gallic acid. The product of aromatic cores with multiple alkyne attachments will be purified and reacted with certain azides to generate the final discotic liquid crystals. By introducing hydrophilic groups into the lateral chains of the discotic molecules, disc-shaped multipolar amphiphiles can be generated.
**POSTER 19**

**Religion in the Works of Miguel Angel Asturias**

Dorothy Caldone

Faculty Mentor: Dr. Sarah Pollack
Department of Modern Languages

In the works of Miguel Angel Asturias, the invasion of Guatemala by conquistadors from Spain is depicted from the point of view of the indigenous Mayan. Therefore, the Mayan religious beliefs are heavily present in the plot and as a result shown in contrast to the Christian beliefs of the conquistadors. The author utilized this contrast to highlight the Mayan connection to the land and their use of justified violence, while the Christians are destructive and violent without a just cause. In this independent study, I will analyze the contact between both the Mayan and the Christian religion present in the works of Miguel Angel Asturias and the elements used by the author to depict this contrast. The invasion of the Spanish was in part motivated by aggressive religious beliefs, which contrasted with the more nature derived religions of the Mayan.

**POSTER 20**

**The Effects of Prosody in Children Diagnosed with Autism**

Seir Nehorah

Faculty Mentors: Dr. Patricia Brooks and Dr. Bertram Ploog
Department of Psychology

Most children diagnosed with autism have deficits in producing and comprehending speech. Our study investigated speech perception in children diagnosed with autism in an effort to explore their sensitivity towards emotional tone of voice, also known as “affective prosody”. Five children diagnosed with autism were presented with a computerized video game that presented them with sentences that differed with respect to the content words (e.g., “Jack saw a mouse” or “Sam shut the door”) and emotional tone of voice (i.e., grouchy vs. enthusiastic). Children learned to select a particular sentence (S+) and then were tested on probe sentences that varied from the S+ with respect to the content words or the emotional tone of voice. Previous work in the lab showed that children diagnosed with autism were able to differentiate the prosodic contours of statements and questions. The five children who were involved in the present study varied in their ability to play the game successfully. Ultimately our goal is to explore differences as well as similarities in speech perception between children diagnosed with autism and children with typical development.
**POSTER 21**

**Inducible Expression of Hyperphosphorylated Tau in PC-12 Cells: A Neurodegeneration Model**

Joseph Merola, Sherry Browne, Lucille Cunsolo, Christopher Corbo, William L’Amoreaux, and Alejandra Alonso

Faculty Mentor: Dr. Alejandra Alonso
Department of Biology

A collective group of neurodegenerative diseases, including Alzheimer’s disease, are referred to as tauopathies. These diseases are histopathologically characterized by neurofibrillary tangles (NFTs) composed of hyperphosphorylated forms of the neuronal microtubule associated phosphoprotein (MAP) tau. Normally this phosphoprotein plays a key role in the stabilization of microtubule networks. When hyperphosphorylated, tau no longer performs these functions and begins to aggregate. To study the effects of hyperphosphorylated tau on the stability of microtubule networks, transient and stable transfection techniques utilizing the PC-12 Tet-off inducible system will be performed. With this system, the production of hyperphosphorylated tau is controlled using tetracycline as an inducer. Cells expressing hyperphosphorylated tau typically result in alterations in shape, and display tau attached to their microtubule networks. Live cell imaging and confocal microscopy will be also utilized to study microtubule dynamics, as well as characterizing abnormal cellular alterations following hyperphosphorylated tau expression.

**POSTER 22**

**Tau-interactions with Nucleotides, Self-assembly and Impact in Neurodegeneration**

Kalpita Abhyankar, Regina Miller, Chris Corbo, and Alejandra Alonso

Faculty Mentor: Dr. Alejandra Alonso
Department of Biology

It is pivotal to understand the mechanistic function of synaptic breakdown that precedes in cell death in Alzheimer’s disease (AD) and other neurodegenerative diseases. One of the causes of neurodegenerative diseases is a defunct tau protein. Accumulation of hyperphosphorylated tau causes the disruption of microtubules, which are related to synaptic loss and pathology of Alzheimer’s disease. Impaired cognitive function and pathology of AD is correlated with this lesion. We have previously shown that the cytosolic Alzheimer hyperphosphorylated tau (AD P-tau) sequesters normal tau, MAP1A, MAP1B and MAP2, which results in the inhibition of microtubule assembly and disruption of microtubules and self assemble into filaments. Tau promotes the assembly and stabilizes microtubules. Tau is a phospho-protein, and its phosphorylation is regulated throughout development. Unraveling the mechanism of self-assembly of tau has generated considerable interest. In vitro assembly of tau has been achieved under different conditions, such as urea treatment for 60 hour or incubations with unsaturated free fatty acids, tRNA, heparin, polyglutamic acid or quinones; with a tau fragment; or with high protein concentration (12 mg/ml) and long incubation period (several days). We have shown that tau self assemble upon phosphorylation. We have found that tau has possessed a consensus sequence for binding ATP. We studied the influence of ATP and GTP on tau self assembly. Using photolabelling we found that tau binds ATP and not GTP and there is no auto-phosphorylation. ATP induces self-assembly of tau into filaments. The implications of tau binding to the nucleotides, its self-assembly and neurodegeneration are discussed.
**Poster 23**

**Changes to Inhibitory Innervation of the Hippocampus in Two Models of Epilepsy**

Eman Tabbara, Nicole Lukovsky, and Azar Latif  
Faculty Mentor: Dr. Dan McCloskey  
Department of Psychology

In a common form of epilepsy, seizures begin in one area of the brain (most commonly the hippocampus) and spread to neighboring regions. We are using two animal models of epilepsy (one developmental, and one adult) to understand how the hippocampus changes to begin producing seizures in epilepsy. Previous work from our lab shows that two regions in the hippocampus have altered physiology under epileptic conditions: CA3 and CA1. We would predict based on our recordings that CA3 has fewer inhibitory fibers in epilepsy while CA1 has more. Here, we used anatomical methods to determine the number of inhibitory axon terminals to test these hypotheses. Sprague Dawley rats were subjected to seizures induced by pilocarpine and developmental hypoxia seizure models. Epileptic and naive control animals were perfused two weeks later, and brains were processed for immunohistochemistry using an antibody to the vesicular GABA transporter (VGAT). Images were collected with a confocal microscope and visualized using 3-D reconstruction software. Preliminary qualitative results suggest that brain sections from epileptic animals showed a reduction of VGAT staining in the CA3 area and more staining in the CA1 area; however, in the control animals, observed sections showed constant staining along the CA3/CA1 axis. Presently, we are quantifying the number of VGAT axon terminals in both the CA3 and CA1 regions. Similar results will be obtained in both seizure-induced models verifying that CA3 area of the hippocampus shows a decrease in VGAT axon terminals and CA1 area demonstrates an increase in VGAT immunoreactivity.

**Poster 24**

**Use of Zebra Fish as a Model of Neurodegeneration**

Yelena Solovyeva, Lucille Cunsolo, and Christopher Corbo  
Faculty Mentor: Dr. Alejandra Alonso  
Department of Biology

Tau, a neuronal microtubule associated protein, has been shown to induce frontal temporal dementia with Parkinsonism linked to chromosome 17 because of point mutations in tau sequence. In other neurodegenerative diseases such as Alzheimer’s disease, tau is found hyperphosphorylated and polymerized into tangles of filaments. Tau expression and phosphorylation patterns change with development. To test tau’s involvement in the process of neurodegeneration in the brain, we will produce transgenic Zebra fish expressing human Tau. Initially, our goal is to explore naive fish brain cells to establish the organism’s actual conditions. We will study the presence of tau in Zebra fish by SDS-PAGE gel electrophoresis and Western blots using a battery of antibodies against tau and phosphorylated tau. As a control we use mouse brain tissue. We will also analyze the cell distribution of the microtubule protein in zebra fish using confocal microscopy. The Zebra fish is a very useful model being cheap to maintain; therefore, we can study the effect of tau expression in normal development. Furthermore, we will also introduce the abnormal phosphorylated form of tau to induce neurodegeneration in the fish. Zebra fish provide a good model allowing us to test preventative drugs dealing with neurodegeneration in water.
The Expression and Purification of the Cytosolic Tail of the Ste2p \(\alpha\)-Factor Receptor

Mohammed H. Bhuiyan
Faculty Mentor: Dr. Fred Naider
Department of Chemistry

One of the most important families of proteins in nature are G-protein coupled receptors (GPCRs) which are characterized by seven transmembrane helical domains that loop in and out of the plasma membrane in a serpentine fashion. GPCRs play vital roles in diverse biological processes, such as cellular development, cellular proliferation, and viral infection and therefore must be highly regulated. The cytosolic tail (CT) is thought to play an important role in GPCR signal regulation. Here we attempt to express and purify the CT of the \(\alpha\)-factor receptor (Ste2p). BL21-DE3 Escherichia coli cells containing a vector coding for the 131 residue tail, plus a histidine tag and linker to give a protein of 17.5kDa, were used. Cells were grown in 15N M9 media, resulting in expression of a 15N labeled protein. After expression cells were lysed using lysis mix and the lysate was first subjected to affinity purification through a Talon Co+2 resin, in which the CT was purified via its His tag. The Talon purified protein was passed through a RP-HPLC column resulting in a 99% homogenous product in yield of ~16mg/L. The CT was characterized by mass spectrometry and 2D NMR analysis. The MS molecular weight was 17426.38Da compared to an expected weight of 17424.62Da. The NMR spectra suggested that the CT is primarily disordered but may have transient secondary structures. This was confirmed by CD analysis. The structure of the CT, its interactions with protein partners and the mechanism of regulation of Ste2p is under investigation.

Histone Acetylation at the Yeast INO1 Promoter, the Transcriptional Activator, and Gcn5p and Esa1p

Michelle Esposito, and Paulina Konarzewska
Faculty Mentor: Dr. Chang-Hui Shen
Department of Biology

The de novo synthesis of phosphatidylinositol from glucose-6-phosphate requires the structural gene INO1. INO1 encodes inositol-1-phosphate synthase, which catalyzes the rate-limiting step in the synthesis of inositol. Previously, we demonstrated that SWI/SNF and INO80 are present at the INO1 promoter and both are activator-dependent remodelers. We also demonstrated that the recruitment of Snf2p is Ino80p-dependent. From our work and that of others, we propose a model to describe how several factors act on INO1 chromatin during gene activation. However, it has yet to be shown how and when histone modification plays a role in INO1 activation. Here, we showed, using chromatin immunoprecipitation coupled with real-time PCR, that induction of INO1 resulted in acetylation of both H3 and H4 at the INO1 promoter and open reading frame. Acetylation of H3 and H4 required the transcriptional activator Ino2p, suggesting activator-dependent recruitment of histone acetylation. Furthermore, histone acetylation is accompanied by the presence of histone acetylase Gcn5p and Esa1p at the INO1 promoter and open reading frame. The presence of both histone acetylases at INO1 promoter is activator-dependent. In light of these findings, we proposed a model which describes the order of events in INO1 activation.
Art, Poetry, and Inspiration: One Woman’s Personal Journey

Kathryn Fazio
Faculty Mentor: Prof. Patricia Passlof
Department of Performing and Creative Arts

I paint and write poetry because I have to metabolize pain. The best way to do this is to aspire to reach a higher point. Making a painting or attending to what is poetic in the physical world is the best way for me to do this. The painting or the success of the poem has little to do with me if it is successfully rendered or articulated. I bow to the beauty outside of me and try to be honest to the thing itself. Finding the painting is a surprise and the space between strokes a necessary silence. Space gives a poem or painting a pumping heart so that the work can breathe and be still at the same time.

In the making of a painting, one must remain true to the strokes. Once the first stroke is on the canvas one must find what the canvas is telling you. The painting itself trumps any preconceived notion of a story, idea, or image. One cannot paint without paint. It must be lusciously present in the same way baby food smears an infant’s face. The strokes and components of the painting must relate to each other not to you.

When articulating a poem, the images, reoccurring themes/metaphors also come as a surprise. I’ve learned to let the compelling poem speak through me so the music and mathematics (silence and word) breathes from me a new soul, a crafted, skillful, expression. One can find the painting or poem or ruin it like a narcissistic mother if you do not listen to what it is compelled to reveal.

Why Physics Isn’t Appealing in Our American High Schools

Jonathan Colangelo
Faculty Mentor: Dr. Charles Liu
Department of Engineering Science and Physics

My presentation is going to revolve around some of the reasons why Physics isn’t a sought after subject like English or History at the secondary education level. In addition to the academic journals I have read, I have conducted 350 anonymous student surveys that I handed out to three New York City Public High Schools regarding different misconceptions surrounding Physics at the secondary level of education. Upon receiving and analyzing the surveys and in conjunction with the academic journal articles, I have theorized some possibilities that should be implemented to try to further promote the studying of physics at the secondary level of education.
**P O S T E R 2 9**

**Wireless Smart Car**

Philip Ciaccio, and Roy Hopkins  
Faculty Mentor: Dr. (Jessica) Xin Jiang  
Department of Engineering Science and Physics

The Wireless Smart Car Project is yet another attempt to design and implement a tool of communication with neighboring vehicles traveling on the road at the same time. This wireless communication would allow the transfer of specific information about each surrounding car. This opens many fields of interest that can be developed for inter-vehicular communications. For instance, it could provide real-time traffic updates that would allow the driver to take immediate action and react to dangerous situations as needed. Automobiles can be provided a real-time status of their surroundings on the road that they or the car can react upon. Emergency responders can fixate on an accident and get to the scene quicker. Many automobile makers today are researching current solutions that utilize wireless communications amongst cars and exploring various uses for it. We are hoping to demonstrate a simple solution that can possibly reduce the reaction time that it would take to avoid any head-on collision. We plan to utilize an Ad-Hoc wireless 802.11 2.4GHz network using the Crossbow Mote wireless system. Wireless Ad-Hoc sensing nodes are small and can be local to the cars they are to measure. Once programmed, these units will be placed on top of each car used in our experiment and will keep track of the other Ad-Hoc Motes around it. Our objective is to run tests using toy cars and be able to have all preceding cars react to an initial car’s sudden stop. All subsequent cars will receive the wireless signal from the first car upon stopping and in turn will stop, hopefully avoiding any collision. Because of certain constraints, we are restricting our experiment to a one-lane road and interactions among four vehicles only.

**P O S T E R 3 0**

**Does Stress Mediate the Relationship between SES and Distress among College Students**

Cory Giannina  
Faculty Mentor: Dr. John Lawrence  
Department of Psychology

The purpose of this study is to examine the relationship between socioeconomic status (SES), cumulative stress, distress and academic performance and retention among college students at the College of Staten Island. My topic in the study is does stress mediate the relationship between SES and distress. It was hypothesized that high levels of stress will increase the correlation between SES and distress. Questionnaires were administered to incoming freshman designed to measure SES, cumulative stress, and distress. At first we had the students complete the survey on their own at home by providing them with accounts to log onto a website and view the survey. However, this method did not prove to be as effective as planned, so an area on campus was set up where the students could come in and complete it at their leisure. In return for their cooperation in the study, students were provided with CLUE credit, had their names entered into a raffle to win either one $100 prize or two $50 prizes, and in some cases they were given extra credit in the course from which they were recruited.

We met weekly as a research team, individually working between 10-12 hours a week. During the fall semester, our primary job was to publicize the study and recruit participants. We were to convince as many students as possible to participate in the study in an attempt to widen our subject pool. In addition to this, the introduction and methods sections of our honors thesis were written at this time. The spring semester was more focused on analyzing our results and writing the results and discussions sections of our papers.
Mechanisms of Neuronal Injury during Brain Edema
Brian Iskra and Lorenz Neuwirth
Faculty Mentors: Dr. Abdeslem El Idrissi and Dr. James Olson, Wright State University
Department of Biology

The presence of brain edema following brain injury is associated with increased neurological sequelae; however, cause and effect relations between the primary brain insult, altered brain water content, and cell damage are ill defined. The increased intracellular water content that characterizes cytotoxic brain edema alters ion and enzyme substrate concentrations and modifies cytoskeletal interactions with the plasma membrane and intracellular organelles, each of which can affect cell function. The studies described in this application will examine mechanisms linking changes in cell volume with neuronal injury using in vitro and in vivo models of brain edema. Our overall hypothesis states that neuronal cell injury and death results from brain edema due to elevated production of ROS activated during processes of cellular volume regulation. In this study we measured cell death and injury following cell swelling using cytological measurements and chemical indices of cell damage. We also tested the association between swelling-induced ROS production and cell damage using antioxidants, genetically modified cells, and inhibitors of specific biochemical ROS production pathways. We also measured cell volume, ROS production rates, oxidative stress, and resulting cellular injury in swollen hippocampal neurons under conditions in which cellular volume regulation is inhibited by pharmacological treatments or by depleting cells of intracellular osmolytes utilized for neuronal volume regulation. To establish relationships between brain edema, oxidative stress, brain injury, and cognitive impairments, we utilized the model for hypo-osmotic brain injury by exposing mice to a hypo-osmotic shock thorough intraperitoneal water injection. We could demonstrate a relationship between edema-induced damage to the hippocampus, decline in locomotor and cognitive functions. The results will provide new information on signaling pathways activated by cell swelling which may be detrimental to neuronal survival and thus, will open new avenues for therapy designed to reduce morbidity.

Altered Paired Pulse Facilitation in the Fragile X Mouse Brain: Implication for Learning Memory
Brian Iskra, Alexandra Marsillo, Luisa Otalora, and Lorenz Neuwirth
Faculty Mentor: Dr. Abdeslem El Idrissi
Department of Biology

Fragile X is a common mental retardation syndrome that results from the silencing of a single gene, FMR1, on the X chromosome. The loss of the FMR1 gene product, FMRP, leads to mental retardation in males and to generally milder effects in heterozygous females. The syndrome has an autistic-like behavioral profile with hyperarousal, self-stimulation, tactile-defensiveness and hypersensitivity to sensory stimuli. There is also an increased prevalence of childhood seizures that may extend into adulthood. Increased seizure susceptibility is also seen in the fragile X knock out mouse model for this disorder. To investigate the increased seizure susceptibility, we examined GABAA receptor expression in the FVB/N fragile X mouse. Western blot analysis indicated that expression of the GABAA receptor subunit (GABARB) was reduced in the cortex, hippocampus, diencephalon and brainstem in adult male fragile X mice. Immunohistochemical analysis of brain sections suggested a reduction in functional GABAA receptors. We also found increased expression of glutamic acid decarboxylase (GAD), the enzyme responsible for GABA synthesis, in the same regions that showed GABARB reduction. This is particularly interesting because reduced GABARB and increased GAD expression are potentially related, compensatory changes. Additionally, we found that short term plasticity is altered in the fragile X mouse brain as measured by paired pulse stimulation.

These results imply that the absence of FMRP leads to alterations of the GABAergic system that could at least partially account for the increased seizure susceptibility of the fragile X mouse and may be relevant to the increase in childhood seizures in the fragile X syndrome. Furthermore, the altered synaptic plasticity in the fragile X mouse brain may explain the altered cellular correlate of learning in these mice.
**POSTER 33**

**Sodium Hydrogen Exchanger – 1 (NHE-1) Function Regulates Mammary Gland Branching**

Surendar Ravindran  
Faculty Mentor: Dr. Jimmie Fata  
Department of Biology

Previously developed three-dimensional (3D) cultures have been used to accurately image the morphogenetic development of mammary gland branches using isolated ducts from the mouse mammary gland. I intend to use this model system to study the effect of intracellular pH modification on branching morphogenesis. This will be achieved by modifying the intracellular pH with a drug of the amiloride family, specifically, (N-Methyl, N-isobutyl) amiloride (MIA). This drug has been shown to specifically abrogate the function of the Na+/H exchanger type-1 (NHE-1), which itself is responsible for maintaining intracellular pH at about 6.8. Previous work in Dr. Fata’s lab has shown NHE-1 to be expressed in mammary epithelial cells while other NHE subtypes are not. We have also found that MIA inhibition of NHE-1 inhibits mammary branching morphogenesis, indicating a novel pathway involved in mammary development. I intend to use a range of concentrations of MIA along with a growth factor to further define this abnormal developmental phenotype.

**POSTER 34**

**Female Teachers and Their Relationships with Students: What Can the Media Tell Us?**

Samantha Balestriere  
Faculty Mentor: Dr. Darryl Hill  
Department of Psychology

Until recently, female sexual offenders have been a highly understudied group. The purpose of this study is to analyze the archival data on female teacher-student sexual relationships. Hypotheses about the nature of these women’s behaviors were based on theories of pedophilia and criminal profiling. In total, 416 cases of teacher/student sexual relationships documented on the Internet in archival sites, news websites, and other sources were used for data analysis. Results indicated that a majority of these offenders were Caucasian, and their victims were typically male. The qualitative data partially supported the hypotheses, with some of the pedophilic themes such as emotional congruence and entrapment significantly illustrated. It was concluded that most of these women would not be diagnosed pedophiles, nor do they exhibit any outstanding mental health issues. There was not one unifying motivation for their behavior, but rather a variety of reasons, which may only be ascertained when only considering primary sources.
**Poster 35**

**Girl Scouting in Detention Centers: Empowering Girls in OCFS to Open Doors**

Sonia Levine  
Faculty Mentor: Dr. Kathleen Cumiskey  
Department of Psychology and the Women's Studies Program

Girl Scouting goes beyond slogans and pledges. Its focus is on leadership development and building “girls of courage, confidence, and character who will make the world a better place”. Scouting helps girls relate to one another in positive ways, increasing their self worth and positive community involvement. While Girl Scouting is available to all girls, for female juvenile delinquents it may meet central needs.

Girl Scouting in Detention Centers' goal is to “reduce recidivism one Girl Scout at a time”. The curriculum’s focus is on trauma recovery, with lessons in violence prevention and building self esteem/trust. In the spring of 2009, a Girl Scout troop was established in a facility run by the New York State Office of Children and Family Services (OCFS). This limited/non-secure facility houses 25 girls ages 12 – 17. Girls have been placed in this facility as the result of a family court case. Most of their crimes are status offenses, meaning that if they were of legal age, they would not be held. Troop meetings are held bi-weekly on Friday afternoons. While in the facility, the girls are developing skills, earning badges and participating in community service. Since the aim of this project is to reduce recidivism, special emphasis is being placed on making connections to troops in the girls' home communities. It is our hope that the girls will become involved in Girl Scouting outside the facility. This will support their goals of aftercare and ease the transition to life at home.

**Poster 36**

**Language Shift**

Kristina Niesi  
Faculty Mentor: Dr. Sarah Benesch

I decided to focus my research project around the Language Shift topic due to the immediate interest that I have in teaching Linguistics, given that it is my major study focus at CSI. Language Shift is defined as “the progressive process whereby a speech community of a language shifts to speaking another language.” Other keywords related to Language Shift are Language Transfer, Language Replacement or Assimilation. An example of Language Shift is someone who is born into a culture that speaks one language but over time, the person learns a second language which then becomes their fluent language and eventually they forget all about their first native language. With America being the world's "Melting Pot" many natives are bilingual and have ESL, English as a Second Language. While Bilingualism or Trilingualism is encouraged throughout many European countries, Americans tend to frown upon a native speaking something other than English. Instead of being encouraged to embrace their first language, students in American schools are taught to push it aside and use English in everyday vernacular. Language Shift occurred in my family, being that my mother was born here in America but never learned English until the age of seven. She is now a speaker of only English, forgetting her first language all together, which was Norwegian. She can still read and understand verbal Norwegian when spoken to her but she cannot write or speak it fluently.
**POSTER 37**

The Sexuality and Gender of Nontraditional Men: “He’s a Little Bit Effeminate, But He’s Cute”

Peter Buratti

Faculty Mentor: Dr. Darryl Hill
Department of Psychology

Men in American society are held to restrictive standards of masculinity. As a result “feminine” men often experience difficulties in finding a romantic partner. This study examines the traditional beliefs of feminine heterosexual men and their relationship dynamics. Male students at the College of Staten Island were given a packet of questionnaires asking about demographics, traditional gender beliefs and the sexual self. The questionnaire results showed that age and level of religiousness correlated with traditional beliefs. Feminine men were found to endorse non-traditional beliefs more than stereotypically masculine men. Participants that were in a long-term relationship or dating were invited to the interview portion of the study. Interviews referenced themes concerning power, psychological gender, sex and relationships.

**POSTER 38**

Drama Production: *The Well of Horniness*

By Holly Hughes

Robert Mahoney

Faculty Mentor: Dr. Maurya Wickstrom
Department of Performing and Creative Arts

Drama major Robert Mahoney directs a play by Holly Hughes, one of America’s foremost daring performance artists and playwrights. The play is Hughes’s hilarious film noir spoof, a wacky murder-mystery that follow the adventures of heroine Vicky as she attempts to escape a murder rap. She and her sisters in the “alleged” sorority, the Tribads, are always on the edge of the well of borniness.
**Biofilm Formation in Candida Albicans**
Kathleen Van Manen
Faculty Mentor: Dr. Elena McCoy
Department of Biology

Candida albicans is a significant human fungal pathogen in which the ability to form biofilms has been associated with drug resistance and virulence. Biofilm formation is dependent on processes associated with adherence to inert materials and filament formation in C. albicans. When 2% glucose and 2% galactose minimal media were compared, differences in growth and adherence were observed. Since previous studies demonstrated that inorganic phosphate affects filamentation and dimorphic transition in this yeast, in this study the effect of phosphate addition on biofilm formation in minimal medium was examined. Three strains of C. albicans currently maintained in the laboratory which differ with respect to nutritional requirements for filament formation were compared. When 2% glucose minimal media with and without 100mM phosphate were employed, adherence to polystyrene plates was observed at 48 hours only in phosphate-containing medium. Whereas in 2% galactose minimal media adherence was observed at 48hrs with and without phosphate. In addition, strain-dependent resistance to the antifungal antibiotic, miconazole in biofilm-grown cells was also observed in 2% glucose minimal media plus the addition of phosphate.

The estrogen metabolite, estradiol, has been reported to enhance growth and filamentation in C. albicans in medium containing modified serum. We have previously demonstrated serum-induced germ tube formation in our yeast strains. In the current study, effects on biofilm formation and miconazole resistance in strains grown in 2% glucose minimal medium with and without phosphate addition, attributable to the addition of 10-9 M estradiol were not observed.

**Mammary Carcinogen Screening Model**
Alexander Perelman
Faculty Mentor: Dr. Jimmie E. Fata
Department of Biology

Animal models have been the predominant source of evidence that specific chemicals can cause mammary tumors to form. Rudel et al., 2007, has shown 216 chemicals that are associated with an increased number of mammary gland tumors; however, little is known about how these chemicals affect mammary development. Therefore of the 216, we have selected 10 that are found relatively more widespread than the others, to be screened for their effect on mammary tissue development. The 10 selected chemicals for study were 1,2-propylene oxide, benzene, ethylene oxide, nitromethane, o-toluidine, styrene, 1,2-dichloroethane, methylene chloride, carbon tetrachloride, and 1-Nitropyrene. All of the suspected carcinogens fall into 4 of 5 particular categories, which are air pollutants, found within consumer products, found as food additives, associated with occupational exposures, and are highly produced. To test how exposure to these chemicals will alter mammary cell morphogenesis we have devised a screen based on a 3 dimensional ex vivo culture assay that models mammary development (Fata et al., 2000). Specifically, mammary ducts, here on referred to as organoids, will be cultured using the aforementioned technique and exposed to one of the 10 selected carcinogens. This assay aims to determine the effects of carcinogen exposure to developing mammary tissue.
POSTER 41
The Development of a Breast Epithelial Culture Assay that Tests the Effects of Exposure to 1-Nitropyrene
Goldie Lazarus
Faculty Mentor: Dr. Jimmie E. Fata
Department of Biology
My research project is concentrated on determining the specific effects that 1-nitropyrene (1NP) has on normal breast epithelial cells. The project aims to discover how this widespread environmental factor affects cell polarity, cell proliferation, and cell death, which are cell characteristics often deregulated during cancer initiation and progression. In order to test these effects, the project transiently exposes “normal” human breast epithelial cells, in both 3-dimensional and 2-dimensional culture assays, to varying amounts of 1NP. Our preliminary results show that 1NP has an adverse affect on the cells and eventually causes apoptosis at high concentrations (100 M 1NP). Furthermore, confocal microscopy has revealed pathways of apoptosis and DNA damage occurring in cells exposed to 100 M of 1NP-treated cells but not control cells. To test how lower concentrations of 1NP affect proliferation and cell cycle regulation we will use flow cytometric analysis. Overall an analysis of this environmental factor and how it affects “normal” breast cells may provide a framework for future precautionary measures and may direct new preventative approaches and life style interventions geared toward decreasing the exposure to 1-nitropyrene.

POSTER 42
Development and Testing of Curcumin Derivatives as Promising Drugs against Breast Cancer
Ashley Mathai
Faculty Mentor: Dr. Jimmie E. Fata
Department of Biology
Curcumin is a phenolic compound derived from the rhizome Cucuma longa and it is commonly used as a spice for food coloring and flavoring. Curcumin has proven to be an effective anti-inflammatory, anti-carcinogenic, and anti-infectious drug and has therefore received much scientific and medical attention. Unfortunately, curcumin is insoluble in water and is biodegraded quickly when administered to patients. Therefore, a derivative of curcumin that overcomes these characteristics may prove to be more effective than curcumin itself. In analyzing curcumin, we have found that at high concentrations (100 M) it can negatively affect a number of human breast cancer cell lines. We then set out to evaluate the 4 novel derivatives of curcumin for their ability to affect several different breast cancer cell lines in a similar fashion as seen with curcumin. Of these derivatives, one was found to act negatively against the breast cancer cell lines as efficiently as curcumin. We show that this derivative is also soluble in water, which may make it a more effective drug than curcumin itself. Further analysis of this curcumin derivative is on the horizon as it holds promise as a novel and effective therapeutic against breast cancer.
**POSTER 43**

**Does Cumulative Stress Mediate the Relationship between SES and Academic Achievement?**

Jason DeGenaro  
Faculty Mentor: Dr. John Lawerence  
Department of Psychology

This study examines the relationship between socioeconomic status (SES), cumulative stress, and academic performance. The part of this experiment that I will be closely examining is the relationship between socioeconomic status and GPA in freshmen and sophomores, with stress as a mediator. My hypothesis is that coming from a lower SES standing will increase the amount of stress on a student, and in turn negatively influence academic performance. Participants completed a survey that measured stress levels in college students. From the results, hopefully a relationship will be established that will provide insight into how stress impacts the academic performance of college students.

**POSTER 44**

**Multi-Purpose Tracking Robot**  
Tsui Siu Lun Ben  
Faculty Mentor: Professor James Hladek  
Department of Engineering Science and Physics

The function of the Multi-Purpose Tracking Robot is to have the ability to run autonomously by recording and storing sensor data into the onboard memory. The robot can also be manually controlled externally with a cable directly connected. Infrared sensors were used to detect objects and ultrasonic sensors indicated the measurement of distance in the surrounding area. This information was sent to the microcontroller which used mapping software to record displacement of the robot. The project design was broken into distinct parts: navigation algorithm, sensor control system, data processing and storage system, and fabrication.
**P O S T E R  4 5**

**Theoretical Studies of an Enneadic Particle System Confined onto a Spherical Surface: Monte Carlo Simulation**

Fatima Z. Rafique  
Faculty Mentor: Prof. Chwen-Yang Shew  
Department of Chemistry

This project focuses on the high-symmetry morphology of particles adsorbed onto spherical surfaces, motivated by those highly ordered macroions through self-assembly. The recent finding of “Blueberry” macroions is known due to self-organization of small inorganic molybdenite or molybdenum/iron charged clusters. For molybdenite ions, the charged clusters aggregate to form charged wheels first, and these highly charged wheels further assemble into a much larger and ordered single layered spherical macroion. It is a daunting task to conduct atomistic simulations for such a large macroion. To this end, we intend to investigate an enneadic particle system with nine spheres confined to a spherical surface through Monte Carlo simulations, prior to the future study of more complex macroions. Our preliminary results indicate this model displays an ordered structure analogy with many existing nonahydrated lanthoid ions (e.g. Eu^{3+}(H_2O)_{9}) and nonahydridorhenate ion (ReH_{9}^{2-}) with D_{3h} symmetry. Two typical interaction potentials, Coulombic repulsion and Lennard-Jones potential, will be considered to elucidate the role of interaction potentials on high-symmetry morphologies. In addition, this work will be extended to understand the disorder-order transition involved in the formation of highly ordered structures. The kinetic pathways for the ordered structure formation will also be addressed in our calculations.

**P O S T E R  4 6**

**Transition Metal-Catalyzed Addition Reactions of Arylboronic Acids with Aromatic Aldehydes**

Matthew Israel, Yuan-Xi Liao, and Qiao-Sheng Hu  
Faculty Mentor: Dr. Qiao-Sheng Hu  
Department of Chemistry

The addition reactions of arylboronic acids with carbonyl-containing compounds constitute some of the most attractive methods to access arylmethyl alcohols, imines and ketones because arylboronic acids are readily available, air/moisture-stable. Rh(I), Ni and Pd(II)-catalyzed such addition reactions have been previously reported. However, reported catalyst systems suffer from low catalyst activity and/or selectivity. It is significant to develop more efficient catalyst systems for such addition reactions, especially under mild conditions. Type I metalacycles have been previously found to be effective catalysts for the addition reaction of arylboronic acids with aldehydes.\textsuperscript{1-3} To gain more insight information, we undertook the study of the influence of bases for this catalyst system. We found that the use of different amounts of base has great impact on the reaction rate, which could be very useful for the development of more efficient catalysts for the addition of arylboronic acids with aldehydes.

Acknowledgments: We thank the NSF for financial support. We also thank members of the Hu research group for their help and support.

References:  
POSTER 47

Effects of Urbanization on Locally Breeding Landbirds of the New York City Area: Estimating Demographic Parameters in Urban Woodlots

Allison Baranski
Faculty Mentor: Dr. Shaibal Mitra
Department of Biology

Since 1997 several field sites have been monitored in Staten Island and Queens, New York, to assess the effects of urbanization on three demographic parameters of locally breeding landbirds. The procedures for gathering data for the study follow that of MAPS (monitoring avian productivity and survivorship), a continent wide program that gathers information from volunteer bird banders to estimate regional demographic parameters on landbirds that breed throughout North America. Utilizing the Pradel model for survivorship and recruitment in program MARK, designed for use with mark-recapture programs, I have estimated demographic parameters for three locally breeding bird species, Gray Catbird (Dumattella Carolinensis), Wood Thrush (Hylocichla mustelina), and American Robin (Turdus migratorius). Ratios of Juvenile to Adult birds captured during the breeding season are used to estimate the reproductive index of these species in local woodlots.

Of the three species I focused on the American Robin, a habitat generalist, had the highest reproductive index, 0.72, when pooling all sites. This is one and a half times higher than the regional reproductive index from the MAPS program. The Gray Catbird, a species that prefers scrub and early successional habitats, had a reproductive index of 0.36, which is very similar to the regional index, whereas the Wood Thrush, a species that prefers mature woodlands, had an alarmingly low reproductive index of 0.16, much lower than the regional index of 0.24. Local survivorship estimates were all lower than regional estimates, whereas recruitment of new adults into the local breeding sites was higher than regional estimates.

POSTER 48

Development of Optically Active Spirodiindanediol-Containing Polymers for Organic Synthesis

Jaclynn Ng, Alexandra Levashvili, Chun-Hui Xing, Tao-Ping Liu, and Qiao-Sheng Hu
Faculty Mentor: Dr. Qiao-Sheng Hu

The addition reactions of arylboronic acids with aldehydes/ketones constitute one of the most attractive methods to access chiral alcohols because arylboronic acids are readily available, air/moisture-stable. Transition metal-catalyzed such addition reactions have been previously reported. However, reported catalyst systems suffer from relative harsh reaction conditions and/or selectivity. We are interested in developing “green” catalyst systems such as polymeric catalysts for such addition reactions, especially under mild conditions.

1,1′-Spirodiindane-7,7′-diol and its derivatives have been demonstrated to be highly efficient enantioselective ligands for a number of useful transformations. However, the polymeric form of such ligands, which could allow easy recovery and reuse, remains unexplored. In this presentation, the preparation of 4,4′-dibromo-1,1′-spirodiindane-7,7′-diol and its resolution, two keys stages in the development of spirodiindanediol-containing polymers, will be presented.

Acknowledgments:
We thank the NSF for financial support. We also thank members of the Hu research group for their help and support.
**Poster 49**

**Effects of Butanol on Filamentation and Phosphatase Activity in Candida Albicans**

Natalia Gozias

Faculty Mentor: Dr. Elena McCoy

Department of Biology

Candida albicans is a dimorphic, opportunistic fungus that causes both superficial and systemic infections in humans. The ability to switch to a filamentous growth pattern is a recognized virulence factor in this fungus, although the yeast phase appears to be important in the persistence of infections. In the model yeast Saccharomyces cerevisiae, Lorenz et al. (2000) demonstrated that alcohols such as butanol, that are byproducts of amino acid metabolism, stimulate haploid cells to differentiate and that the observed filamentation is partially dependent on the STE MAPK signaling pathway.

In strains of C. albicans grown in glucose minimal medium, filamentation is repressed by farnesol, a quorum-sensing metabolite. In this study we demonstrate that in C. albicans strain CC504 exposed to butanol vapor in glucose minimal medium filamentation does not occur, whereas this alcohol induces filamentation when cells are grown in minimal media with galactose and proline as carbon sources. Enhanced alkaline phosphatase activity in response to butanol was also observed in an isogenic strain (CC504-5E) containing cAMP-protein kinase A (PKA) pathway-specific fusion transactivator plasmid.

**Poster 50**

**Preterm Babies and Attention Regulation at School Age**

Sharmila Mohammed

Faculty Mentor: Dr. Comfort Asanbe

Department of Psychology

This study focused on the progress and development in children who were born with very low birth weight (ELBW<1500g), and who were neurologically at risk as infants. These infants have been monitored and studied by researchers from the Institute of Basic Research (IBR) from birth up to the age of five, in five general neurobehavioral categories which include attention, sensory asymmetry, motor asymmetry, head/neck control and extremity movements/tone. Our research focused on the attention regulation in these children who were in the 3rd and 4th grades (mean age 9.68). We hypothesized that there would be gender differences with regard to attention regulation among our subjects. We further believe that differences exist between the rating scales of self-assessment by the child and scores of child-assessment by parent. Data collected from our study might provide answers as to whether attention problems persist through school age in this population.
Characterization of Post Epileptic Hilar Neurons Receiving Inhibitory Input
Azar Latif, Eman Tabbara, and Nicole Lukovsky
Faculty Mentor: Dr. Dan McCloskey
Department of Psychology

Epilepsy is a neurological disorder which induces spontaneous seizures. These seizures are characterized by excessive and synchronous epileptic bursts in the brain, but it is unknown exactly how these bursts originate. In most common forms of epilepsy, seizures are known to commence in hippocampal regions and then spread toward other regions of the brain. Previous work has examined an area of the hippocampus known as the hilus, which we have shown develops an eight-fold increase in mismigrated neurons in an animal model of epilepsy. We estimate that these granule cells that are in the wrong location comprise nearly half of the remaining neurons in the hilus in the epileptic rat brain. This abnormality could lead to a change in the hippocampal circuit and potentially lead to the development of seizures. Electrophysiological recordings of these mismigrated granule cells show that they have a higher level of spontaneous activity than other cells in the hilus, suggesting they may receive less inhibitory input from neighboring neurons. The purpose of this study is to use anatomical methods to test the hypothesis that mismigrated granule cells receive less inhibitory input than other neurons in the hilus. Sprague Dawley rats were induced with seizures via pilocarpine and developmental hypoxia seizure models. Epileptic rats and naive control animals were perfused two weeks later, and brains were processed for immunohistochemistry using the vesicular GABA Transporter (VGAT) antibody. Prox-1 and Gad67 antibodies were used to double label VGAT-stained tissue to identify mismigrated granule cells and inhibitory cells, respectively. Confocal microscopy was used to collect images which were quantified using IMARIS 3-D reconstructive software. Preliminary analysis suggests that inhibitory innervation of neurons in the hilus may be selective for a specific cell type. Double-labeled tissue will help us to characterize which cells receive this selective inhibitory input.

Collaborating to Create Change SC3
Elizabeth Belnavis
Faculty Mentor: Dr. Judit Kerekes
Department of Education

This analysis indicates how collaboration, motivation, discussion, and reflection can contribute to change in a child’s education. The goal of this study was to absolve student misconceptions about cloud formation, and in doing so, make connections between overlapping concepts. I spent seven weeks in a middle school on Staten Island with a sixth grade science class. My time in the classroom exposed the children’s lack of concrete understanding of abstract concepts. The teacher and I collaborated on suitable methods to achieve our goal. The best way for the children to grasp our concepts was to have them discover it for themselves. We then needed to motivate the children to actively participate in the lesson. With the use of smart board technologies, I was able to create an interactive hands-on assessment of the students’ prior knowledge. I then had the students’ full attention for my cloud formation demonstration. I created a cloud in a jar and the students were able to see the materials needed, and the matter of the cloud. Lower and higher level children were grouped together to help one another. Components imperative to the success of this lesson were to plan for enough time for discussion, and create a nonjudgmental and comfortable environment. I posed questions in an order of increasing difficulty and the students were eager to express their findings. Students were not discouraged for wrong answers; rather they were encouraged to consider alternate theories by myself and their classmates. Allowing the children to share freely their understanding helped struggling children to grasp the concept. Children who were normally daydreaming, misbehaving, or even sleeping were eager to share their opinion. The teacher and I then reflected on how many of the students really understood, and how many may need more time. We concluded that it is possible to change a student’s education and that with the right techniques and tools every child can learn.
**POSTER 53**

**Studying Parallel Computation of 2D Turbulence**

Jonathan Maltz

Faculty Mentor: Dr. Andrew Poje
Department of Mathematics

We explore the use of shared-memory parallel computing to improve the efficiency of 2D Navier-Stokes flow calculations. We apply the symmetric multiprocessing (SMP) technologies OpenMP and auto-parallelization performed by the Intel (r) Fortran Compiler to serial source code. We layout metrics used to compare the parallel versions of the computations. The metrics include required source code modifications and timing studies. While the user-implemented OpenMP instructions produced the most efficient multi-threaded code for small problem sizes and less efficient FFT algorithms, auto-parallelization guided by the Fortran compiler produced more efficient code for mid- to large problem sets and optimized FFT solvers.

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**POSTER 54**

**Classification of Brain Tissues from Magnetic Resonance Images**

Troy Johnson, and Ed Wah Chen

Faculty Mentor: Dr. Lihong (Connie) Li
Department of Engineering, Science and Physics

Image classification is of paramount importance in digital imaging. With rapid growth and innovations in technology, researchers and medical doctors have been able to garner graphical representations of regions which were previously deemed inaccessible or hidden behind barriers. An example of a region which was deemed inaccessible to imaging tools is the human brain. However, with the advent of Magnetic Resonance Imaging, brain scans can be easily obtained today.

Despite these advancements, image classification still proves to be a complex task depending on the image type. Segmentation techniques suitable for classifying tissues or joints may not be applicable to brain scans, due to the nature and composition of images. Subsequently, to achieve effective classification, algorithms have to be tailored for the image which is to be segmented.

This project uses combination of segmentation methods (thresholding and region growing) to classify and give a vivid depiction of the human brain. From the created algorithm, individual pixels were grouped based on their intensity and in so doing brain matter which may be of concern to physicians were classified. With the provided information an easier and more novel approach can be taken towards observation or the diagnosis of ailments.
P O S T E R 5 5

A Plug-in for Visualizing MS Lesions

Philip Koshy and Nirav Thakkar
Faculty Mentor: Dr. Deborah Sturm
Department of Computer Science

The location, size and shape of Multiple Sclerosis (MS) lesions are often used to diagnose and to track disease progression. We have developed a lesion-browsing plug-in for ImageJ (a public domain Java image processing program) that allows users to automatically locate successive significant lesions in a MRI stack. Lesions of interest can then be rendered and rotated. Multiple windows allow the viewer to compare the size and shape of lesions from the MRI images of the same patient taken at different time intervals. This may provide a valuable tool for computer-aided diagnosis and disease monitoring.

P O S T E R 5 6

Implementation and Performance Testing of the SQUASH RFID Authentication Protocol

Philip Koshy and Justin Valentin
Faculty Mentor: Dr. Xiaowen Zhang
Department of Computer Science

Radio Frequency Identification (RFID) tags allow large organizations in the public and private sector to catalog, index and process a large volume of data wirelessly. In most cases, RFID reduces the necessity for human supervision and, therefore, drastically increases the speed of transactions and data collection. Because of a growing need for cheap RFID tags in private industry, cost limits the computational capability built into each tag; since individual tags have only a small amount of working memory, security is often implemented by firms as an afterthought. It is no less of a concern to consumers however. Although several algorithms have been proposed to deal with security, many of these algorithms fall short because they lack strong mathematical proofs.

Our project involves testing the viability of a specific security algorithm that was recently designed by world renowned computer scientist Adi Shamir. Shamir has developed a security authentication algorithm, called SQUASH (short for SSQU are-hASH), which allows for an RFID tag design that is simple enough to be implemented on low-cost RFID tags. Shamir has proved mathematically that his SQUASH algorithm is at least as secure as the Rabin encryption scheme, which is another algorithm that was been extensively tested and studied for nearly 30 years. Although the algorithm is provably secure, the performance of the algorithm has not been carefully scrutinized and therefore, the viability of the algorithm for implementation into low-cost RFID tags has yet to be determined.

Our research project will attempt to determine the effectiveness of the SQUASH algorithm by creating a software simulation. Shamir has made a particular claim that his SQUASH algorithm’s performance should scale linearly as the word size of the processor is increased. We hope that by computationally testing the performance of Shamir’s RFID security algorithm, we will be able to reaffirm or refute the claim.
**Poster 57**

**Optimization of Drifter's Launch Location with a Genetic Algorithm**

Ismael Yacoubou Djima  
Faculty Mentor: Dr. Andrew Poje  
Department of Mathematics

Typically, observations of the ocean or the atmosphere are provided by drifting (Lagrangian) platforms. Given the increase in computational power over the last years, it has now become possible to attempt to predict the state of the ocean using data assimilation techniques, which combine Lagrangian observations with numerical models of ocean or atmospheric dynamics. Data gathered from drifters are strongly dependent on their initial launch location. Here we find the drifter launch locations that provide optimal data for assimilation. We consider a very simple model of the ocean consisting of five point-vortices. We develop an optimization scheme based on genetic algorithms, which is capable of exploring the high dimensional search space of initial drifter locations. We make use of the highly parallelizable character of the genetic algorithm to implement our numerical simulations on the local cluster. The genetic algorithm appears to select configurations in which drifters are initially located on each side of outflowing manifolds.

**Poster 58**

**Estimation of Trade Impact on Wage Inequality in the United States**

Ismael Yacoubou Djima  
Faculty Mentor: Dr. Alexandru Voicu  
Department of Political Science, Economics and Philosophy

We use data from the Current Population Survey (CPS) to study the evolution of wage inequality in the United States over the last 40 years. The data show an increase in the real wage inequality (the 10th to 90th percentile range increased by dollars). Several factors can be advanced to explain this increase. Here we focus on the role of international trade. For the individuals in our dataset we construct a measure of trade penetration based on their regions and industries classification. Then using a Blinder-Oaxaca decomposition, we assess the share of the increase in wage inequality that is explained by the increase in trade openness.
Uncovering the Magic behind Walt Disney World
Lauren LoPrimo
Faculty Mentor: Dr. Susan Holak
Department of Business and the Office of Academic Affairs

The Walt Disney Corporation is known worldwide for its excellence in operations management and services marketing. The purpose of my research, which took place during a semester-long internship at Walt Disney World Resort in Orlando, Florida, was to discover the secrets behind Disney’s time management practices and competitive guest service. Using qualitative research approaches, I was able to gather data from two perspectives: cast member and tourist. I also used printed resources to research the concepts that were brought to life through my observations.

My research relied on several techniques including observation, photography, and field notes. Using these methods, I was able to document administrative practices, service delivery, and the management of customer expectations. I observed Disney’s approach to manage queues and customer waiting time. I was then able to reconcile my observations with operations management and services literature.

Throughout the course of my exploration, I have achieved several things. I have familiarized myself with operations management and services marketing and useful qualitative research methods especially observational research. I have gained a unique understanding of management practices and innovation, qualitative data collection, and analysis. I observed first-hand Disney’s ability to maintain quality guest service, customer satisfaction, and effective time management practices. Most importantly, I have discovered part of the mystery behind Disney World’s consistent successful delivery of operations management and services. Gaining insight into Disney’s success as a leader among service providers has benefited my academic and occupational career and will continue to do so long after my internship is completed. My discoveries reveal the magic behind the Walt Disney World Resort.

The Music SILOH Project: Documenting Music Making Activities on Staten Island with Digital Media
Timothy Mullen, and Linda Soria
Faculty Mentor: Dr. William Bauer
Department of Performing and Creative Arts

Staten Island’s local music scene offers a microcosm of the multi-faceted global phenomenon that is American music. In fact, several local scenes are woven into the fabric of Staten Islander’s musical lives, each scene characterized by a defining set of musical styles or genres and expressive culture. Staten Island’s jazz scene, for example, has much in common with jazz scenes in communities elsewhere in the country and, indeed, in the world. Yet due to various factors, for example its proximity to Harlem, a key site in the development of bebop, it also displays distinctive features that set it apart from anywhere else. The richness and distinctiveness of Staten Island’s music culture notwithstanding, there has been precious little documentation of Staten Islanders’ musical activities and the beliefs that lie behind these activities. We therefore know little about their musical and cultural heritage. How are older musicians and audience members passing on this heritage on to younger members of the community? And as these elders pass on to the life beyond, what traditions and memories are being lost? What lessons can we learn from the people who made and who are making music on Staten Island? What impact are larger cultural forces such as technological advancement having on the creation, performance, marketing, and experience of music on Staten Island? What understanding do Staten Islanders need, going forward, in order to forge more effective policies for sustaining local music traditions that do not offer substantial financial incentives to their participants? The Music SILOH Project will give us answers to these and other questions. The project has some urgency: every moment, valuable data are slipping through our fingers like sand in an hourglass.
**Poster 61**

**George Melies, A Cinematic Revolution**  
Jeffrey Man  
Faculty Mentor: Dr. Matthew Solomon  
Department of Media Culture

*A Trip to the Moon* (1902) was one of the most popular films in cinema history. I have gone through an extensive list of archival materials that refer to this film, the making, and the reception of it. Through articles from other filmmakers of their time, newspaper clippings, and magazines I was able to help gather a good amount of material to help learn about this film and its importance. The influence that this movie made among culture in its time is substantial. The film started a wave of piracy around the world. (This was before copyright laws were applied to motion pictures) This film was a major commercial success, one that would be constantly studied throughout history for its technical and storytelling innovations. For audiences, it helped delve into their imaginations of impossible vacations. For other filmmakers, it showed editing techniques that were still uncommon then. In Coney Island, NY, there was a ride named “A Trip to the Moon” and similar rides that were shown around the Pan American Exposition, of which George Méliès, the director, might have been aware. The connections between these two attractions aren’t clearly apparent but my research hopes to help with clarification. The director, Méliès, is one of the pioneers of filmmaking and his vast library of films demonstrates his abilities and contributes to the industry.

**Poster 62**

**2009 ASME Student Design Competition: Mars Rocks**  
John Barricella, and Sujit Potluri  
Faculty Mentor: Dr. (Jessica) Xin Jiang  
Department of Engineering Science and Physics

Given the spectacular success of Phoenix Mars Lander’s space exploration, NASA would like to include on its next mission a radio controlled vehicle to retrieve small rock samples. The purpose of the vehicle is to collect rocks so that we can study them and discover if life ever existed on Mars, and if it ever did then we can use the information gathered from them and relate the cycle of life on Mars to the one here on Earth.

This project is part of a competition of the American Society of Mechanical Engineers (ASME), whose vision is to promote the art, science, engineering and practice throughout the world. It is an international level competition where engineering students throughout the US and other countries come to exhibit their talent. This competition focuses on high level challenges every year that a new project is posted, and throughout the years it has become a prestigious competition where high level schools enter to compete and attain a greater status in the engineering industry. The CSI ASME competition teams have designed and built a lightweight prototype vehicle which is remotely controlled and can go over obstacles, pick up rocks, and drop them off at a receiving area in a limited amount of time with high accuracy. The presentation will cover the design concept, and discussion with issues found in the design process and our solutions. The presentation will also show the real prototype vehicle and demonstrate the operation if permitted.
**POSTER 63**

Neuro Imaging Supports Critical Period Hypothesis
Barbara Fiume
Faculty Mentor: Dr. Sarah Benesch
Department of English

For several decades the critical period hypothesis (CPH) has been a lens for linguists and psychologists studying the process of language acquisition. According to Long (1990), the critical period is the time in childhood when the innate ability to grasp language is the greatest. The ability to acquire language, according to the CPH, diminishes due to incremental losses of neural plasticity as the brain matures. New technology provides useful information concerning these theories. Positron emission tomography (PET) and functional magnetic resonance imaging (fMRI) show images of the areas of the brain where language is processed. Event related potentials (ERP) and magnetic encephalography (MEG) show when various processes and changes take place. This poster session will demonstrate how this new technology may challenge the critical period by showing that synapse development can occur after the critical period. Images show that brain activity continues throughout life.

**POSTER 64**

Pharmacogenetics and Pain Management
Steven Decarlo
Faculty Mentor: Dr. Mary Ellen McMorrow
Department of Nursing

Current research is revealing that there is a correlation between the response to pain and one’s genetic makeup. In addition, numerous studies have shown that the metabolism of pain medication may also be influenced by genetics. The exciting field of pharmacogenetics aims to investigate these claims.

Pain management is a vital aspect in the nursing profession. Nurses should strive to gain as much evidence-based knowledge as they can in regard to variables that may impact on our client’s pain status. By gaining insight into pharmacogenetics, we can play a crucial role in controlling and relieving any pain that our client’s may experience. Hopefully, this knowledge will also lead to a decrease in the tremendous amount of money spent in this area of healthcare.
The Rise of Counterfeit Drugs
Sonia Bairak
Faculty Mentor: Dr. Alan Zimmerman
Department of Business

There are extreme challenges in controlling imported counterfeit drugs coming into the U.S. There is a fear that these drugs may be harmful to unsuspecting people. According to the FDA/US customs investigation, 88% of the imported pharmaceuticals examined contained unapproved drugs, many of which could be harmful. Each year 200,000 kids die after taking bad malaria medicines; some 2,500 patients died after 60,000 fake vaccine doses were distributed in Nigeria, as per WHO (World Health Organization) report. According to TRIPs (Trade-Related aspects of Intellectual Property Rights) organizations review, these medicines are mostly sold directly to authorized wholesalers. The wholesalers in turn distribute them to local pharmacies, doctors, or hospitals. Sometimes they are sold by secondary wholesalers, which open holes in the US safety net where drugs from other countries can enter without being caught. Major exporting countries are China, Mexico and India. This study will address how this counterfeiting of drugs is having an effect on US pharmaceutical companies, the damage it created in worldwide scope, and what measurements are being taken to clamp down on the problem.

Physiology and Metabolism of the Single-celled Green Algae: Chlorella Kessleri
Michael Jean
Faculty Mentor: Dr. Robert E. Corin
Department of Biology

Growth of the green algae Chlorella kessleri was examined under various conditions to better understand its physiology. Growth was examined both mixotrophically (with organic carbon source and light) as well as heterotrophically (with organic carbon source and dark). In addition to measuring growth, chlorophyll content was determined by spectral methods and cells were examined by light microscopy. Mixotrophic growth minus heterotrophic growth represents the autotrophic component of mixotrophic behavior. Cells grew in Tris-acetate-phosphate (TAP), determined by microscopic counts and turbidity at 600 nm, to high densities (~10^8 cells/ml) with generation times (t1/2) of ~20 hours under mixotrophic conditions. The better the carbon source was at supporting growth, the less chlorophyll a and the more starch was present (lugols staining). Methanol extracts exhibited absorption peaks (430 nm, 663 nm) and shoulders (470 nm, 650 nm) consistent with the presence of chlorophyll a and b. Unsurprisingly, growth rates and yields were substantially diminished (>50%) under heterotrophic conditions. Cells grew well both mixotrophically and heterotrophically with glucose and tween80, poorly on xylose and not at all on the amino acids glycine, glutamic acid, serine and pyruvate. Cells which were grown mixotrophically had greater chlorophyll a content than heterotrophically grown cells.
**POSTER 67**

**Exercise-mediated Effects of Hippocampal-dependant Spatial Memory Task Performance in the Rat Perinatal Hypoxia Model of Epilepsy**

Nicole Lukovsky  
Faculty Mentor: Dr. Dan McCloskey  
Department of Psychology

Exercise delays age-related cognitive decline and reduces the risk of stroke. Recently, we have demonstrated that exercise also reduces seizure-related brain damage and preserves memory function in an adult rat model of epilepsy. The current study will measure the effect of exercise on memory and brain circuitry changes in a developmental model of epilepsy, which provides a window for therapeutic intervention. The rat model of perinatal hypoxia is designed to mimic hypoxic episodes at birth in humans, which can lead to later development of seizures and learning difficulties. We will use this model to induce seizures and then introduce running wheels or allow the animals to remain sedentary. We hypothesize that the exercising group will perform better on the Barnes Maze memory test than the sedentary group, indicating that exercise could be a mediating factor in protecting the developing brain from seizures consequences. This will be confirmed with confocal microscopy.

**POSTER 68**

**Stress and Coping Mechanisms Among College Students: A Cross-Cultural Study**

Krista Supino  
Faculty Mentor: Dr. Comfort Asanbe  
Department of Psychology

There have been limited cross-cultural studies that have succeeded in distinguishing the influence of culture on stress and its anxiety component, and stress and coping have scarcely been explored together from a cross-cultural perspective, especially between western and non-western cultures. This study analyzed and compared the state and trait levels of anxiety and the coping mechanisms experienced by college undergraduates from two culturally diverse nations, the United States and Nigeria. Students from the College of Staten Island (United States) and Kogi State Polytechnic (Nigeria) were administered both the State-Trait Anxiety Inventory and the Coping Responses Inventory. The first hypothesis, which was that Nigerian students would report a higher level of anxiety, was not supported in the findings of this study. However, the findings were in accordance with the second hypothesis, which was that students of the different cultural groups would use different coping mechanisms to alleviate the stress and anxiety they experienced. There were significant differences between the two groups in the coping responses scales representing Logical Analysis (p=.006), Problem Solving (p=.038), and Seeking Alternative Rewards (p=.000).
Green Intelligent Parking Lot Control System (aka GIPs)
Alexander Nwanekah
Faculty Mentor: Dr. Charles Liu
Department of Engineering Science and Physics

Green Intelligent Parking Lot Control System is an efficient, environmentally friendly intelligent system that would have the capability of anticipating, predicting, and informing drivers in a timely manner as to which parking lot is or would be available. This project is the second project submitted to the engineering design project (ENS 491) coordinators for spring 2009, after my initial project was not accepted on the basis that it could not be completed at the allowed time frame. The project was embarked upon due to the difficulty experienced by the College community in finding suitable parking space in a timely fashion. This system would be able to anticipate and inform drivers where to find a vacant parking space.

Our goal is to design a system:
- That can give drivers an overall view of the parking lot occupancy
- Aid drivers during the peak hours to find vacant parking space (using data acquired earlier)

Combined electrical engineering and computer engineering skills would be essential for this project. We’ll build a miniature-sized parking lot for demonstration and the project would involve both software and hardware skills learned previously.

Some of our major physical components:
1. PIC18F452
2. 7 digits display LED
3. Infrared sensor
4. Solar panel 3W 12V
5. Weather-proof casing
6. Rechargeable battery
7. Parking lot model

Problems:
- Sense which direction a car is moving
- Predict when a car space will be available
- Design a solution that would be easily adaptable to various parking lots (like the one at CSI)
- How to communicate between different processors using a microprocessor design scheme

The project is currently in the initial stages. This would be divided into various stages: 1. flow chart design, 2. parking lot design, 3. data collection, 4. circuit design, 5. microcontroller programming, 6. Hardware purchase, 7. miniature/prototype design. This project is an ongoing one-year project required for a BS in Engineering Science at the College of Staten Island of The City University of New York.

I believe this green, easily adaptable, replicable, and low-cost (estimated cost is about excluding labor and transportation: $275) system will ease the problem of finding parking space at the College.
Synthesis of Novel Curcumin-derived Environmentally Friendly Plasticizers

Jose Saltos  
Dr. Krishnaswami Raja  
Department of Chemistry

Plasticizers are widely used for their effectiveness in reducing the tensile strength, hardness, density, melt viscosity, glass transition temperature, and volume resistivity of a polymer. They are employed in a wide range of industries such as the biomedical field, construction, plastics, and more. Phthalate esters are the most widely used plasticizers for their suitable applications and availability, and account for 92% of the plasticizers produced worldwide. Its limitation lies in that phthalate esters have been reported to migrate out of the polymers, making them less flexible and less efficient. It is also associated with endocrine disruption, reproductive and developmental toxicity in humans, and with negative environmental impact on plants and animals.

Curcumin is the active ingredient in the curry spice turmeric; it is generally regarded as safe by the FDA. The molecule is rigid in structure with two phenolic groups that can be modified covalently. We plan to synthesize green eco-friendly plasticizers based on curcumin and tetrahydro curcumin, which reacted with excess octanoic acid, will produce curcumin dioctanoate and tetrahydro curcumin dioctanoate. These plasticizers will be blended to three different polymers: PMMA, PMM, and Polystyrene in various percentages: 5%, 10%, and 15%, to test their effectiveness in inducing depression of the glass transition temperature in the polymer/plasticizer system.

Globalization: Challenges in Africa

Rachel Afii

Faculty Mentor: Dr. Alan Zimmerman  
Department of Business

The effects of globalization cannot be denied around the world, especially in developing countries. This integration of markets has been a controversial topic and debated from two different points of view: a negative and a positive side. In Africa for instance there are existing challenges; it is difficult to take sides when globalization obviously benefits the host countries as a whole. At the same time there is evidence that globalization creates disadvantages in the home countries and host countries as well. For the purpose of this research, I reviewed the economic system and development of two West African countries, Ivory Coast and Nigeria which were previously colonies of France and England, respectively. My observation will show that globalization has enabled the Multinational Enterprise to control the most important sectors of Ivory Coast and Nigeria, while contributing to their economic growth and affecting negatively the population’s welfare. I advise that African countries invest in human capital, adopt a different economic model, collaborate on new ways to subsidize their projects of development and implement strategies to be more competitive globally.
## Faculty Mentors

### Undergraduate Conference on Research, Scholarship, and Performance—Faculty Mentors

<table>
<thead>
<tr>
<th>Faculty Mentor</th>
<th>Department</th>
<th>Poster</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Alejandra Alonso</td>
<td>Biology</td>
<td>4, 21, 22, 24</td>
</tr>
<tr>
<td>Dr. Zaghoul Ahmed</td>
<td>Physical Therapy</td>
<td>10</td>
</tr>
<tr>
<td>Dr. Comfort Asanbe</td>
<td>Psychology</td>
<td>50, 68</td>
</tr>
<tr>
<td>Dr. Probal Banerjee</td>
<td>Chemistry</td>
<td>14</td>
</tr>
<tr>
<td>Dr. William Bauer</td>
<td>Performing and Creative Arts</td>
<td>60</td>
</tr>
<tr>
<td>Dr. Sarah Bauer</td>
<td>Psychology</td>
<td>5</td>
</tr>
<tr>
<td>Dr. Patricia Brooks</td>
<td>Psychology</td>
<td>6, 7, 20</td>
</tr>
<tr>
<td>Dr. Sarah Benesch</td>
<td>English</td>
<td>36, 63</td>
</tr>
<tr>
<td>Dr. Robert Corin</td>
<td>Biology</td>
<td>66</td>
</tr>
<tr>
<td>Dr. Kathleen Cumiskey</td>
<td>Psychology</td>
<td>35</td>
</tr>
<tr>
<td>Dr. Abdeslem El Idrissi</td>
<td>Biology</td>
<td>31, 32</td>
</tr>
<tr>
<td>Dr. Jimmie E. Fata</td>
<td>Biology</td>
<td>33, 40, 41, 42</td>
</tr>
<tr>
<td>Dr. Natacha Gueorguieva</td>
<td>Computer Science</td>
<td>1, 2, 3, 9, 11</td>
</tr>
<tr>
<td>Dr. Darryl Hill</td>
<td>Psychology</td>
<td>34, 37</td>
</tr>
<tr>
<td>Prof. James Hladek</td>
<td>Engineering Science</td>
<td>44</td>
</tr>
<tr>
<td>Dr. Susan Holak</td>
<td>Business/Office of Academic Affairs</td>
<td>59</td>
</tr>
<tr>
<td>Dr. Qiao-Sheng Hu</td>
<td>Chemistry</td>
<td>46, 48</td>
</tr>
<tr>
<td>Dr. Xin Jiang</td>
<td>Engineering Science and Physics</td>
<td>29, 62</td>
</tr>
<tr>
<td>Dr. Judit Kerekes</td>
<td>Education</td>
<td>52</td>
</tr>
<tr>
<td>Dr. Michael Kress</td>
<td>Computer Science/VP for Technology Systems</td>
<td>13</td>
</tr>
<tr>
<td>Dr. Michal Kruk</td>
<td>Chemistry</td>
<td>17</td>
</tr>
<tr>
<td>Dr. John Lawerence</td>
<td>Psychology</td>
<td>30, 43</td>
</tr>
<tr>
<td>Dr. Lihong (Connie) Li</td>
<td>Engineering Science and Physics</td>
<td>54</td>
</tr>
<tr>
<td>Dr. Charles Liu</td>
<td>Physics</td>
<td>28, 69</td>
</tr>
<tr>
<td>Dr. Dan McCloskey</td>
<td>Psychology</td>
<td>12, 23, 51, 67</td>
</tr>
<tr>
<td>Dr. Elena McCoy</td>
<td>Biology</td>
<td>39, 49</td>
</tr>
<tr>
<td>Dr. Mary Ellen McMorrow</td>
<td>Nursing</td>
<td>64</td>
</tr>
<tr>
<td>Dr. Shai bal Mitra</td>
<td>Biology</td>
<td>47</td>
</tr>
<tr>
<td>Dr. Fred Naider</td>
<td>Chemistry</td>
<td>15, 25</td>
</tr>
<tr>
<td>Prof. Patricia Passlof</td>
<td>Performing and Creative Arts</td>
<td>27</td>
</tr>
<tr>
<td>Dr. Bertram Ploog</td>
<td>Psychology</td>
<td>20</td>
</tr>
<tr>
<td>Faculty Mentor</td>
<td>Department</td>
<td>Poster</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Dr. Andrew Poje</td>
<td>Mathematics</td>
<td>53, 57</td>
</tr>
<tr>
<td>Dr. Sarah Pollack</td>
<td>Modern Languages</td>
<td>19</td>
</tr>
<tr>
<td>Dr. Sonia Ragir</td>
<td>Psychology</td>
<td>6</td>
</tr>
<tr>
<td>Dr. Krishnaswami Raja</td>
<td>Chemistry</td>
<td>8, 18, 70</td>
</tr>
<tr>
<td>Dr. Chang-Hui Shen</td>
<td>Biology</td>
<td>26</td>
</tr>
<tr>
<td>Dr. Chwen-Yang Shew</td>
<td>Chemistry</td>
<td>16, 45</td>
</tr>
<tr>
<td>Dr. Matthew Solomon</td>
<td>Media Culture</td>
<td>61</td>
</tr>
<tr>
<td>Dr. Deborah Sturm</td>
<td>Computer Science</td>
<td>55</td>
</tr>
<tr>
<td>Dr. Alexandru Voicu</td>
<td>Political Science/Economics/Philosophy</td>
<td>58</td>
</tr>
<tr>
<td>Dr. Maurya Wickstrom</td>
<td>Performing and Creative Arts</td>
<td>38</td>
</tr>
<tr>
<td>Dr. Xiowen Zhang</td>
<td>Computer Science</td>
<td>56</td>
</tr>
<tr>
<td>Dr. Alan Zimmerman</td>
<td>Business</td>
<td>65, 66, 71</td>
</tr>
</tbody>
</table>
### Undergraduate Conference on Research, Scholarship, and Performance—Student Scholars

<table>
<thead>
<tr>
<th>STUDENT</th>
<th>FACULTY</th>
<th>DEPARTMENT</th>
</tr>
</thead>
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