Innovative Strategies to Enhance Faculty-Student Collaborations & Integrate Undergraduate Research at Hunter College

May 2, 2014

Dr. Rachel Verni
Director of Undergraduate Research
Why undergraduate research?

For any student:
Enhances confidence and builds skill sets that are critical for academic and professional success

For students interested in research:
Creates a concrete understanding of the research process, graduate school experience, and research careers

For institutional goals:
Enhances student engagement, helping to increase retention, graduation rates, and student success beyond their undergraduate experience
Enhancing Faculty-Student Collaboration through Undergraduate Research

Science Mathematics Opportunities Network (SciMON)

Undergraduate Research Initiative (UGRI)

Donor-Funded Programs

- McNulty Scholars Program
- Raab Presidential Fellows Program
- Tukman Awards Program

Undergraduate Research Conference (UGRC)
SciMON Goals & Programs

- Support for STEM programs
- Provide resources & outreach at critical education junctures
- Increase engagement in UGR opportunities

<table>
<thead>
<tr>
<th>Program</th>
<th>Funding Agency</th>
<th># Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>AstroCom NYC</td>
<td>NSF</td>
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<tr>
<td>BP Endure</td>
<td>NIH</td>
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<td>Catalyst</td>
<td>NSF</td>
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<td>HHMI</td>
<td>HHMI</td>
<td>8</td>
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<tr>
<td>LSAMP</td>
<td>NSF</td>
<td>0*</td>
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<tr>
<td>MARC</td>
<td>NIH</td>
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<tr>
<td>MBRS-RISE</td>
<td>NIH</td>
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<td>McNair</td>
<td>US Dept. of Education</td>
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<td>McNulty</td>
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<td>MMUF</td>
<td>Mellon Foundation</td>
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<td>MIND Alliance</td>
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<td>Noyce</td>
<td>NSF</td>
<td>23</td>
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<tr>
<td>QuBi</td>
<td>NSF</td>
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<tr>
<td>RAISE-W</td>
<td>NSF</td>
<td>9</td>
</tr>
<tr>
<td>Verizon</td>
<td>Verizon Corp.</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total Enrollment</strong></td>
<td><strong>228</strong></td>
<td><strong>228</strong></td>
</tr>
</tbody>
</table>

*LSAMP is currently recruiting new students with an application deadline in May, 2014.
SciMON: Outreach & Recruitment

- Program faculty and staff
- Classroom Visits
- Tours, orientations, & fairs
- CRM
- Hunter Gatherer
- Hunter Events Calendar
- TV Screens & Flyers
- SciMON Website
- Monthly Bulletin
- Social Media
SciMON Website Resources (continued)

General Application

Steps for Applying

Welcome to the SciMON network General Application page. We are excited that you are interested in enhancing your undergraduate experience by applying to a research and mentoring program. You are taking an important step to prepare for your future in research. SciMON has created a General Application for many of the programs within. Some of the programs, however, have their own application processes. The following are the programs that use the application:

- AstroCom NYC
- Catalyst
- MBB-Rise
- RAISE-W
- BP-ENDURE
- MEC

Choosing the right program

There are so many programs! How do I choose the right one?

You asked for it, so we developed The Program Matching Quiz to help you determine the program(s) best for you!

Matching Quiz
SciMON: Professional Development Workshops

Professional Development Workshops

Workshops Spring 2014

SciMON will be holding a series of general workshops and conference panels and lunches this Spring to help you succeed as you complete your undergraduate degree, continue on to graduate school, and pursue an exciting career in research, teaching or health. Check bit.ly/scimonevents for updates to the events below.

Weds & Thurs, March 5-6
Undergraduate Research Conference (UGRC)
9am-6:30pm, NWC Lobby & 3rd Flr

Weds, February 5
How to Find and Cite a Research Article
10:30am-12pm, Library E114

Weds, February 19
Poster Feedback Drop-In Hours
1pm-2:30pm, HW 215
5:30-6pm, HW 3rd Flr Cafe

Weds, March 5
Lunch: Preparing for and Thriving in Graduate School
12pm-1:30pm, HW 3rd Flr Cafe

Thurs, March 6
Science Degree Career Lunch @ the UGRC
12pm-1:30pm, HW 3rd Flr Cafe

Weds, March 26
How to Read a Research Article
1pm-2:30pm, HE 1203

Weds, April 2
Tackling the GRE
1pm-2:30pm, HE 1203

Thurs, March 6
Tips from Faculty panel @ the UGRC
10:30am-11:30am, HW 3rd Flr Cafe

Weds, April 9
Icahn School of Medicine, Mount Sinai Info Session
1pm-2:30pm, HW 215
Faculty-student collaboration across the disciplines

Alejandro Nunez
Major: Physics
Research Focus: Atmospheric Composition of L-Dwarfs
Hometown: Colombia

Alejandro enrolled at Hunter College for a bachelor’s degree in physics, with the intention of subsequently pursuing a Ph.D. in Astronomy. With the help of the MBRS-RISE Program, Alejandro was recruited to do research by Dr. Kelle Cruz, an Astronomy professor in the Physics & Astronomy department. Alejandro was surprised to learn how eager Hunter professors are in exposing students to research.

Alejandro has been doing research with Dr. Cruz for the past two years analyzing the atmospheric composition of L-dwarfs - star-like objects not massive enough to burn hydrogen in their cores. The study of these objects can shed light on the formation and evolution of stars and planets because they form like stars but are physically similar to giant planets.

Jimena Santillan
Major: Psychology
Research Focus: Neurocognitive Development of Attention and Learning
Hometown: Mexico

Jimena is a senior majoring in Psychology and Interdisciplinary Honors as part of the Thomas Hunter Honors Program. During her junior year, Jimena was a NIMH-CTSA program scholar, a National Institute of Mental Health sponsored program designed to provide underrepresented students with professional development and research training in psychology. This year, Jimena is a BP-ENDURE program scholar, a program funded by the National Institute of Health to support diverse students interested in neuroscience-related careers.

Jimena’s research interests are in the neurocognitive development of attention and learning. She is currently working as a research assistant in the Language and Concepts Development Lab at Hunter College under the mentorship of Dr. Sandeep Prasad. Jimena’s main project focuses on the role of linguistic cues in the acquisition of semantic knowledge (knowledge concerning kinds and their properties) about novel objects in adults and children. Jimena also works as a research assistant in Dr. Jennifer Mangels’ Dynamic Learning Lab at Baruch College, where she assisting in a project examining the relationship between rumination and attention allocation during the processing of learning-relevant information. After graduating in the Spring of 2012, Jimena plans to pursue a PhD in cognitive neuroscience to study the mechanisms underlying effective learning at the neural level, with the purpose of using this knowledge as a tool to design interventions to address educational disparities and strive to close the achievement gap.
Donor-Funded Programs

- **McNulty Scholars Program**
  
  Kartarzyna Golec
  
  Faculty Mentor: Professor Robert Thompson, Mathematics and Statistics
  
  Kartarzyna, from Krasnystaw, Poland, is a third year Mathematics student with a concentration in Quantitative Biology. During her junior year she participated in a CMASC (Computational Modeling and Analysis for Complex Systems) workshop at Lehman College. The workshop involved in-depth analyses of computer programming that modeled the spiral waves of a heart during Atrial Fibrillation. Under the watchful eye of creator of the program Professor Nancy Griffith and guest speaker Professor Flavio Fenton from Georgia Tech, Kartarzyna was able to understand and analyze heart cells and the processes that occur during the Atrial Fibrillation. This project allowed her to combine knowledge of differential equations and biology in order to model the processes of the heart.
  
  Thanks to the John P. McNulty Scholarship, Kartarzyna was given the opportunity to explore the concepts of Probability Theory with the help of her mentor Professor Robert Thompson. She was able to understand the basics as well as the logic that underlines the theory. Since Kartarzyna prefers the applied branch of mathematics instead of the theoretical one, she believes that the research in Probability Theory will help her to continue her career in the Quantitative Biology field.

  In the near future, Kartarzyna plans to attend medical school to become a doctor. Since her freshman year at Hunter College, she has been taking pre-medical classes and plans to take MCAT’s while continuing her research in mathematics.

- **Raab Presidential Fellowship**

- **Tukman Award**

  Ruth Hauptman
  
  Faculty Mentor: Professor Xie Lie, Computer Sciences
  
  Ruth Hauptman is a senior at Hunter College, majoring in Computer Science while simultaneously working on premedical requirements. She is part of the John P. McNulty Scholars program and is grateful for the wonderful opportunity given to her. Ruth is currently working in the Computational Systems Biology, Biomolecular Modeling and Bioinformatics Laboratory with Professor Lie Xie. In Dr. Xie’s lab, Ruth works on network-inference of drug-target networks, which may facilitate drug repositioning, side effect prediction, and polypharmacology drug design. Ruth aspires to be a medical doctor and hopes to continue doing research, combining her programming skills and strong background in computer science with the medical sciences.
Undergraduate Research Conference Goals

For Presenters
- Provide students with experience presenting their research
- Help socialize students into careers in research
- Provide students with an additional conference presentation to add to their CVs
- Celebrate and reward participation in undergraduate research

For Visitors – Students, Faculty, Staff
- Celebrate research at Hunter
- Enhance awareness of research at Hunter
- Engage students in research conducted at Hunter
- Encourage students to participate in research
- Encourage faculty to include undergraduates in their research
# Undergraduate Research Conference Attendees

<table>
<thead>
<tr>
<th>Role</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>634</td>
<td>70%</td>
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<tr>
<td>Presenter</td>
<td>134</td>
<td>14.8%</td>
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<tr>
<td>Not Specified</td>
<td>53</td>
<td>5.8%</td>
</tr>
<tr>
<td>Hunter Faculty</td>
<td>30</td>
<td>3%</td>
</tr>
<tr>
<td>Visitor</td>
<td>27</td>
<td>3%</td>
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<tr>
<td>Staff</td>
<td>16</td>
<td>1.7%</td>
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<tr>
<td>Graduate Student</td>
<td>13</td>
<td>1.4%</td>
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<tr>
<td>Alumni</td>
<td>3</td>
<td>0.3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>905</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Source: Registration data \( (N = 905) \)

Note: Participants may have had more than one role (e.g., presenter and undergraduate). Not specified indicates the attendee chose not to identify their role at the conference. Visitors include faculty from other institutions and presenters’ family members.
KEYNOTE

Gregory A. Petsko, D. Phil.
Arthur J. D'Amato Professor of Neurology and Neuroscience
Director, Helen and Robert Appel Alzheimer's Disease Research Institute
Weill Cornell Medical College

Wednesday, March 5
4:15pm - 5:15pm (Talk) 5:15pm - 6:30pm (Reception)
9th Floor Wood, Faculty Dining Room

What I Learned From Doing and Directing Undergraduate Research, or The Ritual ofBLACK

"When I was a college student, doing undergraduate research—when I originally did it, I was just doing it for fun. Now I've been doing it for the past 15 years, and I've learned a lot about how to do it. But in this case, I was taught to do research by someone who had done it before me, because the graduate students were working in my lab doing the sort of things I did decades earlier. These stories have a couple of useful morals, and are the best kind of stories, because they all end happily."

Career Lunch: What You Can Do with a Science Degree
Thursday, March 6 | 12:00 - 1:30 pm, 3rd Floor West Cafeteria

During lunch, professionals working in different career fields will give short introductions and discuss their undergraduate-to-career trajectories and experiences in their current professional positions with students in groups. This session will allow students to explore and ask questions about the plethora of professional opportunities and options available to them when they graduate with a background in undergraduate research related to Science, Technology, Engineering, and Math (STEM) fields.

Katie Brown, M.A.
Actuarial Analyst

Katie Brown is an actuarial analyst for the employee benefits practice of an actuarial consulting firm. She received her Master of Arts degree in Quantitative & Applied Mathematics from Hunter College and her Bachelor of Arts degree in Mathematics from Queens College.

Susie Cheng, Ph.D., J.D.
Partner, Levin Ellis LLP

Dr. Susie Cheng is a registered patents attorney and a partner at Levin Ellis LLP. She is an intellectual property lawyer in the firm's New York office. She is also the Chair of the China Practice Group at Levin Ellis LLP. She obtained her Ph.D. in Genetics and development from Columbia University College of Physicians & Surgeons and continued with a post-doctoral training at the Rockefeller University. She obtained her J.D. at Brooklyn Law School and has been practicing patent law. Dr. Cheng focuses on all aspects of global strategic patent protection, licensing of inventions and monetization of intellectual property. She also provides advice regarding intellectual property disputes and litigation.
Student Collaboration

- **UGRI**
  - student feedback helped improve the application process
- **McNulty**
  - student feedback led to the addition of the peer mentoring component of the project
- **UGRC 2014**
  - Student Awards Committee –
    - developed procedures for judging best poster/presentation awards
- **SciMON Student Advisory Council – helps improve:**
  - Ask SciMON/SciMON Says
  - Professional Development Workshops
  - Outreach Strategies
Thank you.

Questions?