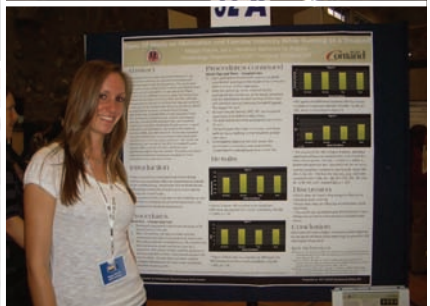
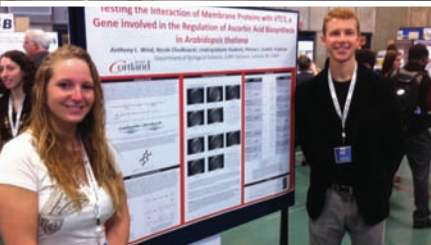
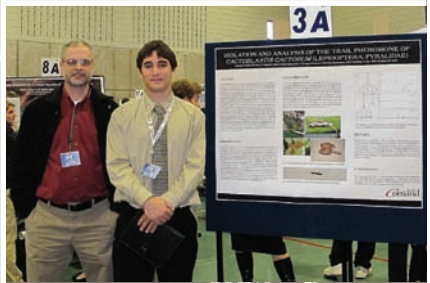


Undergraduate Research Highlights

2010-2011



Undergraduate Research Highlights

Cover

More than a dozen SUNY Cortland undergraduate students participated in the 2011 National Conference on Undergraduate Research (NCUR), held March 30-April 2, at Ithaca College in Ithaca, N.Y. SUNY Cortland had 13 presentations, including three oral presentations, eight poster presentations and two visual arts exhibits.

Undergraduate Research Council

SUNY Cortland's Undergraduate Research Council promotes SUNY Cortland as an institution fully committed to student research, scholarship, and creative pursuits. To this end, the UR Council will assure that faculty and students have easy access to information and resources on best practices, mentoring, student publishing, and other forums for the dissemination of students' scholarly works. Through funding provided by the Provost's and Sponsored Programs Offices, the Office for Resident Life and Housing and the generosity of donors to the the College Foundation, the Undergraduate Research Council directly supports research projects through a number of competitive fellowships and grants.

URC Director: Christopher McRoberts

URC Members: Cynthia Benton, Philip Buckenmeyer, Terrence Fitzgerald, Joy Hendrick, Amy Henderson-Harr, Kathryn Kramer, Mark Prus, Sharon Steadman, and Orvil White

Administrative Support: Haley Zurell

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GET YOUR
hands on
RESEARCH

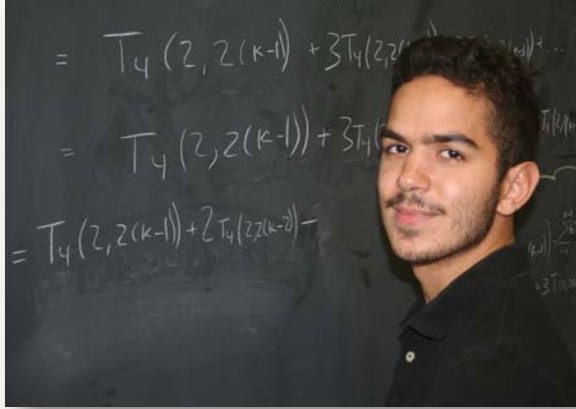
Jehsuamo Casas

Adolescent Education, Mathematics

Polyominoes as a recreational approach to the connections between science and math

“My research has opened up my eyes to the bigger world and made mathematics even more interesting to me.”

Jehsuamo’s research involves counting the number of solutions to polyomino tiling problems. A polyomino is a geometric shape made of adjacent squares. The pieces in the game Tetris are polyominoes made from four



squares. A solution to a tiling problem is an optimal packing of polyominoes into a given region such as a rectangle. This is an active area of combinatorics research with many real world applications. Jehsuamo intends to develop fun and innovative lessons for middle and high-school mathematic students that will use polyominoes as a window to mathematics beyond the classroom students.



Faculty Mentor

Damien Pitman, Assistant Professor,
Mathematics

“Mentoring an undergraduate student like Jehsuamo has had a rejuvenating and reinvigorating effect on my academic interests and reinforces the reason why I’m in higher education.”

Haneul Jeon

International Studies

Influences of Korean popular music: 1945 to the present

“My research on Korean popular music has allowed me to gain a much deeper appreciation of my own culture and sense of identity.”



Haneul's research aims to demonstrate what influence international conflicts and military force has had in contemporary Korean music. Since 1945, pop music in Korea has been strongly influenced by Western influences of US

military forces and broadcasting by the American Forces Korea Network permitting an influx of American-style folks songs, blues, and in particular rock and roll into Korean music culture. Her research uses a combination of ethno-historical methods including examining historical records and interviews of Korean broadcasters and associates to examine cultural relationships that involves a dynamic exchange of music styles, arts and philosophies that have come together as a result of conflict and warfare.

Faculty Mentor

Ralph Dudgeon, Professor, Performing Arts

“Haneul's research not only advances our understanding of the roots of Korean popular music, but has made me more aware of nuances of globalization and the American cultural influences on popular music of other cultures.”



Virginia Martelli

Physics

Effects of water vapor on crystallization processes in erbium containing solid state films



“My research has allowed me to develop a novel system that permits the delivery of water vapor into a furnace – this has potential to increase efficiencies in several commercial and research applications.”

Virginia is investigating the catalyzing effects of atmosphere and water vapor on the development of crystals within fiber optic amplifiers. Virginia’s research should help understand the efficiencies in optical circuits that are impeded by crystal growth that have the effect of scattering photons. Like UGR Summer Fellow Tyler Potter, Virginia’s research is heavily dependent on modern instrumentation including

X-ray diffraction as a means to determine degree of crystallinity through annealing them differing temperatures and vapor pressures and then interpreting kinetics.



Faculty Mentor

Karen Downey, Assistant Professor,
Chemistry

“Virginia’s work has provided an essential component in my larger research program aimed at developing synthesis techniques and analysis of kinetics of thin films.”

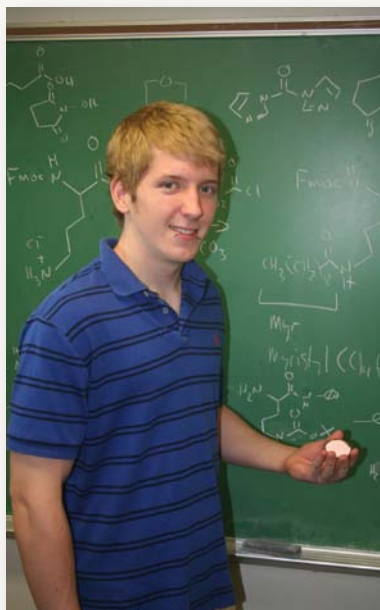
Tyler Potter

Chemistry

Determining the kinetics and activation energies of the crystallization processes in a mixed metal oxide

“Not only has my research experience helped me to learn new and valuable skills in the chemistry lab, I gained a real appreciation as to how much time and patience is necessary to be successful at it.”

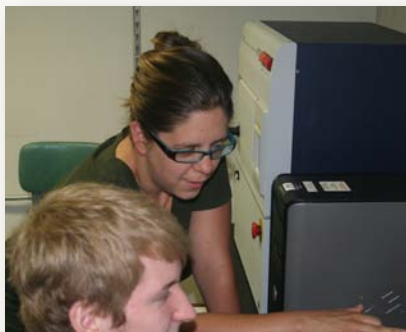
Tyler's research involves synthesis of metal oxide thin glassy films of zinc, silicon, to investigate substances that might help reduce heat around printed circuit boards used in computers and other electronics. Tyler's research utilizes cutting-edge instrumentation including X-ray diffraction (using Cortland's new Rigaku Miniflex X-ray diffractometer) and other instrumentation in Cornell's materials chemistry laboratory to analyze the percent crystallinity of these synthesized thin-films through several different heat regimes. Development of thin glassy films is a necessity for creating integrated optical circuits.



Faculty Mentor

Karen Downey, Assistant Professor,
Chemistry

“Tyler has been an integral part of our team and it has been a rewarding experience to see his personal growth and synergy as he works with others in the lab.”



Michael Reilly

Business Economics

The labor supply response to remittance income in Central America

“My fellowship has provided me with a deeper understanding as to how economic research is really done while at the same time helped me narrow my career goals once I graduate.”



Michael's research examines how remittances affect the labor supply in the receiving countries of Central America. Michael is investigating the question: do remittances lead to

an 'income effect' in which receiver works less reducing per-capita worker productivity or do remittances lead to a 'substitution effect' drawing the receiver of the remittances to work more and thus increasing per capita worker productivity. Among other sources, Michael's research utilizes data from the Inter-America Development Bank and has led him to design an economic statistical design that utilizes regression analyses to determine the factors influencing the labor supply of remittance receivers in Central America countries.

Faculty Mentor

German Zarate, Associate Professor and Chair, Economics

“Michael's work has helped me with my own research and allowed me to understand better the positive and negative effects in remittance economies.”



Tori Smith

Biological Sciences

Ecological role of flowers size and color variation in *Trillium Erectum*

“My research experience has allowed me become more confident in my abilities, to narrow my career objectives and prepare me for graduate school in forestry.”

Tori's research focuses on *Trillium erectum*, a herbaceous perennial found in deciduous forests of Eastern North America. *Trillium erectum* has a relatively long life span, and populations possess extensive variation in flower size, which has been directly linked to the pollen and ovule/seed production. One major component of the research addresses the question whether spatially isolated populations differ in flower color polymorphism and size variation. The research involves collecting data on pollen and ovule counts, measuring flower size and color variation and conducting spectral and statistical analyses of petal colors to determine if significant differences exist among populations.



Faculty Mentor

Steven Broyles, Professor, Biological Sciences

“Tori's research has led to the development of new laboratory techniques in determining the age-histories of Trillium leaves. This has truly advanced not only the work I do in the lab but will be a great value to other researchers in the field”

Michael Tota

Business Economics

Academic salary compression in New York State

“Although an initially daunting prospect, my research has resulted in me gaining an incredible amount of new knowledge, skills and confidence.”

Building upon previous independent studies with Dr. Burke, Michael’s research involves salary compression of university and college faculty in New York State. Using historical salary data from the American Association of University Professors, Michael’s research employs statistical analysis to determine the extent of salary compression in higher education across academic disciplines, academic ranks and gender from different types of institutions in the state. Further analyses will determine how academics in New York compare with national and regional market trends in academic salary.



Faculty Mentor

Kathleen Burke, Associate Professor,
Economics

“Michael’s involvement in my own research has kept me energized and allowed me to explore new avenues of research leading to exciting new collaborations in other disciplines.”

Other Undergraduate Research Awards

The following undergraduate students were awarded an Undergraduate Research Council Travel Grant to attend conferences in which they were a presenter

Joshua Baccile: National Conference on Undergraduate Research (Ithaca, NY)
Thomas Breitfeller: National Conference on Undergraduate Research (Ithaca, NY)
Thomas Breitfeller: Northeastern Education Research Association (Rocky Hill, CT)
Erik Burrows: NYS Political Science Association Annual Conference (Lewiston, NY)
Nicole Chodkowski: National Conference on Undergraduate Research (Ithaca, NY)
Megan Connors: NYS Political Science Association Annual Conference (Lewiston, NY)
Michael Curry: National Conference on Undergraduate Research (Ithaca, NY)
Daniel Drew: American Chemical Society Conference (Boston, MA)
Daniel Drew: National Conference on Undergraduate Research (Ithaca, NY)
Amanda Ephraim: NYS Political Science Association Annual Conference (Lewiston, NY)
Rachel Epstein: Association of Behavioral Analysis Intl. Annual Convention (Denver, CO)
Megan Fearon: National Conference on Undergraduate Research (Ithaca, NY)
Carolyn Furlong: Northeast Geological Society of America Meeting (Pittsburgh, PA)
Michaela Granato: National Conference on Undergraduate Research (Ithaca, NY)
Leanne Hladik: Berkshire Association for Behavior Analysis and Therapy (Amherst, MA)
Macey Kolczynski: National Conference on Undergraduate Research (Ithaca, NY)
Alexandrina MacPherson: Association of Behavioral Analysis Intl. Ann. Conv. (Denver, CO)
Danielle McCarthy: National Conference on Undergraduate Research (Ithaca, NY)
Mark Morrel: National Conference on Undergraduate Research (Ithaca, NY)
Jeffrey Quain: NYS Political Science Association Annual Conference (Lewiston, NY)
Megan Rehm: Association of Behavioral Analysis Intl. Annual Convention (Denver, CO)
Matthew Rankin: National Conference on Undergraduate Research (Ithaca, NY)
Gerald Whalen: NYS Political Science Association Annual Conference (Lewiston, NY)
Anthony Wind: National Conference on Undergraduate Research (Ithaca, NY)
Michael Wolfin: National Conference on Undergraduate Research (Ithaca, NY)
Amanda Zezima: Northeastern Education Research Association (Rocky Hill, CT)
Amanda Zezima: National Conference on Undergraduate Research (Ithaca, NY)

The following undergraduate students were awarded an Undergraduate Research Council Small Grant in support of their research

Alexandra DeVoe: Pilet production of *Recapture*, a creative nonfiction journal
Megan Feron: Types of music on motivation and exercise intensity
Carl Koehler: Native American trail marker trees along the Finger Lakes Trail in NYS
Macey Kolczynski: Learning to write again: Do left-handers truly have an advantage
Brittnay Tillchock: Archeological research St. Eustatius research center, Dutch Antillies