SCHOLARS' DAY 2014

Showcasing the talent and creativity of MCC students, faculty, and staff.

Brighton Campus

Saturday, April 26, 2014

Sponsored by the President's Office, Brighton and Damon Offices of Student and Academic Services, and the Divisions of Liberal Arts, and Science, Health, and Business.

Monroe Community College
STATE UNIVERSITY OF NEW YORK

Inspiring every day.

SCHOLARS' DAY 2014

Welcome to Monroe Community College's Scholars' Day, a day devoted to the academic endeavors of its students and faculty. MCC's Scholars' Day was created to promote and encourage scholarship across the disciplines, and to serve as a showcase for academic excellence. The day's events will include presentations, panel discussions, performances, and poster sessions by MCC faculty, staff, and students.

Monroe Community College's Scholars' Day is dedicated to:

- Publicizing the research of our students and faculty.
- Sharing and expanding knowledge within and across different academic disciplines.
- Creating an atmosphere devoted to scholarly activity.
- Further strengthening MCC's local, state, and national reputation as an academically strong, open-access institution.

Thank you for attending today's events and the 6th Annual Scholars' Day, a tradition we expect to see grow. If you are a member of the MCC community, we hope you will be inspired to consider submitting a paper or panel idea, or working with a student or faculty member for the 2015 Scholars' Day.

The Scholars' Day Committee

Co-Chairs

Michael Ofsowitz – Psychology • Jodi Oriel – Student Life and Leadership Development

Committee

James Cronmiller, Biology
Jennifer Hill, Biology
Christopher Kumar, Engineering Science & Physics
Jennifer Markham, Biology
Michael McCullough, Library
Verdis Robinson, Anthropology/History/Political Science/Sociology
David Shaw, Visual & Performing Arts

Schedule at a Glance
Scholars' Day
Brighton Campus

9:30 a.m.	Refreshments North Atrium Building 12
10:00 a.m. – 2:00 p.m.	Popular Vote (details below) North Atrium
10:00 – 11:00 a.m.	Poster Presentations North Atrium
10:00 – 11:00 a.m.	Session 1 Building 12 Classrooms, Ground Floor
11:10 a.m. – 12:10 p.m.	Session 2 Building 12 Classrooms, Ground Floor
12:10 – 12:50 p.m.	Lunch Featuring MCC Small Group Jazz Ensemble R. Thomas Flynn Campus Center, Monroe A & B
1:00 - 2:00 p.m.	Session 3 Building 12 Classrooms, Ground Floor

VOTE for YOUR favorite presentation, and the presenter(s) with the most votes will receive a $250.00 scholarship. You can vote once for each session.

Voting qualifies you for an opportunity to win prizes throughout the day.

Poster Session

9:30 - 11:00 a.m. North Atrium

Unearthing the Cost of Coltan

Laura Hoodak, Liberal Arts
Jennifer Pfaff, Liberal Arts
Faculty Sponsor: Professor E. Jethro Gaede, Anthropology/History/Poli. Science/Sociology

Coltan is a natural resource capable of holding a sustained electrical charge. It is an essential component used in electronic items including cellphones and computers. It is reported that thirty percent of school-aged children in the Democratic Republic of Congo (DRC) are forced laborers in coltan mines.

See Session 1D for details.

Getting Involved: A Care Plan for Successful Professional Development

Kelsey Hawkins-Rusch, Nursing
Cheryl Brooks, Nursing
Caitlyn Pilc, Nursing
Tami Domokos, Nursing
Michael McAlmon, Nursing
Faculty Sponsor: Professor Jacqueline Dorsey, Nursing

The Student Nurses' Association at Monroe Community College has discovered limited involvement from the student nursing population as an ongoing concern. Our goal is to develop accountable, responsible and empowered leaders by assisting the incoming nursing student through the continuum to their professional role.

See Session 2A for details.

Integration of Complementary Therapies in the Care of Pediatric Oncology Patients: Implications for the Pediatric Oncology Nurse

Cheryl Brooks, Nursing
Faculty Sponsor: Professor Laurie Palmer, Nursing

Symptoms resulting from pediatric cancer and side-effects of cancer treatment therapies interfere with quality of life and promote distress in children and their family members. It has been estimated that up to 84% of children with cancer have used complementary therapies, in conjunction with conventional medicine, in an attempt to alleviate their suffering.

See Session 2A for details.

Down to the Bristles

Tina Barnett, Dental Hygiene
Tricia Wilson, Dental Hygiene
Stephanie Iascone, Dental Hygiene
Faculty Sponsor: Professor Marsha Bower, Health Professions and Professor Suzanne Long, Biology

Based on new technology, often dental hygienists are faced with the question of "What is the best storage method for their toothbrushes?" It is important for dental patients to know how to properly store their toothbrushes to prevent exposure to other harmful bacteria. The purpose of this experiment was to assess the best storage method based on the amount of bacterial growth. This simple experiment utilized six methods of storage; American Dental Association's recommendation to keep stored in a dry upright environment, dipped in antiseptic mouth rinse then placed in a holder in bathroom, a Steri-Pod, a traditional travel holder, a UV sanitizer and one simply placed in a toothbrush holder. Each toothbrush was unused and placed in the same bathroom, within the designated storage method. One brush was cultured at the start of the experiment to determine a baseline for the amount of bacteria naturally occurring on packaged toothbrushes. After two weeks, a culture was taken from each of the brushes and allowed ample time to grow. The growth was visually measured, counted and compared. We hypothesize that the toothbrush dipped antiseptic mouthwash will produce the least amount of bacterial growth.

How Do Children Apply Knowledge From One Context to Another?

Andrea Erazo Espinoza, Liberal Arts
Faculty Sponsor: Professor John Curry, Collegiate Sci. and Tech. Entry Program

With today's technological advances there is a strong belief that the use of tablets and other touchscreen media enhances children's ability to learn; however, plenty of studies show that children in pre-k and kindergarten are not able to apply knowledge across different contexts. This is called the transfer learning deficit. We concentrated on the video deficit effect. We designed a puzzle-imitation paradigm to measure the strategies children employ when learning. We worked with 53 36-month olds and 10 30-month olds. The children were given three consecutive 60 second live demonstrations on how to assemble a three piece puzzle (in 3D or 2D). They then interacted with the pieces for 60 seconds. We wanted to answer the following questions: "Does 'transfer distance' affect kids' ability to demonstrate transfer of learning across dimensions?" and "Do learning strategies change with age?" The data showed a trend towards progression of social strategies. Although we accounted for social and perceptual features, the transfer deficit maintained. Higher emulation scores suggested that symbolic competence plays a role in the video deficit effect. Understanding the factors that may contribute to the transfer deficit across dimensions may help educators mitigate them, thus increasing the efficacy of our educational system.

Modeling the Projectile Motion of Foam Darts

Jermell Jackson, Engineering Science
Faculty Sponsor: Professor John Curry, Collegiate Sci. and Tech. Entry Program

An analysis was performed on the motion of two types of foam darts, which were launched from a NERF® bow and became projectiles. We considered the effects of gravity, air resistance (or drag) and the bow's effective spring constant. The parameters that describe the dart's drag constant were experimentally extracted using a wind tunnel. The parameter describing the bow's spring constant was extracted using a spring scale. These parameters were then employed to make predictions of the dart's trajectory based on the initial velocity and initial angle. Since each dart has a different cross-sectional area and shape, and each bow has a different spring constant; it would allow for the development of projectile challenges for students. The result including drag was very close to the result neglecting drag. This analysis will be incorporated into group projects for an introductory course in classical mechanics and can be delivered at various levels.

Using GIS to Determine Geochemistry of Shallow Groundwater Wells in South-Central NY: Implications for Marcellus Fluid Migration

Rebecca Kreuzer, Undeclared
Faculty Sponsor: Professor Jonathon Little, Chemistry and Geosciences

Advances in oil and gas extraction techniques coupled with a nation-wide interest in reducing dependency on foreign oil, have recently made unconventional gas a new target for the oil industry. The Marcellus Shale of the northern Appalachian Basin contains a vast supply of unconventional natural gas with some estimates exceeding 50 Tcf. In northern Pennsylvanian, hydraulic fracturing (e.g. hydro-fracking) has been met with controversy as homeowners claim the process has contaminated their overlying drinking water aquifers. Recent studies in the area have suggested that water wells located <1km from active drilling sites have statistically higher levels of methane and toxic Marcellus brines (Jackson et al., 2011). Other studies have suggested that these gas and chemical constituents were present in the aquifers before drilling commenced and are a result of natural fluid migration processes (Warner et al., 2012; Molofsky et al., 2013). This study uses Geographical Information Systems to examine the water chemistry of 65 domestic water wells in south-central NY. A clear correlation is evident between faulted aquifers and brine constituents which suggests the faults served as conduits for fluid flow during active tectonism.

Creating Student Resources and Revising Curriculum to Drive Course Enrollment and Career Interest in the Geosciences

Professor Amanda Colosimo, Chemistry and Geosciences

In order to better serve students and increase awareness of geology as a major and career, geology faculty began a strategic two- year revision of student resources and curriculum. An updated department website now includes timely career information and a transfer guide for students researching regional colleges. A Facebook page was created as an avenue to communicate changes and cutting-edge research with students and alumni. While several existing classes include field trips, a separate field course and co-curricular club were created. College funding and resources for the club, in conjunction with fund-raising, have made travel affordable for nearly every student. Faculty collaborated with college personnel and local transfer schools to streamline geology curriculum, including re-numbering specific courses and developing laboratories, to better align with SUNY guidelines. Effective in-person and web-based promotion of new and experimental course offerings resulted in sufficient enrollment to run a Mineralogy course at MCC for the first time in over 20 years and successful execution of a field course for four consecutive years. Implemented changes have increased course offerings and make possible the development of an A.S. Geology degree. Future connections to explore include college orientation, an on-campus career series, and local high schools.

Session 1A
10:00 - 11:00 a.m. Room 12-107

The Diversity and Importance of Fungi

Joseph Perry, Liberal Arts
Faculty Sponsor: Professor Laura Penman, Biology

Fungi are a large and diverse group of organisms who collectively maintain a variety of important roles in our environment. The most conservative estimates of global fungal diversity range between one and two million species. In order to better understand the scope of local fungal diversity, specimens from twenty-three genera were collected during the fall of 2013. Eleven field days were spent collecting specimens from Mendon Ponds Park, Thousand Acre Swamp, and the MCC Woodlot. Air and soil samples were also taken from a local residence. Each specimen was photographed, preserved, and prepared for microscopy. Included in the collection are examples of mushrooms, puffballs, sac fungi, and molds. The importance of each fungal phylum and its characteristics were also explored and included in a research paper.

Toolkit Genes and the Monophyletic Origin of the Eye

Thaddeus Schickling, Liberal Arts
Faculty Sponsor: Professor Richard Stevens, Biology

Until recently the consensus among evolutionary biologists was that the eye evolved independently many times, with some estimates as high as forty-six different times. One of the major lines of evidence supporting this was the vast diversity of eye types in the animal kingdoms. By the mid-1990s, however, this idea of multiple origins of the eye had been challenged by the research of Walter Gehring on the toolkit gene Pax-6. This gene is involved in eye development in animals and has even been found in sponges, which do not have noticeable eyes. Recent research by Gehring has focused on a search for Pax-6 in dinoflagellates, which have a simple light sensitive eyespot. This work could suggest an origin of the eye before the evolution of animals. In this talk, I will provide a brief overview of hypotheses on how the eye evolved, discuss research on Pax-6, and give perspective on how toolkit genes are rewriting the tree of life.

Changes with Bacterial Sensitivity in the Presence of Manuka Honey
Holly Kalb, Liberal Arts
Rawiwan Vogel, Nursing
Glenn Olin, Biotechnology
Andrew Nguyen, Liberal Arts
Chris Sellite, Liberal Arts
Seth Johnston, Liberal Arts
Faculty Sponsor: Professor Kevin Kimber, Biology

The treatment of wound infections topically with Manuka honey has shown to help fight the growth of bacteria resistant cultures. A study was conducted to search for further synergistic combinations of antibiotics and Manuka honey that might have greater potential in treating wounds. The compound most abundantly found in Manuka honey is known as methylglyoxal and believed to be responsible for decreasing bacterial resistance. Antibiotics were tested with a smear of bacteria grown in a medium of different concentrations of Manuka honey, using a disc diffusion technique. Some concentrations were found to improve antibacterial effectiveness that offer alternatives for topical treatments of wound infections caused by bacterial pathogens.

Session 1B
10:00 - 11:00 a.m. Room 12-109

William Shakespeare's "United" Kingdom: Henry V's Captains and the Dawn of Empire
Amanda Urban, Liberal Arts
Faculty Sponsor: Professor Scott Rudd, English/Philosophy

Primary historical accounts contain no indication that Wales, Ireland, and Scotland participated in the battle of Agincourt in the way that Shakespeare portrayed in *The Life of King Henry V*. Henry's captains are strikingly similar to individuals and groups involved in England's past. Specifically, Fluellen seems to be a call-back to the Welsh troops at the battle of Poitiers in 1356, MacMorris a representation of Earl Hugh O'Neill, whose military ferocity caused the English to flee Ireland in 1599, and Jamy, a reference to the Scottish king, James VI, who became King of England and Ireland four years after the play was performed. This essay explores the development of the sense of unity that would envelope the British Isles through Shakespeare's representations of the nations that would make up the United Kingdom. The historical significance of the captains in the context of the rhetorically patriotic play sketches a timeline of British unification through cultural rather than violent imperialism. In reveling in and partaking in Henry's proto-nationalism, the captains became something that was unheard of in 1415, as well as 1599: British.

From Narcissism to Empathy: Ibsen's Plays in the Digital Age

Jeffrey Curtin, Theatre Arts
Faculty Sponsor: Professor Thomas Blake, English/Philosophy

The digital revolution has produced many new forms of communication that present us with the risk of losing touch with one another. As our society increasingly relies on technology as a substitute for face-to-face interaction, there is a tendency among people to form online social groups that reinforce their existing biases and exclude alternative points of view. As a result, social networks – though designed perhaps to cultivate connections – may in fact be producing a more narcissistic society. Empathy, in contradistinction to narcissism, allows us to understand the thoughts and feelings of someone else. Literature (including film and drama), by allowing readers and/or viewers to imaginatively identify with characters different from themselves, fosters empathy and offsets narcissism. This could be precisely why the Humanities have played such a significant role in cultural reform throughout history. In this context, by exploring Henrik Ibsen's drama, we confront our own selfishness, narcissism, desire for control over others, and fear that they may gain control over us. *A Doll's House* and *Hedda Gabler* examine individual freedom from a female perspective, and show us how narcissism – especially in conjunction with intolerance – acts as a corrosive agent to human empathy and compassion.

Physi-Mythic: The Science in Archetypal Symbols

Professor Christopher Otero, English/Philosophy

The brilliance of the sun and purity of water – divine, archetypal symbols found in mythology – share fundamental dominion over our planet and upon human existence. The Egyptians, Babylonians, Mesopotamians, Hebrew, and Hopi rely on them in their creation, deluge, and apocalyptic myths. Innately, we love sun and water when they are balanced; too much of either, we dread them. How common are these ancient symbols? Why do we lay scientists, with little expertise, universally value them? Why are they revered by empiricists and mystics alike? Please join me for 20 minutes reflecting upon these paradoxical, natural forces to inspire further rigor in your own sophisticated cosmic journey!

Session 1C
10:00 - 11:00 a.m. Room 12-111

Division by Zero: Development of a Relevant Algebra with Historical Context

Charlotte Aten, Mathematics
Faculty Sponsor: Professor Judy Dean, Mathematics

Interest in the existence of a multiplicative inverse of zero has been with us as long as the number itself has. In this presentation we explore the similarities and differences which division by zero has to the development of the integers, the rationals, and algebraic numbers. In doing so we also develop an algebra in which division by zero is possible and explore its basic properties. Of particular note are the nonassociativity of the multiplication operation and the failure of multiplication to have a proper inverse operation. Finally we explore some general properties of algebras permitting division by zero and prove that it is in fact impossible for any such algebra to be a group.

Velocity Amplitude of Alfvén Waves in the Solar Photosphere

Melody Kohut, Liberal Arts
Faculty Sponsor: Professor Paul D'Alessandris, Engineering Science and Physics

A MATLAB program was designed to assist in an elaboration of the model of the solar atmosphere presented by De Pontieu, Martens, and Hudson in their 2001 paper on chromospheric damping of Alfvén waves. Its function was to assist in calculations required to extend the analysis to a model that closer approaches the observations of an exponentially changing Alfvén speed in the photosphere. The program yields approximate solutions to this problem by solving the Hankel equations of zeroth order that are themselves functions of zeta, which is a function of Alfvén speed, itself a function of height z, for velocity amplitude per unit distance. Findings suggest that the authors' assumption of constant Alfvén speed made little difference to their analysis of the chromosphere but is significant to an analysis of the photosphere and the solar atmosphere in general.

Volcanoes: Does Planetary Alignment Effect Violent Eruptions?

Teresa Rodriguez, Liberal Arts
Faculty Sponsor: Professor Dan Robertson, Chemistry and Geosciences

The potential effects of planetary alignments on Earth have long been the source of scientific speculation. When reviewing the planetary positions during ten of the most violent volcanic eruptions in recorded history, a pattern of planetary "clumping" or linear planetary alignment was observed. A mathematical analysis of the collective and individual gravitational effects of the other planets, Sun and Moon will be presented. By analyzing the gravitational forces of these celestial bodies we can come closer to understanding if there could be a causal relationship between planetary movements and the triggering of violent eruptions on Earth.

Session 1D
10:00 - 11:00 a.m. Room 12-113

Unearthing the Cost of Coltan [Cancelled; this is a poster only]

Laura Hoodak, Liberal Arts
Jennifer Pfaff, Liberal Arts

Faculty Sponsor: Professor E. Jethro Gaede, Anthropology/History/Poli. Science/Sociology

Coltan is a natural resource capable of holding a sustained electrical charge. It is an essential component used in electronic items including cellphones and computers. It is reported that thirty percent of school-aged children in the Democratic Republic of Congo (DRC) are forced laborers in coltan mines. Children are forced to become miners and girls very often become prostitutes in order to survive. Published reports indicate that airborne particles of coltan, released in the process of extraction, contain dangerous fibers. These particles are inhaled and cause disease and pain to both miners and their infant children who are carried on their backs. Americans indirectly support unethical mining of coltan by purchasing electronic devices primarily manufactured in China. Inevitably, users of cell phones or other electronic devices that require the use of coltan inadvertently support the violation of human rights. Human rights abuses include rape, enslavement, extortion, torture, abduction and the killing of civilians. These crimes are committed by both rebel and government militia forces as they compete for this essential, rare and extremely profitable resource. Our hope is to inform users of the real cost associated with owning your "must have" electronic devices.

The True Cost of Fracking: Tracking Fracking Waste in NYS

Chris Dodds, Diversity and Community Studies
Faculty Sponsor: Professor Bethany Gizzi, Anthropology/History/Poli. Science/Sociology

This paper looks at the transport of fracking waste across state lines and the impact on the communities where the waste is dumped with a focus on the town of Waterloo which is home to the largest landfill in New York State, Seneca Meadows. A short overview of the fracking process is followed by a photo tour of Seneca Meadows and the results of a survey of the local population living around the landfill. The presentation finishes with a look at watersheds affected by lax practices at dump sites across New York State and looks at the total cost of fracking.

Sustainable Community Development from Elsewhere
Professor Joel Helfrich, Anthropology/History/Poli. Science/Sociology

Über environmentalist David Orr wrote, "However conceived, described, or analyzed, sustainability is the issue of our time, all others being subordinate to the global conversation now under way about whether, how, and under what terms the human experiment will continue." Given MCC's efforts to establish and grow a program in sustainability and its commitment to construct LEED-rated buildings, as well as the opportunities that a forthcoming move to Kodak Tower bring about, it seems significant to take Orr's comments seriously, at face value, and "do something." One suggestion is that MCC look to other colleges that have found some success in the establishment of new programs in sustainability generally and sustainable community development (SCD) in particular. This presentation focuses on recent efforts by Hobart & William Smith Colleges, among other regional colleges, to establish SCD programs. What have other schools done right? What can MCC learn from such initiatives? How can MCC gain support for efforts here? In what ways should MCC think about moving forward? This presentation attempts to answer these questions, as well as others.

Session 1E
10:00 - 11:00 a.m. Room 12-125

Static Analysis of a Truss Tower Used to Support a Wind Turbine

John Trout, Engineering Science
Carrie Phillips, Engineering Science
Faculty Sponsor: Professor Christopher Kumar, Engineering Science and Physics

Due to the massive size of modern day wind turbines, the stability of their support towers is critical. This project examines structural forces present in a four sided truss tower modeled as a support system for a wind turbine. Case I examined only forces due to the weight of the nacelle and rotor, while Case II incorporated lateral wind force. All forces were idealized as concentrated forces and theoretic analysis was completed using static equilibrium concepts and truss/frame analysis techniques. A Pasco Structure kit was used to construct a model and validate theoretical findings. Weights were applied to the model and the resulting axial forces were measured using load cells. Experimental data concurred with the theoretical analysis within the measured uncertainty, indicating the tower was accurately analyzed as a frame/truss structure. Case I found support forces were isolated to only the vertical members while Case II showed significant axial forces on both vertical and diagonal members local to the applied wind force. Findings indicate that several considerations should be taken into account when designing such support systems, including tower geometry, length of structural members, nacelle orientation, and environmental conditions. Future analysis should incorporate tower dynamics and material properties.

Six Axis Robotic Arm

Paul Bierworth, Engineering Science
Faculty Sponsor: Professor Christopher Kumar, Engineering Science and Physics

Six axis robotic arms are an incredible asset used on production lines around the world to position parts in very specific positions and orientations in a workspace. A robot having 6 axes has 6 degrees of freedom, which allows for a huge, precise range of movement. Robots such as these are very complex, both in their design as well as the mathematics that governs their movements. Both of these aspects are very interesting problems from an engineering standpoint. Designing and creating a six axis robotic arm that meets specific design requirements is a challenging thing to do. Manual control of each individual axis is possible with a set of two-axis joysticks. Full inverse mechanics analysis has been performed on the arm using Denavit-Hartenberg parameters. Such analysis allows the robotics arm to reach and arbitrary point and orientation in space within its working envelope.

Skeletomuscular Reactionary Forces in the Human Arm

Jeff Daring, Engineering Science
Faculty Sponsor: Professor Christopher Kumar, Engineering Science and Physics

The purpose of these experiments was to analyze the forces exerted on and by the human arm's skeletomuscular components. The hope was to find out how these muscle groups would respond to external stimuli such as a weight and/or a constant force, as well as to examine the forces required to actuate motion. Using Pasco's 'Human Arm Model', a total of eight situations were analyzed. Strings representing muscles and tendons were attached to a force sensor on one end of the apparatus, weaved through the appropriate pulleys and connected to an insertion point on the other end of the model to a second force sensor. In measuring both the external and the resultant forces, relationships between external stimuli and the necessary internal response to reach static equilibrium were observed. It was seen that both the biceps and triceps must generate a force significantly larger in magnitude than their counter forces to either restrain or induce motion. Roughly eight times that of the load is required to keep the elbow bent at a 90∞ angle, with the triceps requiring about nine times the external force. Theoretical calculations were tested by the data collected in these experiments, and were substantiated within a degree of uncertainty and error in each case.

Session 1F
10:00 - 11:00 a.m. Room 12-129

Innovation: Serendipity or Slow Hunch?

Dan Miner, Liberal Arts
Ryan Dillon, Engineering Science
Faculty Sponsor: Professor John Wadach, Engineering Science and Physics

Most people have an image of a scientist or inventor toiling away in a laboratory and suddenly having a flash of inspiration, instantly finding the solution to a problem or coming up with a brand new idea. However is this really what happens? Does innovation come as a momentary spark or is it a slow process based on years of experimentation, research, and knowledge? Some would say innovation comes from inspiration and is a naturally occurring phenomenon, implying that if one person doesn't come up with a solution to a given problem then eventually someone else will. Others would say these moments of brilliance are actually the result of many years of tedious work, and without this work, a solution would have never been found. We will attempt to answer this question by looking at examples of major innovations from history such as Darwin's Theory of Evolution to more modern instances such as Twitter and Facebook and debate the merits of each process. Do good ideas come when the proverbial light bulb goes off or through laborious research? We will present the facts and argue both sides but will leave the final decision to you!

"What Are They Doing With My Money?" The Benefits of Pure and Applied Research

James Guglielmo, Engineering Science
Riczi Kovacs, Engineering Science
Faculty Sponsor: Professor John Wadach, Engineering Science and Physics

In today's turbulent economic times, people are keeping a closer eye on what the government does with our money. With all governmental programs under an increased level of scrutiny, the public understandably questions research projects that appear to have no point. Pure research in this case does not have a tangible goal. It is the kind of scientific inquiry carried out by curious people, solving questions like, "How do a certain species of Thai fireflies synchronize their flashes en masse?" applied research, conversely, is the situation in which scientists are given specific goals, asked to answer some meaningful question that will have immediate benefits to society. An example being, "How do we accurately track our position on the planet." To many who are responsible for the frugal operation of government, it would logically follow that applied research represents a better return on the investment by the American people. Over the course of this presentation we will show that this conclusion is not only demonstrably false, but could represent a missed opportunity for scientific and societal advancement.

Measuring Heat of Reaction for NaOH and HCl for a General Chemistry I Laboratory Experiment: Determining the Effectiveness of Container Lids on Heat Conservation and Reproducibility

Christine Burton, Liberal Arts
Faculty Sponsor: Professor Amy Irwin, Chemistry and Geosciences

In the Monroe Community College General Chemistry I (CHE 151) experiment 8A, entitled *Chemical Change and Energy: What Fuel Makes the Best Energy Source,* students combine a strong base, 1.0M NaOH, and a strong acid, 1.0M HCl, and measure the temperature change of the solution. The temperature change of the solution is then used to calculate the heat of reaction. The reaction is carried out in a Styrofoam cup with a wooden lid to retain heat. The question arose: does covering the reaction vessel with a lid actually retain a statistically significant amount of heat? If covering the reaction vessel retains a significant amount of heat, would the material of the lid show a statistically significant difference in the amount of heat retained? The experiment was run multiple times with no lid and with each of three types of lids: (1) wood, (2) wood lined with Styrofoam and (3) Plexiglas. The temperature change of the solution was measured and the heat of reaction calculated. By comparing the heats of reaction, the effectiveness of the three types of lids on conserving heat was compared with the control vessel with no lid. The results will be presented and discussed.

Session 2A
11:10 a.m. - 12:10 p.m. Room 12-107

Getting Involved: A Care Plan for Successful Professional Development

Kelsey Hawkins-Rusch, Nursing
Cheryl Brooks, Nursing
Caitlyn Pilc, Nursing
Tami Domokos, Nursing
Michael McAlmon, Nursing
Faculty Sponsor: Professor Jacqueline Dorsey, Nursing

The Student Nurses' Association at Monroe Community College has discovered limited involvement from the student nursing population as an ongoing concern. Our goal is to develop accountable, responsible and empowered leaders by assisting the incoming nursing student through the continuum to their professional role. An analysis of evidence-based literature has shown that increased student involvement will enhance student performance and professional development. By implementing the mentoring program and strategies to engage nursing students, Student Nurses' Association has increased student involvement within Monroe Community College. It can be an obstacle to balance nursing school with participation in extracurricular nursing activities. Adequate support from advisors and motivated peers is necessary to encourage continued success.

Diabetes and Periodontitis: Living with Invisible Disease

Tiffany Carrozzi, Dental Hygiene
Debra Stiker, Dental Hygiene
Erin Cleveland, Dental Hygiene
Megan Pratt, Dental Hygiene
Christina McGrath, Dental Hygiene
Faculty Sponsor: Professor Marsha Bower, Health Professions

Diabetes is one of the fastest growing diseases in the United States, and is reaching epidemic proportions. In fact, if current trends continue, 1 of 3 U.S. adults will have diabetes by 2050. We know it can lead to serious complications, including heart, kidney, vision, and circulatory problems, but did you also know that people with diabetes are more likely to have periodontal disease? Periodontal disease begins as an infection in the mouth that effects the integrity of the tissues and supporting bone. This disease often goes unnoticed, without pain, resulting in poor prognosis. This poor prognosis can exacerbate the imbalance of blood-glucose levels, which is why controlling diabetes is so important. Statistics suggest that individuals with diabetes are often undiagnosed, like periodontal disease, creating an unawareness of these invisible diseases.

Integration of Complementary Therapies in the Care of Pediatric Oncology Patients: Implications for the Pediatric Oncology Nurse

Cheryl Brooks, Nursing
Faculty Sponsor: Professor Laurie Palmer, Nursing

Symptoms resulting from pediatric cancer and side-effects of cancer treatment therapies interfere with quality of life and promote distress in children and their family members. It has been estimated that up to 84% of children with cancer have used complementary therapies, in conjunction with conventional medicine, in an attempt to alleviate their suffering. Assisting patients to manage cancer and cancer treatment side-effects and maintain quality of life is an essential role of the nurse. Therefore, it is necessary for the nurse to have knowledge about complementary therapies in order to effectively support and educate patients. An exploration of nursing led side effect management utilizing complementary therapies in pediatric oncology patients revealed a scarcity of evidence based information in pediatric nursing textbooks and limited clinical use in the Rochester, New York area. A comprehensive literature review was undertaken to (a) identify effective, evidenced based, complementary therapies which alleviate, reduce, or prevent treatment related side effects in adult and pediatric oncology patients (b) identify current use and benefits of complementary therapies in pediatric oncology centers around the United States and (c) investigate the benefits and barriers to implementing complementary therapy protocols for side-effect management within Rochester's pediatric oncology population.

Session 2B Justice and Prejudice: An Honors Institute Research Seminar
11:10 a.m. - 12:10 p.m. Room 12-109

The Unveiling of Patriarchal Societies: Separation of Woman and State

Marci Sanders-Arnett, Liberal Arts
Faculty Sponsor: Professor Scott Rudd, English/Philosophy

A patriarchal society excels in its ability to carve boundaries between the powerful and powerless – namely socio-political institutions, and the women who are subjected to oppression due to the interpretation of the doctrines which have historically shaped them. The structure of patriarchal cultures founded on monotheistic religions such as Judaism, Islam, and Christianity can be extrapolated from the parables within these religions' sacred texts. Theological ideologies, especially those rooted in male dominance, use gender hierarchies to shape the family on a fundamental level, which then diffuses into the public sphere and ultimately controls a culture's social ethos. While maintaining a disproportionate balance of political, social, and moral authority, patriarchies subject women to dynamics which subordinate them to men. This essay will analyze the effect that non-secular patriarchal ideology has on gender inequality and how it influences and perpetuates social organization. I argue that monotheistic societies hold their dogmatic practices over a woman's right to autonomy, even in secular, liberal states. Interpreting the "language of God" will be an integral part of this inquiry, as a culture's "reading" of it forms the rhetorical and moral justification on which a society's power structure is founded.

In the Land of Nod: A Failure of Justice for the Mentally Disabled

Nia Mugnolo, Liberal Arts
Faculty Sponsor: Professor Scott Rudd, English/Philosophy

In *Brother's Keeper* and the *Paradise Lost* trilogy, documentary filmmakers Bruce Sinofsky and Joe Berlinger explore the influence of bias in two different murder trials: The West Memphis Three and the case of an elderly farmer named Delbert Ward in upstate NY. Jesse Miskelley, a defendant from West Memphis, and Delbert Ward both have IQs below 70, yet they were interrogated without counsel for over six hours in both cases. Community support for Ward and community condemnation for Miskelley separates the two cases most clearly, which were both weak from an evidentiary standpoint. The current prison population in the United States is 50-55% mentally ill, five times the percentage found in the general population. The presence of this many mentally ill citizens in prison suggests even more are going through the court system. What is allowing these individuals to slip through the cracks and end up on trial and in prison instead of receiving rehabilitation or medical attention? Berlinger and Sinofksy explore why innocent people, who do not operate at the sufficient level of mental competence legally required, can have such vastly differing experiences on trial.

A Dish Best Not Served: Exploring the Psychology of Revenge and the Damaging Effects of Capital Punishment

Brian Calmes, Liberal Arts
Faculty Sponsor: Professor Scott Rudd, English/Philosophy

Since our days spent on the kindergarten playground, the word "fair" has been heeded as the absolute conceptual model from which a universal ethical framework should originate. However, "fairness" is an abstraction and by adopting words such as "equality" or "justice" to better define the idea, we trade one ambiguity for another. When an objective meaning cannot be attributed to an idea so fundamental to the moral and legal deliberations that influence human affairs, the idea becomes susceptible to innumerable interpretations, some of which convert it into a device employed as the rationale for an individual's entitlement to compensation. 32 of the 50 states in the United States permit a form of reciprocative punishment: the execution of capital offenders. Advocates of capital punishment indicate four argumentative positions (deterrence, incapacitation, economic utilitarianism, and retribution) that they believe ascribe validity to the endorsement of state mandated executions. This paper aims to show that the first three arguments for capital punishment are misinformed and erroneous, while exemplifying that the fourth, retribution, in perpetuating psychologically detrimental consequences that affect the general public, lacks coherence with the argument for deterrence, which continues to remain a pillar of the pro-capital punishment platform.

Exculpation and Conviction: Narrative and Metonym in the Language of Criminal Justice

Edward Byrne, Diversity and Community Studies
Faculty Sponsor: Professor Scott Rudd, English/Philosophy

When given the opportunity to describe their reasons to support the death penalty, 37% of respondents to a 2003 poll of Americans – a plurality among supporters – recited an iteration of "an eye for an eye." Four thousand years and the subsequent development of European and US jurisprudence have failed to dislodge five words from the ultimate debate of justice – five words, distilled from sixteen, which serve a metonymic function. With a system of laws and courtroom argumentation entirely composed of language, linguistic ambiguity and arbitrary definition coagulate the broader philosophical conversation enacted in criminal proceedings. When the West Memphis Three, convicted of murder, brought new forensic evidence of exoneration before the Arkansas Supreme Court, a death sentence for one hung in the balance over definition of the word "all." Free today by declaring that the state had sufficient evidence to convict them, the West Memphis Three directly experienced the ability of language to convict and to exculpate. Thorough debate of justice and fairness in the American criminal justice system rarely addresses the power of language, even in light of modern psycholinguistic evidence to suggest inadequate application of courtroom language, which may lead to wrongful conviction and imprisonment.

Session 2C
11:10 a.m. - 12:10 p.m. Room 12-111

Lewis Carroll and Paul Gauguin: Creating Wonderlands Through Their Imaginations

Caitlin Barrale, Liberal Arts
Faculty Sponsor: Professor Karen Sardisco and Professor Dawn Murphy, Visual and Performing Arts

Many writers and artists have used fantasy as a vehicle for creative exploration that subverts societal constraints. From the Renaissance to present day, artists such as Hieronymus Bosch, William Blake, Henri Fuseli, and Jeff Koons have used fantasy to tap into underlying desires and taboos that would be deemed controversial, if not provocative. With this research project I am interested in examining two individuals who used fantasy to construct alternate realities that enabled them to unleash their artistic vision without restraint. An examination of nineteenth century cultural values reveals entrenched mores that prevented creative innovation. Lewis Carroll, (1832 - 1898, the author of *Alice in Wonderland*), is a pseudonym created by the academic Charles Dodgson that allowed him to write stories for children without jeopardizing his professional standing as an Oxford mathematician. Likewise, the French Post-Impressionist painter, Paul Gauguin (1848 - 1903), left his wife, family and bourgeoisie Parisian society to live in Tahiti, in search of a "primitive" land that was as much fantasy as Carroll's "Wonderland." A comparative analysis of these two contemporaries yields some commonalities that point to the legitimizing power of fantasy to enable artists to break with tradition and forge new aesthetic directions.

Imaginative Thought: The Fundamental of Religious and Scientific Knowledge and its Implications

Sarah Knox, Liberal Arts
Faculty Sponsor: Professor Robert Muhlnickel, English/Philosophy

It has commonly been misunderstood that religious and scientific thought do not work well together and often result in a conflict between beliefs. These two thought processes are responsible for answering different types of questions, but that doesn't mean that their results do or should conflict. True scientific and religious knowledge should evolve to fit together as new discoveries are made, not argue against one another. While these fields of knowledge do produce different types of answers, they both seek to understand the world around us and depend on the use of imaginative thought. Imaginative thought involves thinking critically about the observations we make, and allows us to draw useful connections between ideas. It is through imaginative thought that we choose the theoretical framework we study within, and form larger conclusions about our experiences and observations. This paper seeks to demonstrate how both science and religion are stimulated by imaginative thought and require the use of logic to produce trustworthy conclusions. When logical thought and our current understanding of the world are ignored, we are left with nothing but pseudo scientific and pseudo religious claims that encourage more conflict between these bodies of knowledge.

The Cold War and the Rise of the Religious Right

Thaddeus Schickling, Liberal Arts
Faculty Sponsor: Professor Angelique Johnston, English/Philosophy

Drawing principally on the work of historian Angela Lahr I will examine how the modern day Christian Right arose in part as a response to the threat of Communism in the Cold War. Particularly, I will show how this relatively marginal movement drew upon their beliefs in a Second Coming and the end of the world to find a common cause with the broader culture. This broader culture, in spite of not sharing the same theology, did fear the world's end with the advent of nuclear weapons and the forces of Communism. Exploring how the construct of the Cold War divided the world into ultimate good and evil, I will show how secular apocalypticism often paralleled and sometimes supported the Christian Right's worldview. Using the Cold War as an example I will argue that in times of crisis and uncertainty Christian fundamentalists have arisen to provide rhetoric and solutions to face these problems and as a result have often become a broader part of American society and political system.

Session 2D
11:10 a.m. - 12:10 p.m. Room 12-125

Renewable Energy Amplifier

Kristofer Knapp, Engineering Science
Faculty Sponsor: Professor Christopher Kumar, Engineering Science and Physics

We are always seeking better, convenient, and cheaper energy resources. The world's demand for energy is increasing. In more recent years, exploration of alternative and renewable energy resources has become increasingly popular. My proposed idea is to use a series of converters, a mechanical system, and a motor to produce cheaper and more efficient energy. In this project we used a DC (Direct Current) battery source to regulate and power an electric motor to obtain mechanical energy. Then the mechanical energy is converted into electric energy using an AC (Alternating current) generator. Finally, we used an electrical convertor to reverse the process to gain a DC power source. In this presentation, the proposed model will be presented along with theoretical calculations, and experimental results.

Ambitorch: Using Ambient LED Technology in the Ideal Flashlight

Garrett Kinsman, Business Administration
Faculty Sponsor: Professor Christopher Kumar, Engineering Science and Physics

Modern flashlight technology stems off a design that is over 100 years old. David Misell patented an electric torch device in 1899, and the design hasn't changed since. As a designer and business student, it's important to study how a product can be improved. One can think of the ideal light source as a lantern. For me it brings back fond memories of reading books under a warm kerosene glow. In most situations a bright torch-like flashlight is unneeded, blinding and overwhelming. Ambitorch is the attempt at a modern equivalent of a lantern. Its molded body would fit in the palm of your hand, clip to a shirt, or be set down on a surface. An LED would cast a luminous, warm glow through an ambient lens into the surrounding area. This would make reading, working in a dark room, or following a trail much more visible than with a harsh, concentrated beam. The goal of Ambitorch is to provide an "Ambient LED Solution" to personal lighting. Using skills in engineering and business, I will create a working prototype and business plan that can be presented to possible investors. The design is simple, and the effects are truly brilliant. Through good marketing and beautiful product design I want to build a product that can bring useful light to millions.

Lego Vision

Stuart Burtner, Engineering Science
Ian Wilson, Mathematics
Ann Bradish, Undeclared
Faculty Sponsor: Professor Christopher Kumar, Engineering Science and Physics

Our team challenge was to design a fully autonomous robot, subject to design constraints, that could go around a racetrack both with and without obstacles as quickly as possible during team competition. All teams completed the project using an NXT Lego kit in conjunction with the Labview programming environment. Our robot utilized sonar sensors to track and follow the edge of the racetrack, and to sense obstacles ahead, which triggered a second algorithm for obstacle avoidance. We tailored the mechanical design of the robot to fit its task: small, fast, and nimble. However, swiftness had to be tempered with reliability: a robot that can speed through straightaways only to fly off of the track solves only half of the equation. To achieve consistency throughout the time trials required a high degree of coordinating between imperfect physical reality and rigid computer logic both in design and in testing to ensure repeated, desired operation. Our presentation will follow the design of our robot through both its mechanical and software features and functions, and how the constraints of the challenge ultimately molded the final product. We will also discuss generalizations of the algorithms implemented in our final software to other, less specific uses.

Session 2E
11:10 a.m. - 12:10 p.m. Room 12-129

Modernization of the Home Workshop with CNC Machinery [Cancelled]

Bryan Lilly, Engineering Science
Faculty Sponsor: Professor, John Wadach, Engineering Science and Physics

Computerized Numerical Control (CNC) milling machines were once large and expensive pieces of machinery only found in production machine shops or manufacturing centers such as Kodak. They are used to cut and shape raw materials, mostly metal and dense plastics, into very precise components such as internal engine parts, gears, and molds for injection molded plastic components like cell phones. Low cost modern day electronics have brought these fabrication capabilities to the average do-it-yourselfer. I will show how for only a few thousand dollars you can retrofit a used Bridgeport manual mill into a 3 axis automated machine that can cut steel to accuracies thinner than a human hair. Low cost light duty machines have revolutionized the way MCC's Engineering Students design and build components for their final design project. We used to spend countless hours in front of a manual mill to make simple low precision parts and now thanks to low cost yet powerful software such as Mach3 we can fabricate almost anything imaginable in no time at all.

Application of a Differential Drive Control Algorithm for Dynamic Obstacle Navigation

Hannah Mayer, Engineering Science
Sean Reid, Engineering Science
Faculty Sponsor: Professor, John Wadach, Engineering Science and Physics

A robotics platform was developed with the functionality to quickly navigate about an elliptical track and avoid randomly positioned obstacles. The two wheeled platform was designed in Solidworks and machined on-campus with computer numeric control (CNC) milling equipment. A proportional integral differential (PID) control algorithm was developed to provide dynamic set-point following functionality. This capability was combined with real-time modulated infrared sensor feedback for obstacle detection and avoidance.

Project Phoenix, the Fire-Fighting Robot

Kaiwen Zheng, Engineering Science
Zach Baltzer, Engineering Science
Steph Boula, Engineering Science
Dmitry Krupenya, Engineering Science
Faculty Sponsor: Professor, John Wadach, Engineering Science and Physics

"Quick, dispatch the robots!" Far-fetched as it may sound, fire-fighting robots are indeed coming closer and closer to becoming a reality. While some of them are designed to map out a three-dimensional plot of burning buildings before human firefighters, others are indeed engineered to actually put out the flames. Our robot, Project Phoenix, is designed to navigate inside a model house and search each room for fire. Once it detects fire, it will extinguish the fire using pressurized CO_2. And it has to do all that autonomously. By demonstrating how the robot works, we believe that we can help people better understand the significance of fire-fighting robots and give insights to developers and manufacturers.

Lunch
12:10 - 12:50 p.m. R. Thomas Flynn Campus Center, Monroe A & B

Session 3A Peering Through the Looking Glass of Anthropology
1:00 - 2:00 p.m. Room 12-107

Syncretic Religions: How Colonialism Shaped Indigenous Religions

Leia Tijou, Liberal Arts
Faculty Sponsor: Professor E. Jethro Gaede, Anthropology/History/Poli. Science/Sociology

This paper discusses the transformative impact colonialism has had on the indigenous religions of Africa, Brazil, Jamaica and the Pacific Islands. I examine how the African Slave Trade assisted in the creation of both Candomble and Rastafarian traditions. I further discuss how the military occupation of the Pacific Islands during World War II transformed the native religion into the modern Cargo Cult. Emphasis is placed upon the resultant traditions, ritual practices, lore, and cosmology. Ultimately, the reader will learn of not only the history and beliefs of these religions, but will come to understand how religion is not a static institution, but rather a body of beliefs that is constantly evolving to incorporate the world around us.

Indian Boarding Schools: More Than a Faint Memory

Elissa Parker, Liberal Arts
Faculty Sponsor: Professor E. Jethro Gaede, Anthropology/History/Poli. Science/Sociology

This project examines the experiences, and influences, on the American Indian children who have attended Indian boarding schools from the late 1870's until present day. The sole purpose of this paper is to show how the personal accounts of treatment, and education, within the Indian Boarding schools have affected tribal life today. The research in this paper was conducted by listening to and reading personal stories from a child's perspective while attending schools like, Carlisle Indian Industrial School in Pennsylvania, Haskell Institute in Lawrence, Kansas, Riverside Indian School in Anadarko, Oklahoma and other schools in Canada and the United States. While collecting the information for this essay, it became clear that there were negative and positive effects on the lives of the children who attended. By exposing the truths of these institutions, this paper will highlight the boarding school era and reveal how it is more than just a faint memory in American history. This compilation of memories and encounters will display the realities behind these schools, and that their intention to assimilate American Indian families has impacted generations afterwards.

Amylase Variation Between Humans and Non-human Primates

Charles Worl, Liberal Arts
Faculty Sponsor: Professor E. Jethro Gaede, Anthropology/History/Poli. Science/Sociology

The degree to which humans can digest starch is the fundamental core difference between humans and non-human primates. This adaptation in early man led to the ultimate colonization of the planet. The advent and control of fire occurred simultaneously with a drastic increase in brain size, a primary distinction in the genus homo. This makes sense in biological anthropology because starch must be cooked in order to access adequate amounts of nutrition. Amylase converts starch into glucose. Conversely the brain runs on glucose. With a reliable energy source, irrelevant of location or season, early man was able to have a dependable fuel source that allowed for humans' migration out of Africa. With a focus on the salivary amylase gene and its specific function this paper will compare and contrast salivary levels of amylase between the great apes. The results will be useful for both human and non-human primate dietary guidelines.

Session 3B
1:00 - 2:00 p.m. Room 12-109

The Underground Railroad: A Geographic Perspective

Professor Timothy McDonnell, Chemistry and Geosciences
Professor Michael Boester, Chemistry and Geosciences
Louise Rubingu, Liberal Arts
Christine To, Visual Communication Technology
Sara Zeitz, Liberal Arts

Before the Civil War, thousands of Freedom Seekers escaped slavery and traveled north. They were assisted by a network of anti-slavery activists, both black and white. The purpose of this project is to investigate the routes taken by these escaped enslaved people from a geographic perspective. What routes made sense? What was Monroe County's role in the Underground Railroad? Where can we go to see the stations of the UGRR in our local community? The students and their faculty advisors will be making maps using GIS software, and they will also doing work in the field. The presentation will summarize what we discovered about the geography of the Underground Railroad.

Calderas, Arches, and Student Success: The Peaks and Potholes of Implementing a Field Course

Professor Jessica Barone, Chemistry and Geosciences
Professor Amanda Colosimo, Chemistry and Geosciences

An annual introductory field course was developed in 2011 to foster deeper student engagement and conceptual learning. Course implementation required collaboration with the curriculum department as well as coordination of complex travel logistics for multiple field sites during each individual field class. Course materials were created for lecture and field components, focused on the dominant processes shaping the varied geologic settings. Eight to ten weeks prior to the 10-day field component, students attended weekly classes and were assessed through quizzes, laboratory assignments, and exams. Field assessments were based primarily on the quality of field notebooks and group and/or independent projects. Visualizing regional scale features and understanding their formation over geologic time was challenging in the field setting. However, based upon student reflections and assessment, these challenges were minor when compared to skill development, including application of classroom-based knowledge, integration of multiple geologic concepts, and deeper interpersonal connections. Despite substantial course costs, the class has been conducted three times at field locations in the Yellowstone region, Grand Canyon, and southern Utah. These offerings have increased awareness of geology at MCC and have contributed to over 60% of student participants continuing their education at four-year colleges in geology or related fields.

Session 3C
1:00 - 2:00 p.m. Room 12-111

Ethical Divergence in Research and the Evolution of the Institutional Review Board: Where Does the Henrietta Lacks Story Fit?

Professor James R. Cronmiller, Biology
Thaddeus J. Schickling, Liberal Arts
Faculty Sponsor: Professor James R. Cronmuller, Biology

The Association of American Colleges and Universities (AACU) states that student learning-centered processes in the classroom are a high-impact teaching practice. It is purported these methods develop skills in critical thinking, reflective judgment, and group collaboration, and improve the learning process. The purpose of our research was to assess the effectiveness of a combination of two of these teaching techniques, mini-case study and action research, as a supplement in teaching five topics of high importance in Human Physiology. Sixty-eight students in two day sections and one evening section participated in this study during the fall 2013. Students in all sections received the same information about a topic using standard lecture and laboratory methodology. Students in the day sections also performed exercises using mini-cases and action research on two topics. Students in the evening section did the same for three different topics. Students in the sections who performed mini-case/action research exercises had higher grades on questions that pertained to topics than those who did not receive this method of teaching. Some grades were significantly different. Adding a mini-case/action research exercise to the curriculum made a substantial improvement in the grades students achieved on questions pertaining to topics in physiology.

A Prospective Blinded Cross-over Study Assessing the Effectiveness of Inquiry-based Mini-case Study and Peer Group Action Research in Learning Human Physiology.

James R. Cronmiller
Kristen Cronmiller
Kathleen L. O'Connor
Esra Pektas
Christine Burton

The Association of American Colleges and Universities (AACU) states that student learning-centered processes in the classroom are a high-impact teaching practice. It is purported these methods develop skills in critical thinking, reflective judgment, and group collaboration, and improve the learning process. The purpose of our research was to assess the effectiveness of a combination of two of these teaching techniques, mini-case study and action research, as a supplement in teaching five topics of high importance in Human Physiology. Sixty-eight students in two day sections and one evening section participated in this study during the fall 2013. Students in all sections received the same information about a topic using standard lecture and laboratory methodology. Students in the day sections also performed exercises using mini-cases and action research on two topics. Students in the evening section did the same for three different topics. Students in the sections who performed mini-case/action research exercises had higher

grades on questions that pertained to topics than those who did not receive this method of teaching. Some grades were significantly different. Adding a mini-case/action research exercise to the curriculum made a substantial improvement in the grades students achieved on questions pertaining to topics in physiology.

Session 3D
1:00 - 2:00 p.m. Room 12-129

Mini-Indy Racer VI

Jonathan Ward, Engineering Science
Katie Eberhart, Engineering Science
Faculty Sponsor: Professor Christopher Kumar, Engineering Science and Physics

This assigned project goal was to design a robot that could compete in the vehicle triathlon while being aesthetically pleasing. The triathlon consisted of three categories of competition: the straight-line sprint, weight pull, and the oval track. Our design process included the use of the computer aided 3-D modeling software SolidWorks to design the model. The car body design was based on a retro Volkswagen bus and printed using a 3-D printer. The chassis and other parts were fabricated at a machine shop using mills, lathes, and other tools. For the sprint portion of the triathlon, my partner and I switched the gear ratio to a smaller gear on the axle to provide more speed with reduced torque. For the pull event, we changed gear ratios to a larger gear on the axle to increase torque and reduce speed. The back inside wheel in the oval track event needed to have reduced friction to allow the wheel to slip for the robot to turn properly.

Drone Project MAVerick

John Trout, Engineering Science
Jeff Daring, Engineering Science
Faculty Sponsor: Professor Christopher Kumar, Engineering Science and Physics

Autonomous Unmanned Aerial Vehicles (UAVs), or drones, are no longer limited to military use. The commercial drone culture has flourished due to the availability of inexpensive, compact electronics. Today, UAVs are used in different fields: combat, commercial surveillance, the entertainment industry, and research/exploration. In project MAVerick, a multi-rotor UAV was designed and built to self-stabilize, carry a small payload (i.e. a camera) to capture high definition video from the air, and execute an autonomous flight plan using Global Positioning System (GPS) technology. This required the use and modification of control algorithms and feedback systems to ensure stable flight as well as calibration of the UAV's electrical and mechanical systems to achieve efficient performance. Using principles of engineering, the UAV system was tested for stability and performance. The result of this process was the successful development of a stable UAV platform capable of capturing aerial video. The audience will have the opportunity to examine our UAV and observe video collected from autonomous flights around the MCC campus.

All That Jazz

David Schuh, Music Performance
Faculty Sponsor: Professor David Shaw, Visual and Performing Arts

Jazz evolved from a combination of Western classical music traditions and influences from African culture. A condensed survey of the evolution of jazz will reveal seeds of the jazz style in the 17th-century European Baroque before its maturation in America in the late 19th and early 20th centuries. Popular opinion would tell us that jazz is on the decline, but I will demonstrate how musical genres have blurred to such a degree over the past 30 years that elements of jazz can be found across the musical spectrum. I will bring the presentation full-circle by concluding with a live performance in the free jazz style which will incorporate Baroque elements.

Session 3E
1:00 - 2:00 p.m. Black Box Theatre - Building 4-145

Student-Created Original Plays at MCC

Jeffrey Curtin, Theatre Arts
Joseph Jackson, Liberal Arts
Emma Milligan, Liberal Arts
Caitlin Walker, Liberal Arts
Jason A. Whelehan, Liberal Arts
Faculty Sponsor: Professor Maria Brandt, English/Philosophy

This panel will showcase original work written by students in MCC's brand-new "Creative Writing: Playwriting" course. Students will perform each other's plays, script-in-hand, and offer insight into their respective creative processes.

MCC Small Group Jazz Ensemble

Director, Mr. John Nyerges

Michael Capogreco-tenor sax
Kyle Lee - guitar
Jake Saeva - bass
Zach Minier- bass
Nigel Croston - drums
Justin Gross - alto sax
Kristian Ambubuyog - trumpet
Ryan Davis-trumpet
Alisha Allison - trombone
Steve Davis - trombone
Zachary Zwald - trombone
Tim Mitchum - piano
Jesaiah Cox - drums

The Scholars' Day Committee would like to thank the following people for their generous support and dedication to the success of the 6th Annual Scholars' Day.

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MCC faculty and student presenters
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Provost Michael McDonough and Vice President
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Scholars' Day at MCC is an event dedicated to showcasing the work of student researchers and faculty. Scholars' Day celebrates academic excellence while promoting and encouraging scholarship among MCC faculty, staff, and students.

Scholars' Day 2014 will culminate in a keynote address by Neil deGrasse Tyson, astrophysicist, author, former host of TV's NOVA ScienceNOW, host of TV's *Cosmos: A Spacetime Odyssey,* and an immensely popular science advocate, on Wednesday, April 30, at 7:00p.m.

Video Stream Tickets
Monroe A & B of The R. Thomas Flynn Campus Center
$3.00 MCC Students, faculty and staff
$7.00 General Public
Tickets are available at www.monroecctickets.com

Monroe Community College

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