Seventh Annual

ANDREWS UNIVERSITY

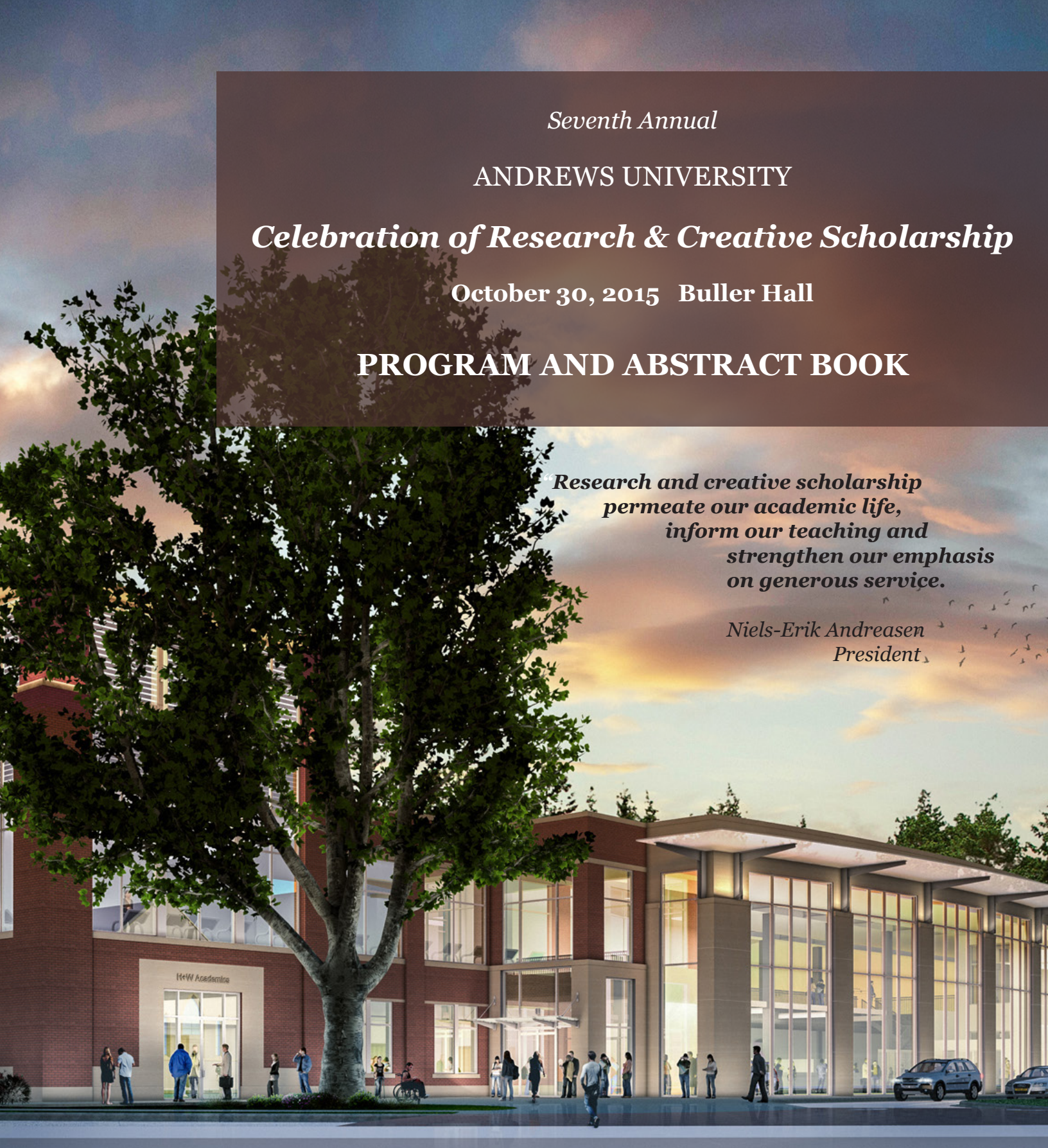
Celebration of Research & Creative Scholarship

October 30, 2015 Buller Hall

PROGRAM AND ABSTRACT BOOK

Research and creative scholarship permeate our academic life, inform our teaching and strengthen our emphasis on generous service.

Niels-Erik Andreasen
President



Health and Wellness Center Design Team: Andrew von Maur, Ariel Solis, Martin Smith, Troy Homenchuk

WELCOME

Welcome to the **Seventh Annual Andrews University Celebration of Research and Creative Scholarship**.

At this annual event we are celebrating, as a university, the accomplishments of our faculty and graduate students both in research and creative scholarship.

We are privileged to have such dedication to excellence on our campus, as exemplified by the many presentations given today. These presentations are the results of many hours, days, months and years of hard work whether in a laboratory, music practice room, quiet study, or conducting a focus group. Some of these projects have been funded by Faculty Research Grants through the Office of Research and Creative Scholarship, while others have received external funding from the General Conference of Archives Statistics & Research, North American Division of Seventh-day Adventists, or National Science Foundation.

The Annual Andrews University Celebration of Research and Creative Scholarship is also a venue in which we recognize the lifetime achievements of the Siegfried H. Horn Excellence in Research and Creative Scholarship awardees. The work of these distinguished colleagues are highlighted during the plenary presentations.

This year, presenters include James Hayward, Andrew von Maur, Carla Trynchuk, and Wagner Kuhn. Hayward, along with Shandelle Henson, has received funding from the National Science Foundation for cutting-edge work on seabirds and continues to pursue other areas of interest in ecology. Von Maur has engaged students in urban and campus planning projects including the Andrews University campus plan and M-139 Corridor Improvement Plan. Trynchuk has performed as a soloist with orchestras across North America and Europe and taught master classes worldwide. Kuhn has published extensively on missions and conducts training programs for missionaries all around the world. Andrews University is proud of your contributions!

I hope you are inspired, as I am, by the immense output of energy and creativity by our exemplary colleagues.

Sincerely,

Christon Arthur

Christon Arthur
Associate Provost & Dean
School of Graduate Studies and Research

SCHEDULE OF EVENTS

12:30-2:00 pm **Plenary Session** (Newbold Auditorium)
See page 5 for program abstracts.

Introduction and Welcome – **Christon Arthur**, Dean, School of Graduate Studies & Research

Introduction of Speakers – **Gary Burdick**, Associate Dean for Research

Presentations by recipients of the ***2015 Siegfried H. Horn Excellence in Research and Creative Scholarship Award:***

PL-1 **James Hayward,** Emeritus Professor of Biology
Deciphering a Slice of Washington's History Writ Large

PL-2 **Andrew von Maur,** Professor of Architecture
Twin Cities Harbor

PL-3 **Carla Trynchuk,** Professor of Music
Piazzolla's Four Seasons: A Performance Preparation

PL-4 **Wagner Kuhn,** Professor of World Mission and Intercultural Studies
Partnership as Mission: Advancing Scholarship Through Publications

Closing Prayer – **Keith Mattingly**, Dean, College of Arts & Sciences

2:00 - 3:00 pm **Poster Presentations** (Buller Hallways)
See pages 10-20 for program abstracts. Refreshments served in the central atrium.

	<u>Humanities & Social Sciences</u>
P-01-03	Agriculture, Archaeology and Anthropology
P-04	Architecture
P-05	English
P-06	Religion
P-07-08	Library
P-09-11	Visual Art and Design
P-12-14	Psychology
P-15-16	Social Work
P-17-20	Denominational Studies
P-21	Education
	<u>Health Professions</u>
P-22-23	Physical Therapy
P-24-25	Public Health
	<u>STEM</u>
P-26-30	Biology
P-31-34	Chemistry and Biochemistry
P-35-36	Engineering and Computer Science
P-37-39	Mathematics
P-40	Physics

3:00 - 4:00 pm **Oral Breakout Sessions** (Buller Classrooms)
See pages 6-9 for program abstracts.

Session A	Theology and Communication (BUL 149)
Session B	Old and New Testament Studies (BUL 150)
Session C	Biology, Public Health, and Engineering (BUL250)
Session D	Leadership, Business, Education, and Music (BUL 251)

ORAL PRESENTATION SCHEDULE

Session A: Theology and Communication BUL149

3:00 pm	**A-1**	Adriani Rodrigues, *Marriage in the Theology of Hebrews*
3:15 pm	**A-2**	Erhard H. Gallos, *What "Rest" remains? A Close Reading of Hebrews 4*
3:30 pm	**A-3**	Rachel Williams-Smith, *A Semiotic Look at the Seventh-day Sabbath as a Biblical Sign [System]*

Session B: Old and New Testament Studies BUL150

3:00 pm	**B-1**	Maksym S. Gordiienko, *Psalm 1: "From Obedience to Eternity"*
3:15 pm	**B-2**	Ronald Rojas, *The Conditionality and Unconditionality in the Latter Prophets' Prophecies*
3:30 pm	**B-3**	Christopher R. Mwashinga, *New Testament and Demonization: Are Demons Respecters of Persons?*

Session C: Biology, Public Health, and Engineering BUL250

3:00 pm	**C-1**	Daniel Gonzalez-Socoloske, Anmari Alvarez-Aleman, Jorge Angulo-Valdes, Mindy McLarty, *Manatee Ecology and Conservation in Cuba*
3:15 pm	**C-2**	Robert Zdor, *Mustard Seed Meal Influences on Velvetleaf Growth*
3:30 pm	**C-3**	Maximino Alfredo Mejia, Joan Sabate, Samuel Sotet, Griselda Uriegas-Mejia, Helen Harwatt, Sherine Brown-Fraser, *Climate Change Mitigation Through Dietary Choices: Meat Analogues—A Case Study*
3:45 pm	**C-4**	Boon-Chai Ng, Will Allen, Dominique Tan-Ng, Lucas Marchado, *Evaluation of anodized aluminum for potential use as an interposer for the test socket industry*

Session D: Leadership, Business, Education, and Music BUL251

3:00 pm	**D-1**	Protas A. Makimu, *The Influence of Prospect Theory on Student Loans in the US: How it Affects Students with Low Socio-economic Status Backgrounds*
3:15 pm	**D-2**	Lucile Sabas, LeRoy Ruhupatty, *Nationally Held Public Debt and Economic Growth: An Application to the US Economy*
3:30 pm	**D-3**	Joel Raveloharimisy, Ave Altius, *Study Abroad Best Practices*
3:45 pm	**D-4**	Chi Yong Yun, *Johann Samuel Schroeter Keyboard Concertos Op.5*

PLENARY PRESENTATIONS

PL-1 *Deciphering a Slice of Washington's History Writ Large*
James Hayward, Emeritus Professor of Biology

Washington State comprises one of the most geologically active regions in North America. A series of exotic terranes have plowed into one another to form the bulk of the state. The Juan de Fuca tectonic plate is diving beneath Washington from its western margin, generating earthquakes and pushing up the Olympics and Cascades. Lava, repeatedly oozed out from enormous fissures, has built up basalt deposits nearly two kilometers deep. Volcanoes in the Cascades intermittently erupt and spew gritty ash over vast areas. Continental glaciers have edged their way into the state from the north multiple times and created a set of unmistakable landforms and deposits. A series of enormous floods repeatedly have swept over the eastern part of the state creating the channeled scablands. Protection Island, where we study the biology of seabirds, preserves a thin but magnificent slice of the Pleistocene component of this history – one of the finest in the state. In collaboration with two geologists, we are producing the first detailed description and interpretation of this spectacular series of deposits. This talk will feature an overview of Washington's geologic past, followed by a description and preliminary analysis of the interval of history revealed by Protection Island's strata.

PL-2 *Twin Cities Harbor*
Andrew C. von Maur, Professor of Architecture

This planning and design study is currently underway to assist the cities of Benton Harbor and Saint Joseph, Michigan to consider a healthier and more prosperous future of their shared harbor area. Today, the 600-acre study area may represent Berrien County's most significant opportunity and challenge for urban development, environmental stewardship, and community life. Pursued with the 2015 graduate Urban Design Studio, and in collaboration with the Southwest Michigan Planning Commission, the work includes extensive site analysis and design research to inform the decision-making of a stakeholder steering committee and will ultimately lead to a proposed illustrative vision for the harbor area. The project reflects a desired synthesis of Christian architectural education, community service and witnessing, applied design research, and hands-on learning through a professional participatory process. It was commissioned by the City of Benton Harbor's *Department of Community and Economic Development* and is funded by various local private stakeholders such as The Prairie Group and Whirlpool Corporation.

PL-3 *Piazzolla's Four Seasons: A Performance Preparation*
Carla Trynchuk, Professor of Music

A performer's preparation is multifaceted with a performance being a culmination of a lifetime of commitment to one's art. Performance opportunities depend upon reputation, connections, and networking (peer review). Individual preparation of the composition comprises scholarly research on the composer, the context of the work and its style, a study of the orchestral score and the performance tradition of the work. The artistic preparation includes countless hours of intensely focused practice. Finally, collaborative preparation consists in rehearsing with a pianist playing a reduction of the orchestral score, meeting with the conductor to coordinate tempi and styles, and finally rehearsals with the orchestra.

PL-4 *Partnership as Mission: Advancing Scholarship Through Publications*
Wagner Kuhn, Professor of World Mission and Intercultural Studies

This presentation provides a summary of a few examples of how creative scholarship can be advanced through presentations in various mission conferences and via academic publications. The results of these academic partnerships done through presentations and publications can be seen in various levels: from creating awareness, and then by way of organizing and hosting mission conferences, to implementation of innovative mission projects, and long-term training programs. In the presentation I will showcase the following three books as examples of successful partnerships:

1) *Passport to Mission*, Cheryl Doss, ed. (Third Revised Edition, 2009): co-author and co-translator. I will also explain the connection of the book and the new major mission conferences called "I Will Go" that are taking place in South and Central America.
2) *The Book and the Student: Theological Education as Mission* (2012): editor and writer of introduction and two chapters.
3) *Biblical Principles for Missiological Issues in Africa* (2015): co-editor with Bruce Bauer.

I will also briefly highlight two articles written in partnership with a couple of colleagues:

1) "Adventist Mission: From Awareness to Engagement – Part I (*Ministry*, Vol. 87, Numbers 7/8: 52-56), and Part II Ministry, Vol. 87, Number 9: 23-26). Co-authored with Marcelo Dias (These articles will also be published in Portuguese by *Revista Ministério* early in 2016).
2) "The Incarnation of Christ: Mystery and Model of Mission." In *Preach the Word*, Artur Stele, editor. Silver Spring, MD: BRI. (Pp. 65-93?). Forthcoming 2015/2016? Co-authored with Adenilton Tavares de Aguiar.

ORAL PRESENTATIONS

A - Theology and Communication

A-1 *Marriage in the Theology of Hebrews*
Adriani Rodrigues, PhD Candidate in Systematic Theology, Department of Theology & Christian Philosophy

This paper attempts to delineate the conception of marriage in the context of the theology of Hebrews. This attempt follows three steps: (1) it depicts the conceptual contours of the transition from chapter 12 to chapter 13; (2) it explores the micro-structure of 13:1-6; and (3) it indicates how the notion of marriage in 13:4 is connected with the two previous steps, showing how they inform the idea of marriage in that verse. In short, the notion of marriage in Hebrews is informed by the attitude of worship to God and the acknowledgment of the future divine judgment.

A-2 *What "Rest" remains? A Close Reading of Hebrews 4*
Erhard H. Gallos, Department of Religion & Biblical Languages

The topic of "rest" in Hebrews has received considerable attention most recently. However, the existence of competing understandings of the religio-historical provenance of "rest" has not led to a consensus regarding its meaning. This paper takes the initiative of not imposing foreign religio-historical constructs on the "rest" motif, but defines both terms κατάπαυσις and σαββατισός etymologically and from the usage in the LXX. Also, the structural relationship between Heb 4 and 10 becomes important in understanding "rest." This paper proposes that various semantic, syntactical, and formal cohesions between Heb 4 and 10 shed crucial light on the "rest" motif. The temporal dimension of "rest" becomes pivotal in understanding Hebrews 4.

A-3 *A Semiotic Look at the Seventh-day Sabbath as a Biblical Sign [System]*
Rachel Williams-Smith, Department of Communication

Using semiotics as a lens through which to view the Biblical Seventh-day Sabbath, this paper explores how the Sabbath fulfills the denotation and connotative definition of a sign, is a combination of both a signifier and the signified, and functions as a part of a comprehensive sign system. The Sabbath qualifies by semiotic definition as a sign because Scriptures clarify that the Sabbath was intended to stand for (or signify) something else. The paper argues that seventh-day Sabbath is a sign by which God communicates His creative and redemptive authority to mankind. Furthermore, in the case of the Bible Sabbath, the signifier is a twenty-four hour, regularly occurring period of time, specified as a particular day, the seventh day of the week. Finally, because the Sabbath sign is rooted in a system that predoates sin, it naturally preserves a wealth of spiritual truths as inevitable and eternal rather than the superficiality of myths that Barthes targeted in his studies. It concludes that though Barthes may have never looked beyond earthly signs, he presents a theory through which we can examine a sign which God created using time itself and find meanings that otherwise might remain hidden.

B - Old and New Testament Studies

B-1 *Psalm 1: "From Obedience to Eternity"*
Maksym S. Gordiienko, MDiv Student, Seventh-day Adventist Theological Seminary

In my paper I analyze Psalm I. There are direct allusions in this psalm to the Pentateuch and to the book of Revelation. Thus it connects the past of Israel with eternity and glorious future of God's people. In poetic form the Psalmist reveals secrets of salvation. In order to understand his wisdom I make two steps. Firstly, I analyze the literary context and the genre of the psalm. I also make exegetical analysis studying the structure of the psalm, its keywords and grammatical data. Secondly, I give suggested theological interpretation. The paper finishes with practical application as any theological work should be useful for church members.

B-2 *The Conditionality and Unconditionality in the Latter Prophets' Prophecies*
Ronald Rojas, PhD Student, Department of Old Testament

In the Old Testament, there are numerous predicted prophecies. J. Barton Payne lists 1,239 predicted prophecies in the Old Testament, which encompass 28.5% of the total verses of the Old Testament. Although they are in the Pentateuch and in the Writings, most of them are mentioned in the (Latter) Prophets. While the New Testament ratified that in Jesus many of those prophecies found fulfillment, the truth is that many others seems to be unfulfilled. Consequently, it is unclear whether those predictions were conditional or God is not able to predict the future. By looking to selected texts of predicted prophecies in the Latter Prophets, this paper attempts to offer criteria on how to determine whether the prophecy was intended to be conditional or unconditional.

B-3 *New Testament and Demonization: Are Demons Respecters of Persons?*
Christopher R. Mwashinga, PhD Student, Department of Theology and Christian Philosophy

This paper looks at demonization and how it affected people in New Testament times. The Bible presents a number of demonic cases and also shows how Jesus and his apostles responded to them in the New Testament. Cases of exorcisms as they are carefully recorded in the New Testament represent victims from various social and religious backgrounds. The goal of this paper is to demonstrate that demonization was not a problem of one particular race, religion, social status, gender or age group, but rather that it affected people from a variety of backgrounds. This has been done by briefly surveying the works of other scholars who have done research in this area and also by examining four exorcism cases in the Synoptic gospels and one in the book of Acts. After a critical analysis and reflection, the research concludes that demonization as a phenomenon presented in the New Testament was no respecter of persons—it affected people from all walks of life. The findings inform and warn contemporary people to be aware of the potentiality of demonization in the world today, regardless of where they live or what their backgrounds may be.

C - Biology, Public Health, and Engineering

C-1 *Manatee Ecology and Conservation in Cuba*

Daniel Gonzalez-Socoloske[1], Anmari Alvarez-Aleman[2], Jorge Angulo-Valdes[2], Mindy McLarty,[3] [1]Department of Biology, [2]Center for Marine Research, University of Havana, Cuba, [3]Graduate Student, Department of Biology

Manatees inhabit fresh, brackish, and marine waters. All species of manatees are currently listed as Vulnerable, due primarily to habitat loss, poaching, entanglement, and other anthropogenic causes. One of the major challenges in ecological studies of manatees is the difficulty of detecting them in their natural habitats, particularly in regions where they have been historically or are currently hunted, as is the case with the West Indian manatee in Cuba. Challenging habitat characteristics (tannin-stained or turbid waters) coupled with elusive and cryptic behavior also impede the study and management of this species. Scientific studies in Cuba have been few and little is known about the abundance, habitat use, movement patterns, behavior, structure, and current health status of the manatee population. The current distribution in Cuba comes from anecdotal information and sporadic mortality records. Despite these limitations, the Center of Marine Investigations (University of Havana) is currently leading a multi-year study of the manatees in the Isla de la Juventud, in order to provide scientifically based recommendations to the government to assist in the management and conservation of this species. The objectives of the multiyear study are: 1. Implement and validate survey methodologies to determine the abundance and distribution of manatees. 2. Locate and characterize critical habitat for the species. 3. Study patterns of habitat use and movements. 4. Analyze food habits of the species. 5. Detect threats to the species. Here we report preliminary results from our collaboration with objectives 1 and 2 over the last two years.

C-2 *Mustard Seed Meal Influences on Velvetleaf Growth*

Robert Zdor, Department of Biology

The use of natural products in weed management is an attractive option to reliance on herbicides for weed control. Mustard seed meal (MSM), a byproduct of mustard condiment production, has been used to suppress a variety of weeds and plant pathogens. In this study oriental mustard “Pacific Gold” seed meal was found to be superior to mustard “Ida Gold” seed meal in reducing velvetleaf seedling growth in soil. Formulation of oriental MSM with a deleterious rhizobacterium did not improve the weed suppressive effect of the MSM probably due to the loss of active agent during the formulation process. Further research is examining ally-isothiocyanate, the active agent in oriental MSM, as a herbicidial chemical in reducing velvetleaf growth.

C-3 *Climate Change Mitigation Through Dietary Choices: Meat Analogues—A Case Study*

Maximino Alfredo Mejia[1], Joan Sabate[2], Samuel Sotet[2], Griselda Uriegas-Mejia[3], Helen Harwatt[2], Sherine Brown-Fraser[1] [1]Department of Public Health, Nutrition and Wellness, [2]School of Public Health, Loma Linda, [3]OptiHealth, PLLC

Background: There is growing concern of climate change and the impact of diet on earth’s climate. The new Dietary Recommendations for Americans aim to address this environmental risk by calling the American public to consume diets that are healthy for them and the environment. Production of animal proteins, particularly beef, put a heavy toll on the environment. Thus, there is a need to find suitable proteins alternatives that are less demanding for the environment. **Purpose:** The purpose of this study was to assess the greenhouse gas emissions (GHGEs) generated by meat analogs. **Methods:** Life cycle assessment (LCA) was performed with SimaPro 8.0 to calculate the GHGEs generated in the production of meat analogs. In our calculations we chose one kg as functional unit; cradle to factory gate, as LCA boundaries; and TRACI 2.0, as the environmental impact method. Data inventories of each meat analog were provided by a leading manufacturer which contained the list and weight of ingredients, gas, electric, packaging materials, water use, transportation and storage. **Results:** The GHGEs as carbon dioxide equivalents (CO2eq) per kg of production were: chops, 3.31; corn dogs, 3.21; gluten stakes, 3.29; meat balls, 2.77; and scallops, 2.76. **Conclusion:** The GHGEs generated from meat analogs ranges from 2.77 to 3.39 kg CO2eq. This is about ten times lower when compared to beef products. Meat analogs are a viable alternative for consumers who intend to protect the environment through dietary choices.

C-4 *Evaluation of anodized aluminum for potential use as an interposer for the test socket industry*

Boon-Chai Ng[1], Will Allen[2], Dominique Tan-Ng[3], Lucas Marchado[3], [1]Department of Engineering & Computer Science, [2]Undergraduate Student, Department of Engineering & Computer Science, [3]Student, Andrews Academy, [4]Student, University of Brasilia

Interposers are used to position (helical springs) pins used to analyze the connectivity of the printed circuit board. The interlocking plates are made of polymers, an electric insulator to prevent the short circuiting of the electronics as well as for ease of manufacturability. But the dimensional accuracy of these polymers may be hampered by the increase in temperature during operation. A new material that has the ease of manufacturability and is a good insulator, but will not be hampered by the increase in temperature, is desired. Aluminum with its surface coated with an oxide layer (aluminum oxide) would fulfill this criterion. Pieces of aluminum alloy 6061, (~1 inch x 1 inch) with fine holes (0.5 mm or less) drilled into the thin sheet (0.01 in) were anodized in the lab. The resistance of these anodized material measured were very high (overload) and an oxide thickness of ~4 microns was determined using the scanning electron microscope. This result suggests that aluminum (with fine holes drilled through them) can be easily anodized. With its ability to remove heat from the contact area via cut portion (removing the oxide layer) of the material, aluminum is a potential material to be used to spear head the next generation of interposer with less instability in the dimensional accuracy of these test sockets.

D - Leadership, Business, Education, and Music

D-1 *The Influence of Prospect Theory on Student Loans in the US: How it Affects Students with Low Socio-economic Status Backgrounds*

Protas A. Makimu, Graduate Student, Department of Leadership

Prospect theory is a behavioral theory, which is employed to determine how people make choices between different options or prospects. It describes, explains, and predicts the choices that an individual makes, especially in situations when the outcomes are uncertain. It is used to explain a common pattern of choice, and is descriptive and empirical in nature. It involves two parts of decision making: the editing, or framing, and evaluation phases. The editing deals with framing effects while the evaluation involves the decision process of choosing among options. The decision is influenced by two processes: one related to subjective value and the second related to perceptual likelihood. Framing is controlled by the manner in which a choice problem is presented as well as the norms, habits, and expectancies of the decision maker. The evaluation phase consists of two parts: the value function and weight function. The value function has three components. The first one is denoted in terms of gains and losses relative to the reference point, the second one is that the value function is convex below the reference point and concave above it, and the third one is the asymmetric nature of the value; it is steeper in the domain of losses than gains. This means that losing hurts more than comparable gain pleases. This study reveals how American students from low socio-economic backgrounds have disadvantages in making choices on the issue of student loans for financing higher education with respect to prospect theory.

D-2 *Nationally Held Public Debt and Economic Growth: An Application to the US Economy*

Lucile Sabas, LeRoy Ruhupatty, Department of Accounting, Economics & Finance

This paper explores the impact of nationally held public debt and foreign debt on the US economy. It has tried to define the nationally held public debt as an additional asset for the private sector by insuring a source of future saving, an increase in investment capacity and a source of increase in demand. A linear regression analysis of 39 observations from 1970 to 2014, using different lengths of lag, from one to five years have shown that for the first year, nationally held public debt has a positive and statistically significant impact on economic growth. However, the coefficient is not economically strong, showing an impact of only 0.36% of increase in US growth, resulting from a 1% increase in public debt. This result, however, is stronger than the outcome of the US public debt held by foreign investors. Furthermore, the results for the following years, though, helping to solve the correlation issue of the residuals, show very little economic impacts. The causality of the relation is also undetermined, the signs of the coefficients being different from one regression to another, and from one year to the next.

D-3 *Study Abroad Best Practices*

Joel Raveloharimisy[1], Ave Altius[2], [1]Community & International Development Program, [2]Graduate Student, Community & International Development Program

Short-term study abroad programs are becoming increasingly popular among colleges in the U.S. Research into the subject has tended to focus on programs in developed countries, especially Europe. This article is an exposition of best practices and guidelines for short term study abroad programs in the context of the developing world. The research is based on first-hand experience of the author in administering a program to the island of Madagascar for four weeks each year from 2011 to 2015, and student experiences on these tours through their daily reports. The article discusses the challenges encountered on the Madagascar study tour and avenues to circumvent these challenges. There is also a discussion on the benefits of the tour to students who participate. Finally, the paper tackles an area that is largely unexplored in the current literature - the effect that study tours have on the local communities in which they are held. The paper was produced with the expectation that administrators of study tours would have a reference point for what is required to administer a tour, good practices that enhance student's educational and cultural experiences, and knowledge of the effects that their presence has on the local community.

D-4 *Johann Samuel Schroeter Keyboard Concertos Op.5*

Chi Yong Yun, Department of Music

Despite Schroeter's prominent influence on the development of piano technique and concerto genre, very little is known about him today. My goal is to bring J. S. Schroeter to the attention of a larger audience of pianists and scholars by examining and performing his concertos op. 5, Nos. 1-6, focusing on his compositional style, performance practice issues, and pianistic techniques as illustrated by this set of works. I will also present a critical modern edition with a scholarly preface. His work, especially the keyboard concertos, gives valuable insight into his contributions as a composer and pianist. Furthermore, these concertos can serve as introductory and/or complementary piece to Mozart's piano concertos.

POSTER PRESENTATIONS

Agriculture, Archaeology and Anthropology

P-01 *An Educational Plan for Agricultural Conservation of Plants, Water and Farmlands in Jordan to Help Solve the Crisis*
Stanley Beikmann, Department of Agriculture

The 2015 Research Poster will chronicle the work that our International Agriculture Development team has been doing. The team has researched species loss of native and socio-economic plants of Jordan through overgrazing/collecting, the loss of water harvesting methods in recent decades due to increased dependence on non-renewable water aquifers and the loss of farmland due to development. Preliminary funding for an Agricultural Education Heritage Center is committed and the logistics and conceptual plans for the educational exhibits in a donated building yet to be renovated at the Tel Hisban site are being finalized. This Center will educate hundreds of schoolchildren to Jordan's plight and will forge a strong sense of conservation in Jordan's future populace. Outside funding and local participation is making this possible along with Andrews Faculty Research grants and the collaboration between Andrews Agriculture, Architecture and Archaeology at Tel Hisban, Jordan.

P-02 *Resilience through Local Knowledge in Jordan: The Ethnography Volume in the Hisban Final Publication Series*
Asta Sakala LaBianca, Department of English

Nearly five decades of archaeological and anthropological research by Andrews University faculty and students at Hisban, Jordan have brought to light the remarkable story of survival resilience of the local population in the face of three millennia of successional imperial domination. Among the secrets of survival that have been identified are: local level water management, fluid homelands, mixed agro-pastoralism and transhumance, residential flexibility, honor and shame, hospitality, and tribalism. Publication of this project will examine these themes from a number of different encounters with the people of the region. The chapters of this multi-authored volume will be: 1. Introduction of the survival strategies; 2. The LaBianca family's personal experiences living in Jordan doing ethnographic fieldwork in 1974, 1980, and 1981; 3. Nineteenth and early 20th century travellers' accounts from the region; 4. A survey of habitation caves throughout Jordan, and particularly in the Hisban region; 5. An analysis of these themes as documented in Narratives and Poems from Hesban: Arabic texts recorded among the semi-nomadic el-Agarma tribe (al-Balqa district, Jordan); 6. Student ethnographers' notes from fieldwork done during Summer seasons of excavations at Hisban; and 7. Conclusion. My particular role with this project is authoring chapters 2 and 5, and editing the remaining chapters together with Øystein Sakala LaBianca, senior director of the Hisban Cultural Heritage Project.

P-03 *The Southern Levant in Global History: The View from Tall Hisban, Jordan*
Øystein LaBianca, Department of Behavioral Sciences

This projects' aim is to undertake a new synthesis of the archaeological and other data from Iron Age, Classical and Islamic Tell Hisban in Jordan that engages current issues in global history and the cultural production of the Anthropocene. Global history is a new kind of history that seeks to crystallize a new narrative of humanity's past that focuses on the cumulative story of the impact of humans on the Earth's ecosystem. The Anthropocene is the epoch in human history when the activities of humans begin to alter and eventually overwhelm the great forces of nature. The anthropological work initiated by LaBianca at Tall Hisban already during the seventies anticipated the research agendas embodied by global history and the Anthropocene. The final outcome of this project will be three book-length publications: one dealing with Late Antique-Early Islamic Hisban (D. Rohl and O. LaBianca); a second dealing with Medieval and Early Modern Hisban (B. Walker and O. LaBianca); and a third incorporating the Iron Age into a multi-millennial synthesis (O. LaBianca and B. Walker). The project will complete a five-decade journey to rethink the goals of historical archaeology research in the Southern Levant which has for most of the past century been dominated by the quest for a particular, longed for desired past, namely the biblical past.

Architecture

P-04 *Cavan Burren 2015 Project*

Rhonda Root[1], Robin Johnson[1], Ariel Solis[1], Abelardo Rivas[2], [1]School of Architecture, [2]PhD Candidate, Institute of Archaeology

The Cavan Burren is a plantation forest within the Marble Arch Caves UNESCO Global Geopark overlay along the Republic of Ireland and Northern Ireland border. The exposure of Cavan Burren's "relict landscape" resulted from a 2012 partial clear fell. Our multidisciplinary team of researchers in architecture, technology, ecology, fine arts, and archaeology investigated domestic architecture reflected in three stone configurations: circular/semicircular sites, rectangular sites, and tomb structures. We also investigated human action on pedestal boulders (PBs), which had been modified by sculpting, splitting, and cutting away. Our first goal was to show human action on structures by using three-dimensional (3D) analyses to investigate relationships among cast-off pieces and resulting modified boulders. Our second goal was to compare our findings with those from Ancient Near East regions, particularly Cisjordan and Transjordan, to explore possible sociocultural parallels. Photographs of artifacts were taken from different angles, organized sequentially, and stitched together via specialized software to create 3D models with photorealistic textures. We also used fine-art (drawing/painting) techniques to render objects in situ, to gain deeper detail than obtained by modern photography alone. We digitally manipulated 3D images to test-fit cast-off remains with split-pedestal boulders and to understand how monuments were made, worked, and assembled. Digital analyses suggest that certain matched sets of boulder parts, previously split and exposed to the same weathering effects, were worked by human action. Comparative analyses suggest that small, circular rings of moderate-sized stones, designated on mapping as Hut Sites, were likely places of cultic activity near tomb structures.

English

P-05 *Intelligibility and comprehensibility of nativized lexis in ELF: The case of Japanese English*

Hiroko Matsuura[1], Reiko Chiba[2], Sarah Rilling[3], Eun-Young Julia Kim[4] , Rini Nur[5], [1]Foreign Language and Foreign Cultural Studies, Fukushima University, [2]Department of Multicultural Communication, Asia University, [3]Department of English, Kent State University, [4]Department of English, [5]Department of Business Administration, Politeknik Negeri Semarang

The present study examines international intelligibility and comprehensibility of nativized English lexis from Japanese as determined by tertiary student listeners in four countries. Specifically, the study seeks to determine which linguistic features of Japanized English lexis reduce intelligibility and comprehensibility for listeners from the US, the Philippines, South Korea, and Indonesia. The results indicate that morphological and semantic modifications tend to be more challenging to American, Filipino, and Indonesian listener groups than phonological ones, and that difficulty rank orders of individual items tend to be shared by the American and Filipino groups. On the other hand, some loanword expressions give Korean listeners an advantage in identifying the word or word meaning. Other factors influencing intelligibility and comprehensibility, such as English proficiency and cultural/linguistic contexts are also discussed.

Religion

P-06 *Using Diagrams as a Teaching Tool*

Lincoln Nogueira, PhD Student, Seventh-day Adventist Theological Seminary

When learning the Greek language students are loaded with grammatical information that serves to indicate morphological inquiries. Today, this information can be easily obtained by one or two clicks of a mouse on the internet or a Bible software program. So, even with classes of Greek, the question remains: what should students do with this basic information, how will it help in advancing to exegesis? I believe no bridge is formed between morphology and syntax to guide in the process towards exegesis. An additional step is needed. The Parts of Speech Diagram is a necessary tool to bridge morphology and syntax. In addition, this methodology (diagramming) can bridge Greek and Theology. I have seen that the tool of diagramming is key, enhancing all areas of Greek studies: acting as a bridge between morphology and grammar, grammar and syntax, and finally between syntax and exegesis (theological/practical interpretation of the text).

Library

P-07 *Information Literacy "Dispositions" Come to the Seminary*

Terry Dwain Robertson, James White Library

The most recent iteration of the ACRL Standards for Information Literacy has added "dispositions" to the repertoire of information literacy practice. This poster will explore how these "dispositions" might be understood in Adventist Theological Education. The first iteration of ACRL Standards for Information Literacy was largely instrumental and most instruction was focused on using technology. This development shifts the focus from learning an ICT skill to transformative learning. Information seeking has been transformed from a scarcity model to an abundance model. Adventists are now flooded with information from all sides and from all types of sources. The SDA pastor and educator must learn to both navigate and participate in this abundance. At the core of this ability are the "dispositions" that filter, organize, manage, and gain knowledge from the abundance. Those who "get it" become effective communicators on multiple levels in a global community. Articulating these "dispositions" is the first step in educating for these competencies. As an experiment in the integration of faith and learning, the Ten Commandments (Exodus 20) will serve as rubric for organizing and explaining information literacy "dispositions" as they pertain to theological education.

P-08 *Out of My Comfort Zone into Yours: Extended Reference Service at Andrews University*
Cynthia Mae Helms, Silas Bruscagin Marques, Lauren R. Matacio, Sarah Kimakwa, James White Library

The Information Services librarians conducted a 16-point anonymous survey in Spring Semester 2014 to study Andrews University students' need for an extended reference service by determining their understanding, value, and use of library and librarians' services. Based on the responses given by the 150 participants, the majority of students could identify the ways by which the librarians can help them and were aware of the Information Desk. In spite of the students' knowledge and awareness of what the library can do for them, librarians came in as their 4th choice when seeking help with their assignments. Google was the students' most frequently used resource (88%). About 50% said that they did not need a librarian's help and did not use the Information Desk because they can help themselves. Other reasons for not using library services were that they have the necessary skills and knowledge, everything is online, and that classes do not require library materials. About one-third of students said that they would use a reference kiosk if it was offered outside the library. Results of this study have ramifications for information literacy needs on campus.

Visual Art and Design

P-09 *Organic Matter - A Series of Cyanotype Images*
Marc G. Ullom, Department of Communication

This fine art body of Cyanotypes titled Organic Matter, explores the observation of common flora of southwest Michigan through the lens of this ancient photographic process, while incorporating digital methods of capture and intermediate output in the form of digital negatives. The subject matter will be digitized using a flatbed scanner, manipulated to create the intermediate digital negative, and then the hand-coated substrate will be exposed to strong UV light. The latent image will then be developed with water and toned using ammonia or hydrogen peroxide to alter the quality and color of the image. The final series of images will be one of a kind hand processed archival cyanotype prints on acid free watercolor paper approximately 11x14 inches in size. The body of work will be exhibited in regional and national juried photographic exhibits.

P-10 *Car Quotes*
Greg Constantine, Department of Visual Art & Design

The *Car Quotes* are a play on words, and most viewers, when confronted by these groupings, will at first see a random juxtaposition of weathered automobile plates from various countries and states. Many are humorous, but also pithy. Most observers do not realize each grouping is meant to be read as a statement, and many wonder where I found them; not knowing that I actually create them from vacuum formed styrene. The juxtaposition of colors, shapes and supposed origins make them visually engaging. They refer to the phenomenon of ubiquitous so-called "vanity" plates, with the exception that these have been joined together to form full statements. Most of the statements are about automobiles and drivers. It may be noted that each plate is rendered as a convincing entity and the groupings appear to be an assemblage of found objects. The license plate format is that of utilitarian objects transformed into functional objects wearing the mantle of "high art". They open another territory in the development of Text Art. In addition to the creation and fabrication of additional car related license plate groupings, I am researching and experimenting with other applications appropriate for the license plate format. I have already created additional series called "Art Quotes," "New York Quotes" and "Artist Myths." I will display a large poster of these Car Quotes as well as one of the actual assemblages.

P-11 *Lookers and Glass Slippers*
Kari Friestad, Department of Visual Art & Design

In contemporary society, the mass media, pop culture, and beauty industries drive the framework of images that encourages Western culture's fascination and obsession with the female form. The framing of contemporary woman through images creates a fractured impression of the identity of woman. This framework of images exposes the awkward tension between the audience and the process of signification that occurs between the body and images. The language of psychoanalysis presented by Sigmund Freud and Jacques Lacan stands as an example of the dominant mode of thought of Western society and its attitude towards the female form. Women are particularly associated with being recipients of the gaze, while the image of woman is continuously manipulated into a specific, idealized kind of beauty image. The compositions function as narratives with the addition of archetypal symbols that are found within different fairy tales, such as the story of Alice in Wonderland. The American beauty pageant system is one facet of Western culture that drives the function of woman as the recipient of the gaze while reinforcing the standards associated with a search for a woman or child winning at beauty. My intentions with the work are to create a narrative that exposes the vehicle of the beauty pageant as a mechanism for control, societal influence, and pressure while demonstrating the depths reached by the myth of perfect beauty.

Psychology

P-12 *Quantifying Sight: Methods for Studying Eye Movement Patterns While Viewing Paintings*
Karl G. D. Bailey and Herbert Helm, Department of Behavioral Sciences

In most settings, people move their eyes two or more time each second in order to continually gather high-quality, detailed information from the visual world. Because of the relatively constrained area of high acuity vision, it is possible to use gaze location to infer where information is being gathered moment-by-moment. As such, the eye movement record is a rich data set, including the coordinates of gaze locations, the duration of fixation events, the relative angle of successive eye movements, and the sequence of eye movements specific to a particular viewing session. However, much of this richness is currently discarded in the analysis process. We report on a number of methods that are used to examine complex and sequential data in other disciplines that may be of use in the analysis of eye movements.

P-13 *The Compassion Fatigue and Resilience Connection: A Survey of Resilience, Compassion Fatigue, Burnout, and Compassion Satisfaction among Trauma Responders*
Harvey J. Burnett Jr[1] and Kathleen Wahl[2], [1]Department of Behavioral Sciences, [2]Michigan Department of Community Health, Office of Public Health Preparedness

Research has shown that compassion fatigue is associated with burnout and compassion satisfaction. Practically no studies have examined how resilience may impact these variables. This study examined how resilience is related to compassion fatigue, burnout, and compassion satisfaction among a convenience sample of disaster behavioral health and emergency preparedness responders (N = 139) attending a training conference in Michigan. Measures included the 30-item Professional Quality of Life Scale, the 14-item Resilience Scale, and a demographic questionnaire. Seventy-two percent of the participants were at risk for compassion fatigue, while 19% were at risk for burnout. Only 22% of participants had scores indicative of high resilience. Resilience was found to have a significant negative correlation with compassion fatigue and with burnout. A significant positive correlation was also found between compassion satisfaction and resilience. Mediation analysis found that resilience moderately mediated the relationship between compassion fatigue and burnout. These findings suggest that resilience plays an important role in mediating the effects between compassion fatigue and burnout. Implications for practice are discussed.

P-14 *Fit or Frazzled? Comparing the Effects of Stress vs. Exercise on the Brain*
Mikyung Kim[1], Rebecca R. Clouse[1], Landen A. Samatua[2], Karl G. D. Bailey[3], Pamela S. Coburn-Litvak[4], [1]Graduate Student, Department of Biology, [2]Undergraduate Student, Department of Biology, [3]Department of Behavioral Sciences, [4]Department of Biology

College freshmen face several unique stressors, such as adjusting to a new living and academic environment and dealing with mounting financial obligations. Chronic stress leads to structural changes in the prefrontal cortex and hippocampus that cause cognitive impairment. But interestingly, exercise is a physical stressor that facilitates function in these brain areas. The goals of the current study were to: 1) compare the effects of physical fitness vs. stress on memory performance in college freshmen (n=22), and 2) compare the effects of fitness vs. stress on the students' acute stress response. Preliminary data indicated that higher fitness levels may have been associated with improved hippocampus-dependent memory scores ($p = 0.08$, Cohen's d=0.7) , but not prefrontal cortex memory. Higher fit students had an increased salivary cortisol response but decreased blood pressure response to a mild, cognitive stressor ($p < 0.05$). Students with higher self-reports of stress performed significantly worse on the prefrontal cortex-based task ($p < 0.05$) and showed a statistical trend for impairment on the hippocampus-based task ($p = 0.06$). Higher stress levels resulted in a significant decrease in salivary cortisol and increase in blood pressure to a mild, cognitive stressor ($p < 0.05$).

Social Work

P-15 *Exploring the Physical Home Environment of Older Adults in the U.S. : Results from the National Health and Aging Trends Study*
Shannon M. Trecartin[1], Devyn M. Walechka[2], [1]Department of Social Work, [2]Graduate Research Assistant, Department of Social Work

The majority of older adults prefer to age in their own home and to maintain as much independence as possible (Bayer & Harper, 2000; Rantz et al., 2011). In 2012, only a small percentage of people 65 and older (3.5%) lived in institutional settings (Administration on Aging, 2012). Time studies indicate that older adults spend as much as 90% of their time at home (Baker, Keall, Lyn, Howden-Chapman, 2007). With such high levels of exposure, the home environment is a potential force for both enhancing and limiting well-being. The primary purpose of this project is to explore the physical home environment of older adults in the United States using the National Health and Aging Trends Study and to develop an initial measurement model of the construct for use in later projects. This poster summarizes the demographic characteristics of 6,665 community dwelling older adults from this population-based sample. Sample weights are applied to account for survey design. The prevalence of physical home environment features in the homes of older adults living in the community are presented and chi square tests of independence are conducted to identify categorical differences.

P-16 *The Life Experiences of Afro-Caribbean Immigrant Women Living with HIV: A Phenomenological Investigation*
Krista Cooper, Department of Social Work

Of the 1.2 million individuals living with HIV, African Americans continue to be the most adversely impacted population in the U.S. (CDC, 2015). While there has been a decrease over time in new HIV infections among this population, statistics indicate that in 2012, African Americans accounted for almost half of those living with HIV (47%) in the U.S. (CDC, 2015). Among those infected men who have sex with men (MSMs), heterosexual males, and heterosexual females account for highest rates of infection among this group in 2010 (CDC, 2015). Among females, African American women continue to lead in both incidence and prevalence of HIV (CDC, 2015). While several social and ecological factors have been noted for African Americans (CDC, 2015), other sub-populations of individuals of African descent in the United States remain largely unexplored. In order to address this gap, a qualitative phenomenological study utilizing the Stevick-Colazzi-Keen Method of Qualitative Phenomenological Analysis (Creswell, 2007; Moustakas, 1994) was conducted with eight Afro-Caribbean immigrant women in the New York Metropolitan Area to further explore their life experiences living with HIV in the U.S. Study results yielded findings that highlight the challenges, life lessons, and importance of formal and informal networks, culture, stigma and a redefinition of self after an HIV diagnosis. These findings have implications for policy, culturally based interventions for immigrant women living with HIV and human service agencies and workers.

Denominational Studies

P-17 *Life in the Fishbowl: Impact of Role Pressure on the Clergy Family*
Alina M. Baltazar[1], René Drumm[2], [1]Department of Social Work and Institute for the Prevention of Addiction, [2]College of Health, University of Southern Mississippi

Clergy families are impacted by the demands of ministers' professional practice in ways that increases the family's level of stress and effects it's functioning. This workshop will examine the results of a survey conducted with pastors, spouses, and young adult children, who are members of a conservative evangelical religion that measured personal challenges and levels of stress. Then there will be an exploration of the pressures identified in follow up focus groups with five pastoral families. Participants will learn about the unique pressures experienced by pastoral families, how those pressures affect the family system, and ways to provide more support.

P-18 *Generation and Mission Giving among North American Division Seventh-day Adventists*
Petr Činčala[1], Duane C. McBride[2], René Drumm[3], Ave Altius[4], [1]Department of World Mission and Insitute of Church Ministry, [2]Department of Behavioral Sciences and Institute for Prevention of Addictions, [3]College of Health, University of Southern Mississippi, [4]Master's Student, Community & International Development Program

Purpose -- In this on-going study we are examining NAD church member's awareness of mission offering, the extent of giving, motivations of giving, barriers to giving and what could overcome those barriers. In these analyses we are examining differences in selected variables by generation. Methods – Initially, a stratified random sample of 200 NAD churches (with membership more than 50) was drawn. Pastors were contacted to provide a list of email addresses of members or to forward the email message with survey link to the church members. Additionally, 300 randomly selected churches including those with membership less 50 were added when anticipated number of responses was not obtained. Variables Examined – We examined variables related to what influenced mission giving by generation/age group. We used Chi Square and correlational analysis to examine these variables. Findings – Younger age groups were more likely to have seen the impact of mission offerings, but were less likely to have given. Further, younger age groups reported that they were more influenced by clear financial reports and trust in church leaders than older generations. Finally, unlike older generations, younger age groups did not believe that their mission giving had any relationship to their love of Christ. Conclusions – Younger generations personally experienced the positive impact of mission giving, but were less likely to give. These data suggest that it is important for church leaders to be more transparent in financial reports, build trust and link ones relationship to Christ to supporting world mission..

P-19 *Spiritual Headship in a Female Clergy Marital Dyad*
Romulus Chelbegean, Department of Behavioral Sciences

As part of a still on-going larger research project on New Dynamics of Pastoral Families, this qualitative study reveals current results of individually interviewing twenty-three North-American Division Seventh-day Adventist female pastors and their clergy or non-clergy spouses on the biblical concept of the household spiritual headship (1 Cor 11:3; Eph 5:23) and its out-of-the-box contemporary implementation.

P-20 *Remaining Adventist: The Influence of Adventist University Experiences on Denominational Persistence*
Larry D. Burton[1], Josephine E. Katenga[2], Michelle Fish[3], Cheryl Logan[2], Patrice Wright[4], A. Yolanda Smith[5], Deborah Omagwa[6], Thula Lambert[6], Jay Brand[7], Charles Dart[8], Nancy J. Carbonell[9],[1]Department of Teaching, Learning & Curriculum, [2]Research Assistant, Department of Teaching, Learning & Curriculum, [3]Department of Education, Bethel College-Mishawaka, [4]Graduate Student, Department of Leadership, [5]Department of Nursing, Oakwood College, [6]Graduate Student, Department of Teaching, Learning and Curriculum, [7]Department of Leadership, [8]School of Allied Health Professions, Loma Linda University, [9]Department of Graduate Psychology & Counseling

Seventh-day Adventists leave the church in many locations around the world. Researchers have investigated reasons for this exodus, but few have investigated individuals' denominational persistence. The purpose of this study is to develop a theory to explain a person's decision to remain a member of the Adventist church. This study uses a qualitative grounded theory research design. The purpose of grounded theory is to develop, not to test, a theory. Semi-structured interviews have been conducted with 30 persons who (1) started university as Adventists, (2) attended an NAD university, and (3) currently self-identify as a Seventh-day Adventist. We analyzed these interviews with several types and rounds of coding to identify life experiences that contribute to denominational persistence. At this time, we have created five, tentative theoretical propositions: (1) Positive relationships within the church help members choose to stay in the church. (2)Beliefs must be intentionally internalized and revisited over time. (3)The number and quality of connections a person has with God or the church contribute to a person's decision to remain Adventist. (4)Active engagement in church and ministry contribute to a person's decision to remain Adventist. (5)Spending time in a distinctive Adventist learning environment contributes to a person's choice to remain Adventist. We will refine these propositions and add others as analysis continues and we conduct interviews with alumni who are no longer Adventists. A final theory will emerge by the end of this academic year and be shared next year and in publication.

Education

P-21 *Youth voices from the classroom: Effective multi-grade education in Zambian community schools*
Lori Imasiku, Department of Teaching, Learning & Curriculum

Within the Zambian educational system, community schools have been established as a means of meeting the education needs of all Zambian children in accordance with the United Nations Millennium Developmental Goals. Located in both urban and rural areas of Zambia, community schools often operate a multi-grade system due to the lack of teacher and/or students. Previous research on multi-grade education in Sub-Saharan African (including Zambia) has focused mainly on the challenges of the multi-grade system, in particular, the lack of teacher training. Previous research has also primarily been conducted through teacher interviews. This study uncovers the educational experiences of youth attending multi-grade classrooms through the collection of narratives and drawings collected from 21 students. Peer teaching emerged as a common success of multi-grade classrooms, while student behavior issues were indicated as the primary drawback to this educational model. The student drawings echoed the successes of peer teaching, but pointed to a lack of perceived teacher presence. Implications of the study and suggestions for further research will be discussed.

Physical Therapy

P-22 *Achieving Competence: Clinical Instructors' Perspectives*
Kim Coleman-Ferreira, Department of Physical Therapy

Introduction: The requirements to become a physical therapist (PT) clinical instructor (CI) are minimal and non- specific. In fact, a definition of CI competence does not exist, nor are there standardized measures or descriptions of the process of becoming competent. Understanding the meaning of competence, and the journey to achieving competence, may provide clarity and direction for future decisions in the clinical education component of PT education. The purpose of this study was to describe the experience of achieving competence as perceived by CIs who have chosen different paths toward becoming effective CIs. **Methods:** Phenomenological methodology to explore the meaning of clinical instructor competence and the experience of achieving competence from the perspectives of the CIs themselves. Data was collected through focus group interviews and written statements, then analyzed for themes using thematic analysis. **Participants:** A purposive sample of twenty-nine PT CIs was recruited to participate in five focus groups. **Results:** An overarching theme of "Empowerment" emerged from the data analysis of the transcriptions and field notes. This overarching theme was supported by eight themes: 1: The meaning of competence, 2: "My first student", 3: Finding the way, 4: Feeling supported, 5: A fork in the road, 6: Barriers to achieving competence, 7: The "ah-ha" moment, 8: "Ongoing road". **Conclusion:** The results of this study provide a description and interpretation of the meaning of clinical instructor competence and the journey of achieving competence. These findings can inform and empower CIs on their own journey to competence. The PT education community and it's professional bodies can also be informed by these findings in establishing a definition of CI competence.

P-23 *Effects of Teacher Methodology and Learning Styles on the Acquisition of Knowledge in a DPT Kinesiology Course*
David Village[1], William Arthur[2], Eric Milam[2], April Taylor[2], Iris Vance[2], [1]Department of Physical Therapy, [2]Graduate Student, Department of Physical Therapy

Background & Purpose. Few educational aids have been developed and validated in the field of kinesiology to help physical therapy students learn and understand kinesiology and biomechanics. The purpose of this study is to examine the validity and reliability of a newly developed kinesiology tutorial as determined by a panel of kinesiology experts. **Method Description and Evaluation.** For this study, a rubric was developed to evaluate the tutorial against course objectives, APTA's Foundational Sciences Matrix, and CAPTE accreditation standards. Questions from the multiple-choice question tutorial, along with the developed rubric, were distributed to content experts, selected based on their expertise in kinesiology concepts as evidenced by teaching foundational kinesiology content to physical therapist or exercise science students. Content experts reviewed their set of questions against the rubric, returning the rubric with constructive feedback to the researchers. Cronbach's alpha, ICC, and kappa statistic were used to analyze the data. Outcomes. Data analysis included calculating the intra-class coefficient (ICC) for reliability among reviewers (overall ICC = .756, p **Discussion and Conclusion.** Validation and reliability scores for the tutorial were significant, with good content and construct validity and excellent inter-rater reliability. Further research investigating the effects of using this newly validated tool in the classroom is suggested.

Public Health

P-24 *Disparities of Breastfeeding patterns between Black and White Adventist Women in North America. Results from the Adventist Health Study (AHS) - 2*
Sozina D. Katuli[1], Synnøve F. Knutsen[2], Raymond Knutsen[2], Keiji Oda[2], Ron Mataya[3], Gary E. Fraser[2], [1]Department of Physical Therapy, [2]Department of Epidemiology, Biostatistics and Population Medicine, School of Public Health, Loma Linda University, [3]Department of Global Health, School of Public Health, Loma Linda University

Background: Racial disparities of breast feeding have been reported in various studies, but few have evaluated the factors associated with racial discrepancies in breastfeeding. **Method:** We evaluated breastfeeding patterns among 26,926 white and 10,550 black parous females, aged 30 years and above, who were enrolled in the Adventist Health Study-2. We evaluated: 1) initiation of breastfeeding and 2) length (months/child) of breastfeeding using log linear binomial and multiple linear regression, respectively adjusting for age, education, parity, body mass index, marital status, country lived during young adult life (age 6-16), oral contraceptive use and dietary patterns. **Results:** Black women were less likely to initiate breastfeeding than white women (Prevalence Ratio=0.87, 95% Confidence Interval: 0.86-0.89) and breastfed on average 1.2 months shorter per child than white women. Older women were less likely to have breastfed their children (PR=0.97, 0.91, 0.87 and 0.95 for ages 41-50, 51-60, 61-70 and 80+ respectively compared to 30-40 year olds. Vegetarians were more likely to initiate breastfeeding than non-vegetarians (Prevalence ratio= 1.07-1.12). **Conclusions:** The racial difference on breastfeeding exist and remained virtually unchanged even after adjusting for a number of socio-economic factors including age, marital status, education and place lived during childhood and adolescence. The observed racial disparity warrants further study into possible factors that can explain the differences seen. Attitudes towards breastfeeding, in particular, need to be investigated among black and white females in the US.

P-25 *The association of the cumulative/lifetime duration of breast feeding and the development of post menopausal breast cancer. Results from Adventist Health study-2*
Sozina D. Katuli[1], Synnøve F. Knutsen[2], Raymond Knutsen[2], Keiji Oda[2], Ron Mataya[3], Gary E. Fraser[2], [1]Department of Physical Therapy, [2]Department of Epidemiology, Biostatistics and Population Medicine, School of Public Health, Loma Linda University, [3]Department of Global Health, School of Public Health, Loma Linda University

Methods: We also modeled the outcome variable breast cancer using attained age model in Cox proportional hazard regression analysis to assess the association. The models consisted of the main exposures; duration of breast feeding and initiation of breast feeding adjusted for age, education, live birth, age at menarche, age at first birth, period between first child birth and last child birth, body mass index, exercise, hormone replacement therapy (HRT), use of birth control pills, and family history of breast cancer.**Results:** There was an inverse association between breast feeding and risk of breast cancer, 25% lower risk for those who have initiated breastfeeding, Months of breastfeeding was associated with risk of breast cancer, but the effect seems to be a threshold effect with any breastfeeding (1+ month) being protective compared to those who have not breastfed. Family history of breast cancer, recent HRT use, and higher education were associated with increased risk of breast cancer. **Conclusions:** Breast feeding is associated with some reduction in risk of breast cancer, but the findings did not reach statistical significance. However the study is limited to a few cases hence wide confidence intervals. Further studies are required to investigate this relationship with a study sample with enough cases.

Biology

P-26 *Purification and characterization of Ecm14, a fungal pseudopeptidase*
Peter J. Lyons[1] and Matthew Schott[2], [1]Department of Biology, [2]Graduate Student, Department of Biology

Peptidases are enzymes important for hydrolysis of peptide bonds and hence degradation or modification of proteins. Many families of peptidases also contain inactive enzyme homologs that are predicted to be inactive due to the alteration of critical active site amino acids. The M14 family of metallocarboxypeptidases is a large family of peptidases made up of 23 members in humans, although three members are predicted to be inactive. The important eukaryotic model system, the yeast *Saccharomyces cerevisiae*, has only one metallocarboxypeptidase homolog, Ecm14, and this sole homolog is predicted to be inactive. An analysis of available fungal amino acid sequences showed that the Ecm14 gene was present and conserved in ascomycete fungi only. In order to characterize the function of Ecm14, we expressed a C-terminally histidine tagged version of Ecm14 using the Sf9/baculovirus system. The protein was secreted and subsequently purified by metal affinity chromatography. Incubation of Ecm14 with trypsin or chymotrypsin resulted in the specific removal of the Ecm14 prodomain. The mature form of Ecm14 lacked any detectable enzymatic activity, but was able to prevent the cleavage of standard substrates by an active metallocarboxypeptidase. We propose that Ecm14 may perform a regulatory function through binding to specific C-terminal amino acids, thus blocking their cleavage by active carboxypeptidases.

P-27 *The effect of dual-frequency calls in the phonotactic and neuronal responses in female cricket Acheta domesticus*
Benjamin Navia[1] and Jeong Bin Lee[2], [1]Department of Biology, [2]Undergraduate Student, Department of Biology

Female *Acheta domesticus* respond selectively to model calling songs with intensities above 75 dB and a carrier frequency of 4 – 5 kHz. When the animal is exposed to calling songs with varying syllable periods (30 to 90 ms), it is more likely to perform phonotaxis to calls with syllable periods that approach the most attractive range (50 – 70 ms), hence demonstrating its selectivity. On the contrary, it is less likely to respond phonotactically to calling songs with syllable periods that deviate from the most attractive range. Higher frequency sounds (16 kHz), have been reported to produce an aversive effect on this females, reducing its likelihood of responding phonotactically to such calls. We hypothesized that an attractive call can become unattractive by adding a 16 kHz component to an already existing 5 kHz call. In this experiment, young females (5 – 7 days) were behaviorally tested to 5 kHz, 85 dB calls, followed by a 16 kHz call added in at 65 dB to the existing call. The intensity of the 5 kHz component remained unchanged, while the intensity of the 16 kHz component varied. Preliminary results suggest presenting a combined stimulus can lead to negative phonotaxis. Similarly, the L3 auditory interneuron in response to attractive calls exhibits higher levels of decrement, and responds with less decrement to unattractive calls. We hypothesized that presenting a dual-frequency call will change the decrement levels in the response of the L3. Preliminary results suggest a reduction in L3's decrement can occur in response to a dual-frequency call.

P-28 *Seabird Ecology Team celebrates 13 years of research*
Shandelle Henson[1] and James Hayward[2], [1]Department of Mathematics, [2]Department of Biology

Since 2002 the Seabird Ecology Team has applied cutting edge techniques from mathematics and statistics to problems in behavioral ecology. Many undergraduate and graduate students have been integral to this interdisciplinary work through funding from the National Science Foundation. Currently the Team is studying the effects of climate change on the feeding and reproductive behaviors of colonial seabirds.

P-29 *Diversity and Species Turnover of Late Cenozoic Ground Squirrels in the Meade Basin, KS*
H. Thomas Goodwin, Department of Biology

The Meade Basin of southwestern Kansas preserves one of the richest fossil sequences from the late Cenozoic of North America. An ongoing study has documented a rich record of fossils, especially rodents; established episodes of especially rapid species turnover (when species appear or disappear from the local record); and has attempted to relate these processes to environmental change inferred from stable isotope and other proxies for ancient climate. Here, I report on fossil squirrels from the record. At least 7 genera and 13 species are present in the composite record. Species turnover occurs throughout the record, but an especially high turnover is associated with the transition between the warmer Pliocene and cooler Pleistocene. Documentation of the relationship between inferred paleoenvironmental change, diversity, and species turnover from the fossil record might shed light on plausible consequences of the current episode of anthropogenic environmental change.

P-30 *Characterization of West Indian manatee habitat using side-scan sonar in the Isla de la Juventud, Cuba*
Mindy J. McLarty[1], Daniel Gonzalez-Socoloske[2], Anmari Alvarez-Aleman[3], Jorge Angulo-Valdes[3], Roamsy Volta[3], [1]MS Student, Department of Biology, [2]Department of Biology, [3]Center for Marine Research, University of Havana, Cuba

The West Indian manatee is divided into two subspecies, both listed as endangered. The Antillean subspecies (*Trichechus manatus manatus*) inhabits coastal tropical waters of Latin America and the Caribbean. Effective conservation strategies depend on understanding local habitat use, which is poorly studied in much of its range. Important habitat characteristics for manatees include availability of freshwater and vegetation, lack of strong currents, and shallow water depth. Other aspects of manatee habitat, such as benthic biotic and abiotic features, are more difficult to determine due to low water visibility. Recent studies have demonstrated that these features may be characterized using side-scan sonar. Buena Vista and San Pedro, two areas of manatee use within the Isla de la Juventud, Cuba, were characterized using side-scan sonar. The environmental complexity of both regions was measured by imaging the benthic environment and measuring water depth. Sonar images were ground-truthed visually. Additionally, freshwater sources were mapped. The number and length of creeks and channels was recorded as an indicator of the abundance of sheltered areas. Buena Vista is composed of several large, shallow lagoons, interconnected and with access to the sea by multiple channels. San Pedro is composed of two large, deeper lagoons and several smaller, very shallow lagoons. Compared to Buena Vista, San Pedro had a greater range of depth, more channels and lagoons, and access to freshwater sources. Despite the differences, both of these areas appear to be important to manatees in the region and may provide different resources (e.g. food, shelter).

Chemistry and Biochemistry

P-31 *Characterization and pH dependence stability of non-organically supported silver nanoparticles produced via silver oxide reduction*
Getahun Merga[1] and Noah Chun[2], [1]Department of Chemistry & Biochemistry, [2]Undergraduate Student, Department of Chemistry & Biochemistry

The non-organically supported silver nanoparticles produced via the reduction of silver oxide by hydrogen and acetvlacetone (acac) have unusual stability in aqueous solution. We have previously reported that the negative potential, the hydrophilic surface that is created by the adsorbed hydroxide ions, which resembles an oxide interface, and the low ionic strength of the solution due to the small salt concentrations in this synthetic approach all contribute to the unusual stability of the colloidal suspension.[1] However, their stability with pH variation has not been well documented. In order to use these silver nanoparticles for biological relevance understanding of their suspension stability characteristics at different pH values is crucial. This work is investigating more methods of synthesizing similar naked nanoparticles and their stability as a function of different pH levels.

[1] Redox Catalysis on "Naked" Silver Nanoparticles. Getahun Merga, Robert Wilson, Geoffrey Lynn, Bratoljub H. Milosavljevic, and Dan Meisel; J. Phys. Chem. C, 2007, 111 (33), pp 12220–12226

P-32 *Screening of Ylidene Rhodanines as Effective Metal Detectors*
Kaydra Bailey[1] and Desmond Murray[2], [1]Undergraduate Student, Department of Chemistry & Biochemistry; Building Excellence In Science and Technology, [2]Department of Chemistry & Biochemistry; Founder & Executive Director of Building Excellence in Science and Technology (BEST)

In this phase of our project we are conducting broad screens of previously synthesized ylidene rhodanines to explore their metal sensing capabilities. This communication will discuss our results to date. Our long-term goal is development of liquid crystalline ylidene rhodanines for novel applications in histochemistry. Based on ongoing work in Prof Murray's lab, with undergraduates and high school students, a new 'green' approach has been developed for facile synthesis of ylidene rhodanines. This prior synthesis facilitates exploring new applications for arylidene rhodanines in areas of biomedical and material science. Imaging of metals in human tissue is an important area of biomedical research and technology since metal (especially zinc, iron, and copper) imbalance is increasingly found to be critical in a number of diseases, such as, Alzheimer's, Parkinson's and Wilson's. Our working hypothesis for the development of liquid crystalline arylidene rhodanine dyes and stains is that in addition to the visualization of cells and their organelles afforded by stains, more information about cellular organization, structure and dynamics could be captured.

P-33 *Synthesis of Hybrid Heterocyclic Boronic Acids*

Jemma McLeish[1] and Desmond Murray[2], [1]Graduate? Student, Department of Biology, [2]Department of Chemistry & Biochemistry; Founder & Executive Director of Building Excellence in Science and Technology (BEST)

This phase of our research is focused on synthesizing hybrid heterocyclic boronic acids by covalently attaching boronic acids to heterocycles. Synthesis and application of these compounds is an ongoing research project in Professor Murray's lab over the last few years. The concept of hybrid compounds from a medicinal chemistry perspective involves covalently combining two or more pharmacophores into a single compound. It is part of a new paradigm and growing realization that most diseases are not simple but complex and require a multi-target, multivalent drug approach. Boronic acids were previously not viewed as viable functional groups in medicinal chemistry or for pharmaceuticals. However, with FDA approval of boronic acid containing Velcade in 2003 for multiple myeloma they have become accepted pharmacophores showing a diversity of significant biological activity, such as, anticancer, antiviral and antibacterial. Heterocycles such as rhodanines have also demonstrated a very wide range of biological activity. So, our long-term research goal is to systematically explore the biological activity of hybrid heterocyclic boronic acids. In particular, this project will investigate the antiviral activities of these novel compounds.

P-34 *PAMAM Dendrimer Nanocontainers: A General Chemistry Capstone Laboratory Experiment using Nanomaterials*

Ryan T. Hayes[1], David W. Randall[1], Seth Campbell[2], [1]Department of Chemistry & Biochemistry, [2]Research Assistant, Department of Chemistry & Biochemistry

Nanomaterials, such as dendrimers, are currently being evaluated for new cancer treatments because of their unique size, properties, and reactivities. We have developed a General Chemistry laboratory experiment that utilizes PAMAM dendrimers to entrap chemical cargo and then deliver it via a controlled release reaction similar to novel cancer treatments being explored by researchers. A Generation 2-PAMAM Dendrimer with octyl surface groups (octyl-dendrimer) was used to transfer transition metal ions from an aqueous solution into a non-polar solvent, dichloromethane. The transition metal was then released from the dendrimer structure by lowering the pH of the solvent mixture. Students evaluated the color and location of three different transition metals in water and dichloromethane solvents mixtures with and without the octyl-dendrimer. This experiment provides a capstone activity that highlights a variety of General Chemistry topics along with an introduction to Organic Chemistry. This laboratory experience provides introduction to topics such as organic nanomaterials, dendrimers, transition metals, and metal-ligand interactions while reinforcing concepts relating to solvent polarity, pH, miscibility, density, spectroscopy, solubility, kinetics, and deductive reasoning from experimental observations.

Engineering and Computer Science

P-35 *Mobile application for colorimetric analysis of paper biosensors*

Rodney Lee Summerscales[1], Eui Bin You[2], Hyun J. Kwon[1], [1]Department of Engineering & Computer Science, [2]Undergradaute Student, Department of Engineering & Computer Science

Paper biosensors are a low cost, low tech diagnostic tool. A limitation of biosensors is that the sensor reaction color needs to be interpreted by a trained expert. To make the interpretation biosensors more accessible to untrained individuals, we are developing a mobile app to perform the color analysis using the on-device camera. Photographing and analyzing the biosensor poses challenges. The app may be used in a variety of light scenarios (e.g. inside vs. outside, sunny vs. cloudy, fluorescent lighting vs. incandescent). Different lighting conditions affect the white balance of the image and complicate the sensor analysis. We propose the use of machine learning to train the app to correctly identify positive and negative readings under a variety of lighting conditions. This is a joint project with Dr. Kwon who is developing the paper biosensors.

P-36 *Development of Paper Diagnostics for Biomarkers*

Hyun J. Kwon[1], Heaven Shin[2], Rodney Lee Summerscales[1],[1]Department of Engineering & Computer Science, [2]Undergradaute Student, Department of Biology

Paper based Point-of-Care diagnostics tools are gaining attention due to its easy operation, cheap cost, no need for pumps or skilled technician, and its simplicity. A drop of fluid such as blood or urine can pass through wax printed patterns to a testing zone, where a preloaded antibody can bind to the sample indicating different conditions. The results show up as colors of gold nano-particles (GNP) that can be distinguished by bare eyes. This research is a joint effort with Dr. Summerscales, who develops mobile apps to aid in the detection of colors and communication with the health care center. Migration of fluids and binding reaction were simulated for various designs of micro-channels that are printed on either chromatographic or nitrocellulose papers. The COMSOL Multiphysics was used to develop and simulate the mathematical models for various patterns and optical size of channels. In our initial effort to prove the concept, PSA (Prostate Specific Antigen) biomarker was used to indicate high levels that may be linked to the presence of prostate cancer. The sensor platform is developed for multi biomarkers and for less sample volumes as it can be easily implemented in our combination of lateral and vertical flow patterns, compared to common lateral flow devices that are designed for one type of target.

Mathematics

P-37 *When we grade proofs, do our students understand what we're saying?*
Robert C. Moore[1], Martha Byrne[2], Sarah Hanusch[3], Tim Fukawa-Connelly[4], [1]Department of Mathematics, [2]Department of Mathematics, Earlham College, [3]Department of Mathematics, Texas State University- San Marcos, [4]School of Education, Drexel University

The ability to write clear, correct proofs is a central goal of the curriculum for undergraduate mathematics majors. In an earlier study Moore (under review) investigated the proof-grading practices of four mathematics professors and showed that these professors devote much time and effort to reading students' written proofs and marking the papers with corrections and suggestions for improvement. To learn how students interpret and make use of such feedback, we interviewed eight advanced mathematics undergraduates and asked them to respond to professor comments on three or four written proofs. The participants were asked to interpret and justify each comment and then write a revised version of each proof. Using the theoretical frameworks of communities of practice and legitimate peripheral participation, we analyzed the interviews and written data, compared the students' interpretations of the comments to expert consensus, and identified patterns and commonalities in their responses and actions. A noteworthy finding was that even though students were able to identify and correctly implement the professor's recommended changes, they sometimes misinterpreted the professor's intentions.

P-38 *On the Riemannian submersion invariant*
Yun Myung Oh, Department of Mathematics

For a Riemannian submersion pi: $M^n \to B^b$ with totally geodesic fibers, the submersion invariant was introduced using the integrability tensor of the submersion. B. Y. Chen has provided the inequality on this invariant if the manifold M admits an isometric immersion into a Riemannian manifold M^m. Some of the recent results on this invariant are included with examples. This is a continuation of the work published in 2013.

P-39 *A general non-linear second order system of partial differential equations with homogemeous boundary conditions and applications*
Joon H. Kang, Department of Mathematics

We study mathematical conditions to guarantee the existence of positive solutions to a general non-linear second order system of partial differential equations with homogemeous boundary conditions. This result may apply to illustrate biological conditions under which species of animals residing in the same environment can peacefully coexist forever.

Physics

P-40 *The Search for Gravitational Waves with Advanced LIGO*
Tiffany Summerscales, Department of Physics

The Advanced LIGO detectors began their first observing run on September 18. The upgraded detectors include many improvements that are expected to result in a factor of 10 improvement in sensitivity over the initial detectors. Gravitational wave astronomy should soon be entering a new era..

Additional Abstract

P-41 *Documentation of William Huber, Jr. Collection at The Library of Congress and Its Namesake; Musical Composition Fostering and Efficiency Project*
Kenneth Logan, Department of Music

In June 2015 I travelled to a rural part of British Columbia, Canada for the express purpose of creating music within its highly-conducive environment, an aspect of my AU FRG-sponsored activity. I composed mostly outside, sitting in a pasture with an ebb-and-flow of some 30 alpacas and three horses, often pausing to soak in the inspiring environment and to exercise (including bicycle riding in the pasture). On average, I composed for approximately 55 hours per week for about three weeks. This process was extraordinarily productive (even while mostly done less efficiently with pencil and paper instead of with computer and keyboard), yielding drafts of approximately two dozen new musical works. The major aspect was creating musical drafts for the *There Is* set of four anthems for SAB voices and organ, which have been edited, computer entered, and submitted for publication consideration. Overall, I wrote for several choral combinations (Soprano I/Soprano II/Alto I/Alto II, for example), with some emphasis on texts by Christina Rossetti. Finally, I drafted two organ solo compositions anticipating my participation as organist in the 2015 General Conference Session.

INDEX

The Office of Research & Creative Scholarship would like to thank the many individuals who made this event a success: the session moderators for chairing the oral presentation sessions, Dining Services for the wonderful food, the Office of the Provost for co-sponsoring the event, and Mordekai Ongo and Sarah Burton for their help in organizing and facilitating the event.

NOTES

UPCOMING RESEARCH EVENTS

Fulbright Informational Tuesday Choice
November 3, 2015 11:30 am-12:15 pm
Randall Student Lounge, Buller Hall

The Fulbright Informational Tuesday Choice will introduce student and faculty opportunties offered by the Fulbright Program.

Fall Honors Thesis Symposium
November 19, 2015 4:00-6:00 pm
Buller Hall

The Honors Thesis Symposium is the final presentation of Honors theses by J.N. Andrews Scholars.

Seminary Scholarship Symposium
February 2, 4-5
Seminary

The Seminary Scholarship Symposium is an academic symposium that seeks to foster scholarly dialogue among Seminary faculty and students. The Symposium includes a Recognition Assembly, plenary presentation, and oral and poster presentations by faculty and students on their current research.

Honors Scholars and Undergraduate Research Poster Symposium
February 26, 2016 2:30-4:00 pm
Buller Hall Lobby

Honors Scholars, Undergraduate Research Scholars and undergraduates engaged in mentored research will present their research during this poster symposium.

Michigan Academy of Science, Arts and Letters
March 4, 2016
Saginaw Valley State University

The Michigan Academy of Science, Arts and Letters (MASAL) is a regional professional association that fosters scholarly dialogue through annual conferences and a quarterly journal that includes papers and news about ongoing research at Michigan institutions.

Torah Conference: Exploring the Composition of the Pentateuch
April 3-5, 2016
Seminary

The upcoming conference “Exploring the Composition of the Pentateuch” will feature presentations by scholars such as Richard Averbeck, Daniel Block, Joshua Berman, James Hoffmeier, and Michael LeFebvre besides our own Richard Davidson, Roy Gane, Gerald Klingbeil, and Jiri Moskala on the topic of how to approach the question of the composition of the Pentateuch.

Honors Thesis Symposium
April 7, 2016 1:30-5:30 pm
Buller Hall

The Honors Thesis Symposium is the final presentation of Honors theses by J.N. Andrews Scholars.

Andrews Research Conference: Early Career Researchers and Creative Scholars in the Arts and Humanities
May 4-8, 2016
Buller Hall
www.andrews.edu/research/arc

The Andrews Research Conference is organized by the Office of Research and Creative Scholarship at Andrews University. The purpose of the conference is to provide Adventist graduate students, post-docs and early career faculty with the opportunity to share their research and creative scholarship with one another and with Andrews University.

Support provided by:

Office of Research & Creative Scholarship
Andrews University

Gary W. Burdick, PhD
Associate Dean for Research,
Professor of Physics

Mordekai Ongo, MA, PhD in progress
Research Integrity and Compliance Officer

Sarah Burton, BA, BS, MA
Research Services Specialist

Phone: (269) 471-3042
Email: research@andrews.edu
URL: http://www.andrews.edu/research
Facebook: www.facebook.com/auresearch

Office of the Provost
Andrews University

Andrea Luxton, PhD
Provost

Tracy Humphrey
Executive Assistant to the Provost

Phone: (269) 471-3404
Email: thumphrey@andrews.edu

Below: Michigan Academy of Science, Arts and Letters Poster Session, Howard Performing Arts Center lobby, March 13, 2015. (Photo by IMC)