



*Sixth Annual*

ANDREWS UNIVERSITY

*Celebration of Research & Creative Scholarship*

October 31, 2014 | 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*

# WELCOME

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



This Celebration is in recognition of the importance of research and creative scholarship to academia as well as appreciation of the hard work and accomplishments of faculty and graduate students. Research is part of our faithful witness.

The University serves as a laboratory for research in which researchers, budding and experienced, can experiment with new ideas in new ways. The budding researchers are mentored to test their ideas in the safety of the educational environment and the experienced researchers and scholars refine and enhance their work for consumption in the marketplace. The University also serves as a stage on which to showcase creative scholarship. Universities often enjoy the work of young musicians and artists, before they become widely recognized, as well as the performances and exhibitions of its faculty.

Additionally, the Annual Andrews University Celebration of Research and Creative Scholarship is a venue to 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 Greg Constantine, Roy Gane, and Marcia Kilsby. Constantine has used his talent for storytelling and art to forge new pathways in the art world, with a humorous twist. Gane's groundbreaking work on the sacrificial system in Leviticus has thrust Adventist scholarship into the spheres of Evangelical and critical biblical scholarship. Kilsby's research has led her to organize and conduct workshops all over the world, including North Korea, teaching medical staff how to use laboratory equipment. Gary Burdick, the fourth Horn awardee, presides over this celebration, a fitting role for someone who has done so much for the research environment at Andrews University.

My hope is that this event will inspire scholars-to-be, as well as seasoned scholars, to dig deeper into their studies, not just for the benefit of the university, but for the community and the world around them, and ultimately for the glory and honor of God.

Sincerely,

*Christon Arthur*

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

# SCHEDULE OF EVENTS

12:30-1:30 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

Video Statement – **Marcia Kilsby**, Professor Emerita of Medical Laboratory Sciences

Presentations by recipients of the **2014 Siegfried H. Horn Excellence in Research and Creative Scholarship Award:**

PL-1 **Greg Constantine**, Emeritus Professor of Art  
*Ready 4 Opportunities*

PL-2 **Roy Gane**, Professor of Hebrew Bible & Ancient Near Eastern Languages  
*Didactic Logic and the Authorship of Leviticus*

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

1:30 - 3:00 pm

## **Poster Presentations** (Buller Hallways)

*See pages 11-18 for program abstracts. Refreshments served in the central atrium*

### Humanities & Social Sciences

P-01 Agriculture  
P-02 Archaeology  
P-03 Communication  
P-04-05 English  
P-06 Music  
P-07-10 Library  
P-11-13 Religion  
P-14 Visual Art and Design  
P-15-16 Psychology  
P-17 Community and International Development  
P-18-19 Business

### Health Professions

P-20 Nursing  
P-21-23 Physical Therapy  
P-24 Speech Language Pathology and Audiology

### STEM

P-25-27 Biology  
P-28-30 Chemistry  
P-31-32 Engineering and Computer Science  
P-33 Mathematics  
P-34 Physics

3:00 - 4:00 pm

## **Oral Breakout Sessions** (Buller Classrooms)

*See pages 6-10 for program abstracts.*

Session A Community and International Development (BUL 108)

Session B Biology and Ecology (BUL 149)

Session C Health, Leadership, and Education (BUL150)

Session D Biblical Studies (BUL 250)

Session E Theology and Missiology (BUL251)

Session F Theology and Literature (BUL208)

# ORAL PRESENTATION SCHEDULE

## Session A: Community and International Development BUL108

- 3:00 pm**    **A-1**        Kern Agard and Joel Raveloharimisy, *The Seventh-day Adventist church's response to disasters in the Indian Ocean*
- 3:15 pm**    **A-2**        Alexandra Raney and Joel Raveloharimisy, *The Role of Faith-Based Organizations in Development: ADRA's Contribution*
- 3:30 pm**    **A-3**        Ave Altius and Joel Raveloharimisy, *Factors Contributing to Women's Leadership Roles in Politics: Madagascar*
- 3:45 pm**    **A-4**        Ezra Kenyana and Joel Raveloharimisy, *What are the Factors that make the poor to seek help from Civil Societies over Public Institutions?*

## Session B: Biology and Ecology BUL149

- 3:00 pm**    **B-1**        James L. Hayward, Shandelle M. Henson, Roy E. Jenson, and Robert Cushman, *Rocky story of change: The Pleistocene deposits of Protection Island*
- 3:15 pm**    **B-2**        Shandelle M. Henson and James L. Hayward, *Changing sea surface temperature alters timescale of reproductive synchrony in seabird colony*
- 3:30 pm**    **B-3**        Athena Smith and Robert Zdor, *Combinational effects in weed suppression by deleterious rhizobacteria*
- 3:45 pm**    **B-4**        Alfred Mejia, *Greenhouse Emissions from Tofu Production*

## Session C: Health, Leadership, and Education BUL150

- 3:00 pm**    **C-1**        Lori Maria Walton, Roan Asumbrado, Lindsey Machamer, and Mary Anne Behrens, *Nutrition, exercise type, exercise intensity and stress and predictive relationship with premenstrual symptoms*
- 3:15 pm**    **C-2**        Brenda Markert-Green, *Disenfranchised Grief: The Unwed Widow*
- 3:30 pm**    **C-3**        Ellen Rodrigues, *A System of Discipline: A Review of Classroom Management Models and Strategies*
- 3:45 pm**    **C-4**        Susan M. Taylor, *Climbing the Rope Ladder to Success*

## Session D: Biblical Studies BUL250

- 3:00 pm**    **D-1**        Erhard Gallos, *The Law in James*
- 3:15 pm**    **D-2**        Erick Mendieta, *Typology and Adventist Eschatological Identity: Friend or Foe?*
- 3:30 pm**    **D-3**        Ronald Rojas, *The "Day of the Lord" in Jubilees 3:9: A Textual Analysis in the Light of the Dead Sea Scrolls*
- 3:45 pm**    **D-4**        Sergio L. Silva, *Creation and Covenant: A Hermeneutical Analysis on the Correlation of the Seventh Day and the Biblical Sabbath*

## Session E: Theology and Missiology BUL251

- 3:00 pm**    **E-1**        Glenn Russell, *Open Your Hands: Poverty and Cross-Cultural Youth Missions*
- 3:15 pm**    **E-2**        Adriani Milli Rodrigues, *The priesthood of Christ and the priesthood of all believers: connections between priestly Christology and Ecclesiology*
- 3:30 pm**    **E-3**        Paul Petersen, *The Subordination of the Son and the Submission of Women*

## Session F: Theology and Literature BUL208

- 3:00 pm**    **F-1**        Nicholas P. Miller, *God's Moral Government of Love: The Theological Background of the Civil War*
- 3:15 pm**    **F-2**        L. Monique Pittman, *Heroes, Villains, and Balkans: Intertextual Masculinities in Ralph Fiennes's Coriolanus*

# PLENARY PRESENTATIONS

**PL-1** *Ready 4 Opportunities*

**Greg Constantine, Emeritus Professor of Art**

I have always maintained an attitude of readiness to accept invitations to share my discoveries with the Art World. The sharing (gallery exhibitions) follows the focused accomplishments of creative studio work. Working on ideas in my studio begets other ideas that in turn need to be investigated and developed. It is not really a vicious circle of frenetic activity, but rather a steady dynamic exercise in prioritizing the direction of my work. Having a body of coherent artworks defines readiness to accept opportunities to share (exhibit) them. This is the story of my exhibition and publication life for the last 55 years.

**PL-2** *Didactic Logic and the Authorship of Leviticus*

**Roy Gane, Professor of Hebrew Bible & Ancient Near Eastern Languages**

The presentation summarizes findings from my essay with this title that is to be published in *Current Issues in Priestly and Related Literature: The Legacy of Jacob Milgrom and Beyond* (Resources for Biblical Study series), which I am editing with Ada Taggar-Cohen. The essay opens up a new approach to a biblical book by probing evidence for teaching logic in Leviticus and the implications of this logic for the purpose and authorship of the book. The first part of the essay identifies examples of ten literary relationships that could function as effective didactic strategies. The second part weighs the likelihood of pedagogical authorial intention against the possibility that what appear to be teaching strategies may have resulted secondarily from other literary factors. The third part enters preliminary exploration of the question, “Who was trying to teach what to whom by writing this book?” by pointing out some aspects of the didactic background and foreground of Leviticus. The essay concludes by considering implications of didactic logic for the authorship of the book, which counter the current theory of historical-critical scholarship that Leviticus was composed within a priestly scribal matrix during the Persian period after the Babylonian exile.

# ORAL PRESENTATIONS

## A - Community and International Development

### A-1 *The Seventh-day Adventist church's response to disasters in the Indian Ocean*

Kern Agard<sup>1</sup> and Joel Raveloharimisy, Community and International Development Program, <sup>1</sup>Master's Student

The purpose of this paper is to assess the organizational capacity of the Seventh-day Adventist church in the Indian Ocean to respond to natural emergencies and reach their local constituents, specifically in the islands of Madagascar, Mauritius, Reunion, Comoros, and Seychelles. When it comes to emergencies, churches in rural areas are in a position poised to respond – where it may take up to 72 hours for emergency aid to arrive in these remote, rural areas. These local churches with their large buildings and service-oriented populations, are ideally positioned to respond to the immediate needs of persons during emergencies by properly planning and preparing for such emergencies. We use qualitative research methods to examine the church's current practices in relation to the specific humanitarian principles of competence, co-ordination, effectiveness, and efficiency in response to natural emergencies. We argue that this organization's response to emergencies lacks the necessary capacity, knowledge, and experience, thereby leaving an opportunity to improve its current method. Thus, this research proposes capacity building for church leaders so that they will be better able to respond to emergencies.

### A-2 *The Role of Faith-Based Organizations in Development: ADRA's Contribution*

Alexandra Raney<sup>1</sup> and Joel Raveloharimisy, Community and International Development Program, <sup>1</sup>Master's Student

The purpose of this paper is to assess the role of faith-based organizations (FBOs) in the field of development and humanitarian action using faith-based typologies from the literature. Mixed methods research is used to conduct a case study of the Adventist Development and Relief Agency (ADRA), evaluating its mission, mandate, organizational structure, and activities conducted in more than 125 countries. We argue that ADRA's contribution to the humanitarian field is heavily influenced by its core principles but also by its ability to secure internal and external funding. The paper concludes with recommendations for FBOs as we move toward the post-2015 Sustainable Development Goals, while improving delivery for beneficiaries, and upholding human rights and their core values.

### A-3 *Factors Contributing to Women's Leadership Roles in Politics: Madagascar*

Ave Altius<sup>1</sup> and Joel Raveloharimisy, Community and International Development Program, <sup>1</sup>Master's Student

The purpose of this paper is to explore the reasons behind women's participation in politics, focusing on the case of Madagascar. The particular focus is on leadership roles of women in politics – as heads of state, government and political parties. The research uses qualitative methods to collect data. Among others, three major reasons for women's political participation have been found across the literature: gender quotas; kinship ties to leadership, and societal upheaval and revolution. However, upon examination of the special case of Madagascar, reasons were found that explained women's participation and leadership in politics that were not generally found in the literature. The historical legacy of Madagascar, and women's social and political activism were found to be the guiding forces to women's participation in politics. The findings might have wider implications in explaining women's access to political leadership roles.

### A-4 *What are the Factors that make the poor to seek help from Civil Societies over Public Institutions?*

Ezra Kenyana<sup>1</sup> and Joel Raveloharimisy, Community and International Development Program, <sup>1</sup>Master's Student

The literature suggests that legitimacy, legality, efficiency, effectiveness, and accessibility are key factors that motivate people to seek help from organizations to address their needs. We use these factors to determine why the poor choose civil society institutions over public institutions in Madagascar. We argue that the poor seek help from civil societies instead of public institutions because of the failure of public institutions to be legitimate, legal, efficient, effective, and accessible in comparison to civil society institutions. Data collected from Madagascar is analyzed using mixed research methods. We conclude the paper with a discussion about public institutional reform and capacity building of civil societies.

## B - Biology and Ecology

### B-1 *Rocky story of change: The Pleistocene deposits of Protection Island*

James L. Hayward<sup>1</sup>, Shandelle M. Henson,<sup>2</sup> Roy E. Jenson<sup>3</sup>, and Robert Cushman<sup>4</sup>

<sup>1</sup>Department of Biology, Andrews University, <sup>2</sup>Department of Mathematics, Andrews University, <sup>3</sup>Hart Crowser, Inc., Seattle, <sup>4</sup>Department of Biological Sciences, Walla Walla University

Protection Island, located at the east end of the Strait of Juan de Fuca, is the largest marine bird and mammal breeding site in the state of Washington. Protection Island National Wildlife Refuge was the only such refuge set aside during Ronald Reagan's presidency. Marine birds and mammals are strongly attracted to this island as a result of unique geological features that provide suitable breeding habitat. No detailed study of its geological features has been undertaken or published, however, despite the fact one of the region's best exposures of Pleistocene sediments occurs here. Our research team set out to characterize Protection Island's unique geological features and history. Using standard geological mapping, sampling, palynological, and dating techniques, we are uncovering the island's past. This past includes at least two glacial advances and interglacial periods characterized by extensive peat bed formation and woolly mammoth, giant beaver, and wild horse occupancy. More recently the island was inundated by a shallow marine bay which supported an extensive clam bed. Today, having risen from the sea, Protection Island serves as Washington's premiere breeding site for more than 80,000 marine birds and mammals.

### B-2 *Changing sea surface temperature alters timescale of reproductive synchrony in seabird colony*

Shandelle M. Henson<sup>1</sup> and James L. Hayward,<sup>2</sup> <sup>1</sup>Department of Mathematics, Andrews University, <sup>2</sup>Department of Biology, Andrews University

On a yearly timescale, colonial birds breed approximately synchronously in an annual pulse within a time window set by photoperiod. If a nesting colony is sufficiently dense, higher frequency reproductive oscillations on a daily timescale can form within the annual pulse due to synchronized ovulation cycles. Tight annual pulses do not afford sufficient time for ovulation cycles to synchronize. Data from a colony of Glaucous-winged Gulls support the hypothesis that the degree of yearly synchrony is inversely related to the degree of ovulation synchrony. Yearly synchrony may be advantageous due to predator satiation (Fraser Darling effect); similarly, ovulation synchrony may be advantageous due to cannibal satiation during El Nino years with high cannibalism rates. This suggests a tradeoff between strategies of synchronous reproduction on two timescales.

### B-3 *Combinational effects in weed suppression by deleterious rhizobacteria*

Athena Smith<sup>1</sup> and Robert Zdor, Department of Biology, <sup>1</sup>Undergraduate Student

The ability of weed deleterious rhizobacteria to reduce plant growth is dependent on the production of bacterial factors such as cyanide and plant hormones. Bacteria utilize amino acids to produce these factors: tryptophan for indole acetic acid production and glycine for cyanide production. The goal of this project is to manipulate rhizosphere conditions to favor the action of rhizobacteria in suppressing weeds. This work will test for the effect of combined strains in the presence of various amino acid amendments on velvetleaf growth in soil. Specifically a cyanogenic strain *Pseudomonas putida* (ATH-1RI/9) will be combined with *Rhizobium rubi* AT3-4RS/6 (which produces an IAA-like compound). The goal is to assess if combinations of bacteria (with & without amino acids) perform better in reducing weed growth than the use of single bacterial strains.

### B-4 *Greenhouse Emissions from Tofu Production*

Alfred Mejia<sup>1</sup>, K. Jaceldo<sup>2</sup>, J. Sabaté<sup>2</sup>, H. Harwatt<sup>2</sup>, Soret Samuel<sup>3</sup>, K. Sranacharoenpong<sup>2</sup>

<sup>1</sup>Department of Public Health, Nutrition and Wellness, Andrews University, <sup>2</sup>Department of Nutrition, Healthy Lifestyle, and Disease Prevention, Loma Linda University, <sup>3</sup>Department of Community Resilience, Loma Linda University

**Background:** Tofu is perceived as healthy and ecofriendly protein-rich food, but little is known about the carbon footprint generated by this soy product. **Objectives:** The purpose of this study was to evaluate the emissions of greenhouse gases (GHG) generated by the production of tofu. **Methods:** We performed a life cycle assessment (LCA) to calculate the greenhouse gases emissions (GHG) generated by tofu using SimaPro 7. Our LCA calculations include materials and energy inputs required to produce tofu: whole soybeans, water, electricity, natural gas, transportation and packaging materials. The functional unit: 1 kg of tofu. The boundary is from cradle to factory gate. **Results:** The total GHG emissions per one kilogram of tofu produced are 893 g of CO<sub>2</sub>eq. Monte Carlo simulations shows that the CO<sub>2</sub>eq estimation is robust. The GHG emissions are mainly generated by whole soybeans (50%), natural gas (27%), packaging (13%), transportation (6%) and electricity (4%). **Conclusion:** Tofu is a protein rich food that generates relatively low GHG emissions when compared to protein-rich animal foods. Tofu generates 22 to 34 times less greenhouse gas emissions than beef products. Thus, tofu is a suitable food to consume by people who intend to reduce their carbon footprint by dietary choices.

## C - Health, Leadership, and Education

- C-1** *Nutrition, exercise type, exercise intensity and stress and predictive relationship with premenstrual symptoms*  
Lori Maria Walton, Roan Asumbrado<sup>1</sup>, Lindsey Machamer<sup>1</sup>, and Mary Anne Behrens,<sup>1</sup> Department of Physical Therapy,  
<sup>1</sup>Graduate Student

**Purpose:** The purpose of this study was to determine if there was a predictive relationship between (1) exercise type and intensity on the Veteran Specific Activity Questionnaire(VSAQ), (2) nutrition, measured by the Rapid Eating Assessment for Patients (REAP), (3) stress (VAS) and premenstrual symptoms (PMS) as measured by the PSST (Premenstrual Symptoms Screening Tool). **Methods:** This was a prospective correlation study of seventy-six females (n=76), with active menstruation history. Each subject who volunteered to be in the study and signed a written consent prior to participation, completed VSAQ, REAP, VAS, and a health questionnaire. **Results:** Multiple linear regression found a significant, but weak, predictive relationship between stress and diagnostic PMS symptoms on the PSST ( $r = .466$ ,  $df=75$ ,  $p= .027$ ). Exercise type, exercise intensity (VSAQ) and nutrition (REAP) did not show a significant predictive relationship with the symptoms of PMS. However, ninety-eight percent (98.7%) of subjects reported one or more symptoms of PMS. **Discussion:** This study found a high incidence of PMS and a positive predictive relationship between stress and PMS. However, no significant relationship between exercise intensity, type, and nutrition and PMS was found. Future research should focus on the role of stress in premenstrual symptoms.

- C-2** *Disenfranchised Grief: The Unwed Widow*  
Brenda Markert-Green, DMFT, Department of School Psychology and Counseling, La Sierra University and Graduate Student in the Department of Graduate Psychology and Counseling, Andrews University

Disenfranchised loss has been described as a loss that is unrecognized by society, with those suffering from it prevented from grieving through acceptable and societally sanctioned ways. This needs assessment examined the effects of losing an unmarried partner to death, and whether the surviving individual suffered from disenfranchisement due to their non-marital status. The purpose in examining unmarried partnership lay in the lack of research in the field on how partners deal with loss and mourning when that loss lies outside of the parameters of what is societally considered a significant loss. Individual interviews were utilized with phenomenology as the methodological framework employed in order to ensure that the foundation of the research was based on the direct experiences of unmarried individuals whose partner has died, and to allow for the assessment of the needs of this population of grievers. The assumptions of this study were that individuals who experience the premarital loss of a partner suffer from disenfranchised loss, and that they are prevented from mourning in ways that are societally recognized and sanctioned. It was the assumption of this researcher that the surviving ex-partner would have unique needs associated with this loss, and that the grief and mourning process would not follow the same path as the path for an individual for whom society recognizes the loss as significant and needing to be mourned. The final assumption of this researcher was that those responding to the advertisement for participants in this study would include individuals for whom the loss has either not been supported, and/or who have not resolved their loss in accordance with societal expectations. The results of the research verified this population to be disenfranchised in their grief process, and identified three subpopulations: *The Relieved*, *The Unreceptive*, and *The Unacknowledged*. The results of this research provides for the creation of treatment programs specific to the needs of those who experience disenfranchisement in the grief recovery process.

- C-3** *A System of Discipline: A Review of Classroom Management Models and Strategies*  
Ellen Rodrigues, PhD candidate, Department of Teaching, Learning & Curriculum

An orderly classroom environment where teachers have the ability to manage and discipline students to engage cooperatively maximizes academic achievement. Teachers' inability to manage disruptive behaviors is a source of frustration and an obstacle for their maintenance in the profession. Consequently, a systematic and intentional approach, along with careful orchestrated mechanisms must be built to provide ways to deal with unwanted behavioral problems in the classroom. The present paper pursues to review some of the most known models and strategies of classroom management showing how the literature currently has perceived them. The study explores the following models: Assertive Discipline, Model Logic Consequences, Discipline with Dignity, Positive Behavior Support Approach, and the Behavioral Education Program. The literature also proposes procedures and strategies for managing behaviors in the classroom, where classroom rules, praise, and planned ignoring are analyzed.

- C-4** *Climbing the Rope Ladder to Success*  
Susan M. Taylor, School of Business

Some women, once they have reached the top of the corporate ladder and have secured that coveted corner office, are willing to help other women on their climb. This is the "sisterhood" people often talk about. However, there are other women who will sabotage their "sisters" by pulling up that rope ladder, thus preventing their climb. This type of bullying is prevalent in the workplace. Women are targeted at a higher rate by female bullies (71%) than by male bullies (46%). Women tend to be crueler to other women. This workplace problem persists because there are few anti-bullying ethics and laws in practice. But, it goes deeper than that, not only do managers unwittingly encourage bullying, but women are socialized to bully other women. There is only one effective way to deal with workplace women on women bullying: treat it like a business problem.



## D - Biblical Studies

### D-1 *The Law in James*

Erhard Gallos, Department of Religion and Biblical Languages

In James 1:25 and 2:12 the author of the Epistle talks about the law as “the law of freedom” or as most translators put it “the law of liberty” (“But one who looks intently at the perfect law, the law of liberty, and abides by it, not having become a forgetful hearer but an effectual doer, this man shall be blessed in what he does.” [1: 15] “So speak and so act, as those who are to be judged by the law of liberty.” [2: 12]). While in James 2:12 the law is described as “the royal law” (“If, however, you are fulfilling the royal law, according to the Scripture, ‘You shall love your neighbor as yourself,’ you are doing well.”). Thus far, James has described the law as “perfect law” (1 :25), “kingly law” (2:8), and “law of freedom” (2: 12). Has he done this because there are three different laws he refers to? What is the function of the adjective “royal” in the phrase “royal law” or the adjective perfect in the phrase “perfect law?” Does the term law need to be understood from the background of the Old Testament, Stoicism, Hellenistic Judaism, or early Christianity itself?

### D-2 *Typology and Adventist Eschatological Identity: Friend or Foe?*

Erick Mendieta, PhD Student, Department of Old Testament

For Seventh-day Adventists, the significance of typology is not only a matter of historical research. Davidson has rightly argued that “the historic Adventist interpretation of the sanctuary...stands or falls depending upon the validity of its hermeneutic method.” This study has tried to show that typology in Adventism has proven to be a defining force in our theology, our thinking and even, at times, our practices. Since its first appearing in early Adventism, typology has provided assistance to our understanding of Scripture, but also has been the source of much misunderstanding. The need to explore its nature, characteristics, and application has been an ongoing concern for Adventism and it must continue to be so.

### D-3 *The “Day of the Lord” in Jubilees 3:9: A Textual Analysis in the Light of the Dead Sea Scrolls*

Ronald Rojas, PhD Student, Department of Old Testament

According to the book of Jubilees, on the eighth day of the creation of the world, God commanded Adam not to eat from the Tree of Knowledge of good and evil. This eighth day is identified as the “day of the Lord”(Jub 3:9). While there is no doubt among the scholars that the eighth day (Sunday) was considered the “day of the Lord” among the Christians, the available evidences only go back to the second century A.D. Since the book of Jubilees was written in the second century B.C., that is, before the birth of Christianity, Jub 3:9 has the earliest occurrence of the phrase “day of the Lord.” Consequently, it represents a challenge to those who still held that the reference to the “day of the Lord” as Sunday comes very late into Christianity. However, a comparison of the Greek, Hebrew, and Ethiopic version of the book of Jubilees suggests that the phrase “the day of the Lord” in the Greek version is a Christian gloss rather than part of the original text.

### D-4 *Creation and Covenant: A Hermeneutical Analysis on the Correlation of the Seventh Day and the Biblical Sabbath*

Sergio L. Silva, PhD Candidate, Department of Theology and Christian Philosophy

This paper is an attempt to engage new covenant Christian into a dialogue about the theological foundation of the Sabbath. In particular, it addresses the claim that the Sabbath in the Decalogue is not theologically founded in the seventh day of the creation week, and that its observance is only required from the people of Israel. Using an interdisciplinary approach, this research evaluates the legitimacy of these claims in light of the biblical metanarrative. The aftermath of this research might impact the way Seventh-day Adventists and other Evangelicals interpret the Sabbath of the Decalogue.

## E - Theology and Missiology

### E-1 *Open Your Hands: Poverty and Cross-Cultural Youth Missions*

Glenn Russell, Department of Religion & Biblical Languages

Responding to poverty is an issue of proximity and attention. The poor get our attention when we are so close we can't avoid them. Cross-cultural mission trips expose youth to the harsh realities of poverty for the first time. Over 50% of the world's population lives on less than \$2.50 a day. Most mission participants come from middle class backgrounds. Research documents how mission trip participants wrestle with practical and existential questions: What does the Bible say about the poor? How can we help without hurting? This presentation addresses the challenges and growth opportunities when mission trip participants minister to the poverty. The presentation also presents essential biblical and missiological principles to assist cross-cultural teams encountering poverty.

## **E - Theology and Missiology (continued)**

- E-2**    *The priesthood of Christ and the priesthood of all believers: connections between priestly Christology and Ecclesiology*  
Adriani Milli Rodrigues, PhD Candidate, Department of Theology and Christian Philosophy

The idea that the priesthood of all believers derives from the priesthood of Christ is affirmed by Catholic and Protestant theologians, even though they tend to understand the Christological priesthood and the ecclesiological priesthood in different ways. Essentially, this idea implies that Christology is foundational for ecclesiology, particularly from the perspective of the priestly work of Christ. The purpose of this paper is to analyze the connection between the priesthood of all believers and the priesthood of Christ as proposed by Martin Luther, John Calvin, and Gerald O'Collins. This analysis takes into account their notion of the priesthood of Christ, their understanding of the priesthood of all believers, and how they articulate the connection between the priesthood of Christ and the priesthood of all believers. Particular attention is given to their use of biblical data to support this connection. The main thesis of this study is that the affirmation of a relationship between the priesthood of all believers and the priesthood of Christ is theologically legitimate. However, the proposals analyzed in this paper reveal the need of a more sustained study of the biblical data for a proper definition of the nature of that relationship.

- E-3**    *The Subordination of the Son and the Submission of Women*  
Paul Petersen, Department of Religion & Biblical Languages

In the last decade part of the discussion of the Trinity the doctrine of the Trinity by way of the social analogy has been applied to the relationship between male and female particularly in marriage and church. The presentation summarizes the discussion in both the Anglican Church in Australia and among evangelicals in US. It will illustrate the issue by references to recent Adventist examples, and it will provide a biblical and theological assessment.

## **F - Theology and Literature**

- F-1**    *God's Moral Government of Love: The Theological Background of the Civil War*  
Nicholas P. Miller, Department of Church History

The role of religion in the lead up to the U.S. Civil War is a contested topic, with many pointing to a secularized rights movement is being the primary motive for abolition. But this paper will show that the "arminianization" of American theology that led to the Second Great Awakening was not primarily a result of the secular enlightenment, but rather was largely a Biblically-conservative development flowing from roots deep within the Protestant theological heritage, going back to Arminius, and even earlier. Rather than a failure of Evangelical thought, as proposed by some, the Civil War represents the culmination of the moral teaching of this tradition. Rare is it in the history of the world where a nation has undertaken the sacrifice and suffering of a major war over the question of the moral treatment of an internal minority. But conceptions of God as a moral governor, who sits in judgment on the moral behavior of both people and nations, helped provide the popular impetus to support an extend a costly war effort in pursuit of a moral cause.

- F-2**    *Heroes, Villains, and Balkans: Intertextual Masculinities in Ralph Fiennes's Coriolanus*  
L. Monique Pittman, Department of English

Filmed Shakespeare often reinvents the poet's drama by appropriating popular representational devices. One technique, intertextual referencing by means of casting or setting selection, provides a crucial but ontologically unstable means by which the adaptor of Shakespeare heightens relevance and increases appeal. Ralph Fiennes's 2011 adaptation of *Coriolanus* (1607/08) instantiates the vexed layers of association generated by means of such intertextuality. By casting himself as the titular general and Gerard Butler as his nemesis Aufidius, Fiennes shorthands filmic intertexts—the Harry Potter oeuvre and 300—that shape a viewer's access to the Roman play. On the one hand, these intertexts access film idiom to expose mythologies of masculinity grounded in violence as self-defining and self-annihilating. However, complicating the movie's critique of masculine identity is Fiennes's choice to film in Serbia and Montenegro as well as to utilize found news footage from the 1990s Yugoslav Wars. Fiennes's recontextualization of the Roman-Volsce conflict accesses a raft of stereotypes of the Balkan male as violent and uncontrollable that yoke an entire European region to the patterns of self-destruction manifested by Coriolanus and Aufidius. Thus, Fiennes's filmic and historical intertexts inadvertently impress the seal of Shakespearean approval on dubious European stereotypes of the Balkan Other.

# POSTER PRESENTATIONS

## Agriculture

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

The 2014 Research Poster will chronicle the work that our research team has been doing in relation to studying 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. Plans for an Agricultural Education Heritage Center have been designed and a narrative of educational exhibits underway to orient hundreds of schoolchildren to Jordan's plight, bringing a strong sense of conservation to 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.

## Archaeology

- P-02** *2014 Excavation Season at San Miceli: Exploring Early Christianity in Rural Roman Sicily*  
Shellie Berglin and Christopher Chadwick, PhD Students, Institute of Archaeology

The 2014 season at San Miceli, an ancient Roman/Byzantine settlement near the modern town of Salemi, was excavated with the purpose of better understanding the emergence of Christianity in western Sicily. Previous excavations at this site, the first in 1893 by Antonio Salinas, provided a tantalizing glimpse into the early centuries of the Christian era. The site includes a partially (not stratigraphically) excavated basilica that some date as early as the 4th century CE, and which continued in use until it was destroyed sometime around the 6th century. This basilica was established within the confines of what appears to be a Roman/Byzantine village that surface sherding indicates may go back as early as the 2nd century. The Andrews University project at San Miceli seeks to better understand both the establishment and socio-cultural development of this early Roman village, as well as the later emergence of Christianity within the context of a rural Roman town. In pursuit of these goals two fields were opened during the 2014 season: Field A was opened in order to expose the Roman/Byzantine village to the south of the basilica; Field B, the basilica itself, was opened with the hope of dating the structure and developing a better stratigraphic understanding of the basilica and its history. This poster will describe this initial season's excavation and its results.

## Communication

- P-03** *A Unique Approach to Doing Autoethnography*  
Rachel Williams-Smith, Department of Communication

The autoethnography-based dissertation, *Adaptation and Beyond: From Isolation and Separation Toward Broader Cultural Inclusion and Integration*, examines the unique challenges of adaptation from an isolated religious subculture to the broader social and cultural milieu. Systematic introspection and emotional recall captured relived experiences. Interviews with acquaintances provided objective perspectives on intensely subjective experiences. Interviews with me, conducted by others, yielded rich, otherwise unavailable insights. Reviews of a substantial personal journal collection provided objective accounts of remembered experiences. These four techniques together lend an increased authenticity and degree of objectivity to a research approach that is highly subjective in nature.

## English

- P-04** *From the Academy to the Airwaves: Essaying with National Public Radio's "Listener Commentary" Community at WVPE-FM 88.1 Elkhart, IN*  
Beverly Matiko, Department of English and Department of Communication

As a twenty-two-year resident of the United States, I have found myself drawn to the spaces that National Public Radio makes for the genre that is the subject of my doctoral dissertation and much of my teaching—the essay. Six months ago, I decided to take my expertise from the academy to the airwaves by embarking on a creative research project that involves interrogating my own experience for subject matter. I resolved to act on a belief that I share with nonfiction prose writer Annie Dillard: “What a marvel it [is] that so many times a day the world, like a church bell, remind[s] me to recall and contemplate the durable fact that I [am] here ...” (*An American Childhood* 17). To date, three of my essays—“Levi,” “Summertime and the Livin’ is Easily Misunderstood,” and “With a Birthday Bee in my Bonnet”—have been written, recorded, and broadcasted; a fourth, “Oak à la Home” is pending.

**P-05** *Error gravity in a nonnative English speaker's speech: The case of article errors and pluralizing non-count nouns*  
Eun-Young Julia Kim, Department of English

An empirical study was conducted to investigate the effect of article errors and pluralizing non-count nouns on the listeners' comprehension and perceptions of nonnative English speakers' speech by comparing the listeners' responses in two different conditions: first, when the nonnative speech is grammatically accurate but marked for a noticeable foreign accent; second, when the nonnative speech displays both a noticeable foreign accent and common nonnative speakers' grammatical errors in article usage and pluralizing non-count nouns such as 'advice' and 'information.' The study analyzed the comprehension and perceptions of 104 U.S. college students, who listened to Korean, Russian, and Chinese speakers and answered questions that measured their comprehension and perceptions. The results showed that there were no statistically significant differences in the adjusted means between error groups and no error groups in comprehension and any of the perception items. Additionally, there were no statistically significant interactions between language groups and error groups in comprehension and perception items. This study has also confirmed the well-established notion that listeners tend to respond to the pronunciation. However, the strength of a speaker's accent affected only certain aspects of how the listeners perceived them, but not enough to make a difference in comprehension.

## **Music**

**P-06** *Musical Composition Fostering Project*  
Kenneth Logan, Department of Music

This past summer 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 35 alpacas, three horses and occasional dogs, often stopping to soak in the inspiring environment, to photograph in nature, and to exercise (including bicycle riding in the pasture). On average, I composed for approximately 40 hours per week, for about one month. 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 a dozen new musical works. The major aspect was creating compressed-score drafts ("short scores") for most of a four-movement concert band suite concerning Adventist history in Battle Creek, Michigan—publishing, college, tabernacle and cemetery. I am planning to complete this by 2015, the centennial of Ellen G. White's death. Other drafts involved vocal, congregational or choral music including texts by George Herbert, Christina Rossetti and Christopher Smart.

## **Library**

**P-07** *Why Go to the Library? Pedagogical Reflections*  
Terry Dwain Robertson, James White Library

This poster illustrates three pedagogical functions achieved through the competent use of library resources: 1. Memory — testimony about times, places, events and people not accessible through first-hand perception. 2. Mentoring — knowledgeable experts share what they know so novices can form expertise as well. 3. Discipleship — novice learners are invited to follow along as experts debate and work together on open problems. Implications: Library assignments would benefit from a more intentional framing of how the particular assignment fits into this memory/mentoring/discipleship paradigm. Key questions: Students: Why are you reading this particular source? Is it to acquire standard factual knowledge, or to learn from the wisdom of a mentor, or to engage with experts tackling a challenging problem? Professors: What are you expecting your students to experience as they access particular sources? Are you expecting them to become familiar with the status quo, or to think through a significant theme with the guidance of a mentor, or might it be to gain the cognitive and rhetorical skills that may contribute to a scholarly conversation?

**P-08** *What Students Really Want: Library as Place at Andrews University*  
Silas Bruscaquin Marques, James White Library

Although there is abundant information available remotely, higher education students and teachers still seek the campus library to meet many of their teaching, research, and learning needs. The usefulness of the spaces provided is directly dependent on the match between these spaces and the learning and teaching styles students and teachers engage in today. Thus, the purpose of this study was to identify what types of spaces students really want in order to better accomplish their academic requirements and learning needs. The data was collected through several ethnographic techniques, such as focus groups, design charrettes, and image analogy. Information from students reading, studying, or using their laptops and computers in other places in the university was also gathered with the main objective of identifying the reasons they prefer or choose to be there and not in the library. The findings was supplemented by an actual field survey so the participants could identify special priorities. Main results: 138 students participated in the design charrettes. Most students preferred individual study areas. 63% of the students were using individual carrels or computer stations. In average, students greatly value silence. 75% of the students indicate that they didn't use more the library due to distance, and 50% because they preferred open spaces.

**P-09** *Adventist Librarianship: Worth Writing About*  
Lauren Matacio and Terry Dwain Robertson, James White Library

A Festschrift-style publication would provide a venue for SDA librarians to publish research and develop a body of professional literature that addresses the needs of SDA libraries and librarians. It is proposed because it does not involve specific time deadlines and allows for short-term commitments for editorial leadership.

**P-10** *Faith and Simplicity of Life and Praxis of Ancient Apostolic People: Early Inhabitants of Alpes Cottiae*  
Kathleen M. Demsky, James White Library and School of Architecture, Art & Design

There is a place of majestic grandeur in the northern Alps of Italy, once known as Alpa Cottiae, which few travelers to Europe discover. Nestled in these Alps lay the Piedmont valleys, home of Waldensian Christians. For a thousand years these witnesses to the truth found refuge in seclusion and obscurity in these dense alpine valleys. The name “Waldenses” is derived from Vallis Densa, meaning a dreary or dark, deep valley. These ancient peoples sacrificed all worldly honor and material goods to dwell in peace, practicing the pure faith of the Apostles with a patience and constancy that was an honor to their Creator and Redeemer. History relates that these ancient believers occupied these valleys from the ancient times to avoid the persecution inflicted on them by the Romans. The Scriptures were central to the Waldensians’ lives of faith. Men, women, and children committed large passages of Scripture to memory. They were not content to keep the truth found in Scripture to themselves. Acting as troubadours, Physicians, and merchants they went as missionaries to many parts of the world far removed from their native valleys. Wherever they found hearts open to the gospel they shared their faith at the risk of persecution and death notwithstanding the crusades against them, and the inhumane butchery to which they were subjected. They were hunted to death: yet their blood watered the seeds of the Reformation.

## Religion

**P-11** *Millennial Young Adults and their responses to the Seventh-day Adventist Creation Fundamental*  
Leanne M. Sigvartsen<sup>1</sup>, Jan A. Sigvartsen<sup>2</sup>, and Paul B. Petersen,<sup>3</sup>PhD Student, Avondale College (Deferred),<sup>2</sup>PhD Student, Department of Old Testament, <sup>3</sup>Department of Religion & Biblical Languages

The Beyond Beliefs study undertaken by ClergyEd.com and the Religion and Biblical Languages Department at Andrews University investigated responses to the Seventh-day Adventist Creation fundamental with a sample 679 Millennial young adults. This component of the Beyond Beliefs study asked participants to select a statement that best described their belief regarding the origin of the world; to identify how strongly they felt about this belief; and if they would be bothered if life on earth came about differently or on a different time scale than what they currently believed. The findings suggest that Seventh-day Adventist Millennial young adults hold varying views relating to the origin of the world; that they claim they feel very strongly about these beliefs; however, if life on earth came about differently or on a different time scale than what they currently believe, most would not lose their faith.

**P-12** *Millennial Young Adults and their responses to the Ordination of Women within the Seventh-day Adventist Church*  
Leanne M. Sigvartsen<sup>1</sup>, Jan A. Sigvartsen<sup>2</sup>, and Paul B. Petersen,<sup>3</sup>PhD Student, Avondale College (Deferred),<sup>2</sup>PhD Student, Department of Old Testament, <sup>3</sup>Department of Religion & Biblical Languages

The Beyond Beliefs study undertaken by ClergyEd.com and the Religion and Biblical Languages Department at Andrews University investigated responses to the ordination of women clergy within the Seventh-day Adventist Church with a sample 679 Millennial young adults, approximately a third of which were born outside of the United States. This component of the Beyond Beliefs study asked if Millennial young adults agreed or disagreed with the ordination of women clergy, if the decision to ordain would positively or negatively influence their perception of the Seventh-day Adventist Church, and if the decision to not ordain would positively or negatively influence their perception. Participants were also asked if they identified with conservative or liberal ideologies and if they would withhold tithe if the corporate church organization endorsed inequality in hiring practices with regard to female ministers/corporate leaders. While Millennial young adults (18-32 years) largely support the idea of women being ordained to ministry and many would have a positive to very positive response to this action, it would seem the decision to not ordain women, for many, would not be a deal breaker when it comes to their perception of the Seventh-day Adventist church and their willingness to support this church financially.

**P-13** *Projections and prophecies - the 2010 Brazilian Census and SDA Eschatology*  
Rodrigo de Galiza Barbosa, PhD Student, Department of Church History

My work evaluates from an Adventist prophetic perspective the religious tendencies of Brazil based on the last Census (2010). Brazil is one of the largest Catholic and Adventist country in the world which creates an interesting religious landscape. The numbers shows that Catholics are decreasing in number speedily while Protestants are rising. Since SDA prophetic interpretation suggests a Catholic “dominion” in the end times, does the numbers of the Brazilian Census contradicts this interpretation? I point why this is not so based on Canale’s historiography applied to prophetic interpretation. My suggestion is that when the CENSUS is carefully analyzed its tendencies may fit with the SDA prophetic understanding.

## Visual Art and Design

### P-14 *Proximity*

Kari Friestad, Department of Visual Art and Design

This series focuses on the experience, effects and phenomena of social networking. A progressively common aspect of this feature of modern culture is disconnection from the immediate social environment, facilitated by a total absorption in the ubiquitous online connection. Within a society dominated by a frenzied image-saturated culture, personal identity is now aligned with an online persona. We are defined, debatably in narrow terms, through the vehicle of the online profile, available on a huge range of available networks, gaming pages, work sites, personal websites, dating sites, blogs and more-- by our comments, our likes and dislikes, what we eat, who we vote for, how we look, what music we like, what we believe, and our vacations. We manufacture our virtual identity, however deliberately, through images and the increasingly reflexive “status update,” similar to the image crafted by celebrities and public figures. The digital world redefines the rules of boundaries, communication styles, personalities, and personal identity. These paintings juxtapose a singular figure within a solitary, undefined space, with the individual preoccupied by a glowing technical device. The progress in the last year with this project included exploring various dominant trends of online culture, such as the “selfie”, hashtags, and the “like” system of Facebook. One of my paintings from this series was shown in the 12th Michiana Annual Art Competition, where it won Best Painting. I also had the opportunity to show five of the paintings in an exhibition at Open Concept Gallery in Grand Rapids.

## Psychology

### P-15 *Exploring religiosity and domestic violence beliefs of Hispanic, Adventist women in the Lake Union Conference*

Melissa Ponce-Rodas, Department of Behavioral Sciences

In the domestic violence (DV) literature, few studies have explored perceptions of domestic violence among Hispanic or religious groups. Therefore, there is little empirical evidence to inform prevention and intervention programs targeted for these groups. The current study worked with Hispanic, Adventist women in order to begin understanding how these “cultures” intersect and impact their beliefs about which acts constitute domestic violence and their perceived acceptability of secular and church related resources for DV victims. Attendance at Adventist Youth Society, small groups, and church socials were positively related to endorsing broader definitions of what constitutes domestic violence in this sample. Attendance at local women’s ministry meetings was positively correlated with perceptions of acceptability of church related helping resources, whereas attendance at biennial Lake Union Conference women’s retreats was positively correlated with greater acceptability of secular helping resources for victims. Implications of these results and their potential usefulness in church-based programs will be discussed.

### P-16 *Kindergarten Children’s Number Comparison Skills Predict Later Math Scores: Evidence From a Two-minute Test*

Nadia Nosworthy<sup>1</sup>, Samuel Zheng<sup>2</sup>, and Daniel Ansari<sup>3</sup>, <sup>1</sup>Department of Graduate Psychology and Counseling, Andrews University, <sup>2</sup>Toronto District School Board, <sup>3</sup>University of Western Ontario

Children’s ability to compare symbolic (e.g., Arabic numerals) and nonsymbolic (e.g., dot arrays) numerical magnitudes has been found to correlate with their math achievement. Most research, however, has focused on computerized paradigms, which may not always be suitable for quick application in classrooms. Consequently, we designed a two-minute paper-and-pencil assessment to measure kindergarten children’s ability to compare symbolic and nonsymbolic numerical magnitudes and assessed the degree to which performance on this measure explains individual differences in achievement. Children were required to cross out the larger of two, single-digit numerical magnitudes. Results from 250 kindergartners revealed that symbolic and nonsymbolic number comparison accuracy scores correlated with individual differences in arithmetic achievement. Results also demonstrated that participants’ scores on the paper-and-pencil test in kindergarten was a significant predictor of math performance in a later grade. These findings suggest the important role of symbolic and nonsymbolic processing in children’s higher-level math abilities and the importance of assessing this very basic skill in children, highlighting the potential of this tool for the assessment of early, foundational numerical abilities.

## Community and International Development

### P-17 *The Relationship between the Values of Social Science and the Values of Seventh-day Adventist (SDA) Philosophy of Education*

Joel L. Raveloharimisy and Peter Injae Son<sup>1</sup>, Community and International Development Program, <sup>1</sup>Master’s Student

This paper analyzes the relationship between the values found in religion and social sciences using the Seventh-day Adventist (SDA) graduate programs as a case study. By using mixed methods research, the study identifies and compares social science values and the values of SDA education philosophy, and analyzes various graduate social science programs in the SDA higher education system. We argue that the SDA philosophy of education puts greater emphasis on relationship values, which have three interconnected dimensions (God, self, and others) and is unified by three virtues (love, hope, and service). Applying the dimensions of SDA philosophy of education to the social science programs currently offered in the SDA graduate institutions, we found that the values in SDA beliefs espouse social science values. The conclusion of the paper discusses the relationships between social science disciplines and the dimensions of SDA philosophy of education, and the implications of those relationships in development.

## Business

### P-18 *2013-2014 Publications* School of Business Administration

During the past year, the faculty of the Andrews University School of Business Administration published twenty-three different articles and conducted twenty-two presentations across the United States, Asia, and South America. These research topics spanned the fields of auditing, marketing, finance, management, economics, and Christian business leadership and were published in respected academic journals such as: Applied Financial Economics, International Journal of Commerce and Management, and Christian Business Academy Review. Through our research we continue to emphasize excellence in teaching our disciplines, and, ultimately, challenging students to search for knowledge illumined by Christian insight in preparation for service to the world.

### P-19 *Perceived Executive Leader's Integrity in Terms of Servant and Ethical Leadership on Job Burnout among Christian Healthcare Service Providers - Test of a Structural Equation Model* Jerry Chi<sup>1</sup> and Grace Chi<sup>2</sup>, <sup>1</sup>School of Business Administration, <sup>2</sup>Department of Nursing

Integrity is a key component in the definition of servant and ethical leadership, and honesty, authenticity, sincerity, respect and righteousness are major virtues and descriptors that make up this leadership integrity. Many leadership studies indicate that the lack of integrity from a leader, as well as the perception of the lack thereof, will exhaust the employees' exhilaration, degrade their physical and psychological health, and lead to frustration, fatigue and anxiety. For human service professions, this has become an occupational hazard for human service professions and is regarded as the last straw for workers, causing people to burnout and quit their jobs. 325 Full-time employees of the Metroplex Adventist Hospital were surveyed. Structural Equation Model (SEM) analysis showed that a leader's integrity offers two virtues: perceived positive integrity behavior and perceived negative integrity behavior, both of which significantly correlated with job burnout in terms of emotional exhaustion, depersonalization, and personal accomplishment. Excluding ethnic backgrounds, some of the most significant demographic variables to determine a leader's integrity and job burnout include Years of Service, gender and age. Employees with income below \$29,999, have 1-5 years of service, who are Asian, and are of female gender have experienced the highest score of job burnout and perceived highest score of negative integrity behavior (NIB) and lowest score of perceived positive integrity behavior (IB).

## Nursing

### P-20 *The impact of servant leadership on job burnout among Adventist healthcare nurses* Grace Chi<sup>1</sup> and Jerry Chi<sup>2</sup>, <sup>1</sup>Department of Nursing, <sup>2</sup> School of Business Administration

Many nurses enter the healthcare with great passion. They believe nursing is to serve and help patients. However, the pressure and workload in reality frequently exhaust nurses' enthusiasm and idealism. These lead to frustration and burnout. Servant leadership is a model growing among professionals. The concept begins with serving and inspiring followers. This model emphasized on partnership, trust, listening, and proper use of power. The study is to examine whether servant leadership is well implemented in a Christian hospital, to evaluate its influences to burnout levels perceived by nurses, and to identify which servant leadership components influence burnout. Online surveys are sent. Structural Equation Model (SEM) and Multivariate Analysis of Variance (MANOVA) are used. The SEM results showed that the Comparative Fit Index (CFI) was sufficient: CFI = 0.910, Standardized Regression Weight = -0.68, Canonical Correlation = 0.937,  $\chi^2 = 3296.37$ , degree of freedom = 1028, probability level (p) = 0.000, RMSEA = 0.021, NFI = 0.910, IFI = 0.910, TLI = 0.905. The findings demonstrate that servant leadership significantly negatively influences nurse's job burnout. Perceiving support from leaders is important. The practice of servant leadership increases job satisfaction and reduces burnout. The finding is beneficial in improving healthcare managerial skills to retain nurses and battle with nursing shortage issues.

## Physical Therapy

### P-21 *Factors Influencing the Enrollment of Clinical Instructors in the APTA Credentialed Clinical Instructor Program: Perspectives of the APTA Credentialed Trainers* Kimberly Ferreira, G. Daaku<sup>1</sup>, J. Zollinger<sup>1</sup>, and K. Miller<sup>1</sup>, Department of Physical Therapy, <sup>1</sup>Recent DPT graduates

**Introduction:** The Physical Therapist Clinical Instructor (PTCI) is an essential role in the education of Physical Therapist students. In an effort to equip the PTCI, the American Physical Therapy Association developed the Credentialed Clinical Instructor Program (CCIP), a continuing education course that helps CIs learn how to effectively teach their students. **Purpose:** To investigate the factors that facilitate or impede the CI's decision to take the CCIP from the perspective of the CCIP instructors, Credentialed Clinical Trainers (CCT). **Review of Literature:** **Subjects:** Total population sampling of 204 CCTs. **Methods:** Descriptive exploratory study utilizing an idiosyncratic survey instrument. Pilot study was conducted. Internal consistency was tested using Cronbach's Alpha. Majority trends in the data were found with frequencies and percentages. **Results and Conclusion:** CCTs perceive PTCI's prefer to take CEUs relevant to clinical practice (n = 94/99, 95.2% A/SA), CI's intend to take the course but are too busy (n = 82/99, 82.8% A/SA). CCTs perceived facilitating factors are, CI has a personal desire to strengthen their skills as an instructor (97.0% A/SA), first time CI's desire to gain new skills and ideas (88.9% A/SA), reduced travel time to the course (82.8% A/SA), and to gain CEUs (81.8% A/SA).

**P-22** *Validation of an Educational Kinesiology Tutorial for Entry-Level DPT Students*

Jessica Stotz<sup>1</sup>, A. Davis<sup>1</sup>, R. Maltez<sup>1</sup>, E. Moll<sup>1</sup>, Lori Walton, and David Village, Department of Physical Therapy, <sup>1</sup>Recent DPT graduates

**Introduction/Clinical Relevance:** 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. **Methods:** For this study, a rubric was developed to evaluate the tutorial against course objectives, APTA's Foundational Sciences Matrix, and CAPTE accreditation standards. The electronic-based tutorial included video clips and images of human movement activities. Items 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. **Results:** Data analysis included calculating the intra-class coefficient (ICC) for reliability among reviewers (overall ICC = .756,  $p < 0.001$ ). Cronbach's Alpha was calculated, comparing similar questions of the rubric among the five reviewers for consistency as well as individually comparing questions of the objectives of a Pathokinesiology course with those questions in the CAPTE Problem Solving Skills section of the rubric (scores ranging  $\alpha = .656-.921$ , overall  $\alpha = .954$ ,  $p < 0.001$ ). Kappa statistic evaluating the percent agreement between reviewers' scores revealed overall agreement of 62.7%. **Discussion:** 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.

**P-23** *The Effectiveness of Contrast Bath on Reducing Hand and Wrist Pain*

Elizabeth Oakley, A. Patton, and V. Sutton, Department of Physical Therapy

**Intro:** The purpose of this study was to examine the effect of patient education compared to patient education and contrast bath, for alleviating symptoms of hand and wrist pain. **Methods:** Eight subjects were randomly assigned to either the control group (education only) or the treatment group (education and contrast bath). Upon Initial, mid and final Assessment, pain, strength, function and swelling was assessed. Descriptive data was analyzed and mixed model repeated measures ANOVA was used to compare differences between groups for the dependent variables. Data was considered significant at  $p = \leq 0.05$ . **Results:** Friedman's ANOVA found a significant difference for both groups for admit to discharge for wrist flexion (Chi square= 7,  $p = 0.008$ ,  $df=1$ ) and wrist extension (Chi square= 8,  $p=0.005$ ,  $df=1$ ). There was a significance found in the contrast bath treatment between admit and discharge for wrist flexion (Chi square=4,  $p=0.046$ ,  $df=1$ ) and wrist extension (Chi square=5,  $p=0.025$ ,  $df=1$ ). Subject's AROM flexion and extension for the contrast bath group improved from baseline to final treatment. **Conclusion:** Contrast bath does not reduce hand and wrist pain, however, our results showed that contrast bath increased active range of motion for wrist flexion and extension and thus increases function.

## Speech Language Pathology and Audiology

**P-24** *Musicians & Hearing Loss: Determination of Need for Curriculum for Music Majors in Universities*

Darah Regal, Gerilyn Jones<sup>1</sup>, Bethany Leavitt<sup>1</sup>, and David Regal<sup>1</sup>, Department of Speech Language Pathology and Audiology, <sup>1</sup>Undergraduate Student

Musicians are exposed to potentially damaging sound frequently, but rarely wear ear protection. The objective of this study was to identify the need for specified curriculum for music majors by identifying prevalence of hearing loss, and determining knowledge regarding the need for hearing conservation among music majors at Andrews University.

## Biology

**P-25** *Expression and characterization of Ecm14, a putative metalloprotease from *Saccharomyces cerevisiae**

Matthew J. Schott<sup>1</sup> and Peter J. Lyons, Department of Biology, <sup>1</sup>Master's Student

Metalloproteases are found in most organisms and function in the digestion and maturation of proteins. Ecm14 is a putative metalloprotease found in the yeast *Saccharomyces cerevisiae* vacuole. There are a number of amino acids in the putative active site of Ecm14 that suggest a mechanism different from the typical carboxypeptidase. In order to investigate the enzymatic mechanism of Ecm14, expression of histidine-tagged Ecm14 protein was attempted in human HEK293T cell culture, *S. cerevisiae*, and baculovirus expression systems. No expression was detected in HEK293T cells in preliminary experiments. Expression in the yeast system resulted in insolubility of Ecm14, regardless of induction time, temperature, or inducer concentration. In contrast, following expression of Ecm14 in Sf9 cells using the baculovirus system, approximately 31% of Ecm14 was soluble and detected as a 40 kDa histidine-tagged protein by western blotting. Sf9-expressed Ecm14 was purified using metal affinity chromatography. No enzymatic activity could be detected for purified Ecm14 in the presence of substrate consisting of chromogenic 3-(2-furyl) acryloyl conjugated to a C-terminal dipeptide (Phe-Ala). Activation of Ecm14 by enzymatic removal of the prodomain is currently being pursued. Alternatively, Ecm14 may catalyze the cleavage of an unknown substrate or be an example of a catalytically-inactive protease-like protein.



**P-26** *Overexpression of the transcription factor NF- $\kappa$ B in HER2/Neu positive breast cancer*

Denise L. Smith, Department of Biology

Breast cancer is the second leading cause of death in women, accounting for about 40,000 deaths per year. A specific mutation in the human epidermal growth factor receptor 2 (HER2/Neu) has been shown to lead to a more invasive cancer and poor prognosis. Current research has shown that when HER2/neu is overexpressed, a transcription factor nuclear factor-kappa B (NF- $\kappa$ B) is also overexpressed. NF- $\kappa$ B exists as a dimer made up of five potential proteins. This research is evaluating the role of each of these five proteins in a HER2/neu positive breast cancer cell line NF-639. Using the technique of interference RNA (RNAi), each of the five separate protein's expression has been blocked to evaluate its role in the function of the transcription factor and any phenotypic changes seen in the cancer cells. Protein levels and mRNA levels were also evaluated to validate the success of the RNAi.

**P-27** *The Effects of Juvenile Hormone III and Chelerythrine Chloride in the Selectivity of Phonotaxis and its Neuronal Correlates in Female Cricket Acheta domesticus*

Benjamin Navia, Ashley Groeneweg-Lynch<sup>1</sup>, Gordon Atkins and John Stout, Department of Biology, <sup>1</sup>Master's Student

Female *A. domesticus* exhibit variability in their phonotactic behavior. Some females respond to syllable periods (SPs) typical of the males' calling song (CS; 50–70 ms), others respond additionally to CSs with shorter or longer SPs, outside the range of males' calls. Other females are not selective to SP and respond to the full range of SPs. Nanoinjection of Juvenile Hormone III (JHIII) into the prothoracic ganglion increases phonotactic selectivity. Nanoinjection of chelerythrine chloride (a protein kinase C inhibitor) reduces the effect of JHIII. The L3 prothoracic interneuron responds selectively to the SP of the male's CS and is proposed to be involved in controlling SP-selective phonotaxis. Prothoracic nanoinjection of JHIII increases selective responses of L3 which parallels its' effects on phonotaxis. This increase in selectivity seems to result from a decrease in decrement, predominantly at the shorter and longer SPs. Such effects increase selectivity in response to the SPs that are most attractive phonotactically. The data support the hypothesis that processing by L3 contributes to the SP selective phonotaxis observed in this species. Data currently being evaluated suggest that chelerythrine chloride opposes the effect of JH III on L3's SP-selective responses.

## Chemistry

**P-28** *Preliminary Study of the Effect of PAMAM Dendrimers on Mushroom Tyrosinase Activity*

Andrew Hong<sup>1</sup> and D. David Nowack, Department of Chemistry and Biochemistry, <sup>1</sup>Undergraduate Student

Traditional polymer chemistry has focused widely on the use of linear polymers; however, the unique properties of highly branched polymers, called dendrimers, exhibit different functional uses as opposed to their linear counterparts. A well characterized enzyme, mushroom tyrosinase, was chosen to investigate the biological function changes, if any, caused by dendrimers. Our study measured the kinetic's parameters (KM and Vmax) of mushroom tyrosinase, then observed those parameters in the presence of PAMAMs (polyamidodiamines) dendrimers. Tyrosinase assays showed distinct inhibition of KM and Vmax as the concentration of the dendrimer (PAMAM G1) increased from 0.2 mM to 5 mM. From the analysis of the Lineweaver-Burk plots, the dendrimer had a mixed inhibitory effect on the enzyme, in which it is binding to the enzyme and to the enzyme-substrate complex to inhibit both species simultaneously. Mushroom tyrosinase and dendrimer interactions can be extensively studied as models for other enzymes and allow for further study of the biological applications of dendrimers.

**P-29** *Simultaneous Hydroxyl Number Determination and Moisture Analysis of Dendritic Polymers using NIR Spectroscopy*

Ryan T. Hayes, HwukChan Woo<sup>1</sup>, Seth Stacey<sup>1</sup>, Department of Chemistry and Biochemistry, <sup>1</sup>Undergraduate Student

NIR spectroscopy is a valuable tool for many industries, especially those that need rapid moisture analysis. NIR absorption spectroscopy has not been applied to highly branched (or dendritic) polymers such as hyperbranched polymers and dendrimers. Our research investigates the advantages and disadvantages of using NIR absorption spectroscopy to quantitate the hydroxyl functional group density, called Hydroxyl Number, simultaneously with the analysis of water content in a dendritic polymer sample. Hydroxyl-surface dendrimers are expensive which presents a sample size problem, and they are highly soluble in protic solvents which interferes with analysis. This research will demonstrate a methodology to overcome these challenges which allows the simplicity, ease, and quantitative power of NIR spectroscopy to be applied to dendritic polymer analysis.

**P-30** *Synthesis and Characterization of "Clean Surface" Gold Nanoparticles*

Getahun Merga<sup>1,2</sup>, Nuvia Saucedo<sup>1</sup>, Laura C. Cass<sup>2</sup>, James Puthussery<sup>2</sup> and Dan Meisel,<sup>2,1</sup>Department of Chemistry and Biochemistry, Andrews University, <sup>2</sup> Radiation Laboratory and Department of Chemistry and Biochemistry, University of Notre Dame

We depict the synthesis of gold nanoparticle, free of stabilizing organic molecule, upon reduction of Au<sub>2</sub>O<sub>3</sub> powder by hydrogen molecule in proportion of 0.8 g per 1.0 L of deionizer water. The content was free of oxygen gas by bubbled with argon gas through the spout and then saturated with hydrogen gas. The Au (III) reduction readily proceeds at elevated temperature, about 10 degree less than the boiling point of water, and at slightly higher pressure than the atmospheric pressure. The suspensions of the nanoparticles growth was monitored by UV-Vis, its size by TEM and dynamic light scattering and its surface chemistry by surface enhanced Raman scattering (SERS) employing a probing molecule. The stability of the suspended gold nanoparticles is suggested to have hydroxyl group on their surfaces.

## Engineering and Computer Science

### **P-31** *Development of paper based biosensor for PSA detection*

Hyun J. Kwon, Department of Engineering and Computer Science

In recent years, researchers pay attention to simple and affordable paper based biosensor as the cost of biosensors and lack of equipment are obstacles for early detection of diseases. The paper based biosensor has advantages to become a point-of-care diagnostic platform especially in developing countries as it requires minimal equipment or trained individuals to perform the test. The biosensor can be prepared in a paper via inexpensive wax printing and run the sample fluid without a pump. The detection can be colorimetric so that the pattern can be identified by naked eyes or with the help of smart phone camera and app system. We are taking a first step into development of paper based biosensor exploring different fluid channel patterns and detection scheme. The model detection system is developed for prostate cancer antigen (PSA) that is an early biomarker for prostate cancer and is present in blood serum at an elevated level of 100 ng/ml for onset of the cancer. Antibodies are attached to 40 nm gold nanoparticle to deliver a clear red-purple detection mark when an elevated level of PSA is present in the sample.

### **P-32** *Using Evidence-based medicine summaries to help answer health economic questions*

Rodney Summerscales<sup>1</sup>, Karen Fitzner<sup>2</sup>, Shlomo Argamon<sup>3</sup>, June McKoy<sup>4</sup>, <sup>1</sup>Department of Engineering and Computer Science, Andrews University, <sup>2</sup>DePaul University, <sup>3</sup>Illinois Institute of Technology, <sup>4</sup>Northwestern University

High quality meta-analyses, systematic reviews, and structured literature reviews are extremely useful for understanding the quality, and strength of published findings. However, high quality review studies, are time consuming and many published studies are suboptimal – lacking rigor, statistical power, or sufficiently specified models, a particular concern for cost-related studies. ACRES (Automatic Clinical Result Extraction and Summarization) is a machine learning-based software program designed to read abstracts from PubMed, extract the key trial elements, compute ratios (e.g., absolute risk reduction (ARR)) for proposed treatments, and generate summaries for the purpose of evidence-based medicine decision making. By generating detailed summaries and three ranking categories for PubMed search results, ACRES reduced time spent examining irrelevant papers, and was 4% more accurate in identifying relevant papers than was a systematic review on diabetes education and cost that was conducted by humans in 2008.

## Mathematics

### **P-33** *When Mathematicians Grade Proofs, Why Don't They Agree?*

Robert C. Moore, Department of Mathematics

Mathematical proof is a fundamental component of the undergraduate mathematics curriculum for mathematics majors. To teach students the deductive nature of mathematics and how to write proofs that meet an acceptable level of rigor and clarity, mathematics professors require students to write proofs for homework and tests. The professors then grade the proofs by writing marks and comments on them, assigning each proof a score, and returning the papers to the students. A larger study examined this process of grading students' proofs, including the question of whether mathematics professors agree in their evaluation and scoring of students' proofs. This poster focuses on one finding of the larger study, namely, that the scores assigned to the proofs by the professors varied considerably. Four reasons are discussed for the spread in the scores: (a) performance errors, (b) disposition toward grading, (c) judgments about the seriousness of errors and the student's level of understanding, and (d) contextual factors.

## Physics

### **P-34** *Gravitational Waves: On the Brink of a New Astronomy*

Tiffany Summerscales, Department of Physics

The Advanced LIGO detectors are being installed and are already reaching unprecedented levels of sensitivity. The new detectors will eventually be 10 times more sensitive than the initial LIGO detectors which will guarantee gravitational wave detections provided that the predictions of General Relativity and astrophysical population models are correct. To prepare for the new kind of astronomy that will be done with gravitational waves, the Andrews University LIGO group is helping to develop methods for estimating the parameters of gravitational waveforms from detector data.

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**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**  
Administrative Assistant

**Phone:** (269) 471-3042  
**Email:** [research@andrews.edu](mailto:research@andrews.edu)  
**URL:** <http://www.andrews.edu/research>  
**Facebook:** [www.facebook.com/auresearch](http://www.facebook.com/auresearch)



**Andrea Luxton, PhD**  
Provost

**Tracy Humphrey**  
Executive Assistant to the Provost

**Phone:** (269) 471-3404  
**Email:** [thumphrey@andrews.edu](mailto:thumphrey@andrews.edu)

*"The Passion According to Matthew" presented by the Andrews University Department of Music, Howard Performing Arts Center, April 18 & 19, 2014. (Photo by IMC)*

