
## Roger Epp Board Room

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| **Mark Briggs & Luke Rostad** | Dr. Bill Hackborn | AUMAT/ AUPHY 480 | **The Mother of Modern Algebra and Matriarch of Symmetry: Emmy Noether's Contributions to Math and Physics** | 6:00 - 6:25pm |
| **Jessica Logan** | Dr. Tomislav Terzin | AUBIO 419 | **A New Model Organism for the Study of Aesthetics: An Interdisciplinary Approach** | 6:30 - 6:55pm |
| **Crystal Lebrecque** | Dr. Roxanne Harde | AUENG 401 | **The Power of Shame and Female Sexuality: Rape Culture in Young Adult Novels** | **7:00 - 7:25 pm** |

## FL 1-305

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| **Emily Peterson** | Dr. Andrea Korda | AUART 421 | **A New Portrait of Vincent van Gogh** | 6:00 - 6:25pm |
| **Jinzhe Li** | Dr. Roseanna Heise | AUCSC 401 | **20 Years of Evolution: Inspiration from a Computer Hardware Practicum** | 6:30 - 6:55pm |
| **Alex Albers, Mel Tiangson** | Dr. Bill Hackborn | AUMAT/ AUPHY 480 | **Quantum Entanglement: Spooky Action at a Distance** | 7:00 - 7:25pm |
| **BREAK - Poster Display in Forum 7:30 - 8:00pm** | | | | |
| **Krista. Erdmann, Drew. Fitzgerald** | Dr. Bill Hackborn | AUMAT/ AUPHY 480 | **Something Out of Nothing: The Historical Significance of Zero** | 8:00 - 8:25pm |
| **Vanessa Lievers & Rae Metrunec** | Dr. Bill Hackborn | AUMAT/ AUPHY 480 | **Unseen Mysteries of Space: Black Holes** | 8:30 - 8:55pm |
| **Kole Lundstrom & Nidhi Patel** | Dr. Bill Hackborn | AUMAT/ AUPHY 480 | **Methodology of Instruction in Math and Physics: Historically, Now, and in the Future** | 9:00 - 9:25 pm |
| **Connor Munday & Arlyss Stewart** | Dr. Bill Hackborn | AUMAT/ AUPHY 480 | **The History of Heat** | 9:30 - 9:55 pm |


| L2-102 | | | | |
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| **Randy Paquette** | Drs. Glen Hvenegaard & Glynnis Hood | AUBIO/ AUENV 334 | **Comparing the Biodiversity of Native and Non-native Species of Vegetation in a Reclaimed Oil Site and Native Grasslands in Miquelon Lake Provincial Park** | 6:30 - 6:55pm |
| **Braeden Kelly** | Dr. Glen Hvenegaard | AUENV 401 | **Effects of Landlord Stewardship Activities on Purple Martin Nesting Occupancy** | 7:00 - 7:25 pm |
| **BREAK - Poster Display in Forum 7:30 - 8:00pm** | | | | |
| **Mary Cairns** | Dr. Tomislav Terzin | AUBIO 419 | **The question we forgot to ask: What are eye patterns?** | 8:00 - 8:25pm |
| **Jamie Cole & Kaylee Ma** | Dr. James Kariuki | AUCHE 410 | **Beyond the Degree: The Covert Curriculum of Our Education** | 8:30 - 8:55pm |

| Wahkotowin Lodge | | | | |
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| **Jenny Green** | Dr. Paula Marentette | AUPSY 497 | **Gesture and Language Go Hand in Hand: A Study on Bimodal Bilingualism.** | 6:00 - 6:25pm |
| **Keely Blake** | Dr. Rebecca Purc-Stephenson | AUPSY 497 | **Creating Safe Learning Environments for Children** | 6:30 - 6:55pm |
| **Sydney Thackeray** | Dr. Rebecca Purc-Stephenson | AUPSY 497 | **Building the Blue Wall of Alliance** | 7:00 - 7:25pm |
| **BREAK - Poster Display in Forum 7:30 - 8:00pm** | | | | |
| **Ty Helfrich** | Dr. Rebecca Purc-Stephenson | AUPSY 497 | **University Student's Perceptions of Male Sexual Assault** | 8:00 - 8:25pm |
| **D. Ryan Maisey** | Dr. Ana Klahr | AUPSY 499 | **Seizure Activity After Unanesthetized Intracerebral Hemorrhage Induction in Rats** | 8:30 - 8:55pm |


| Chapel | | | | |
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| **Breanna Girvan, Alexandra Brigley, Francesca Middleton, Ozan Ardic, Danielle Lee, David Salmon, Megara Szott, Abigail Milgate, Chantel Schultz, Colden Palo, Alexander Windsor** | Dr. Roger Admiral | AUMUS 369/469 | **Postmodernism in Music** | 7:00 - 7:35 pm |
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| **BREAK - Poster Display in Forum 7:30 - 8:00pm** | | | | |

| Roger Epp Board Room | | | | |
|---|---|---|---|---|
| **Mark Briggs & Luke Rostad** | Dr. Bill Hackborn | AUMAT/ AUPHY 480 | **The Mother of Modern Algebra and Matriarch of Symmetry: Emmy Noether's Contributions to Math and Physics**<br><br>Emmy Noether (1882-1935) was a significant contributor to the fields of pure and applied mathematics. Known for her generosity and willingness to share her ideas freely with her students, her complete contribution to these fields is beyond the scope of this presentation. We will present on just a few of her key ideas, and discuss how those insights developed abstract algebra and were fundamental to our understanding of symmetry as it relates to conservation laws. | 6:00 - 6:25pm |
| **Jessica Logan** | Dr. Tomislav Terzin | AUBIO 419 | **A New Model Organism for the Study of Aesthetics: An Interdisciplinary Approach**<br><br>When selecting a model for aesthetic studies, researchers often use computer designed structures or images in order to maximize the level of control, and to allow for selection of only specific variables. However, this limits the ability to extrapolate based on ones' results, and reduces the number of aesthetic perception models that can be used to explain results. That said, natural landscapes and most animals are not used because they are difficult to control, and leave too much room for emotional responses, rather than simply aesthetic perceptions. Previous research into structural colours in insects left me with several key questions about what people found aesthetically pleasant, and why? This introduced me to a research project already underway at Augustana. This project had already been started by multiple researchers, providing many perspectives on the original study. When Dr. Terzin first approached a survey based study of butterfly pairs, he wanted to see if humans visual preferences were predictable based on different markers, including colour, size, and contrast. When student researcher Carly Heck continued the research, she studied the possible impact of demographics (age, education, etc.) on visual preference. The moment I reviewed the results of their research, I saw a very different perspective; butterflies and moths seem to solve most of the concerns of researchers regarding natural models for aesthetic research, providing an inexpensive, highly controllable, natural model organism. My focus over the remainder of the semester has been combining the research already done with further analysis, and finding the best means of presenting this information to communities in both the sciences and humanities, for application across many disciplines. | 6:30 - 6:55pm |
| **Crystal Lebrecque** | Dr. Roxanne Harde | AUENG 401 | **The Power of Shame and Female Sexuality: Rape Culture in Young Adult Novels**<br><br>This paper discusses the problematic discourse surrounding rape and rape culture in young adult novels and focuses on the concepts of "slut shaming," the practice of criticizing or defaming individuals, particularly women and girls, for their perceived infringement of socially acceptable behaviors or appearances in relation to sexuality. Drawing on Silvan Tomkins theories of affect, in particular shame, and Michel Foucault's work on sexuality and power dynamics in the western world, this presentation considers how shame is used as a source of power to influence female bodies and behaviors. Beginning with public perception and the use of slut shaming as a tool, this examination of young adult novels seeks to address the danger of internalizing shame as a part of a larger attempt to control or subjugate the female body and sexuality. However, the presentation will also incorporate comparative discussions of how the term "slut" has been used as a means of empowerment for some women to reclaim sexual agency rather than discourage them from exploring female sexuality. | 7:00 - 7:25 pm |
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| FL 1-305 | | | | |
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| **Emily Peterson** | Dr. Andrea Korda | AUART 421 | **A New Portrait of Vincent van Gogh**<br><br>Due to the widespread representation of Vincent van Gogh's "tragic life" through biographical depictions, the public view of his artwork is connected to a stereotypical association between great artists and unpeaceful souls. As a result, we only view Van Gogh's work through this romanticized lens. This depiction of Van Gogh in both past and current literature is problematic, because it romanticizes mental illness and provides a harmful ideal for creativity. However, new arguments have been made that place his work within the wider historical context of the times in which he lived, separating his work from his characterization. This is important as it provides a new understanding of Van Gogh that moves beyond viewing his work as the result of mental illness. | 6:00 - 6:25pm |
| **Jinzhe Li** | Dr. Roseanna Heise | AUCSC 401 | **20 Years of Evolution: Inspiration from a Computer Hardware Practicum**<br><br>Computer software and hardware changes, that is, the evolution of computers over the last two decades, are described based on the perspective of a computer hardware practicum. Software level changes will be discussed from the experience of performing software cleaning-up, diagnosing, and fixing operations. A lot of things at the software level, like the driver for a floppy drive, are not supported by Windows 10. Many of the changes in software levels are made because of the evolution of the hardware. Benefiting from the development of new technology, computer hardware is progressing rapidly, which forces the software to meet the new requirements. For example, the newest version of Windows allows 64-bit programs, compared to the old 32-bit programs, because 32-bit machines can only support four gigabytes of memory (RAM) and many computers today have eight or more gigabytes. On the hardware level two main components are described: the central processing unit (CPU) and the graphical processing unit (GPU), which is the video card. It will be shown that proper advancements in these architectures give competitors an edge. A description of how to build a computer from basic hardware parts will be presented. | 6:30 - 6:55pm |
| **Alex Albers, Mel Tiangson** | Dr. Bill Hackborn | AUMAT/ AUPHY 480 | **Quantum Entanglement: Spooky Action at a Distance**<br><br>Quantum Entanglement of particles involves the dependency of a quantum state (such as particle spin) of one particle on the quantum state of another particle. This action is independent of distance and seems to occur instantaneously, leading Einstein and others to call it “spooky action at a distance.” In 1964, John Stewart Bell proposed the idea of measuring entangled spin particles to prove whether entanglement was indeed faster than light communication or there was a predetermined state of the particles as they were created, leading to Bell’s Inequality. Whether entanglement is “spooky” or not, it can be theoretically useful for technology such as in quantum computing and quantum teleportation. | 7:00 - 7:25pm |
| **BREAK - Poster Display in Forum 7:30 - 8:00pm** | | | | |
| **Krista. Erdmann, Drew. Fitzgerald** | Dr. Bill Hackborn | AUMAT/ AUPHY 480 | **Something Out of Nothing: The Historical Significance of Zero**<br><br>Zero represents both nothing and everything. It is one of the greatest paradoxes of human thought. While taken for granted in modern society, the development of zero was a milestone in mathematics. We will discuss the introduction of zero to historical Europe through the Arabic number system, its transformation from a placeholder to a number with its own special properties, and how this phenomenon helped to evolve ancient mathematics. | 8:00 - 8:25pm |
| **Vanessa Lievers & Rae Metrunec** | Dr. Bill Hackborn | AUMAT/ AUPHY 480 | **Unseen Mysteries of Space: Black Holes**<br><br>Black holes hold a sense of fascination in popular culture and in physics. But how much do we know about black holes? In this presentation, we explore the origins and discovery of these mysterious objects starting in the 18th century and continuing to the present day. This journey includes the formation and evolution of black holes coupled with evidence for these phenomena, all to ensure your complete preparation to explore deep space. | 8:30 - 8:55pm |

| FL 1-305 | | | | |
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| **Kole Lundstrom & Nidhi Patel** | Dr. Bill Hackborn | AUMAT/ AUPHY 480 | **Methodology of Instruction in Math and Physics: Historically, Now, and in the Future**<br><br>For thousands of years humans have been interested in mathematics, physics and their related implications. When discoveries were made, a method for communicating results became necessary. As a result, professionals with the knowledge, skills, resources, and passion to share their insights became responsible for informing students. Teachers and professors must appropriately use examples, theory, and other techniques to effectively communicate concepts. However, accepted methods for teaching mathematics and physics has varied over the years. Investigation and application of appropriate methods is necessary for a professional to foster insightful understanding in a student. | 9:00 - 9:25 pm |
| **Connor Munday & Arlyss Stewart** | Dr. Bill Hackborn | AUMAT/ AUPHY 480 | **The History of Heat**<br><br>From the beginnings of thermodynamics, to its application in thermal control systems in space stations, we will be discussing the history of heat in physics. But how did we get to our understanding of infrared radiation and blackbodies from the earliest beginnings with the first fires in caves? Come to our presentation, The History of Heat, to learn about the elaborate history behind our fascinating topic. | 9:30 - 9:55 pm |

| L2-102 | | | | |
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| **Randy Paquette** | Drs. Glen Hvenegaard & Glynnis Hood | AUBIO/ AUENV 334 | **Comparing the Biodiversity of Native and Non-native Species of Vegetation in a Reclaimed Oil Site and Native Grasslands in Miquelon Lake Provincial Park**<br>Biodiversity measures can be made to infer on how diverse or healthy an ecosystem is. One way to measure this is through studying the biodiversity of vegetation. Oil sites that are no longer in use need to undergo reclamation to return back into its former state in order to be recognized as fully decommissioned and be able to receive a reclamation certificate. Many reclaimed sites are prone to invasive vegetative species due to the clearing of existing vegetation prior to the installation of the infrastructure for the oil head and the replanting of the vegetation in the reclamation process. This study shows the comparison of the biodiversity of vegetation of a reclaimed oil site and surrounding native grasslands in Miquelon Lake Provincial Park to evaluate the diversification of native and non-native species present. | 6:30 - 6:55pm |
| **Braeden Kelly** | Dr. Glen Hvenegaard | AUENV 401 | **Effects of Landlord Stewardship Activities on Purple Martin Nesting Occupancy**<br>Purple Martins are the largest members of the swallow family in North America, and they nest almost exclusively in human-made cavity nest boxes. Purple Martin landlords manage these nest boxes with varying levels of engagement and methods. I hypothesize that performing multiple Purple Martin management practises has a positive association with high Purple Martin occupancy. I interviewed Purple Martin landlords in Camrose over the phone and in-person and accessed Purple Martin Occupancy data from the Camrose Wildlife Stewardship Society. My results showed significant positive correlations between many landlord management practices and nest occupancy variables. This information will help future Purple Martin conservation efforts. | 7:00 - 7:25 pm |
| **BREAK - Poster Display in Forum 7:30 - 8:00pm** | | | | |
| **Mary Cairns** | Dr. Tomislav Terzin | AUBIO 419 | **The question we forgot to ask: What are eye patterns?**<br>From fish to birds to butterflies, patterns that seem to mimic predatory eyes are abundant in nature! Scientists have spent years trying to understand what these patterns do, and how they are developed, but has anyone stopped to ask what they are? Currently, eye patterns are defined as circular patterns with surrounding concentric circles however this definition negates much of the diversity and complexity of these intriguing patterns. In this project, which I inherited from two previous Augustana students, I aim to develop a definition of eye patterns that addresses these shortcomings. Looking specifically at Lepidopteran (moths and butterflies) eye patterns 14 common elements were identified. Then, to determine the importance of each of these elements, a rigorous presence-absence analysis was conducted to determine the frequency of each characteristic in nearly 500 species. Using the characteristics most commonly present I was able to identify two subtypes of eye patterns that to our knowledge have not previously been recognized. | 8:00 - 8:25pm |
| **Jamie Cole & Kaylee Ma** | Dr. James Kariuki | AUCHE 410 | **Beyond the Degree: The Covert Curriculum of Our Education**<br>As students emerge from their degrees, it is important to note that they are not merely defined by their majors. Each course contains material pertaining to the degree, however, there are a variety of skills that students develop directly and indirectly. These skills allow individuals, novices and experts, to find ways to enhance our learning methods. We can recognize and develop these skills when we are placed in an environment that challenges us but also one that provides us the freedom to look back at where we started and reflect on our personal and academic growth. Augustana provides a larger-than-normal opportunity to incorporate skills of learning, teaching, reflecting and researching that provides students with not only knowledge, but experience and perspective. How we learn is how we teach; the AUCHE 410 Senior Mentorship course provides us with the opportunity to reflect upon our undergraduate journey, understand the progress we have made, and move forward with personally-tailored approaches to learning and education. | 8:30 - 8:55pm |

## Wahkotowin Lodge Classroom

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| **Jenny Green** | Dr. Paula Marentette | AUPSY 497 | **Gesture and Language Go Hand in Hand: A Study on Bimodal Bilingualism**<br><br>Does knowledge of sign language affect gesturing when speaking English? Co-speech gestures have been argued to influence cognitive functions, such as information packaging. Bimodal bilinguals, whose languages include both spoken and manual modalities (here, English and ASL), provide insight regarding the effect language has on gesture. The languages of bimodal bilinguals may overlap, such as through occasional insertions of sign when speaking, since this does not hinder their spoken message. On the other hand, the gestures of monolinguals could not reflect such influence as they do not have knowledge of sign language. Based on past research, my hypotheses will focus on comparing the i) frequency of gesture, ii) variety of hand configurations, iii) consistency of locations, and iv) viewpoints between bimodal bilinguals and monolinguals. | 6:00 - 6:25pm |
| **Keely Blake** | Dr. Rebecca Purc-Stephenson | AUPSY 497 | **Creating Safe Learning Environments for Children**<br><br>The purpose of this study is to identify the strategies teachers use to create safe learning environments that support students who may have experienced trauma. Children spend a large portion of their life in school, and educators are in a unique position to help build resilience, model pro-social behaviour, and provide support. Previous research shows that children who have experienced trauma may show withdrawing behaviour and struggle to establish trust in relationships. Research also shows that symptoms of trauma include difficulty with short-term memory, concentration, and problem-solving (Blitz, Anderson & Saastamoinen, 2016; McKee, & Dillenburger 2009); all of which impact a students ability to be successful. In the wake of recent Canadian natural disasters (e.g., forest fires, floods, tornados), increases in the rates of domestic violence, and the influx of immigrants and refugees seeking a better life, it is important to investigate whether or not Canadian school teachers and Educational Assistants are prepared to support students who may have experienced some kind of trauma. | 6:30 - 6:55pm |
| **Sydney Thackeray** | Dr. Rebecca Purc-Stephenson | AUPSY 497 | **Building the Blue Wall of Alliance**<br><br>Community Policing is an alternative to the traditional law enforcement policing (LEP). In contrast to LEP, which is characterized as reactive, highly centralized, and distant from community members, Community policing is proactive and promotes greater communication between the police and community to prevent crime. However, police agencies have struggled to implement Community Policing initiatives due to budgetary restraints and resistance from front-line officers. The purpose of my study is to examine if interest in the Community Policing philosophy and job duties is related to a person's gender-role identification and personality traits. I will survey approximately 150 university students from Augustana. The survey will include descriptions of each policing model, the Bem Sex Role Inventory, and the Big Five Inventory. Data gathered from the study may aid in future recruitment of police officers geared toward community policing approaches. | 7:00 - 7:25pm |

**BREAK - Poster Display in Forum 7:30 - 8:00pm**

# Wahkotowin Lodge Classroom

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| **Ty Helfrich** | Dr. Rebecca Purc-Stephenson | AUPSY 497 | **University Student's Perceptions of Male Sexual Assault**<br><br>Male victims of sexual assault is an issue that has been largely neglected by society as well as in the research literature. However, male sexual assault is more common that people might think. Previous studies report the prevalence of male sexual assault can range between 10%-18%. Moreover, there is virtually no research on transgender victims of sexual assault despite growing evidence suggesting transgendered individuals are more likely to be victimized, harassed, and discriminated against by others (Mont et al., 2013). The present study aims to provide more information on rape myth acceptance among university students. Specifically, this study will examine rape myth acceptance and victim blaming using vignettes that include victims who are male, female, and transgender. | 8:00 - 8:25pm |
| **D. Ryan Maisey** | Dr. Ana Klahr | AUPSY 499 | **Seizure Activity After Unanesthetized Intracerebral Hemorrhage Induction in Rats**<br><br>Intracerebral hemorrhage (ICH) is a devastating stroke leading to 40% mortality, and is caused by bleeding within the brain. Survivors of ICH are often left with cognitive and motor deficits that negatively impact activities of daily living. A common complication following ICH is seizure activity. Defined as an abnormal and excessive synchronous neurological activity, seizures can occur at any given point after hemorrhaging, exacerbating the outcome of ICH, and increasing mortality rates. Due to the growing elderly population, ICH has become more prevalent. Despite this, there has been no decline in the mortality rate as there are no treatment options. Animals are used in research to model disease and illnesses like ICH to further understand the pathology and find treatments for human applications. However, current ICH animal models contain several limitations, affecting their application to human studies. Anesthetics (volatile or injection) are used in animal models during ICH procedures. Nevertheless, anesthetics introduce confounding factors as they affect metabolism and brain activity, detracting from the clinical relevance of animal studies. In our study, we will alter a commonly used ICH rat model by injecting collagenase, which breaks down the lining of the blood vessel, into the brains of unanesthetized rats. We will look at electroencephalogram activity (brain activity) recorded using a telemetry probe, prior to, and two days after ICH induction. We hypothesize that seizure activity will occur following ICH induction without anesthetic, which strengthens this model's application, as seizures commonly occur following ICH in humans. Thus, our study can further the development of stronger ICH animal models to better understand research treatment options, and help reduce seizure activity and mortality in patients. | 8:30 - 8:55pm |

| Chapel | | | | |
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| **Breanna Girvan, Alexandra Brigley, Francesca Middleton, Ozan Ardic, Danielle Lee, David Salmon, Megara Szott, Abigail Milgate, Chantel Schultz, Colden Palo, Alexander Windsor** | Dr. Roger Admiral | AUMUS 369/469 | **Postmodernism in Music**<br><br>Students enrolled in the "Retheorizing Music: From Modernism to Postmodernism" course will perform three chamber music works composed within the last 10 years, and representing postmodern approaches to art music. Program will include Jennifer Walshe's EVERYTHING YOU OWN HAS BEEN TAKEN TO A DEPOT SOMEWHERE, Simon Steen-Anderson's Difficulties Putting It Into Practice, and James Saunders' positions in the sequence correctly recalled. All are welcome to attend. | 7:00 - 7:35 pm |
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| **BREAK - Poster Display in Forum 7:30 - 8:00pm** | | | | |

| Forum (Poster Presentations) 6:00 - 9:30pm | | | |
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| **Jamie Cole, Gabriel Godziuk, Allyson Hamilton, Duncan McDonald, Sara Paulgaard, Sasha Schneider, Timothy Shapka** | Dr. Doris Audet | AUBIO 390 | **Animal Super Powers**<br>These 7 posters from students in the Animal Behaviour course will present awe-inspiring behavioural adaptations and highlight how these 'superpowers' are being investigated. |
| **Gillian Larsen, Kayleigh Bartley, Jennifer Lenherr, and Malcolm Scott** | Dr. Anne McIntosh | AUBIO 355 | **Food from Fire: Deer Mouse Seed Predation Habits due to Forest Fire Disturbances in North America**<br>Area burned from forest fires is increasing. The severity of burn affects the duration of time for biotic organisms to recover. Seed predation is commonly completed by small mammals. Deer mice predate on seeds in North American forests, most commonly from conifer, white spruce and subalpine fir trees. The objective of our poster was to investigate how fire disturbances in North America will affect seed predation dietary habits by deer mice. |
| **Dana Eistetter** | Dr. Sheryl Gares | AUBIO 475 | **A comparative analysis on the effectiveness of contact lens cleaning solutions on removing bacterial biofilms from contact lenses**<br>Contaminated contact lenses may transmit a disease of the eye called bacterial keratitis. Our skin and eyes support a permanent or transient microbiota that may adhere to contact lenses while lenses are worn, so if contact lenses are not sufficiently cleaned these bacteria may grow on the lenses and form biofilms. A biofilm consists of bacteria protected by a slime layer that is very difficult to eliminate. The purpose of the study was to determine whether contact lens cleaning solutions remove biofilms and, if so, which cleaning solution works best. Three types of contact lenses were tested in this study: monthly lenses, two-week lenses, and extended wear lenses. Three types of contact lens cleaning solutions were tested: Biotrue, Opti-free PureMoist and Clear Care. Each lens type was inoculated with a normal microbiota organism called Staphylococcus epidermidis. Biofilms were allowed to form then each type of cleaning solution was tested on each lens type. The bacteria were enumerated and compared to the lenses left untreated with cleaning solution. It is expected that lens cleaning solutions will eliminate the bacteria in the biofilms. |
| **Farheen Afaque** | Dr. Sheryl Gares | AUBIO 475 | **Investigating removal of Salmonella enterica and Escherichia coli from cantaloupe rinds using water or chlorine rinses**<br>Consumption of cantaloupe has recently been associated with several large outbreaks of gastroenteritis disease in North America, highlighting the need for a better understanding of practices and processes that may contribute to contamination. Netted melons like cantaloupe grow on the ground and can come in contact with pathogens such as Salmonella enterica and Escherichia coli in non-composted fertilizer, contaminated irrigation water or through handling during processing and shipping. Unlike other fruits, cantaloupes are not acidic and readily support the growth of pathogens once they are sliced open. Preventive measures focused on reducing bacterial contamination of melons both domestically and internationally could decrease the number and severity of melon-associated outbreaks. The purpose of my study was to compare water and chlorine rinses of intact cantaloupe to determine if casual surface contaminants or established biofilms of Salmonella or E. coli are methods to remove contaminating bacteria from the rinds. |
| **Benjamin Elkin** | Dr. Sheryl Gares | AUBIO 475 | **Do contact lens cleaning solutions prevent biofilm formation on contact lenses?**<br>The presence of bacterial biofilms on contact lenses poses a threat to the user's eye health. The goal of my research is to determine if standard contact lens cleaning solutions can prevent the formation of biofilms by Staphylococcus epidermidis over a range of concentrations. It is expected that with stronger concentration of cleaning solutions there will be a decrease in biofilm organisms and with reduced concentrations there will be an increase. |

# Forum (Poster Presentations) 6:00 - 9:30pm

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| **Alicia Andriashyk** | Dr. Sheryl Gares | AUBIO 475 | **Do contact lens cleaning solutions remove microbial biofilms from contact lenses?**<br><br>Contact lenses provide an ideal environment for bacterial contaminants to grow and this may lead to eye infections like keratitis, red-eye, peripheral ulcer or infiltrate corneal scarring. As the bacterial population grows, a microbial community called a biofilm may form. Studies show that biofilms are very difficult to remove from a variety of surfaces. Casual bacterial contaminants on contact lenses are readily removed using lens cleaning solutions, but are bacterial biofilms removed? The focus of my research was to compare the effectiveness of three different kinds of contact lens cleaning solution to eliminate Staphylococcus aureus biofilms from contact lenses. Biofilms were allowed to form on lenses for 24 hours at room temperature on a shaker. After 24 hours the contact lenses were exposed to lens cleaning solution for 8 hours then remaining microorganisms were collected and enumerated. I hypothesize that the more expensive contact lens cleaning solution will have fewer bacteria remaining on lenses compared to the lower-priced cleaning solutions. |
| **Mark Briggs** | Dr. Sheryl Gares | AUBIO 475 | **Risky business: Evaluating best practices for disinfecting Salmonella enterica-contaminated cantaloupe**<br><br>Reports of Salmonella enterica contaminated cantaloupe melons have led researchers to discover that the rinds of these fruit are ideal breeding grounds for Salmonella biofilms to form. Biofilms are communities of bacteria that are typically very difficult to remove from surfaces once they are established; thus, present an important source of contamination. In this investigation, various methods of preventing biofilm formation and disinfecting biofilm-contaminated melons are examined. These findings could be used to guide future industry and household handling of cantaloupe melons to minimize or eliminate bacterial contamination of exposed melon. |
| **Jen Lenherr** | Dr. Sheryl Gares | AUBIO 475 | **Removal of staphylococcal biofilms on multi-use contact lenses**<br><br>Keratitis is an inflammation of the cornea that can result from bacterial contaminants on the surface of contact lenses that arise from improper storage or cleaning of lenses. Bacterial contaminants such as Staphylococcus epidermidis and S. aureus are common contaminants of lenses and these microorganisms may form biofilms on lenses that are very difficult to remove. The objective of this study was to investigate the susceptibility of single vs.multi-use lenses to develop S. epidermidis and S. aureus biofilms and to compare the effectiveness of Biotrue and OPTI-FREE® multi-purpose contact lens cleaning solutions (MPS) to remove biofilms. Single use and multi-use soft hydrogen gel lenses were inoculated with S. epidermidis or S. aureus cultures for 48 hours to establish biofilms. Contacts were then subjected to either 100% MPS, 50% MPS:50% distilled water, or no MPS (control) for 8 hours. Biofilms were enumerated using the colony counting method. Results showed that S. epidermidis and S. aureus both formed biofilms on single and multi-use lenses. Slime-producing S. epidermidis produced more biofilms and were less susceptible to removal by cleaning. Both S. epidermidis and S. aureus biofilms were effectively removed from either lens type when subjected to either brand of pure MPS. In general, Biotrue was most effective. Ultimately, these results provide us with greater insights into the susceptibility of single versus multi-use lenses to develop bacterial biofilms which can influence proper contact lens care. |
| **Mary Cairns** | Dr. Sheryl Gares | AUBIO 475 | **Do probiotic Lactobacillus reuteri prevent Candida albicans biofilm formation on artificial dental matter?**<br><br>Candida albicans is a fungal yeast commonly found in the human microbiota. In healthy hosts it is commensal; however, a number of environmental and host factors can trigger the commensal state to progress toward infection and disease. Treatment of infected tissue is exacerbated by the formation of C. albicans biofilms that protect the yeast cells from most standard anti-microbial therapies. Biofilms are readily established on medical implants such as dentures, and stomatitis (inflammation of the mouth and lips) is a common problem. Lactobacillus species commonly used in probiotic yogurts and other food products, may be part of the solution, as they have been shown to effectively treat C. albicans-related stomatitis. Based on these successes, I investigated the use of the probiotic Lactobacillus reuteri as a prophylactic to C. albicans stomatitis. I hypothesized that the presence of L. reuteri would hinder C. albicans growth on artificial tooth surfaces; thus, preventing Candida biofilm formation. Preliminary results suggest that L. reuteri arrest planktonic C. albicans growth, suggesting that it may prevent biofilm formation on dental surfaces. These findings suggest that incorporating probiotics into the diet of denture users could prevent C. albicans biofilm growth and associated disease. |

# Forum (Poster Presentations) 6:00 - 9:30pm

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| **Malcolm Scott** | Dr. Sheryl Gares | AUBIO 475 | **Traditional denture cleaning methods and their effect on Candida albicans biofilm development**<br><br>Candida albicans is a yeast that is a member of the human oral microbiota. This organism can also form biofilms on artificial dental surfaces that, if not eliminated, may progress to cause disease including oral candidiasis (thrush) and denture-related stomatitis. The purpose of this study was to look at the effectiveness of traditional cleaning methods to prevent the formation of yeast biofilms on dentures. Three cleaning solutions were used: vinegar, mouthwash and denture cleaning solution. Denture-mimicking acrylic surfaces were left uncleaned or cleaned using one of the three solutions then exposed to C. albicans cultures for a defined time period followed by enumeration of adhering yeast. Lower levels of biofilm formation were observed in all three applied treatments with the least number of C. albicans occurring on surfaces exposed to denture cleaning solution. By understanding how best to combat oral biofilm growth, effective denture hygiene regimens can be designed. |
| **Will Dobson** | Britta Boden | AUCHE 320 | **If Brewers Make Wort and Yeast Makes Beer, What Makes Whisky?**<br><br>There are two categories of alcoholic beverages: fermented and distilled. Fermented drinks like beer and wine have a lower concentration of ethanol when compared to distilled spirits like vodka and whisky. However, even in these categories, there is a wide variation in how they taste because of all the chemical components other than ethanol and water. The focus of this presentation will be background research in preparation for my directed reading next semester, when I plan to make molecular whisky. Before I begin this future project, I must determine what the characteristics of whisky are, so I know my eventual goal. Therefore, I will look into various analytical reports to primarily establish the qualitative components of whisky, as well as gain some insight into the quantitative nature of these components. The amount of each unique chemical compound affects the taste, aroma and mouthfeel of a whisky, so knowing the composition to aim for is crucial to that future research. The analytical techniques used in the papers will also serve to guide me for how I will analyse my samples next semester when looking for the presence of these components. |
| **Adam Beaunoyer** | Britta Boden | AUCHE 320 | **PEDs: How Chemists Catch Cheaters**<br><br>Athletes are always looking for a way to improve themselves to get an advantage in competition. Part of being a competitor is winning, unfortunately some athletes will take this mindset to the extreme and cheat by using performance enhancing drugs to gain an edge in competition. However, analytical chemistry can be used to combat these cheaters by testing them for banned substances. Analytical techniques like mass spectrometry, chromatography and potentiometry can be used to detect these banned substances in athletes. There are also new and exciting ways chemists can test for banned substances that may lead to a world with no performance enhancing drugs being missed. |
| **Kellen Morris** | Britta Boden | AUCHE 320 | **Medical Applications of NMR**<br><br>I want to research how nuclear magnetic resonance has been used throughout history in medicine. For example, it's most common application is magnetic resonance imaging (MRI's) which is well known. However, it can also be used in biochemical studies, notably in NMR spectroscopy such as proton NMR, carbon-13 NMR, deuterium NMR and phosphorus-31 NMR. Biochemical information can also be obtained from living tissue, such as brain tumours, with the technique known as in vivo magnetic resonance spectroscopy or chemical shift NMR microscopy. |
| **Kaylee Connors** | Britta Boden | AUCHE 320 | **The Use of Electron Paramagnetic Resonance (EPR) in the Study of Catalysts**<br><br>Catalysis is a process that involves adding a catalyst to a solution to increase the rate of reaction. A good catalyst does not interfere with the chemical reaction taking place, and so only a small amount of catalyst is needed. Understanding the reactivity of different chemical species is essential to the study of catalysts, and one important tool for the characterization of reactive intermediaries in homogenous catalysts is electron paramagnetic resonance (EPR). EPR spectroscopy uses electron spin states to determine the molecular structure of a sample near its unpaired electron, making it ideal for studying transition metal ions involved in catalyst reactions. |
| **Victoria Elliott** | Britta Boden | AUCHE 320 | **Carbon Dating Using the Method of Accelerator Mass Spectrometry**<br><br>Carbon dating using radioactive carbon-14 is an invaluable method for analyzing organic matter. Carbon-14, also known as radiocarbon, is an isotope that has a half life of about 5760 years. Once organic matter dies, such as animals or plants, the amount of radioactive carbon in their system will stop increasing, and the amount of carbon-14 that can be found in a sample by analysis can give scientists an idea of how long ago the sample died. One way to detect carbon-14 is through accelerator mass spectrometry, which works by taking a solid graphite sample and accelerating ions at it, which produces carbon atoms and isotopes. The MS can then read the amount of carbon isotopes present in the sample. It is this process that will mainly be investigated, in order to give the audience a better understanding. |

| Forum (Poster Presentations) 6:00 - 9:30pm | | | |
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| **Danielle Brozny, Sydney Goodman, Kayla Irvine, Layne Weinhandl** | Dr. Tim Parker | AUPSY 303 | **The Role of Anxiolytic Drugs and the Amygdala in Fears, Phobias, and Anxiety**<br><br>The poster will look into the effects of anxiolytic drugs on fears, phobias, and anxiety as well as the role of the amygdala. The basic neuroanatomy circuits that control fear and anxiety behaviours will be illustrated, along with key structures involved in fear extinction. Insight into how anxiety can be lowered by reducing amygdala responsivity will be explored. Lastly, the topics surrounding phobias of flying and how age affects anxiety rates will be discussed using knowledge of anxiolytic drugs, the amygdala, and neuroanatomical circuits presented. |
| **Deborah Guilbeault, Halle McNeil, Kyla Stang, Alanna Tillotson** | Dr. Tim Parker | AUPSY 303 | **Possible Rehabilitative Effects of Propranolol on Patients with Post-Traumatic Stress Disorder (PTSD)**<br><br>Our poster will look at the possible rehabilitative effects that propranolol has in blocking memory recall and reconsolidation of traumatic events. There will also be a discussion of the use of propranolol to treat the symptoms of PTSD such as freezing behaviour and the activation of stress responses. |
| **Taryn Eleniak, Shelby Meyer, Thomas Zimmerman** | Dr. Tim Parker | AUPSY 303 | **Aggression Applied to Modern Day**<br><br>Serotonin and aggression is a topic that has been vastly studied in animals, and there are more studies being done in humans as well. Animal studies suggest that low serotonin leads to aggressive behaviours, impulsivity, and risky behaviour. Aggression is also known to be linked to testosterone levels and has been studied in humans. Testosterone-induced aggression occurs when there are high levels of testosterone being produced in individuals, and can be linked to aggression in sports with regards to winning versus losing, and the biosocial and challenge hypothesis. |
| **Cassidy Blyan, Emily Thompson, Leah Wilkins, Zainab Yekeen** | Dr. Tim Parker | AUPSY 303 | **Temperature Regulation During Rapid Eye Movement (REM) Sleep**<br><br>Our poster will address the topic of temperature regulation during REM sleep. By drawing upon scholarly articles obtained from the Web of Science database, we will analyze this topic through a series of six experiments that include both human and animal subjects. This mix of research subjects will enable an effective and comparative demonstration of how temperature regulation during REM sleep influences both species. Each experiment also seeks to research REM sleep in a slightly different manner, so they include an array of methodologies in addition to measuring the effects in both humans and animals. The most important and underlying factor regarding these experiments is that they conclude how temperature regulation decreases during REM sleep, which is the central principle we aim to address. |
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