

# *Program*

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## **Welcome**

Dr. Garry Fehr, Associate Vice-President  
Research, Engagement, and Graduate Studies

## **President's Remarks**

Dr. Joanne MacLean, President and Vice-Chancellor

## **Acknowledgement of Student Awards**

Dr. Garry Fehr, Associate Vice-President

## **Provost & VP Academic's Remarks**

Dr. James Mandigo

## **Closing Remarks**

*The University of the Fraser Valley is located on the traditional unceded territory of the Stó:lō peoples. We gratefully acknowledge our ability to live, work, and thrive together on this land.*

# *Welcome to the 2020 Undergraduate Research Excellence Awards Presentation*

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Curiosity. It is what drives us to learn, to discover, and to interact with our environment.

Researchers are curious people. Curious to learn about plants and planets, animals and the Arts, stalagmites and our subconscious. Whether studying the ocean depths or outer space, there is still much to be discovered.

The University of the Fraser Valley is excited to present 41 of our most curious students with research awards totalling over \$25,000.

These students were nominated by their faculty supervisors for extraordinary research work, either as part of the UFV work study program, as research assistants, or for an outstanding research project as part of a course.

We also acknowledge the many students who received prestigious awards from UFV, the Ministry of Advanced Education, Skills & Training, federal granting agencies, and other external organizations.

Congratulations to all the students whose participation in research built amazing experiential learning into their education. Combining knowledge, skills, and experience with curious minds leads to new discoveries!

With more than 15,000 students attending UFV this year, these awards represent only a small portion of the research and other experiential learning activities which students are involved in that enhance their UFV education.

*I have no  
special talents,  
I am only  
passionately  
curious.*

Albert Einstein



# *UFV Undergraduate Research Excellence Award Recipients*

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## **College of Arts**

Madeline Allen, Jessica Janik, Peter MacDonald, and Ryan Werbin —  
Communications

Landon Kaetler — Criminal Justice

Wiley Reid — Economics

Steven Sprott — English

Marlowe Ferris — History

Ekaterina Marenkov — Philosophy

Tracy Morrison — Political Science

Taylor Allenby — Psychology

Paul Jakhu — Sociology

Albert Woods — Visual Arts



*The constant  
happiness  
is curiosity.*

Alice Munroe  
Canadian short story writer

## **Faculty of Health Sciences**

Joleen Prystupa — Kinesiology

Julie Rhodes — Nursing

## **Faculty of Professional Studies**

Trisha Bugra, Ashreet Dhiman, Thanh Nguyen, and Steven Perry —  
Business

## **Faculty of Applied & Technical Studies**

Kaden Ray — Physics

Chris Reed — Agriculture

## **Faculty of Science**

Aisa Dobie — Biology

Kyla Woelk — Chemistry

Gurdeepak Sidhu — Mathematics & Statistics

Paige Bogaerts — School of Land Use and Environmental Change

## **Community Service Research**

Vanessa Brewer, Claire Cook, Caitlin Parray, Andrew Schulz, and Ian Wilson — School of Land Use and Environmental Change

## **Indigenous Research**

Sasha Tuttle — Biology

Leanne Herrett — History

## **Industry Engagement Research**

Evan Foley — Chemistry

Rochelle Thrift, Alec Baker, Garrett Paddon — Physics

Zi Tong (Yuki) Lam, Aron McKague, Rebecca Vandenberg, Michaela Warmerdam, Maaria Zafar, Jiajing Ning — Graphic & Digital Design and Communications

# ***Madeline Allen, Jessica Janik, Peter MacDonald, and Ryan Werbin***

## **Communications**

**Faculty Supervisor:** Mai Anh Doan

**Award:** \$250 each

**Madeline:** As I come to the end of my undergraduate career, this award is a true testament to my hard work and dedication over the last several years. Graduating with a Bachelor of Arts in Criminal Justice with a minor in Communications and a certificate in Journalism, I hope to continue on to graduate studies and eventually establish myself in the field of advocacy. This research project was of personal importance as my career goals revolve around championing human and civil rights in Canada and abroad.

**Jessica:** Ey Swayel. I am from Tzeachten First Nations. I am proud to say I am in my fourth year in the Bachelor of Arts majoring in Indigenous Studies. My educational goals for this year include finishing up my major and graduating. My career goals are to work for my community which I am already doing as a finance clerk at Tzeachten First Nations. Overall I want to take everything I have learned at UFV and share that knowledge with the next generations.

**Peter:** I am so happy to say I have completed my Bachelor of Arts in Criminal Justice this semester. I am already working in my chosen profession and found that research has always broadened my understanding on complex issues that I see day to day. UFV's unique small class settings has allowed me to engage with both students and professors that have guided me through this educational journey. My goal is to continue my education at UFV through graduate studies.

**Ryan:** I have spent the last 5 years at UFV, and I can honestly say they have been some of the best years of my life. Working towards my Bachelor of Arts has helped me to realize what I want out of my future career and through this time UFV has given me such an amazing experience. I am truly happy that this project we have spent so much time on will be the platform RAN is going to use, and I look forward to hearing about its success.

## **Public Relation Plan: #RACEwithRAN**

The purpose of our research project was to provide a comprehensive public relations campaign for the Race and Antiracism Network (RAN). The ultimate goal of the campaign was to “advance awareness and promote change at UFV and the community abroad about subtle racism and discrimination.”

The #RACEwithRAN PR Plan addresses internal and external environmental factors found through PEST and SWOT analyses, identifies and targets key publics at UFV, and promotes RAN and its mission through tactics and events that utilize emotional and logical appeals.

The results of our PR Plan can help RAN organize itself to increase participation at RAN events and meetings and ultimately raise awareness, change attitudes, and encourage action against racism and discrimination.

*Research is formalized curiosity. It is poking and prying with a purpose.*

Zora Neale Hurston, American Author

# **Landon Kaetler**

## **Criminal Justice**

**Faculty Supervisor:** Yvon Dandurand

**Award:** \$1,000

**Landon:** I am graduating with a Bachelor of Arts in Criminal Justice. I will most likely attend law school or pursue a Master’s degree. In my second year I enrolled in Criminal Justice and continued taking Political Science courses as my electives. Together, these two disciplines equipped me with the knowledge and skills that I was able to apply in my final practicum in a United Nations affiliated research institute.

Throughout university, I took an interest in global issues. I am extremely grateful that I had this opportunity to familiarize myself with the policy process of key multilateral organizations and hopefully contribute to making a positive difference in the area of crime prevention.

## **Practicum: International Centre for Criminal Law Reform**

I assisted my supervisor in the completion of three main projects at the International Centre for Criminal Law Reform in preparation for the 14th United Nations Congress on Crime Prevention and Criminal Justice.

The first project involved the preparation of a report for a presentation at an event held by the Organized Crime Observatory in Geneva (Nov., 2019). I gathered policy briefs and other publications, and organized this information into a document outlining broad themes/subtopics along with a brief description of new and emerging threats of organized crime.

The second project involved contributing to the development of a background paper on the integration of sports into crime prevention strategies. The paper was considered during a United Nations expert

group meeting in Thailand (Dec., 2019). I helped identify and review the relevant research literature and created a database of relevant studies, a list of existing programs, and a preliminary bibliography.

Additionally, I worked on a separate project on police governance for the 14th Crime Congress. I gathered existing available research on police performance, and submitted a research paper on the issue of money laundering in Canada to my supervisor. During the practicum, I was also given the opportunity to provide my own written feedback on various projects.

**Note:** *Landon was also nominated for his work on the South Asian Canadian Youth and Violence project in the South Asian Studies Institute (SASI).*

*Think left and think right  
and think low and think high.  
Oh, the thinks you can think up  
if only you try!*

*Dr. Seuss*



# **Wiley Reid**

## **Economics**

**Faculty Supervisor:** Young-Il Albert Kim

**Award:** \$1,000

**Wiley:** I'm a 4th-year Economics student at UFV. I'm currently in the application process at multiple law enforcement agencies with the intention of becoming a financial crime/fraud investigator. I found my research on criminal deterrence to be fascinating, and the process of writing this paper gave me confidence that I could take my education to the graduate level if I so desire.

### **Certainty vs. Severity: How to Best Deter Crime**

Previous economic analysis on the topic of criminal deterrence has thus far reinforced a key assertion of the expected utility-maximizing criminal model. Namely, the assertion that the certainty of a criminal being caught and punished has a more significant effect on criminal deterrence than the severity of the punishment given. However, almost every quantitative analysis of this assertion has relied on cross-sectional national and state level data, which does very little to control for endogeneity.

For this project, a panel data set that was taken at the county level, and controls for county fixed effects is used to perform analysis instead. Using ordinary least squares regression, it is found that certainty does appear to deter crime more than severity, with the certainty of being arrested after committing an offence having the most considerable deterrent effect.

# **Steven Sprott**

## **English**

**Faculty Supervisor:** Andrew Gutteridge

**Award:** \$1,000

**Steven:** This year I graduate from UFV and move on to pursue a Master's degree in Literature at Queen's University. Eventually I would like to teach at a university level. The research I have done during my Bachelor of Arts has played a large part in my development as an individual thinker and human being, and I am thankful to have been able to pursue ideas that feel important – even if at first I wasn't sure why.

## **The Architectural Psyche in the Works of George MacDonald and John Ruskin**

The friendship between Victorian critic and artist, John Ruskin, and the Victorian novelist George MacDonald, has been well studied. However, relations between their works themselves require attention, in particular their understanding of architecture and space.

MacDonald uses a variety of architectural elements symbolically in his fiction – churches, attics, staircases – while Ruskin's architectural criticism illustrates how buildings express human character and religion.

Ultimately, this project shows how both writers draw an essential connection between architecture, space, and the human mind. Specific parallels include the moral role of architecture as well as the implications of human space in reference to natural space. I believe this project develops an important relation between two prominent Victorians that has been overlooked.

# **Marlowe Farris**

## **History**

**Faculty Supervisor:** Scott Sheffield

**Award:** \$1,000

**Marlowe:** I am a student in the Bachelor of Arts program, and have just completed the final semester of my degree. My major is English Literature and my minor is History. I have long been fascinated with the connection between language and history. My dream is to write a book on the evolution of English, and its sister-languages, from Proto-Germanic.

In the short term, I intend to finish UFV's Teacher Education program and become a high school teacher. I chose my research topic because I saw it as an event that is overwhelmingly studied from one perspective, and I saw value in exploring it from a different perspective. Additionally, it allowed me to explore the role of language barriers and culture-shock.

## **Wars & Rumors of Wars: A Fictional Memoir Regarding Inuit and Beothuk Encounters with Pale People from Beyond the Sea**

Wars & Rumors of Wars is a work of historical fiction that explores the Norse settlement of Newfoundland from the perspective of an Inuit boy. Given that the Vinland sagas are the only surviving accounts of the event, I relied upon later accounts of Canada's Indigenous peoples to re-construct how their civilizations might have been at the time.

Interestingly, there are multiple Indigenous groups that may have been present at the time. The most likely were the Inuit and the Beothuk, so both are present in the story.

The most significant findings, for me, were the massive cultural distinctions between the Beothuk and Inuit even after centuries as neighbours, and the fact that several recently-published oral traditions are supported by older written accounts, demonstrating their consistency.

# **Ekaterina Marenkov**

## **Philosophy**

**Faculty Supervisor:** Glen Baier

**Award:** \$1,000

**Ekaterina:** I am currently chipping away at my Bachelor of Arts with double majors in Philosophy and Sociology, along with an extended minor in English. Upon the eventual completion of my BA, my goal is to further my education in Philosophy, pursuing research in continental thought.

## **Foucault's Genealogy and Archaeology: Two Essays**

In the first paper, it is my goal to situate Foucault's perspective on the relationship between power and discourse as it is presented in his essay "Nietzsche, Genealogy, History." Foucault's thesis builds on Nietzsche's image of genealogy as "gray, meticulous, and patiently documentary." In making genealogy his starting point, a realm of moral and historical implications is unveiled, one which constitutes the active domain of power and discourse. Thus, Foucault appropriates Nietzschean genealogy and makes it his own. In other words, where Nietzsche opens up new avenues of thought, Foucault studies those spaces — interstices — in which the production of knowledge takes place. This allows Foucault to initiate the thesis that knowledge is itself a product of history, best understood through genealogical analysis.

The second paper follows in tandem with the previous paper and illustrates the way Foucault's theorizing highlights human finitude and how it plays into the construction of the future, past, and present. As noted in the previous essay, for Foucault, Nietzsche illuminates the role of the philosopher as someone meant to diagnose the existing state of thought. From there, two kinds of philosophers can be envisaged. First, the kind who opens up new avenues of thought, such as Nietzsche, and second, the kind who in a sense plays the role of an archaeologist, such as Foucault. Accordingly, this paper serves to illustrate two things. First, the way Foucault exposes the seams in our understanding with his archaeological method, and second, the way he aims to remedy the model governing conventional histories of ideas.

# ***Tracy Morrison***

## **Political Science**

**Faculty Supervisor:** Fiona MacDonald

**Award:** \$1,000

**Tracy:** Tracy is a fourth year Political Science student finishing her degree next year. She would like to go into a Master's program with a focus either in International Relations or feminism. Tracy chose UFV because of its sense of community, welcoming professors, and friendly students. UFV provides her with a sense of belonging, and a fantastic education from its knowledgeable faculty and staff. Research has enhanced her learning experience immensely by showing there can be multiple answers to a particular question and findings are not always what was originally perceived to be true, which has guided her research with Professor Fiona MacDonald. Tracy began seeing feminist issues she learned about in her everyday life. As a sports mom, her paper was influenced by the toxic masculinity she saw in her son's life and how it has been amplified through his experiences in organized sports. She began observing the behaviours of toxic masculinity and realizing how influential it can be, not just in her son's life but in the acceptance of the behaviours by society.

### **It's Just a Boys' Game**

The project was to see another side of feminism, that not only women suffer from the objectification of females being perceived as a weaker sex, that toxic masculinity is affecting the well-being of many people. The emphasis and acceptance of masculine behaviours in society has produced toxic masculinity and has been amplified in organized sports. The acceptance of these behaviours has produced society's influence and acceptance of overt aggressive behaviour in boys and men, and a rejection of males showing any other emotions that could be deemed as "weak" such as crying, which is associated with effeminate traits, also leading to the further oppression of women. Sayings such as "boys will be boys," and "there's no crying in baseball," has led to society allowing men to suppress their emotions and displaying aggressive outbursts as an acceptable behavior.

Toxic masculinity has proven to produce hyper-masculinity, a widening gender gap and disparity, and violence toward women through a rape culture found in organized sports through entitlement and privilege.

# **Taylor Allenby**

## **Psychology**

**Project Supervisor:** Sven van de Wetering

**Award:** \$1,000

**Taylor:** I chose to do this research after reading about claims made by Terror Management theorists regarding the role of death reminders in influencing political attitudes. Since confronting one's mortality is an experience common to all, investigating the influence of death reminders on attitudes and perceptions is a relevant and important area of research. Having the opportunity to conduct this research alongside my advisor was the highlight of my degree, and has fueled my aspirations to pursue graduate studies.

### **In the Shadow of Mortality: The Impact of Priming Specific Types of Death on the Terror Management Literature**

My project served to address a gap in the Terror Management literature by investigating how priming specific ways of dying would impact individuals' political attitudes and perceptions of meaning in life. This research evaluated claims made by terror management theorists regarding changes in political attitudes and support for meaningful cultural values in response to death reminders.

The difference between pretest and posttest authoritarianism scores and responses to a perception of meaning in life questionnaire were the dependent measures. No significant differences were found between group means for either dependent variable. This is an interesting finding, as the lack of significant differences between groups on the authoritarianism measure displays a failure to replicate previous terror management findings.

Further, the finding that death reminders do not impact how individuals perceive meaning indicates that the claim that death reminders cause individuals to increase their support for meaningful cultural values and institutions may lack support. In sum, these findings are important because they indicate that Terror Management Theory may require substantial revisions.

# **Paul Jakhu**

## **Sociology**

**Faculty Supervisor:** Alicia Horton

**Award:** \$1,000

Paul is in his fourth year at UFV, working towards a Bachelor of Arts with a major in Sociology.

## **To Tell or Not Tell: The Dilemmas in the Lives of Prisoners' Families**

This study presents the results of four in-depth qualitative interviews with prisoners' families that explore the stigma they experience with their relatives' incarceration. Although, scholars frequently recognize stigma as a collateral consequence of imprisonment, scant research has addressed the decisions families construct in choosing to disclose their relatives' incarceration.

Results from this study suggest families experience a fluidity with their stigma as they initially engage in forms of "passing" (Goffman, 1963) and a selectivity of disclosure on the basis of social bonds. Yet, as time persists following post-incarceration, the stigma families experience diminishes as they move forward with their lives. Methodological and theoretical implications are discussed, along with policy recommendations that alleviate the hardships families experience with incarceration.

*I have a certain curiosity for life that drives me and propels me forward.*

Rachel McAdams, Canadian Actress

# **Albert Woods**

## **Visual Arts**

**Faculty Supervisor:** Grace Tsurumaru

**Award:** \$1,000

**Albert:** I am graduating this year from the Bachelor of Fine Arts program with a major in Visual Arts.

My time at UFV has aided and inspired me to pursue a fulfilling career as a museum/gallery technician.

## **Anthropos Morphos Series 2020**

### **Mixed Media**

My grad artwork series entitled Anthropos Morphos encompasses three interactive sculptures depicting real-world environments like a New York street corner and a Congolese artisanal mine. The series presents specific contemporary cases of subjugation brought about by technological change. These miniature environments were produced to the scale of the preserved bees and flies that are naturalistically posed therein.

This project gave me an opportunity to conduct new research with several different entomological practices far removed from my skill set. Through technical experimentation, this project has given me a new medium to work and draw inspiration from.

# **Joleen Prystupa**

## **Kinesiology**

**Faculty Supervisors:** Iris Lesser

**Award:** \$1,000

**Joleen:** Engaging in research at the University of the Fraser Valley has allowed me to become passionate about future research and has opened the door to unique opportunities and experiences. I appreciate the time Dr. Iris Lesser has taken to provide mentorship and oversee the project.

My future plans are to attend the University of Saskatchewan for the Master's of Physical Therapy program starting September 2020.

### **Take a hike:**

## **The effectiveness of group-based trail walking on anxiety in cancer survivors**

This study looked at the benefits of performing physical activity in green nature. Primarily, the study aimed to evaluate the impact of an eight-week trail walking program on anxiety in cancer survivors. There were also nine other secondary outcomes measured. The trail walks were held twice a week and designed to maximize physical and psychological benefits by meeting the physical activity guidelines of 150 minutes/week.

Results did not show a significant reduction in general anxiety, however there was a significant decrease in perceived stress and state anxiety. Negative mood symptoms such as anxiety and stress often co-occur. The study may have been too short to elicit a significant response in generalized anxiety.

# **Julie Rhodes**

## **Nursing**

**Faculty Supervisor:** Shelley Canning

**Award:** \$1,000

**Julie:** I am a 4th year student nurse in the Bachelor of Science in Nursing program at UFV. My aspirations are to pursue public health and global health nursing, focusing on the concepts of health promotion and primary health care.

Pursuing undergraduate research at UFV enriched my studies, allowing for hands-on experience with qualitative research since I intend to continue research in my nursing career.

## **Exploring barriers and facilitators affecting the student nurse's experience of patient teaching in the clinical setting**

My undergraduate research project investigated barriers and facilitators experienced by the student nurse during patient teaching interventions within the clinical setting. Through interviews, student nurses' past experiences of patient teaching, and what factors helped those interventions be successful or unsuccessful, were explored.

Findings showed that students who have a strong knowledge base and practice with teaching express more success. As well, subtle barriers exist within a student's teaching experience, such as feeling novice in an expert's role, unreceptive patients, and contextual constraints.

Supportive instructors and nursing staff were the most significant facilitators to a student nurses' teaching competency.

# **Trisha Bugra, Ashreet Dhiman, Thanh Nguyen, and Steven Perry**

## **Business**

**Faculty Supervisor:** David Dobson

**Award:** \$250 each

**Trisha:** My name is Trisha Bugra and I am a Bachelor of Business Administration student with a minor in Operations Management. This remarkable opportunity discovered my new passion for research and reminded me to continue to embrace expanding my knowledge. I am also grateful for the new relationships I created with my professors and my peers.

**Ashreet** is completing his third year in the Bachelor of Business Administration, with a focus on Human Resources Management.

**Thanh** is a fourth year student in the Bachelor of Business Administration in Accounting.

**Steven** is also in his fourth year of the Bachelor of Business Administration in Accounting.

## **The Truth About Fast Fashion**

Our research study was on “fast fashion” the practice of mass-producing inexpensive clothing to help keep up with the latest trends. Fast fashion companies rely on efficient supply chain management, outsourced labour, and a copious amount of resources. However, there are several global consequences including unethical labour, water pollution, and excessive waste.

From our results, it appears that consumers are regularly purchasing clothes from fast fashion retailers, but almost one in every three consumers are unaware of these consequences. Purchasers prefer buying from this industry for the trade-off between quality and price, without knowing the humanitarian and environmental impacts.

We found that people are not willing to go out of the way to purchase ethically sourced clothing. Therefore, raising awareness on fast fashion would be the optimal solution to decrease it.

# **Kaden Ray**

## **Physics**

**Faculty Supervisor:** Derek Harnett

**Award:** \$1,000

**Kaden:** I will be graduating from UFV this winter with a Bachelor of Science degree in Physics after four and a half years of study. Engaging in research made me appreciate how much work goes into advancing the sciences.

I am going to continue my education in Physics by beginning my Master's studies this coming January.

## **Radiative Corrections to the Light $0^{++}$ Tetraquark Correlator using the Numerical Integrator pySecDec**

Tetraquarks are particles composed of two quarks and two antiquarks. Several tetraquarks have recently been discovered and many more are expected to exist. To aid in the detection of tetraquarks, theoretical predictions for properties such as mass and decay rates can be calculated.

These calculations involve integrals that are challenging to evaluate by hand. This project looked to update existing predictions by numerically computing radiative corrections to a light tetraquark correlator using the numerical integrator pySecDec.

Results indicate that these corrections are comparable in size to leading-order results and may significantly update existing predictions.

# Chris Reed

## Agriculture

**Faculty Supervisor:** Renee Prasad

**Award:** \$1,000

**Chris:** I am an international exchange student visiting UFV from Charles Sturt University in New South Wales, Australia. Upon finishing my current course, an online Master of Sustainable Agriculture, I plan to complete a PhD in the same field. I chose LED-grown microgreens as a research subject because of their relevance to urban agriculture and the development of protected cultivation. I had a fantastic experience with this project, learning a lot about the topic and developing the skills needed to build an experiment from the ground up.

None of it would have been possible without my supervisor Renee Prasad, to whom I owe an enormous debt of gratitude.

Thank you Renee!

[Watch the video!](#)

## The effects of short-term LED blue light treatment on soil-grown broccoli microgreens

Broccoli microgreens are a rich source of glucoraphanin. This is the precursor form of a powerful indirect antioxidant known as sulforaphane, which triggers production of endogenous antioxidants within the human body known as phase II detoxification enzymes. These are direct antioxidants that combat carcinogenesis, DNA mutation, and oxidation. Therefore, it has been suggested that glucoraphanin is responsible for the inverse correlation between broccoli consumption and the incidence of cancer. Recent research indicates that LED blue light can be used to increase glucoraphanin concentration in broccoli microgreens, potentially magnifying this carcinopreventive effect. However, this was demonstrated using a hydroponic system that is unsuited to commercial microgreens production.

For widespread cultivation of LED blue light enhanced broccoli microgreens to be possible, the observed increase in glucoraphanin content must be replicated in a soil-based growing system. The purpose of my research project is to determine whether this is possible. Analysis is ongoing, due to the COVID-19 pandemic, but preliminary findings suggest significant differences between LED blue light treatment and control groups.

# **Aisa Dobie**

## **Biology**

**Faculty Supervisor:** Nathan Bialas

**Award:** \$1,000

**Aisa:** I am graduating with a Bachelor of Science, Biology major with distinction. I intend to further my education by continuing onto a Doctorate of Optometry degree at the University of Waterloo in the fall.

This research project was completed as part of an 8-month self-directed study course and has given me applicable skills for my academic and professional future. This opportunity has shown me first-hand the importance of problem-solving, critical thinking, and communication.

## **Investigating the Neuroprotective Effects of Haskap Berry (*Lonicera caerulea*) extract on *Caenorhabditis elegans***

Alzheimer's Disease is a neurodegenerative disorder characterized by the toxic accumulation of  $\beta$ -amyloid protein. Investigating plant-based therapeutics that are high in phytochemicals are a research focus of scientists to aid in the search for preventative measures. Using the model organism *C. elegans*, the Haskap berry is currently being investigated for its ability to increase lifespan and stress response.

In this research, Haskap is applied to the disease model of Alzheimer's to determine if the berry has neuroprotective effects. Using strains of *C. elegans* that produce intracellular  $\beta$ -amyloid, Haskap significantly reduces the toxic accumulation of  $\beta$ -amyloid and reduces toxic symptoms compared to control groups.

These results further implicate the berry as a potential candidate for further therapeutic intervention research.

# **Kyla Woelk**

## **Chemistry**

**Faculty Supervisor:** Cory Beshara

**Award:** \$1,000

**Kyla:** I will be graduating this winter from UFV with a Bachelor of Science degree in Chemistry with a minor in Biology. Starting in January, I will be continuing my education in Synthetic Chemistry through graduate studies at the University of Victoria. My research at UFV has led me to my interests in synthetic and medicinal chemistry. I have a career goal of working as a synthetic chemist for a pharmaceutical company.

### **Experimental and Theoretical Studies of Cycloaddition Reactions: Synthetic Optimization and High Pressure Sensitivity**

Cycloaddition reactions play an important role in both experimental and theoretical chemistry due to their synthetic potential and nontrivial chemistry. Experimentally, I utilized the Huisgen type 1,3-dipolar cycloaddition of azide to 2-cyanopyrrole as a synthetic tool in the optimization of the 2 step synthesis of the target compound 5-5'-(phenylmethylene)bis-[2-(tetrazol-5-yl)-1H-pyrrole].

Theoretically, I looked at high-pressure effects on the 1,4-cycloaddition of maleic anhydride to various substituted dienes. This involved quantum mechanical calculations and molecular dynamic simulations of the reactants, products and transition states involved in the 1,4-cycloaddition in various solvents

# ***Gurdeepak Sidhu***

## **Mathematics & Statics**

**Faculty Supervisor:** David Chu

**Award:** \$1,000

**Gurdeep** is a fourth year Bachelor of Science student with a major in Mathematics, also completing a Data Analysis certificate.

### **Modeling on effects of sports analytics and team attributes on successful NHL regular season and postseason**

In this paper, we study how the sports analytics belief, number of analytics staff, and number of professional staff hired affect team success in NHL regular season and postseason. Conditional probabilities, correlations, and regression models are used to assess team success through the empirical data of 2014-2019. Team payroll is shown to be significantly positively correlated with team success in regular season, but not in postseason. It is interesting to see that teams scored 96 points or higher are very likely advancing to playoffs, whereas teams scored 92 points or lower are very unlikely advancing to playoffs.

Various team attributes such as the average age of players, payrolls of different positions (goalies, defensemen, forwards), numbers of first round draft picks in the previous three years, playoffs experience, and coach playoffs winning percentage are also considered in this study.

Four predictive modeling techniques (decision trees, random forests, logistic regressions, neural networks) are applied to the data for classifying teams into playoffs or no playoffs, and for classifying playoffs teams into different stages towards the championship of the Stanley Cup. Random forests appear to be the best or as good as the other three techniques to yield the lowest misclassification error rate under different situations. The team success in regular season apparently does not translate to success in postseason that can be viewed as a random event.

# Paige Bogaerts

## School of Land Use and Environmental Change

Faculty Supervisor: Claire Hay

Award: \$1,000

**Paige:** I chose to complete an honours thesis as a capstone of my Bachelor's degree in Geography. I always threw myself into my studies and student life at UFV, and choosing to complete this thesis benefitted me in critical thinking, problem solving, project planning and presenting original research. The option to research something I was personally interested in and see it through from the bottom up was an amazing experience, and something that will benefit me in my career in research for many decades to come.

### Salt Marshes and Sea Level Rise: Coastal Ecosystems Slipping Beneath the Waves

I chose to investigate the impact of rising seas on coastal salt marshes on the Pacific southwest coast, namely the Mud Bay salt marsh in South Surrey. Looking at changing marsh elevation, marsh health and using models to predict future change, we were able to suggest areas where the marsh is at greatest risk. Under IPCC sea level predications, the Mud Bay marsh is threatened by 1.1m of sea level rise and accompanying coastal squeeze.

The research has the potential to contribute to future efforts to protect the coastal communities in South Surrey and maintain the health of the marsh.



*To me, science is just formalized curiosity.*

Chris Hadfield  
Astronaut

# ***Community Service Research***

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***Vanessa Brewer, Claire Cook, Caitlin Parray, Andrew Schulz, and Ian Wilson***

**School of Land Use and Environmental Change**

**Faculty Supervisors:** Mariano Mapili and Paul Fontaine

**Community Partners:** Alison Martens and Magda Lajlee —

City of Abbotsford

**Award:** \$200 each

**Vanessa:** My goals academically include completing a Bachelor of Science in Physical Geography honours, and in the future to complete my Master's in Volcanology and a PhD. My career goal is to become a professor in volcanology or paleoclimatology. This project has allowed me to understanding the relationship between punctuated classroom learning and the application of research in real life.

**Claire:** I am an undergraduate student currently pursuing a Bachelor of Arts in Geography, with a concentration in environmental science. Though I have an Intermediate French Proficiency Certificate from UFV, I plan for my career to have an environmental focus rather than a language focus. Participating in this research enriched my education at UFV as I was able to learn through experience rather than lecture.

**Caitlin** is a third year Bachelor of Arts student who is majoring in Geography with a minor in History.

**Andrew** is also a third year student working towards a degree in Physical Geography.

**Ian:** I have just finished a Bachelor of Science degree with a major in Physical Geography and extended minor in Theatre. I have aspirations to become either a broadcast meteorologist or a sports broadcaster and if I'm not at school you can find me lifeguarding in Harrison Hot Springs or playing basketball in the Abbotsford Men's League. Being able to participate in this project allowed for a richer learning experience accompanied by the opportunity to practice and develop skills that I learned with previous UFV research projects.

## **Starling Management in the City of Abbotsford: Descriptive and Exploratory Analysis of Appropriate Technologies, Landscape Analysis, and Perceptions of Residents and Farmers**

Starlings have long been an assailant to the blueberry fields of Abbotsford and the current means attempting to deter them are inadequate and leave opportunity for conflict between the farmers and residents of the community. This project allowed for an in-depth look to be taken at several deterrent methods for the starlings and in the end the best possible options were highlighted with the benefits and obstacles of their use.

Throughout the project we held true to a set of values that would ensure our recommendations would be economically viable, environmentally and scientifically ethical, effective, and build better community relations between the farmers and residents.

After exploring many different genres of avian pest control, it was found that birds of prey was the most effective in deterring starlings from entering the field. This is because birds of prey tap into a natural instinct within the starlings that causes them to avoid their territory, and unlike other bird deterrent strategies, starlings cannot adapt or habituate to the bird of prey.

*It's about human imagination and curiosity.  
What's out there? What's in the great beyond?  
What exists at levels we can't see with our five senses?*

*James Cameron  
Canadian Screenwriter*

# Indigenous Research

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## Sasha Tuttle

### Biology

Faculty Supervisor: Carin Bondar

Award: \$1,000

**Sasha:** I plan to graduate from the University of the Fraser Valley, after the Fall 2020 semester, with a Bachelor of Science and a major in Biology. Following this, I plan on pursuing a Master's degree at Simon Fraser University. I plan to eventually work as a wildlife biologist. I chose this project for my directed study because I became interested in the use of parasitoid wasps as biocontrol agents through a summer job and wanted to learn more.

### **The Effects of Genotype and Host Species on the Offspring of the Parasitoid *Trissolcus japonicus* in Terms of Fitness**

I investigated the effects of the natal host species and parasitoid strain on the offspring of *Trissolcus japonicus*, in terms of their fitness. This research is important to the field of biocontrol because *T. japonicus* is being considered for release to control *H. halys*, a stinkbug that damages crops in North America. This wasp can't be released until we better understand the potential for attack on non-target stinkbug species.

I found that both the natal host species and the parasitoid strain influenced the fitness of the wasp offspring and that the natal host species could even determine if relationships existed between certain fitness related traits (e.g. fecundity and circadian rhythm).

The findings indicate that biocontrol programs considering parasitoid use should study multiple strains to see which one faces the greatest fitness consequences from being reared on non-target stinkbugs.

# ***Indigenous Research***

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## ***Leanne Herrett***

### **History**

**Faculty Supervisor:** Larissa Horne

**Award:** \$1,000

**Leanne:** I recently completed a Bachelor of Arts degree with a major in History, and in the fall I will begin the Bachelor of Education program at UFV as I work toward becoming an elementary school teacher. I chose the topic of the Navajo code as it is a unique subject that combines the study of intelligence with Indigenous involvement in World War II.

This project allowed me to explore the experience of the Navajo people in the United States during WWII and in the years following, and analyze representations of the Navajo people in intelligence history.

### **The Navajo Code: Recolonization in the Field of Intelligence**

The Navajo code was derived from the Navajo language and utilized by the United States Marines. While the code and the Navajo code talkers are widely regarded as a valuable contribution to the US war effort, as I studied the Navajo code talkers in the context of their experience in the military and in American society, I discovered that the use of the code was arguably a recolonization of the Navajo people. Although the code was used for the benefit of the US war effort, discrimination and a disregard for Navajo culture and language continued to characterize their treatment.

The involvement of the Navajo people in US intelligence has, in many cases, been misrepresented, and through my research I discovered that to consider the code without acknowledging the broader history of the Navajo people provides only a partial understanding of this event in intelligence history.

# ***Industry Engagement Research***

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***Evan Foley***

## **Chemistry**

**Faculty Supervisor:** Golfam Ghafourifar      **Award:** \$1,000  
**Industry Partners:** NUCOR, Ammonia Safety & Training Institute, Hazmasters, and GHD

**Evan** is graduating with a Bachelor of Science in Chemistry and a Professional Communications certificate.

## **The Effects of Gaseous Ammonia Environment on Industrial and First Responder Clothing Materials**

This research project involved the analysis of various clothing materials worn in different environments by industry workers and first responders in Immediately Dangerous to Life and Health (IDLH) gaseous ammonia atmospheres. As aqueous ammonia is one of the most common industry chemicals in the world it was important to understand the effects it has in different situations.

Workers and first responders wear different clothing materials into different environments based on known factors of the response such as possible chemical concentration in room, risk of chemical exposure, and geographic implications. As there are many different situations, these materials in question were analyzed in order to see how they retain chemical gaseous ammonia once removed from the IDLH environment.

Currently, little research has been done around the chemical retention of first responder clothing with the focus being mainly on chemical breakthrough times on polymer suits. The project can yield great insight into developing standards for first responder decontamination requirements in gaseous ammonia IDLH atmospheres.

# ***Industry Engagement Research***

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## ***Rochelle Thrift, Alec Baker, Garrett Paddon***

### **Physics**

**Faculty Supervisors:** Lin Long, Jeff Krahn      **Award:** \$350 each  
**Industry Partner:** Worker Bee Honey Co.

**Rochelle:** I am completing my Engineering Physics diploma in Mechatronics and a Bachelor's degree in Physics. Upon graduation I would like to move to New Zealand to pursue grad school to obtain a Master's degree in Mechatronics.

**Alec:** This project was the conclusion of my Engineering Physics in Mechatronics diploma, and closed my 7th semester at UFV. It brought together most of what was learned over the past couple years, from drafting to programming to mechanics to electronics. With my diploma I've started a career as a technologist at 3DM Devices, a company that engineers and manufactures laser measuring and profiling systems.

**Garrett:** Working on this project has given me an opportunity to put all the skills and knowledge I have obtained through my time in the Engineering Physics diploma. I plan to take my experience from this project and put it towards a career in manufacturing and automation once I finish my Physics degree in the coming year.

### **Automating a PH Sensor Probe**

In collaboration with Worker Bee Honey Co., our group worked on engineering a solution to automate a time-consuming laboratory process. The project automates a system that moves a sensor probe which measures and adjusts the pH value of multiple test tubes of honey samples. Preparing samples for Nuclear Magnetic Resonance testing requires samples to be at a pH of 3.1, and at Worker Bee Honey this is achieved with a Bruker BTpH titration unit.

Currently the process requires a person to operate, which is tedious and time-consuming. Our group built a 3D gantry robot with

programmable point to point motion. By automating the system, it frees up this person to perform other tasks increasing the overall efficiency and cost competitiveness of the business.

We also designed and 3D-printed a cleaning station that mounts nozzles to spray deionized water and air, to rinse and then dry the titration probe. The system is controlled via a touchscreen, allowing the user to easily select which samples are to be titrated, as well as manually control the motion of the probe. Due to the COVID 19 situation, we weren't able to integrate all three parts and troubleshoot the final product by the end of the semester, but one of our members has been hired to complete the project over the summer.

Working with this company has given us great experience, skills, and a chance to create a network. We utilized the knowledge learned over the years studying Mechatronics and Physics to design, model, and build the automated sensor probe. We also learned how to manage time and delegate complex tasks within a team.



Comic by Charles M. Schultz

# ***Industry Engagement Research***

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***Zi Tong (Yuki) Lam, Aron McKague,  
Rebecca Vandenberg, Michaela  
Warmerdam, Maaria Zafar, Jiajing Ning***

## **Graphic & Digital Design / Communications**

**Faculty Supervisor:** Gino Burich

**Award:** \$200 each

**Industry Partner:** Terry Hood, Stave West Regional District

**Zi Tong (Yuki):** I am a second year Graphic Design student working towards a Bachelor of Arts in Graphic Design. UFV has given me an opportunity to venture out and explore further in the field of Design and Arts. The Stave Lake Interpretive Panel Design and Signage project has granted me an opportunity to grow and build new relationships with fellow peers, professors, and professionals. As the future progresses I do hope to learn more and expand my knowledge in the world of design.

**Aron** is completing a diploma in Digital and Graphic Design, with a focus on communications.

**Rebecca:** I'm a second year Graphic Design student at UFV. I'm passionate about branding and would love to work in a studio when I graduate, and eventually start my own business one day. This research project was really helpful to my education because I was able to learn how to work with clients on projects and how to overcome obstacles that I will be facing when I begin working after graduation. This project has been a great learning experience and it's exciting to be able to have my work actually become something for the public to use and enjoy.

**Michaela:** I'm third year Graphic and Digital Design student at UFV. I plan to design around the world with different people and communities. This research project has set me up for my future goals by teaching me about working in a group and what it means to create something from the ground up.

**Maaria** has studied for four years at UFV, including an exchange semester in Prague, Czechoslovakia. She is currently completing a Bachelor of Arts in Criminal Justice with a minor in Communications.

**Jiajing:** I am a Graphic Design student at UFV. My goal is to keep gaining more experiences and developing more life skills. My career plan is working in a design studio after graduation. I chose this project because I love to use my design skills. I enjoyed participating in the Stave West signage design project as we worked in a team. I like this experiential learning because this project brought me good aspects: not only did I learn how to design park signage, I also realized what my major weakness is in working as a team. I learned some good strengths from my team members, such as communication skills, and how to take responsibility for the team.

## **Stave West Interpretive Panel Design & Signage**

The goal of this project was to provide signage and a consistent brand identity for the Stave West Forest and Recreation Area. It's become a busy area of Mission for 4x4ing, camping, and weekend visitors, but with very little signage the area is being misused and the land is being damaged. We were tasked with creating kiosk and interpretive signage to engage the public and give the area more purpose for people coming up to the lakes and forestry area.

We began by visiting the site and learning about Indigenous communities, species, forestry, and recreation. It was important for us to highlight the First Nations and TFL 26 as key players in the care for the land.

As a team, we also researched about a new design topic we had never encountered until now: experiential design. This means designing in a physical space. It is concerned with the look and feel and how people navigate through the space. Value added features make the area more interactive for visitors.

The new signage for this area provides its users with insightful information in unique ways and will inform people about the land, its usage, and its importance. Overall, it was a really great project to work on and will hopefully leave a lasting impression on the community.

# *BC Graduate Scholarships*

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## **Ministry of Advanced Education, Skills, and Training \$15,000 (10 awards)**

The Ministry of Advanced Education, Skills, and Training has awarded funding to provide competitive, merit-based graduate student scholarships. These scholarships will enable British Columbia institutions to attract and retain the best and brightest graduate students, and increase their ability to compete for students who are leaders in their field.

UFV is delighted to receive \$75,000 from the Ministry, which was combined with matching funds from some of our loyal supporters, to provide ten \$15,000 BCGS awards over the next two years.

We are honoured this year to award the 2020 BC Graduate Scholarships to two new students admitted into the Master of Social Work program.

*UFV gratefully acknowledges the contribution from the BC Ministry of Advanced Education, Skills and Training, as well as private donors, for funding the BC Graduate Studies Scholarships.*

## *Other Prestigious Scholarships*

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### **Canadian Institute of Nuclear Physics \$9,000 or more**

The Canadian Institute of Nuclear Physics (CINP) Undergraduate Research Scholarships program enables gifted undergraduates to work with a supervisor on nuclear physics research over the summer.

The program is open to any Physics or Engineering Physics major enrolled in a Bachelor of Science or Applied Science program at a Canadian university.

The duration of the scholarship is 16 weeks on a full-time basis. The scholarship consists of a \$5,000 stipend, supplemented with other funds to a total of not less than \$9,000.

#### **Emily Rettich**

Faculty Researcher: Derek Harnett

Research: Decay rates of the lightest  $1^{--}$  hybrid from QCD sum rules

# **Natural Science and Engineering Research Council (NSERC) Undergraduate Student Research Awards (USRA)**

**\$4,500**

These national awards are meant to stimulate interest in research in the natural sciences and engineering. They allow students to gain valuable research experience that complements their studies by working full-time for a term with a nationally recognized UFV faculty researcher.

Additional funds are provided by the faculty researcher's grant.

## **Kaden Ray, Physics**

Faculty Researcher: Derek Harnett

## **Daylan Pritchard, Biology**

Faculty Researcher: Lucy Lee

## **Dilan Praat, Biology**

Faculty Researcher: Gregory Schmaltz

## **Anmol Sharma, Chemistry**

Faculty Researcher: Linus Chiang

## **Kyla Woelk, Chemistry**

Faculty Researcher: Noham Weinberg

## **Christian Trelenberg, Computer Information Systems**

Faculty Researcher: Gabriel Murray

## **Vanessa Brewer, Geography**

Faculty Researcher: Olav Lian

*UFV gratefully acknowledges the support of the Tri-Council Granting Agencies (SSHRC, NSERC & CIHR) through their Research Support Fund and financial contributions to the UFV Research Office.*

# Student Presentation Grants

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## *Oh, the places they go!*

In addition to the awards mentioned here, the Research, Engagement, and Graduate Studies office provides travel grants to students presenting their research at professional conferences. In 2019-20, 30 students were provided up to \$1,500 each to present at conferences across Canada, throughout the USA, and internationally in places like Austria and Poland.

Our amazing students are often the only undergraduates presenting at the conference, and they get to connect with leading researchers in their field of study. They report that the experience was life changing and the highlight of their time at UFV, building on their education with real world experience.



*Comic by "Calvin and Hobbes" creator by Bill Watterson*

# UFV Student Research Day Awards

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COVID-19 may have kept us apart this year, but that did not stop the Research Office from making Student Research Day a success! Changing gears quickly, we held the poster event online and more than 190 students (96 posters) participated in the competition. Funds saved by not having the in-person event were used to increase the prizes from \$200 to \$500 each.

Engagement in research and events such as this can help students obtain scholarships, awards, and graduate school positions. It also contributes to UFV's strategic goal of providing "the best undergraduate education in Canada."

## UFV Student Research Day Awards

### **Jeremy Poortvliet — English**

Award: President's

*The two cultures debate: Historical contexts and future prospects*

Faculty Supervisor: Alex Wetmore

### **Sierra Schwab — Biology**

Award: Provost & Vice-President Academic

*Restoration management plan for the UFV campus forest*

Faculty Supervisor: Sharon Gillies

### **Jessica De Sousa and Navdeep Rai — Kinesiology**

Award: Associate VP Research, Engagement, and Graduate Studies

*Preliminary results from the Call to Action program*

Faculty Supervisor: Iris Lesser

### **Shan Dhaliwal, Kayla Normandeau, Navneet Kaur, Carina Banwait, Simran Chabba — Business**

Award: VP Students

*Race through the finish line with your customers*

Faculty Supervisor: David Dobson

**Teis Heemskerk, Kirah McCaffertry, Kiranjot Sidhu, Emma Skaaning  
— Agriculture**

Award: Vice-Provost & Associate VP Academic

*Assessing the antimicrobial activity of a copper-free foot bath  
solution: Preliminary results*

Faculty Supervisor: Renee Prasad

**Taylor Allenby — Psychology**

Award: Dean, College of Arts

*In the shadow of mortality: The impact of priming specific types of  
death on the terror management literature*

Faculty Supervisor: Sven van de Wetering

**Joleen Prystupa – Kinesiology**

Award: Dean, Faculty of Health Sciences

*Take a hike: The effectiveness of group-based trail walking on anxiety  
in cancer survivors*

Faculty Supervisor: Iris Lesser

**Farzad Famini — Chemistry**

Award: Dean, Faculty of Science

*Effects of pendant phenol functional groups on secondary  
coordination spheres of heme like Fe-salen complexes*

Faculty Supervisor: Linus Chiang

**Holden Milne — Computer Information Systems**

Award: Dean, Faculty of Professional Studies

*Job shop operator scheduling software with change-over times*

Faculty Supervisor: Opeyemi Adesina

**Kaden Ray — Physics**

Award: Dean, Faculty Applied and Technical Studies

*Radiative corrections to the light  $0^{++}$  tetraquark correlator using the  
numerical integrator pySecDec*

Faculty Supervisor: Derek Harnett

**Amneek Randhawa — Chemistry**

Award: Associate VP Research, Engagement, and Graduate Studies  
*Optimizing digestion of hemoglobin using chymotrypsin and assessing efficiency by capillary electrophoresis*

Faculty Supervisor: Golfam Ghafourifar

**Aisa Dobie — Biology**

Award: Associate VP Research, Engagement, and Graduate Studies  
*The effects of Lonicera caerulea extract on fat accumulation and autophagy levels in Caenorhabditis elegans*

Faculty Supervisor: Nathan Bialas

**Paul Jakhu — Sociology**

Award: Associate VP Research, Engagement, and Graduate Studies  
*Families' strategies for managing information about incarceration*

Faculty Supervisor: Alicia Horton

[Read about Student Research Day on UFV Today](#)

[View all the posters online](#)



# THANK YOU!

As children, our students learned by being curious about their environment. With support from their parents, family, and friends they have been encouraged to develop that sense of curiosity into discovery and learning. They could not succeed without your support.

Special thanks to the faculty mentors who have guided them to apply curiosity to their studies, and who provided opportunities to explore new frontiers and elevate their aspirations.

When our students succeed, we all succeed!

*Keep moving forward, opening new doors, and doing new things, because we're curious and curiosity keeps leading us down new paths.*

*Walt Disney*

