WISEST

women in scholarship, engineering, science & technology

# JOURNAL OF STUDENT RESEARCH 2014

Cover photos are credited to Joanna McQueen



WISEST

# SUMMER **RESEARCH PROGRAM** 2014

The WISEST Summer Research Program is a six-week paid experience for young women and men who have completed grade 11 to gain first-hand experience about diverse science and engineering disciplines. It is an exceptional opportunity for the students to learn about innovative research, participate in current investigations, meet incredible people, and broaden their horizons. The young women experience research in science, engineering and technology, fields that are currently experiencing an underrepresentation of women, whereas the young men are placed in fields that have fewer males, such as nursing, nutrition and human ecology.

*Photo: Joanna McQueen*

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# **WISEST** ENCOURAGES DIVERSITY

In 1982, WISEST was created by the University of Alberta to find the reasons why so few women were choosing careers in engineering and science and then to 'do' something to change that. Our vision is to ***empower women in the sciences, engineering and technology.*** We offer programs and networks that are designed to provide opportunities and hands-on experiences that promote and nurture interest in careers that are currently experiencing an underrepresentation of women.

Community outreach events hosted by WISEST are dedicated to building a stronger, more diverse work force in science, engineering and technology.
WISEST initiatives are funded through donations from corporations, individuals and the public sector.

**Choices** - a fabulous day of science, engineering & technology activities for 600 Grade 6 girls and their teachers.

**SET** - a one day Science, Engineering & Technology conference that provides young women in grades 10-12 with the opportunity to engage in hands-on experiences and learn more about careers and studies in the SET fields.

**Summer Research Program** - a once-in-a-lifetime six-week paid research work experience for young men and women in Grade 11. This unique program allows students to be actual researchers in fields such as science, engineering, nutrition and nursing.
Meet-a-Mentor –video conferenced experiments presented by researchers in science, engineering and technology.

**Tales from the Science Buffalo** - a series of interactive and hands-on classroom presentations that honour Aboriginal Ways of Knowing and introduce careers in the sciences.

**UA-WiSE Network** – a learning and support group for undergraduate women in the fields of science and engineering.

**WISER Network** - connects early-career women in STEM fields with one other and with the information, resources, support, and professional development opportunities they require to advance in their careers.

**WISEST Annual Guest Lectureship** - raises awareness of the importance and value of diverse voices being heard in all areas of science, engineering, and technology.

**WISEST Annual Golf Tournament** - an important fund-raising event to support WISEST in the promotion of diversity in the fields of science, technology and engineering.

WISEST's vision is to ***empower women in the sciences, engineering and technology.***

*Photo: Joanna McQueen*

# **THANK YOU** TO THE **WISEST** COMMUNITY

The WISEST Team would like to extend its sincere appreciation to the many thoughtful, dedicated people who make our remarkable Summer Research Program possible for the students involved. Thank you all for your amazing work!

We are grateful for all of the high-school teachers throughout Alberta that support WISEST by publicizing information about our programs. It is often teachers who first spark their students' interest and enthusiasm in the science, engineering or technology fields.

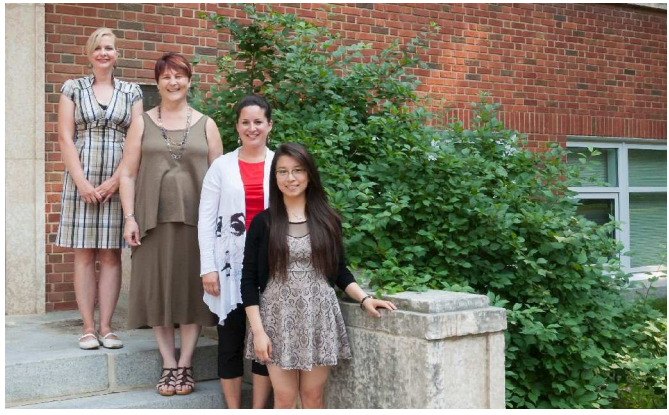
We are also immensely thankful for the University of Alberta faculty and their research teams who volunteer to provide our students with a positive and meaningful experience. Their guidance and mentorship inspires and teaches WISEST students in a challenging research setting, helping them realize their full potential in world full of possibilities.

The many learning sessions that WISEST incorporates into this program would not be possible without the support of volunteers from many different sectors. Throughout the program, numerous people from the science, engineering and technology communities share their experiences and wisdom with our students and help to broaden their awareness of diverse career options available to them. They do so by giving tours of research facilities, teaching students how to create research posters, giving tips on how to make effective presentations, and above all, by building the students' confidence to succeed in the science, engineering and technology fields. Volunteers are the backbone of WISEST and the key to the success of our programs.

Once WISEST has the high-school students and the in-kind support of hundreds of volunteers in place, we need the financial support of the broader community. It is important to acknowledge the financial commitment given by local industries, philanthropic groups, the Provincial and Federal governments, and the University of Alberta. We simply could not present the WISEST Summer Research Program without their financial support.

Everyone's commitment to the Summer Research Program means so much to WISEST but even more to the students we interact with through our inspirational programs.

Thank you from the WISEST Team.



WISEST Staff (left to right): Angela Wilson, Denise Hemmings, Kristy Burke, Cecilia Gee

*Photo: Joanna McQueen*

# 2014 **PARTNERS** AND **CONTRIBUTORS**

*Photo: Joanna McQueen*

Alberta Education

Alberta Innovates: Health Solutions

Alberta Women's Science Network

Canada Summer Jobs

Edmonton Area Council: Beta Sigma Phi

Edmonton Glenora Rotary Club

The GlaxoSmithKline Foundation

Nexen

NSERC PromoScience

Process Solutions Canada

Syncrude Canada Ltd.

Society of Petroleum Engineers Canadian Educational Trust Fund

University of Alberta

- Faculty of Agricultural, Life & Environmental Sciences
- Faculty of Engineering
- Faculty of Medicine & Dentistry
- Faculty of Nursing
- Faculty of Science

Weyerhaeuser

WISEST Golf Tournament

WISEST Guest Lecture in honor of Dr. Maria Klawe, PhD, President of Harvey Mudd College, US

Kimberly Hauer, P.Eng

**Contributors:**

New Paradigm Engineering Ltd.

St. John's Institute

Young Scientists Conference

Edna Dach

# A WELCOME TO **WISEST**

*Photo: Cecilia Gee*

*Weekly seminars help WISEST students develop important leadership skills and gain insight into diverse careers and academic opportunities.*

# **WISEST** ORIENTATION

*By Callie Lissina* *Photo: Cecilia Gee*

When I arrived at Engineering Teaching and Learning Complex (ETLC) the morning of orientation, thirty-nine students had seated themselves in the Solarium leaving the first two rows of chairs nearly empty. “Everyone else must be feeling as shy as me,” I thought as I grabbed an extra chair and added it to the back row. We were greeted by Denise Hemmings, the WISEST Chair, who was in turn welcomed by a nervous silence. As she spoke to us about what the Summer Research Program has to offer she asked us easy but thought-provoking questions about our personal goals and expectations for the summer. Throughout her presentation more and more students began raising their hands to answer her and the nervousness in the room relaxed. Presentations from Kristy Burke, Angela Wilson and Leah Hackman flooded us with information about the upcoming summer and left us looking forward to this new, exciting experience.

By far my favorite speaker was Dr. Margaret-Ann Armour. We absorbed her wise and inspiring words as she explained the mission and history of WISEST, along with some of her personal history. She stressed the importance of diversity in our world. By the end of her presentation I understood that not only biological ecosystems thrive on diversity; academic and industrial systems do too. I looked around the room, surveying the diversity in my own group of student researchers and other than the disproportionate number of women I was impressed by how diverse we were. I couldn’t wait to get to know all these new faces!

Then Cecilia, the Student Coordinator, led a couple ice breaker games that helped me do just that. After ten minutes we had all learned about thirty new names (thank goodness for name tags!) and we were feeling a lot more comfortable in our group. Since we now knew one another we began to acquaint ourselves with the campus. We set out in groups of five for a scavenger hunt that sent us running all over the university. My favorite parts of this activity were getting to see the beautiful gardens around campus in full bloom and receiving our One Cards in HUB.

We returned to the Solarium worn out from all that walking in the hot afternoon sun. Thankfully lunch was waiting for us. We settled down at tables to talk with the people we had met that morning. The most popular topic of conversation was something that we all had in common: complete befuddlement as to what we were going to be researching. What is a laser scanner: something that uses a laser to scan things, or something that scans lasers? And what does “intraspinal microstimulation” even mean? Many friendships were established during this lunch break because of a common curiosity towards one another’s projects.

The answers to all of these questions that had been swirling in our heads since we first heard about our projects were about to be answered: it was time to meet our Principal Investigators and Direct Supervisors. I stood in the Solarium waiting to be picked up by my research team, brimming with anticipation. Before long, the time had come to start the work that I knew would fascinate, challenge and invigorate me for the next six weeks. Equipped with the new knowledge I gained at orientation, I felt ready to tackle the frontiers of science and to help cultivate diversity in the academic world.

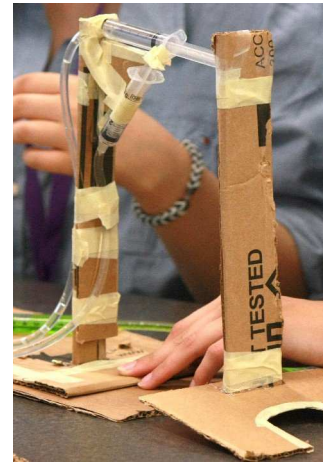
# SOCIAL SCIENCE **CHALLENGE**

*By Ema Beka*

It was the afternoon of our first day of research, and after just enduring the major culture shock that is a university lab, the Social Science Challenge could have been anything in our minds. Secretly we all hoped the challenge would be something we had prior experience with, but just like everything else at WISEST, this would require us to stretch out of our comfort zones and discover our unexplored capabilities. So what was this mystery challenge you ask? Why nothing would suffice but an invigorating HYDRAULICS challenge.
Everyone was arranged into predetermined groups, and the task was simply to create a hydraulics powered "arm" that could pick up or put down a Styrofoam cup. Materials consisted of: cardboard, syringes, three tubes, tape and of course, water, with the added luxury of multicoloured food colouring! Since it couldn't be expected that we all were hydraulic engineer protégés, and since our coordinators are decent human beings, we were given a very basic template and previewed videos of hydraulic arms done online. When the call was made, we all scurried off grabbing our resources and rushing to get started... which proved to be the most difficult task of all.

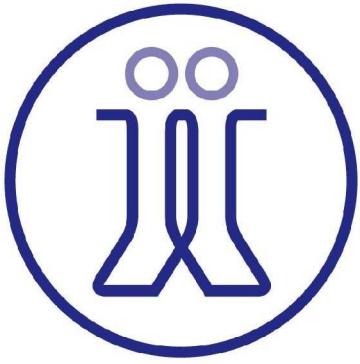
Personally, and with strong assurance on behalf of fellow WISEST participants, it is safe to say the hydraulics challenge made for a great way to get to know one another and pave the beginning of new friendships and the start of the next six weeks. The anxiety and excitement we all had transferred into intense thinking and problem solving as we struggled to develop the design in our minds then convey our ideas to our teammates and listen and understand each other's suggestions. But above all, after frustrating and silly rejections, roars of laughter served to release any nervousness or pressure any of us may have been feeling. A bystander walking past the room we were in could think we were curing cancer by the amount of joy and cheer we gave after our successes. Even without a legitimate incentive to win, because no prizes were even awarded, there was a competitive environment that was fun and exhilarating to participate in. It was very satisfying as the final minutes were counted down, and our projects finally began to take their shapes.

Examining each other's projects proved very impressive and fun as well. We all felt very accomplished with our hydraulic systems, in some way or another, and rightly so, however the interesting thing became the result that each group's "arm" was designed significantly different than another. Some arms picked up the cup, some lowered the cup, moved horizontally, poured water from one cup to another, could clasp the cup, some had more tape than others, and some even used excessive amounts of pencils. All and all, each system was very unique, which shows the powerful result of team collaboration and the merging of ideas from a diverse group of people.



*Photos: Cecilia Gee*

***"We all felt very accomplished with our hydraulic systems..."***



# LEARNING **OPPORTUNITIES**


*Photo: Cecilia Gee*

*The WISEST Summer Research Program is more than just a summer job. It is full of opportunities to help students learn and to grow as individuals.*

# **WISEST** 101/LIBRARY **ORIENTATION**

*By Aaron Grenke*

Although our WISEST endeavor was riddled with exceptional themes and lessons, I personally was struck by the sheer amount of diversity around me. From start to finish this idea of the value in variety became clear from day one, and was especially highlighted on our third day (highlighting librarians to former researcher students). The session was split into two groups which would alternate between the *WISEST 101* and the *Library Orientation* classes. Although it was nearing the end of the day, we were still quite intimidated by our new workplace and were eager for any words of advice—advice which would prove exceptionally valuable.

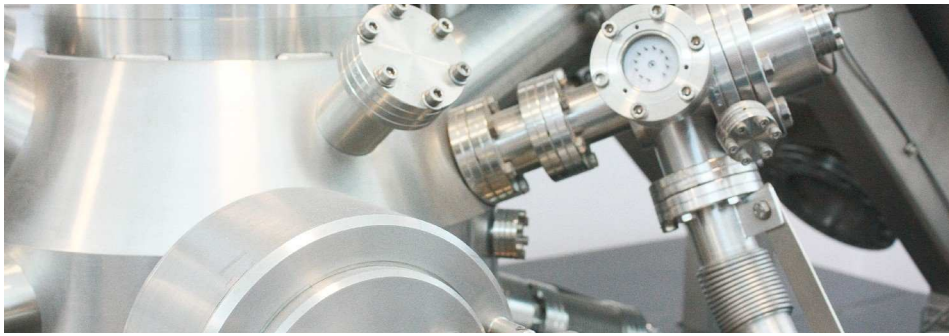
In the *Library Orientation,* we were promptly welcomed by Elizabeth Wallace, a highly passionate staff member of Cameron library. Although I am certain her expansive knowledge and vocabulary could have lectured us all day, she knew the time boundaries better than anyone, and adjusted accordingly. In a well-timed and paced lesson, she started us at square-one: where all the libraries are, what the different libraries do, and most importantly, how to use them. Yet what struck me the most was how modern the University's resources are. Without having to leave our seats, she guided us through hundreds of papers and journals with the simple movement of a mouse. At one point on a webpage she even noted how thousands of dollars of resources were sitting right in front of us. Her chemistry background even made some appearances in a quick lesson on exactly what research journals are (and the different types), and how to read them. You can imagine that by the end of the lesson, we were a little overwhelmed. Yet her ingenuity surfaced one last time when she revealed an online guide built just for us, to help us further navigate and explore the wealth of knowledge waiting to be explored.

***"The well-crafted guidance between WISEST 101 and the Library Orientation not only paved the way for our confidence, but also acclimatized us to the upcoming six weeks of diversity.***

*WISEST 101* might have initially sounded like another orientation, but once again we were pleasantly surprised to be welcomed by a panel of six former WISEST Summer Researchers. They ranged from Delia Cormier to Brittany Lissinna and had gratefully volunteered their time to give answers to our questions. Considering that we had only made the migration from a high school classroom to a university research lab in two days, those questions and their answers were greatly welcomed. Although the questions ranged from initial fears to real-world applications, they consistently related to a single theme: communication. They not only noted how each of their projects were founded on teamwork, but how we would have the opportunity to build connections, hear stories and—most importantly—gain guidance from our mentors. They earnestly reminded us that we could build long-lasting networks of role-models, but only if we would take the effort to communicate. Without a doubt, every person in the room walked away with an appreciation and confidence that only a panel of past student researchers could have given us.

It's been said that a picture is worth a thousand words, and I believe that it is also true for experience. Yet before we had been given a real opportunity to do so, the well-crafted guidance between the WISEST 101 and the Library Orientation not only paved the way for our confidence, but also acclimatized us to the upcoming six weeks of diversity. Photo: Cecilia Gee

# EXPLORING **U OF A RESEARCH: ACSES**



*By Melissa Bouvier* *Photo: Cecilia Gee*

Within the WISEST Summer Research Program we had been given an opportunity to experience one of multiple research labs on campus. Myself and three other girls were fortunate enough to tour the Alberta Center for Surface Engineering and Science (ACSES) laboratory. While walking to the ACSES lab, we joked that it was like we were walking through a James Bond scene on a top secret mission; not only did we take an elevator to the very bottom floor of Centennial Centre for Interdisciplinary Science (CCIS), but in order to reach the lab there were a series of halls and a tunnel to navigate through.

After maneuvering our way through the maze we reached the lab where we were kindly welcomed in by Dr. Dimitre Karpuzov, the facility manager. He then went on to explain that the ACSES lab has been consistently rated within the top three surface engineering facilities in Canada, and last year it was recognized as second best. He also mentioned that some of the equipment within the lab was valued over fifty million dollars and could easily magnify over one million times. After a brief overview of the lab, we progressed into a separate room, where we were shown a scanning electron microscope, which he then put a dime into. When looking at the coin with a naked eye it seemed as though it were flawless, but under six hundred times magnification it was simple to see multiple scratches and even clumps of dirt that were previously indistinguishable. Afterward, we toured other parts of the lab where we saw multiple sophisticated spectrometers and microscopes that used an assortment of x-rays, ions, helium light and infrared light as an excitation source. This type of technology was foreign to me, as I have a very limited knowledge of microscopes and had never seen a spectrometer or viewed objects with a microscope that used anything other than visual light.

After asking questions, we learned that ACSES covered all areas of science and more. Dr. Dimitre Karpuzov told a story about a professor bringing in a paper to analyze the ink in order to determine if someone had cheated. He also mentioned that common samples brought to the lab include chemicals and materials from the Chemistry Department to determine the composition, bugs and bacteria from Biological Sciences, or even meteorites and metals from the Physics Department. They also receive materials from other locations to analyze, not just from the U of A.

As a high school student I feel very privileged to have had this rare opportunity to view the advanced instruments within the ACSES laboratory. I really enjoyed touring ACSES because of my current work with WISEST in the microscopy unit and I valued the chance to experience more advanced devices within that area of technology. After talking to the other WISEST students who were also on the tour, I got an overall feeling of pleasure and peaked interest from all. I would like thank all of the PI's, laboratories, volunteers and WISEST for this fantastic opportunity.

***"I feel very privileged to have had this rare opportunity to view the advanced instruments within the ACSES laboratory."***

# **EXPLORING** U OF A RESEARCH: **NANOFAB**

*By Aiman Khan*

One of the greatest flaws of being a human being, in my opinion, is probably the inability to stay in one spot. The Law of Vibration states that everything is vibration at one speed or another, as a result, we are never completely at a standstill. Though the Law of Vibration doesn't really explain the boredom and unrest we feel when sitting in a lab, I still believe that because we are confined to a lab on a daily basis, we have a lot of unused potential energy. I suppose the restlessness we feel caused by unused energy may be the reason we aren't able to learn as properly as when we are completely and fully immersed in the workings of a thing called experience. Although learning and gaining interests is easily done by reading and listening to various lectures, experience is what really matters. Experience preserves and solidifies your interest, making it easier to not only properly understand your interest but to see the fun in it as well.

I suppose WISEST knew that putting some forty questionably active teenagers in a room for a lecture about each research facility would result in all of us squirming in our seats, only half paying attention. As a result, I believe that WISEST knew that by arranging tours around campus so that we could have a chance to explore different fields of research, we would be more engaged and responsive. I, myself, was fortunate enough to be put into the Nano Fabrication lab tour with three other girls.

We met with the director of the NanoFAB, Dr. Flaim, who took us down to the NanoFAB lab, stopping only to show us a white tank through a window right outside the staircases leading to the lab. Apparently, the tank was filled completely with copious amounts of liquid nitrogen, used for various procedures in the lab. He also explained that the mailbox beside the tank was so that the nitrogen would be regularly changed, and not because it was lonely, as we had previously joked. When finally reaching the level that held the NanoFAB, I was completely blown away by the various posters and many different rooms containing intricate machines, called cleanrooms. One cleanroom was completely doused in yellow light, as it is necessary for photolithography to prevent a process called photoresist and, consequently, damage samples.

With over $30,000,000 worth of nano and micro fabrication equipment, I suppose it is only necessary that they become paranoid at contamination. After all, working with pieces that are sometimes smaller than the width of a hair is not the easiest thing to do and when even the smallest of dust particles can ruin your project, extra precautions are necessary to prevent damage. Some of these precautions include the iconic NanoFAB body gear and air blowing through grates in the floor in order to create a positive air pressure so that less dust particles would float around and contaminate the projects.
Going to the NanoFAB made me realize that one single lab could not survive without the help of another and vice versa. The tour truly broadened my awareness of different types of research that I could potentially pursue and because of that, I would like to thank Dr. Flaim and WISEST for arranging this tour.

# RESEARCH IN ACTION: **INDUSTRY TOURS**

*By Salauni Patel* *Photo: Cecilia Gee*

Before joining the WISEST Summer Research Program (WSRP) I was clueless about all the different kinds of fields of work related to engineering out there. For example, take technology into account, we use all kinds of electrical devices but I never thought about the small important parts that were used in developing such devices. I'm talking about the Micro-Electro-Mechanical Systems (MEMS). They are small yet one of the most important pieces in a device. Thanks to one of the Professional Development Seminars (PDS) of the WSRP, the WISEST students got to tour an industry of their choice. I chose to visit Micralyne Industry.

When the students first reached the Micralyne, Mary Seto, our tour guide, guided us to the conference room, for a brief presentation for an overview of Micralyne. We learnt that Micralyne is a world-renowned MEMS foundry. They fabricate and manufacture MEMS for customers, using many different techniques. A few being lithography, wet processing, and plasma etching. Micralyne also manufactures silicon and gold based wafers.

Before getting a tour of the labs, we were shown the safety protocols an employee there would have to take before entering the labs. An employee that had recently joined, Debbie Ha, along with a WISEST student, wore the equipment one has to wear before entering and demonstrated the protocol. The gear that they had to put on literally covered every inch of their skin. The only thing visible was their eyes, which were protected with safety goggles. Mary Seto explained that the reason for this heavy safety protocol is that since everyone inside the lab is working with MEMS, it is important that not even a speck of dust lands on their work, or else it may cause a mess up. Also before entering the lab, after putting on the safety suit, the person has to go through an 'air shower' which blew off all the dust particles sticking on that individual. The lab is frequently ventilated in order to remove all the dust particles in the lab. We were also shown the different machineries that they use, and the processes that they have to go through.

Before leaving the industry, we had gone back to the conference room for questions and answers time. Yan Qi, the Vice President of Operations, also came to answer our questions. It was really exciting to learn about Micralyne Industry as it was something new to me. What made the experience even better was the enthusiasm that Mary Seto had about her work and the industry. When the people around you are enthusiastic, it encourages you to engage in enjoying your experience even more. I really enjoyed my time at Micralyne as I got to know more about MEMS, which I had no idea existed before. It opened up a new field in engineering for me. I'm grateful for the wonderful opportunities that WISEST offers for us, because we get to learn about so many new things outside of our labs as well.

**~An afternoon at the Edmonton Research Park~**
***Micralyne Inc./Quantiam Technologies Inc./Schlumberger***

# **NETWORKING FAIR** WITH ROLE MODELS

***"I didn't realize the diversity of jobs that exist and how complex (or how simple) our dream jobs really were... I was able to ask for advice on how to be successful in their fields."***

*Photo: Kristy Burke*

*By Yjy Lim*

When Kristy called the WISEST students over from the end of the hallway, I immediately dropped all conversation and practically ran to the presentation room. It was evident that I was pretty excited to meet the role models that gathered just for us. When I walked into the room I was greeted with the friendly and confident faces of engineers, scientists, psychologists, and much more. I was eager to learn any knowledge that could be imparted from such admirable people. After the WISEST team announced news and notices we were split into groups and guided to separate rooms.

The conference room my group was assigned to had a large table in the centre with chairs spread evenly throughout. After we were all seated we went around in a circle and introduced ourselves; we gave out our names and our affiliations. The role models told us of their occupations while we told them about our projects. Our group was fortunate to have a structural engineer, a psychologist, and an inorganic chemist present. After we were all acquainted with one another the role models handed the stage over to the students which gave us the chance to ask them questions about things from what their daily work life was like to how they got to where they were. The information I gained within that half-hour was eye opening. I didn't realize the diversity of jobs that exist and how complex (or how simple) our dream jobs really were.

After we noticed the sound of shuffling feet mixed in with laughter from outside we knew our time was up. We left the conference room to join the rest of the group in the main presentation room. The next half-hour was dedicated to freely talking with the other role models. I was able to talk to the structural engineer about her daily work routine and I spoke with a materials engineer about the challenges within her job. I talked to an agriculturist and nutritionist and met many others with jobs I look up to. I was able to network with them and ask for advice on how to be successful in their fields. As the event wound down I went to the snack table to chat with other students about who they met and how awesome it was to be able to talk with them.

I was--and still am--very thankful to the WISEST team and the role models for cooperating with each other that day. I was able to open my eyes to new job options that I'd like to pursue and the event also allowed me to network with successful people in each of their fields. The Networking Fair refreshed my mind and reminded me of what I loved most about the WISEST program. It reminded me that I was surrounded by like-minded people with such diverse backgrounds and circumstances, which truly captures the spirit of WISEST's raison d'être.

# **ENTREPRENEURIAL** SPIRIT

*By Shannon Clark*

The allure of choosing work hours and projects along with endless potential to increase earnings makes owning a business an intriguing prospect, but how can this dream become a reality? Entrepreneur Kim Hauer as well as Alexandra and Nicole from Alberta Women Entrepreneurs came to share their expertise with us in accomplishing this feat.

Kim is an inspiring former WISEST Summer Research Program student who went on to become an electrical engineer and to start her own business. Having been in our shoes, she equipped us with the information we needed to demystify entrepreneurship. To start the session she asked us what our plans for the future were. Everyone raised their hand for graduating high school and completing post-secondary education, but starting a business hadn't been on any of our minds. Being open to unexpected opportunities and keeping our plans flexible was some of the advice she gave us. She made us aware of the reasons someone may have for starting their own business whether it be dissatisfaction with their job, money, or an amazing idea that they want to implement. She told us that a successful business, whether it's a sole proprietorship, partnership, or corporation, it starts with a plan outlining a vision and the means to getting there. Other considerations mentioned were having a good credit rating and working out the legalities to ensure that the business can run smoothly.

Networking is essential to entrepreneurship. To demonstrate its importance, Kim set up a networking activity. We were split into groups of five and given "ownership" of our own business. The task was to brainstorm all the connections we might need to operate successfully. We quickly found that every business, whether it was a vet clinic or engineering company, needs so many different types of people including marketers, maintenance, and web designers. The idea was to realize that networking with many professions of people is essential because it opens up more opportunities to advance a business. We also learned that businesses require hard work and dedication, but that it's possible to find the right work/life balance for ourselves with the flexibility that they provide.

After learning from Kim what owning a business is all about, Alexandra from Alberta Women Entrepreneurs talked to us about some of the programs they offer to help women get there as well as a few more tips to help us out. She told us that being young gives us many advantages because we have fresh perspectives, new ideas, and nothing to lose. Some advice she had for us was to align ourselves with our passions and find a mentor and learn from their experiences. She also mentioned workshops such as "Are you Ready for Entrepreneurship?" and "Roadmap for Success" which are offered by Alberta Women Entrepreneurs along with loan programs to help women create successful businesses.

Not only was the Entrepreneurial Spirit session informative and insightful, it was also engaging and fun. Like with other WISEST seminars, the opportunity to learn from inspiring role models in an interactive way was invaluable. This session broadened our awareness of the endless possibilities that our futures can hold in entrepreneurism and equipped us with the knowledge of how to start.

***"Starting a business hadn't been on any of our minds... This session broadened our awareness of the endless possibilities that our futures can hold in entrepreneurism and equipped us with the knowledge of how to start.***

aWe
ALBERTA WOMEN ENTREPRENEURS

# LUNCH N' LEARNS

## UofA Q&A

*By Dana Andrishak*

On July 11 WISEST students had the opportunity to ask questions concerning university. These questions were answered and discussed by current university students at the UofA. The WISEST students were separated into 3 different groups and each group had a different panel of university students. Some of the questions asked included topics such as the workload, exams, co-op programs, different disciplines for science and engineering, the transition from high school to university, residence, loans and scholarships, and experiences of the U of A life.

This session provided all the students with new and helpful information. The thoughts provided by the university students in response to the questions effectively answered each question. I learned many helpful tips and tricks to get the most out of the university life. I learnt that it is important to maintain a balance between academic focuses and extracurricular activities.

This session was successful at answering any curious student's questions and gave many a new confidence about university that they didn't have before.

***"I learned many helpful tricks to get the most out of university life"***

## Designing a Research Poster

*By Zoe Cire*

One of the most intimidating responsibilities as an ambassador of the WISEST program is the final project. We have to compose a research poster by the end of the summer. Fortunately, in the first week we were provided with a very beneficial lesson based strictly on the how to design a research poster. In the hour we had to delve into the discussion, I was skeptical that I would be prepared from such a quick lesson. Dr. Marilee Stephens was our instructor. She is a professional in the art of perfecting a research poster since she has vast experience designing and critiquing them. After the session was over I was instantly reassured on the difficulty level of the poster. She shared numerous tips and tricks on how to invest into our own posters.

After a profound breakdown of how to format our posters, I gained confidence and realized that the poster was not going to be as intimidating as I had originally assumed. Dr. Stephens aided me, along with the rest of the students, and taught us to obtain tenacity and have shared insight on how to keep calm and have fun! I felt fully prepared after the session

**"I gained confidence and realized that the poster was not going to be as intimidating as I had originally assumed."**

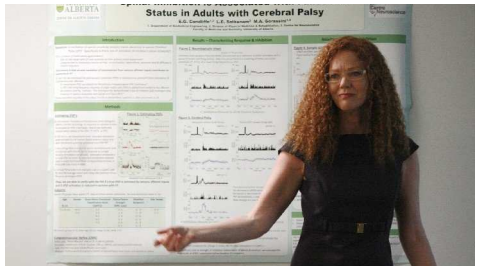



*Photo: Cecilia Gee*

## Writing a Resume

*By Brynn Lewis*

Most high school students—and most people in general—groan at the idea of creating a resume. What do you focus on and how do you communicate it? What are you even looking for in a job? How can you stand out? When presenter Stacey Sayler polled WISEST students on whether anyone actually liked writing resumes, it was unsurprising when no hands went up. But this "necessary evil" was made a lot more painless with the help of Sayler 's session on writing effective resumes.

We learned that a good resume comes out of the preparation and reflection that happens long before you start to type. Sayler discussed end goals, work culture, and how to find jobs that would actually suit us well. She also pointed out that even promising applicants can be lost if they don't communicate in a clear manner. Recruiters often spend mere seconds considering a resume before deciding to keep or discard it. From the moment that recruiter picks up your resume, it has to be as straightforward as possible.

The time she spent looking at social media and online branding was very interesting and particularly relevant in today's digital age. Sayler discussed the possible uses of sites such as Linked In, giving lots of tips about how to successfully network online. Our online image is a huge part of how the world views us, and she not only gave us the eternal reminder to be wary of risqué Facebook posts but also showed us positive steps we could take to becoming more appealing to employers online.

Next, we turned to the resume itself. She made sure we had the basics down: what to include, what to leave out, how to use what you have to make the largest impact, and of course, the magical power of descriptive verbs. It's hard to navigate the pitfalls that come with self-promotion, but the payoff can be huge. Will I suddenly be enthused about writing resumes? Maybe not. But I don't think I'm alone among WISEST students in thinking that with Stacey Sayler 's road map, the journey just became a whole lot smoother.

## The Art of Networking

*By Aishwarya Venkitachalam*

How do people interact with each other? How does one overcome the fear of approaching new people? What is networking? The Art of Networking session was designed to answer these burning questions. It not only prepared us for the upcoming Networking Fair, but it also trained us to make the most of our own everyday interactions, which without a doubt will immensely impact our future in both academia and the working world. After all, it all boils down to networking!

First, we were told why networking is important: it is the doorway to meeting new people, finding career prospects, making good first impressions, learning about companies, and most importantly, making lasting connections with vital stakeholders in the working world. Tips on how to begin and maintain a conversation followed. We could sense each other making mental notes on the presumably obvious practices: Start off with a good greeting, be approachable, smile, find a common interest to talk about, be yourself. We were also enlightened with the psychological dimensions of networking. Approaching small, open groups rather than large, closed-off groups is a fool-proof plan for a good networking experience. We were also shown a video about an experiment conducted which proved that confidence and good body language correlate directly with successful interactions. Finally, we were taught to take advantages of networking events by not monopolizing anyone's time, and by gaining as much information from as many people as we can. With this came ways for ending a conversation, and of course, initiating steps towards future interaction.

Along with the useful information, WISEST's delivery of the information, with relatable examples and engaging humor made the session even more memorable. To this day I find myself revisiting the tips and tricks, and I surely will for the rest of my career.

# LUNCH N' LEARNS

## Writing a Professional Report

*By Daena Yra*

Before coming into the Writing a Professional Report session, delivered by Angela Wilson, I think we were all aware about the WISEST Journal of Student Research already. Nonetheless, there were still plenty of things to learn. We were told that the purpose of our report was to be able to share the wonderful experiences that we've had this summer with our peers, families, sponsors and partners, as well as students who would be participating in the WISEST Summer Research Program in the future.

During the session we talked about what sorts of topics to include in our report. I already had a good, basic understanding of what should be included, but the presentation provided us with more clarity. It made the job a lot easier to tackle since Angela gave us an example of how to break up the report. As she was mentioning what sorts of things we could write about, I could not help but reminisce about the amount of new things that I had been able to pack into my brain over just three weeks.

Besides the content, Angela talked about some common grammar mistakes and how to fix them. We were surprised to see that there were still some things that we were not aware of, which was helpful because we could use this newfound knowledge for future writing assignments as well. After we learned all the basics, it was time to look at some examples. Hearing everyone's critiques was what I liked most about the session because I got to learn and encounter perspectives that I had not seen before. Overall, I thought this session was a great way to learn about report writing.

***"This reflection period helped the students realize what they had gained from the program..."***

*Photo: Joanna McQueen*

## Sharing the WISEST Experience

*By Jaime Hicks*

During the Sharing the WISEST Experience session, we were distributed a handout that outlined possible questions that could be asked about our time with WISEST. These questions were separated into five sections and the students were given time to recall professional skills they gained, opportunities they had to learn and interact with role models, insights gained into university life, information they received regarding careers available in science, engineering and technology, as well as the personal impact of the program. This reflection period helped the students realize what they had gained from the program and all the valuable knowledge and advice they had obtained through interactions with professionals in their fields. Also, it encouraged students to think about questions they normally would not ask themselves, such as "How has the program helped you grow as a person?" and "Was there a session that was most impactful for helping your future plans?"

Students were also placed into groups of two or three to share their insights and the experiences they had during the WISEST Summer Research Program. This was their last opportunity to meet other WISEST students as well as to catch up on everyone's research projects. The group activity acted as a brainstorming session, where everyone could share their answers and jot down anything they might have forgotten to mention. This was extremely valuable to the students in terms of reflection of their experiences in the Summer Research Program.

# Effective Presentations

*By Suzana Trac*

From the perspective of a student researcher, presenting a poster during Teacher Appreciation Day and the Celebration of Research is an incredibly daunting task. Not only do we represent WISEST, we also represent our lab, as well as our research team. Thankfully, the WISEST team foresaw such anxiety and hence, dedicated a training seminar to giving effective presentations.

Once all the WISEST students assembled for the seminar, the WISEST team introduced the presenters from Toastmasters International, as well as Dr. Marilee Stephens, whom they have invited to lead the session. The first speaker, Martha Varga, taught us how to design an engaging PowerPoint presentation. She put much emphasis on simplifying our information, as well as utilizing different techniques to portray our core message, or the main message we are trying to deliver.

To give us some tips on public speaking, Ingrid Pederson, explained how the mood created during our presentation could be influenced by the volume and speed of our voice, as well as our body language and eye contact. In order to emphasize her point, Ingrid prepared a pitch exercise where we were to say a sentence in various pitches: high, normal, and low. Kim Hauer, the third presenter, tackled impromptu speaking. Her presentation involved teaching us to use her OREO method when stating opinions. According to the method, we must first state our opinion, provide reasons and evidence to back it up, and then restate our opinion. To stress the usage of this method, Kim would randomly select a student to argue for or against a certain topic. Though impromptu speaking is very difficult, I was amazed and surprised by how well my fellow WISEST students argued for their respective topics.

Finally, Dr. Stephens showed us how to apply everything we have learned so far during our poster presentations. By attending the effective presentations session, we WISEST students were able to develop and refine our public speaking skills. We now understand how to manipulate images, voice, and critical thinking to express ourselves, and our messages. Though we are definitely prepared to present during Teacher Appreciation Day and the Celebration of Research, this session has also given us a skill much more valuable: the tools to become successful in life.

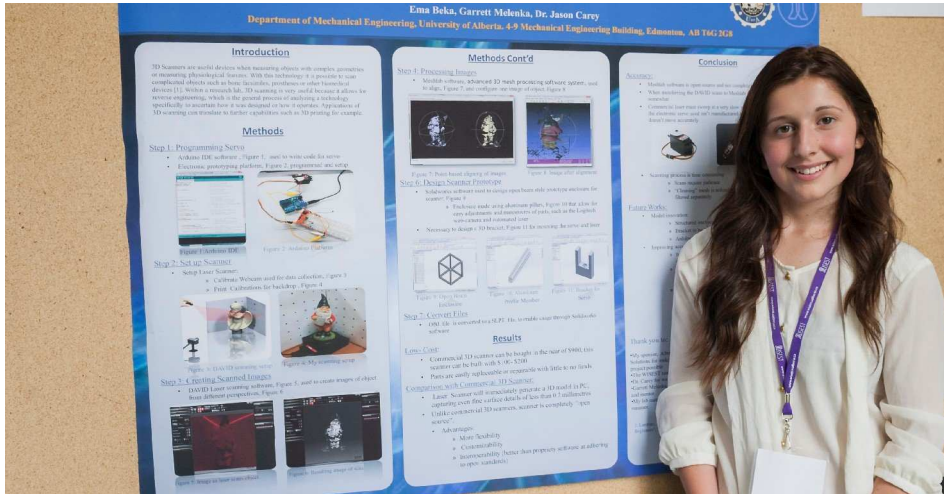



*Photo: Joanna McQueen*

# **LIVING IN** ST. JOHN'S INSTITUTE

*By Jessy Xie* *Photo: Joanna McQueen*

The thought of being away from family, friends, and home may be quite frightening. For six weeks, ten of us who were in the WISEST program lived in St. John's Institute with our Residence Advisor, Nicole. Each of us got a little taste of independence and a preview of university life. I remember feeling uncertain about the whole concept of living in an unfamiliar place. However, that subsided when I met Nicole and the other students living in residence. Nicole was there, right from the start, to help everyone get settled into their own rooms. On the first day of work, she led us through the unfamiliar campus. We could always depend on her to assist us when needed (especially when asking for directions to maneuver around the city).

Being in residence has, without a doubt, brought the ten of us closer together. Whether it was movie nights, birthday celebrations, weekend explorations or friendly competitions in the Rec room (playing ping pong, cards or pool), we always had a blast spending time with one another. It did not matter if it was to go to the grocery store, to work out in the fitness room or to tour the downtown library, you could always find someone who was willing to keep you company. After those six weeks, we had accumulated an enormous amount of goofy photos, inside jokes, and lifelong memories.

There was so much to explore, to see, and to experience in Edmonton. There was the Edmonton International Street Festival where we saw many talented performers. Few of us also went to the TELUS World of Science Centre where we met Roger Roger Roger the Third – a talking robot – who continuously mispronounced all of our names. The various foods at both Taste of Edmonton and Heritage Days were fantastic; I especially liked the 'hurricane potato'. Everyday exploration down Whyte Ave. by going to clothing stores, gift shops, Chapters and little snack shops was quite enjoyable as well. Together, we always found something fun to do.

Living in residence showed us the necessity of doing household chores. Dirty dishes had to be washed before they overflowed in the sink, laundries were done so fresh clothing would be available, and garbage was thrown away before any atrocious smell occurred. Once we start university, the skills we learned for these extra steps to living independently will definitely be an asset. Fortunately, we did not have to cook our own food thanks to the most amazing and friendliest chefs at the St. John's Institute; there were always great tasting meals, fruits, drinks, and the best snacks in the main floor's dining room. Meal times were when we would learn about one another's day, plan future activities, and general chit-chat. All of us in residence knew that we could depend on one another and that we were never alone. Through those six weeks, we had grown to know so much about each other.

On behalf of all WISEST students living in St. John's Institute, I would like to thank the staff for the phenomenal hospitality they provided, WISEST for arranging this accommodation, and to all the donors of the Margaret-Ann Armour Endowment for Rural Students for making this stay possible for many of us.

# **SPECIAL** EVENTS

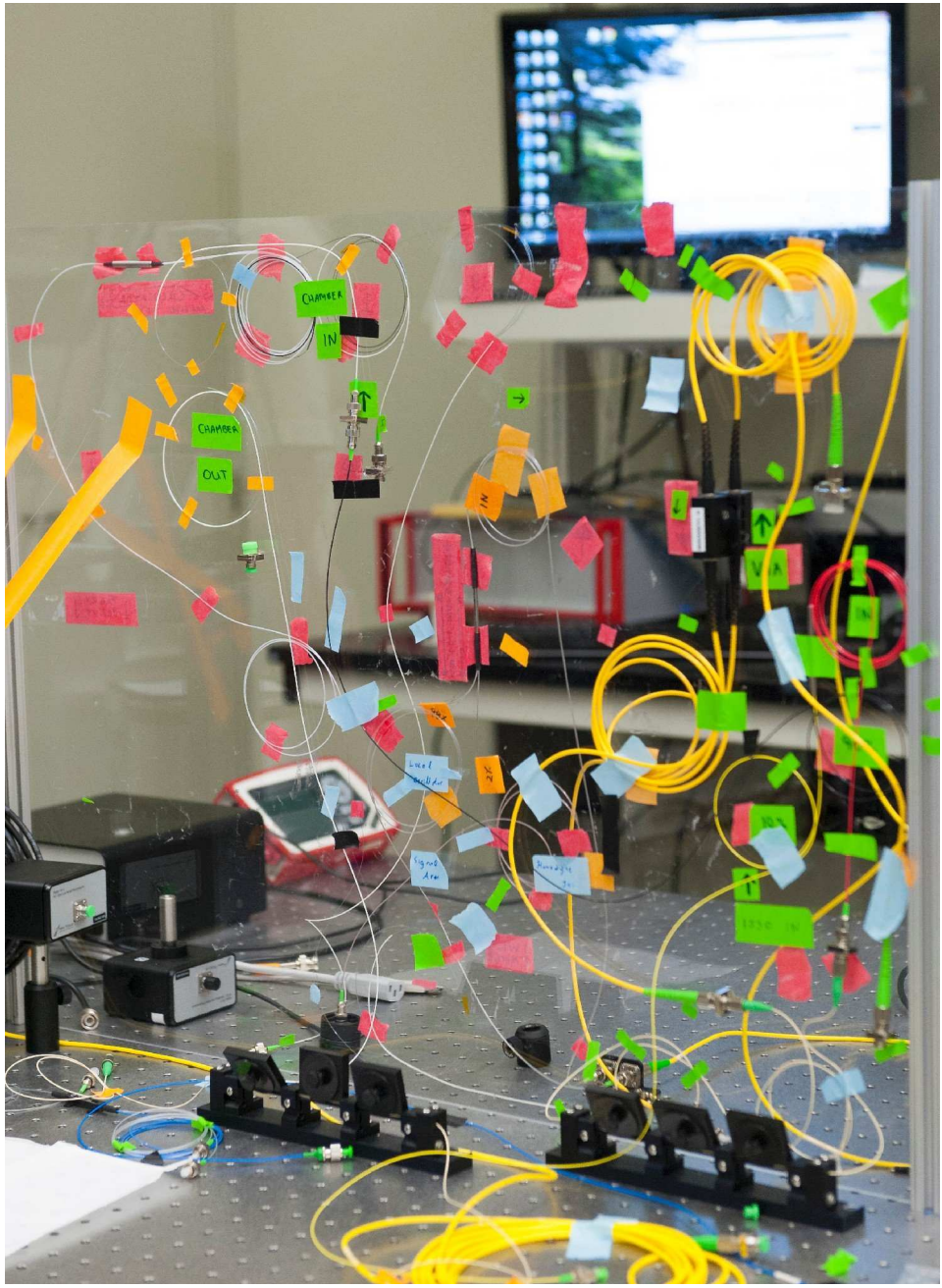



*Photo: Joanna McQueen*

# **TEACHER** APPRECIATION **DAY**

*By Grace Silver*

Teachers across Alberta have been inspiring students and fostering a love of science for a long time. From an early age, our teachers introduce us to these subjects in ways that ignite our interest. As we progress further into our education, this role helps us to determine where our passions lie. Our teachers strive to support and guide us in our journeys. Many of the WISEST students were introduced to the research program and encouraged to apply to it by our teachers. As we looked towards the end of our six week journey we had the chance to thank them on Teacher Appreciation Day.

Vacationing teachers took a day to join us on the campus to see research happening around campus and to learn more about WISEST. They began the morning with a welcome from WISEST, followed by a wonderful speech by Dana Andrishak, one of the WISEST summer researchers. For the rest of the morning, teachers had the opportunity to explore some of the state of the art research labs at the University of Alberta. Labs such as NanoFab, BELIEVE, laser plasma, and the DINO lab, as well as the biology greenhouse were kind enough to welcome our teachers and allow them a glance at some of the trail-blazing research going on around campus. Following lunch there was a presentation by Dr. Jerine Pegg regarding her research on teaching science.

As our teachers were in sessions, the WISEST researchers began assembling at the Centennial Centre for Interdisciplinary Sciences (CCIS). With newly printed posters in tow, we set up and anxiously awaited the presentation session. We explored our fellow researchers' projects and practiced our speeches. This would be our first experience in publicly presenting our research and speaking about our experience. We wanted our teachers, who mentor us and support us, to see our work and share our success. We wanted to do our best so they would be proud.

Soon, the anticipated arrival of our teachers was upon us. Friendly faces appeared and came to speak with us. They perused our posters, listened carefully to our explanations and asked questions about the summer. Our teachers were interested in our work, but they also wanted to know more about our experiences and how we had been impacted by the summer. They showed genuine interest in our journey, and we greatly appreciated this. As the hour long poster presentation session came to a close, we breathed a sigh of relief. For this first presentation, we had the most warm and supportive group to speak to. The always supportive group of teachers had once again helped us to become more comfortable with a new and unfamiliar experience. Some students then had the chance to take their teachers into their own lab and give an overview of their summer research. Having individual time to give back to our own teachers was great. They were able to see some of our daily jobs, as well as some of the more specified parts of our work.

Overall, Teacher Appreciation Day was a great success and a lovely time. The teachers who took time away from their summer to come spend the day with us were truly inspirational. Without them, most of the summer students would not have experienced this six week journey. From introducing us to the program and other paths, to encouraging our application, to writing references for us, our teachers go far beyond just teaching the curriculum. And for the extra effort they give to us, we could only host this appreciation day and welcome them into our experience. Although it can never fully express our sincere gratitude and appreciation, there is only two words left to say. Thank you.

***"Teachers had the opportunity to explore some of the state of the art research labs..."***

*Photo: Joanna McQueen*

# RESEARCH TEAM **THANK YOU**

*Photo: Cecilia Gee*

The morning of the final day of the Summer Research Program is a day of thanks and of celebration. Students invite their research teams to a formal poster presentation where they can share their work and give thanks to them for all of the support that they offered during their 6-week work term.

Our 2014 Research Team Thank You welcomed approximately 150 faculty members and their research teams for coffee, tea, snacks and a special thank you from Aiman Khan, one of our student researchers.

# **CELEBRATION** OF RESEARCH

Finally, during the afternoon of the final day of the program, students are able to share their successes with their friends, family, and members of the community. Visitors are invited to view students' work, to ask questions, and to learn more about this transformational experience. Representatives of sponsoring organizations are also invited to see just how much their contributions have impacted these young people.

Student researcher, Ema Beka gave a wonderful speech to highlight some of her experiences and the WISEST team was extremely proud of the high calibre of work conducted by these 40 students.

*Photos: Cecilia Gee*

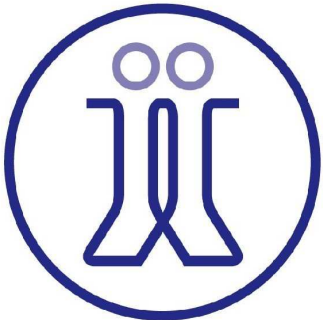




*Photo: Joanna McQueen*
*All student portraits (pg 34-73): Joanna McQueen*

# Rawan Ahmed

***Supervisor:***
***Dr. Heather Bruce***

***Department:***
***Agricultural, Food & Nutritional Science***

***Sponsor:***
***Alberta Education***

Ever since I was a little kid, my parents would always tell me what I should become in the future and what careers I should be interested in. I knew that they were hoping the best for me but as I grew up I realized that I never really had an idea of what I truly enjoyed and wanted to do for the rest of my life. I wanted the opportunity to find a path that I could, somehow, make my own. I was passionate about math and sciences, but my knowledge of possible careers was very limited. That's why I was very excited when I heard about the WISEST program. I honestly wanted to discover more fields in science, engineering and technology in order to find something that I know I will love and be happy doing.

The first day of the program, I got a little nervous. It was definitely something I wasn't used to, but as people slowly started to talk and get to know each other I felt a bit more relaxed. Before Lunch we were separated into small teams and went on a scavenger hunt for buildings, landmarks and artifacts located all over North Campus. It was a confusing but adventurous way of getting familiarized with my surroundings. After a while, we got to meet with our principle investigator (PI) and supervisors who were very nice. I was placed in the Department of Agricultural, Food and Nutritional Science in meat science, under the supervision of Dr. Heather Bruce and Mr. Bimol Roy, studying and being involved in the extraction of collagen and transforming it into gelatin. For the first two weeks, I was very confused and overwhelmed with all the information I was getting. Although, thanks to Mr. Roy and Melissa (a research technician who helps in the lab) all my questions were answered and I slowly got familiar with everything. All the people working in the lab and the PI were very supportive and would make me feel welcome and appreciated. It was also awesome once I got to do some hands-on work because it made me feel like I was important and needed in the lab. I had so much fun working in a lab and enjoyed learning something new every day.

While our work in the lab kept us busy all day and helped us develop many skills, the WISEST program allowed us to learn more about ourselves and the opportunities available to us in very unique ways. Every Monday and Friday was an opportunity to learn something, thanks to the new amazing Lunch 'n' Learn Sessions and Professional Development Seminars that helped us understand more about the world of science, engineering, and technology.

I would like to thank Alberta Education for funding my position and for making my participation possible, the WISEST coordinators for a great six weeks full of excitement, and the research team for allowing me to work with them. A special thank you goes to my supervisors for all their advice and help and to Melissa for answering all my questions and helping me in the lab.

# Dana Andrishak

***Supervisor:***
***Dr. Kajsa Duke***

***Department:***
***Mechanical Engineering***

***Sponsor:***
***SPE Canadian Educational Trust Fund***

I came into the WISEST Summer Research Program anticipating a rewarding experience, but it exceeded all of my expectations and provided me with an amazing summer that I will never forget. I did not know that I would be learning so many new and exciting things as well as meeting so many great people. The first time I heard of this program was last September when one of my friends told me about it. She encouraged me to apply and really got me excited to try it out. Hearing about this program was nothing compared to being able to step out and live it myself. Being able to experience this program was an outstanding opportunity that consisted of learning new skills, applying previous knowledge, meeting mentors, making friends, and having fun.

During my stay, I was placed to work in the Department of Mechanical Engineering in the Biomedical and Composite Materials Lab. I was researching screw fixation in dual pubic rami fractures. The purpose of my project was to determine the maximum displacement of the fracture for successful screw insertion in a variety of patients. It was very interesting to view the differences in pelvic structure in 14 different people and see the results of screw insertion. My project was very challenging at times but being able to solve a problem was very rewarding and really exciting. I spent most of my time working on a 3D modeling software called SolidWorks to create solid models of the pelvis, cut the model to simulate fractures, and insert screws through those fractures. I would then record the measurement of displacement of the dual rami fracture.

Between the Professional Development seminars and Lunch N' Learn sessions I learned so much about the UofA, engineering and science careers, professionalism, and networking. The session that I found most valuable was Networking Fair where I could meet and speak to women in engineering, science, and technological fields. What an amazing time! I could listen to people with real first-hand experiences working as engineers and learn about their struggles as well as their successes. Before this session I believed I knew exactly what I wanted to pursue as a career. After, I discovered that there were so many amazing fields of engineering that caught my attention such as biomedical, civil, and materials engineering. The Exploring UofA Research tour was another session that I found great value in. For this I was able to go to a prosthetics and orthodontics lab and see all of the amazing technology used to help amputees as well as research to improve brackets for braces.

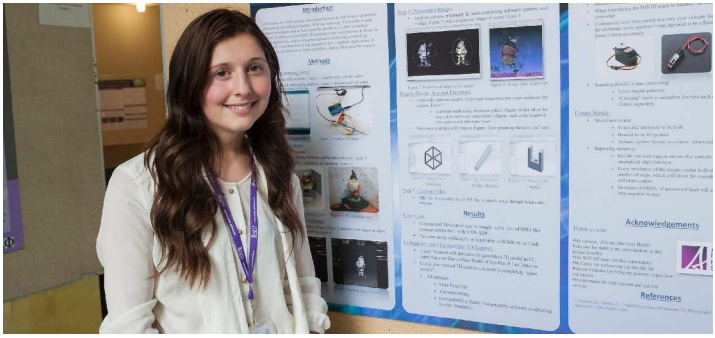
WISEST has been able to effectively inform me of the different roles of engineers and has encouraged me to further pursue this field. The skills that I have learnt during these six weeks I will take with me to the future. I will never forget all of the amazing people I have had the pleasure to meet and all of the outstanding places that I have been. I would like to thank my sponsors at The Society of Petroleum Engineers because without them I would have never been able to partake in this once in a lifetime experience. I would also like to thank my supervisor Dr. Kasja Duke for providing me with a fantastic research project and helping me throughout the program with my work. Thanks to WISEST, I have grown as an individual and have a great future to look forward to!

# Ema Beka

***Supervisor:***
***Dr. Jason Carey***

***Department:***
***Mechanical Engineering***

***Sponsor:***
***Alberta Innovates Health Solutions***




I wish I could put an experience into words, like the one and only Shakespeare himself; if I could capture and convey all the feelings and emotions that ran through my friends and me at WISEST this summer, in the least, there would be many young persons indebted to me for enlightening their minds into pursuing the WISEST Summer Research Program. Personally, WISEST appealed to me in its entirety immediately. At this stage in my life, alongside my like-minded peers, I don't know much about what I really want, but any chance to catch a glimpse of the possibilities out there is blessing in my mind. WISEST is just that. The program overwhelmed me with its inviting and supporting ways of introducing university life, and welcoming us to broaden our minds to endless opportunities.

A week at WISEST ranges from ecstatic to more calm, from Professional Development Seminars, Lunch N' Learns, and off campus Field Trips to lunches with Ada's team, hanging with other summer program kids and touring labs on campus. Seminars and Lunch N' Learns were very informative, giving us knowledge that'll stick with us as we proceed in our careers, while allowing us to get know one another better. One of the best aspects of this program is that regardless of the activity, the company makes for an enjoyable time. It is always encouraged to speak and start conversations at WISEST, which results in a relaxed atmosphere where sitting next to someone you have never talked to before on the bus and walking off together laughing hysterically is a casual encounter. So many small talks in the elevator or chats while cleaning dishware I have had at WISEST have proved to be more memorable than I would have ever imagined, because of the special people that I held the conversations with.

This summer I was fortunate enough to be placed in a mechanical engineering lab, run by Dr. Jason Carey. I got to work with many researchers, ranging from undergraduate student to PhD candidate. I was assigned the project of building a 3D laser scanner, while keeping costs low and maintenance minimal. Admittedly, I was surprised by the lab atmosphere initially, only because it wasn't as shiny and luxurious as the labs I had seen in films. My surprise wasn't any disappointment however, instead it gave me an opportunity to get my hands dirty like a true engineer who doesn't always have the perfect pieces to her puzzle, but rather has to improvise and solve the problem in other ways, which proved to be more satisfying when I finished than if I had had all the pieces simply laid out for me. Just like most of my experiences at WISEST, although my initial impression was not what I had expected, in the end I was pleasantly surprised.

WISEST is an extraordinary program that is founded upon great values and beliefs, but no matter how great the intention it is undeniably true that WISEST would cease to exist without the volunteers, sponsors and coordinators that support and fund it. It is hopeful of me to think our saying thank you can suffice to convey our gratitude and respect us here at WISEST have for our supporters. Nowhere is it said a busy university research lab is obligated to adopt and mentor a high school student for the summer, and none of our donators receive any funds back after the program, but without these two legs holding up WISEST, the program would undoubtedly crumble. I also have to thank the coordinators that organize, plan and arrange every step we take throughout our WISEST journey. I can't describe how much they have done for us. So thank you, to all.

# Krista Bergen

***Supervisor:***
***Dr. Heather Bruce***

***Department:***
***Agricultural, Food & Nutritional Science***

***Sponsor:***
***Faculty of Agricultural, Life & Environmental Science***

Opportunities are something I look out for, I am always searching for chances to explore, learn, and participate in ways that I may not get to do again. I found out about WISEST because of a suggestion from one of the sciences teachers at my school. Thankfully I was convinced to apply or I would have missed out on an amazing experience! I suspected the program would teach me about how a lab works and different careers in science, engineering, and technology but I learned so much more! There were so many activities and sessions in the program that taught me a great deal about the University of Alberta, women in science, networking, research, and working in a lab setting. The WISEST Team made sure that all six weeks went beyond my expectations. I was great to make lots of friends and meet so many like-minded people.

This summer I was working in meat sciences under Dr. Heather Bruce, I was able to learn all about extracting gelatin from bovine (cow) hearts and lungs, and a little about sensory testing for pork too. There is so much to learn about and it is difficult to fit it all in six weeks. For my project we were extracting gelatin from cow lungs and examining it's characteristics. Since the lungs are a relatively unused part, often they are shipped to foreign markets or disposed of, we wanted to see whether or not it could be used as a gelatin source. We tried five different extraction methods and tested the melting points, boiling points, conductivity, clarity, composition, strength (known as bloom) and found which method gives highest yield. I wasn't sure what to expect for working in a lab. It was really interesting to get to see all the different equipment used and learn about the gelatin experiments going on around the lab. I've learned that gelatin has dozens of uses from food applications to photography developing, to hard and soft gel capsules in the pharmaceutical industry. This research has forever changed the way I look at gelatin.

Not only was there research but other activities as well, Professional Development Seminars and Lunch'n'Learns filled the weeks with informative and interesting sessions. One of my favourite sessions was the Networking Fair, it was great to hear all about the different careers and fields that women are in and the successes and challenges that brought them there. It gives me confidence to hear that others have been in my shoes, unsure about what they want to pursue after high school, and found work in science that they are passionate about and accomplished great things. I was also very excited to learn more about prostheses in the Exploring U of A Research tours. Being able to see all the different research makes me amazed and excited. There are many positive speakers and great role models to meet at WISEST and Dr. Margaret-Ann Armour is one of those people. She is so inspiring and makes you want to strive for excellence. I have learned so much about gaining confidence, making my writing professional, and the wonderful research that can be explored.

My experience in WISEST is one that I will cherish and never forget as I go into further academic pursuits. A great deal of thanks to my supervisors Jennifer Potter and Dr. Bimol Roy, my research team for all the encouragement and making the lab work much more enjoyable. Likewise thanks to Mr. Worobec for going out of his way to notify and encourage me to go into the program. Thanks to those who support the Margaret-Ann Endowment Fund for making it possible for me to attend, and to the generosity of the Faculty of Agricultural, Life and Environmental Sciences for sponsoring this amazing experience for me.

# Melissa Bouvier

***Supervisor: Dr. Cindy Paszkowski***

***Department: Biological Sciences***

***Sponsor: Edmonton Area Council: Beta Sigma Phi***

Before applying for the WISEST Summer Research Program, we were told that this is a once in a lifetime opportunity and let me tell you, it was nothing short of it. I learned valuable life lessons, met many amazing new people, and also spent my summer working in a research lab, which is almost unheard of for high school students. I will forever value all the knowledge and experiences I have gained through the past six weeks in this life changing adventure.

The Department of Biological Sciences had become my home for the duration of the six weeks, where I worked with Dr. Cynthia Pazskowski and her graduate student, Kyle Welsh on the Western Tiger Salamander populations in the Beaver Hills region. I spent my time in the Microscopy Unit with a fellow WISEST student where we analyzed cross sections of salamander toes under a fluorescent microscope. By using skeletochronology I was then able to look at multiple different cross sections to decipher the age of the salamander. Because the Beaver Hills region is the most northern part of the Western Tiger Salamander's range and they were recently named a species of special concern, my team was trying to discover the age distribution within the population and in the future take those findings and apply it to the core of the range to prevent further decline within salamander populations.

The lab always had some sort of fascinating and appealing things going on. For example, one day a girl brought in her three day old zebra fish into the where we looked at their muscle fibres under polarized light which caused them to glow. The excitement she had just over a simple glimmer of light inspired me to find a field and career where a small occurrence would truly excite me the way it did with her. But there was one specific person who made my summer much more exciting, enjoyable and valuable. Nhu Trieu, the lab tech was such a kind and helpful person and who would give up her own time to take me and another WISEST student on tours to many diverse labs. One day we went on a tour of the paleontology lab and got an opportunity to look their miraculous collection of fossils which included an array of dinosaurs, prehistoric birds, and my favourite, a sabre tooth tiger skull. One morning she had arranged for us to watch a mouse dissection, which may not be something for everyone but was right up my alley! Nhu also gave very helpful advice on how to deal with problems within our daily jobs and for our future at university. The kindness and selflessness Nhu had showed towards us had made my experience so much more beneficial and I enjoyed and am very thankful for every opportunity she presented.

Aside from the time I spent in the lab, WISEST also gave us opportunities to attend Professional Development Seminars, which occurred on Monday afternoons and Lunch N' Learn Sessions on Fridays during lunch (big surprise). We got the chance to check out diverse labs throughout the university, and to go to explore different research facilities. But my favourite session was the one where I was able to talk to women working in both research and industry. These sessions we were also given the opportunity to bond with fellow WISEST students.

My six week experience in the WISEST Summer Research Program was an extremely valuable, life changing and rewarding opportunity. Between all the fun in the lab, tours and new friendships this summer was most definitely one for the books. I would like to thank WISEST, everyone in my lab and research team and sponsor for the amazing and memorable summer.

# Robyn Cameron

***Supervisor: Dr. Rajender Gupta***

***Department: Chemical and Materials Engineering***

***Sponsor: SPE Canadian Educational Trust Fund***

This summer I was placed in a chemical and materials engineering lab called the Canadian Centre for Clean Coal/Carbon Mineral Processing Technologies (C5MPT) under the supervision of Dr. Gupta and Dr. Rahman. The project I was working on was looking at the characteristics of the residue produced from coal liquefaction. Coal liquefaction is the process of turning coal into a liquid fuel source, and in the process a waste residue is produced. So the graduate student I got the opportunity to work with, Nitya Iyer, is trying to figure out how to turn this residual waste into a usable energy source. This wasn't the only project I got to help out on though. There was another WISEST student in my lab, Carly Schultz, and another girl in the same grade as us, Sarah Almas, which I worked closely with throughout my time in the Summer Research Program. Carly was working on a CO2 capture project and Sarah on an oxygen separation project. As well, we were allowed the opportunity to help out an other student, Teresa Bisson, on a mercury capture project. We worked, learned, and grew together over the summer, and every day we faced a new experience and a challenge.

This summer was not easy, the first day I met my supervisor I received five long research papers on the topic I was working on. These papers contained words, acronyms, processes and information I did not understand. However, there were always people there willing to answer my questions and with a little help from Google I slowly pieced together the research papers. Also the lab and the equipment were unfamiliar to me. I was working with expensive equipment and hazardous materials, I even had to go through respirator fitting and training for my lab work. It started to get easier though when I started to gain confidence in my abilities and become comfortable with who I am.

This program awarded us the opportunity to learn about and explore different areas of science, as well as many personal development sessions. My favorite session was the "Exploring U of A labs" where we chose a lab within the University of Alberta to visit and tour. I went to the observatory where we got to examine the sun through their microscopes as well talk about the observatory and the different public programs they offer.

Coming into the program my goal was to find a direction for the future, but this summer I realized it is okay to not know what you want to do in the future. Talking to different woman during the "Networking session" I learned about different career opportunities and education paths, but the one thing that stood out the most was that when they were in high school they had no idea what the future held for them. This summer did give me a general idea about the future, but I also learned that it is okay to change your mind and explore different paths. Throughout this program I did learn a lot about engineering, coal, and chemistry, but I also learned a lot about myself. I learned that I can handle working under pressure, how to be comfortable talking to different people, to have confidence in my own ability, and to accept and remain calm in uncertainty and adversity. This program also helped me meet many different people, make connections, and make friends. So I would like to thank WISEST for this opportunity, the Society of Petroleum Engineers for their financial support, along with Nitya Iyer for allowing me to work with her and all her help. As well as thank you to Dr. Rahman, Dr. Pudasainee, and Dr. Gupta for their help and the opportunity to work in the C5MPT Lab.

# Sung Eun Cho

***Supervisor:***
***Dr. Jillian Buriak***

***Department:***
***Chemistry***

***Sponsor:***
***Syncrude Canada Ltd.***

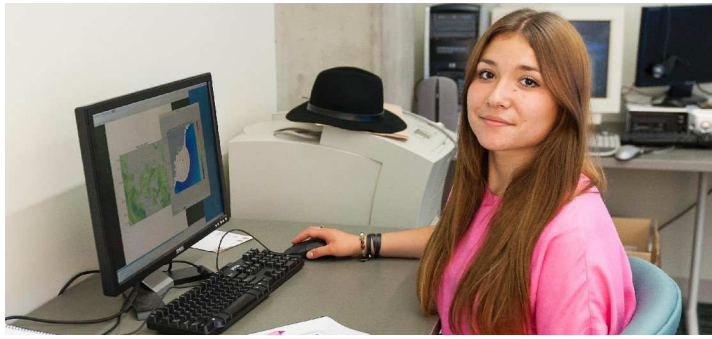
To be frank, when I first applied to the WISEST Summer Research Program, I had no idea what this program was about. Being new to Canada and unfamiliar with the school system, I simply applied based on my mom's recommendation. So, when I got a phone call from the WISEST office regarding my acceptance, I was more fearful and anxious about what this unknown program demanded, rather than excited about the benefits that everyone else foresaw for me. The thought of using English all day, a language I still struggle with, was enough to send me into a panic. However, after a summer that has gone by far too quickly, I can honestly credit my experience in the WISEST Summer Research Program for positively shifting and reframing my world view and perspective on society and myself.

In Dr. Jillian Buriak's lab, where nanoscience and material chemistry studies are in progress, my project, in making nanoscale patterns using inorganic chemical compound called Block Copolymer (BCP), created a "macro"-shift in the way I organized my time: I learned the aesthetic of waiting. BCPs can self assemble into nanoscale patterns that can be used in solar cells, ultra high-density storage media, circuit boards in CPU, etc. Unfortunately, for a person who always wanted to finish and submit everything as soon as possible, there was a lot of wait time for samples to be finished. After doing everything humanly possible, time was the only key to complete the experiments properly. While waiting, I did not want to waste time that could be used in a better way, so, I started to make schedules or to do lists that I could do while I waited. Even though I am not perfect in managing my time yet, I now know that my time can be managed, and lack of time is no longer a good excuse for not doing something that you are supposed to do or wanted to do.

My experience was further enhanced by sessions provided by WISEST and I have attained valuable life skills and information which will help me in my journey through life. Among the many sessions, The Entrepreneurial Spirit was the one that I enjoyed the most. Unlike the title, instead of gaining "spirit" I learned perspective: the need for work-life balance and a belief in myself that I always lacked. This lecture inspired me to design my life more specifically: on my own terms, not following someone else's plan without thinking through what I really need.

Finally, exposed to a new environment and people who are enthusiastic about their jobs, so different from the humdrum high school existence where most students just want to leave school, I had this huge and uncertain feeling that welled up from the very bottom of my being. These people's passion reminded me of a child who had a lot of dreams and strongly believed in herself. She always thought the world existed for her and that she was absolutely capable of achieving anything she set her mind to. This summer, I finally met this girl that I was missing for such a long time, and we have re-set the start line, starting our chase for our dreams from the beginning again. Thank you to my family and friends for their endless love and support. Thank you to Aunty Aimee, without whom I would never have gotten into the program. Thank you to Mrs. Wishieu and Mr. Delcioppo for believing in me enough to write me wonderful recommendation letters. Thank you to Dr. Jillian Buriak, Cong Jin, and the Buriak group for all your patience, help, and support. Thank you to Syncrude Canada and Ms. Tara Abraham for sponsoring me--you provided me with an once-in-a-lifetime opportunity. Thank you to the WISEST Summer Research Program for choosing me, inspiring me, and re-opening my eyes toward the world.

# Zoe Cire



***Supervisor:***
***Dr. Paul Myers***

***Department:***
***Earth and Atmospheric Sciences***

***Sponsor:***
***NSERC PromoScience***

Passion is a driving force in pursuing what you love. Aristotle once said, "Educating the mind without educating the heart is no education at all". Sciences have always played a particular interest in my life inside and outside of school. From conducting chemistry labs to observing wildlife and nature at home, I knew that I had a strong passion for researching. With such vast options in the field of science I have never been sure on what I wanted to pursue. The WISEST program was the perfect opportunity to expose myself to diverse career options that were offered in university. When I received a call back confirming my acceptance I could not be more thrilled. This summer I worked with Dr. Amber Holdsworth and Dr. Paul Myers, in Earth and Atmospheric Sciences, tracking and studying storms in the Arctic and Subarctic regions. Though my decision on what stream of science I want to delve into is indefinite, storm chasing has always been an option for my future.

Over the course of the six weeks I was stationed on a computer in a lab known as “Geophysical Fluid Dynamics Modelling Laboratory”. The students and doctors who study in this lab mainly focus on oceanography. Where I fit in was tracking hurricane strength storms in the Arctic region. To differentiate which storms were hurricanes or not I watched two types of movies. The first identified which storms exceeds wind speeds of 30 meters per second at a point in their evolution. The second movie determined which storms reach a pressures below 98, 000 Pascals. Once deciphering which are hurricanes I used a computer programmer called “Python” to track the centre of the hurricane. Python is a coding language. Being one who is not computer savvy the idea of using a code was perplexing. Soon, with the help of my research team I was flying through my tracks and having a blast while doing it. The purpose of my research was to identify hurricanes. We were successful in acquiring valid data from the hurricanes in 2003 to 2010. Based on my tracks, we were able to extract preliminary results determining the location, duration, seasonality and number of hurricanes per year. We probe into this topic because as global warming increases, the melt of glaciers do as well. In the near future shipping routes in the Arctic are expected to inflate. By identifying these hurricanes it will help us get a better understanding to where the shipping routes are permitted to go.

Before WISEST I was unsure on what to expect from University. This program prepared me through many different seminars regarding life as a University student. One of my personal favourite activities was the Lunch N’ Learn where Dr. Margaret-Ann Armour graced us with a speech. Dr. Armour is one of the most influential women in science and has made an immense difference in welcoming women to underrepresented careers. She left me with a sense of invincibility when tackling my future goals.

This summer can be marked as unforgettable and I am grateful to have had the honour of attending WISEST. I would like to thank all those who made the WISEST program possible. Thank you to Natural Sciences and Engineering Research Council of Canada for sponsoring me. I am thankful to have received the Margaret-Ann Armour Fund for Rural Wisest Students scholarship which made it possible for me to attend. Thanks to the special guests who shared their knowledge based on their careers. Special thanks to Dr. Holdsworth, who guided me when welcoming me into her research as well as Dr. Myers and my research team for mentoring me. Last but not least, thanks to my family for their encouragement and love throughout. This experience exceeds research, it was an adventure that opened doors to dreams and prosperity.

# Shannon Clark

***Supervisor:***
***Dr. Jillian Buriak***

***Department:***
***Chemistry***

***Sponsor:***
***Faculty of Science***

From the moment that I heard about the WISEST Summer Research Program, I made it my goal to participate in it. I expected a summer of hands-on invaluable work experience in a university lab that would ignite my passion for science and related fields. I was not disappointed. Throughout the summer I have been continually surprised by the programs ability to push me further and open my eyes to the endless career opportunities that I never knew existed. It has been an irreplaceable and unforgettable experience that I am extremely grateful for.

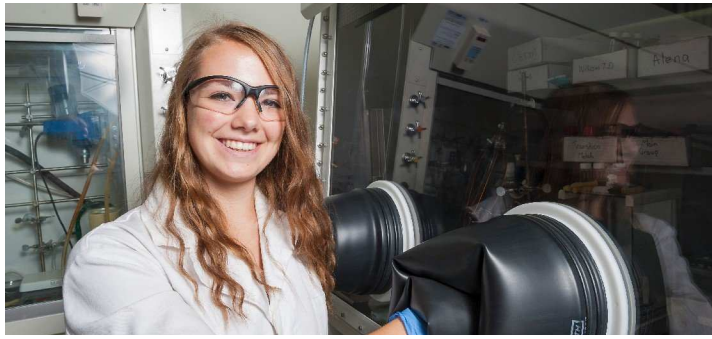
During the summer I worked in the lab of Dr. Jillian Buriak in the Department of Chemistry, where my supervisor Bing Cao is researching next generation organic photovoltaic cells. Using a bulk-heterojunction active layer of a organic semiconductors, these solar cells capture the sun's energy to produce electricity. My part in the project was to research the effect of the active layer thickness on cell efficiency. A regular day consisted of me fabricating samples and altering the thickness of the active layer by manipulating the concentration of solution and the speed at which it was spin coated. I've had the opportunity to create and test various solar cells by using different equipment such as a sonicator, plasma cleaner, spin-coater, vacuum evaporator, solar simulator, and profilometer. I enjoyed the experience of working in a clean room as well as observing the operation of a scanning electron microscope (SEM). It was exciting to be a part of an actual research project and ask questions that don't have answers yet.

By working alongside members of the research group I was able to learn so much about what conducting research is all about. I'm thankful that everyone was kind, helpful, and funny. They were patient and always willing and excited to answer any questions that I had. In addition to my research team, I had the opportunity to meet so many interesting and fun people. I had the chance to connect with other WISEST students during twice weekly sessions as well as speak one on one to role models during the Networking Fair. I pulled from their knowledge and experiences and was comforted to learn that even after choosing a specific degree I can still have limitless career options.

The Professional Development Seminars and Lunch 'n' Learn sessions have equipped me with the skills and knowledge that I need to succeed in the future. My favourite sessions were "Exploring UofA Research" and "Research in Action". I had the opportunity to tour and explore the university observatory and look through a solar telescope to see solar filaments and prominence. During the "Research in Action" session I got to tour the company Micralyne, which is a micro-electromechanical system (MEMS) foundry. My visit helped me realize that no matter which career path I choose, there is always the possibility to have a far-reaching impact on many different fields.

This summer was full of more fun and learning experiences than I imagined possible! I would like to thank Dr. Jillian Buriak for inviting me into her lab, Bing for guiding me through this experience, and my research team for welcoming me and allowing me a glimpse into cutting edge science. I'd also like to thank the Faculty of Science at the U of A for making my summer experience possible by generously sponsoring my position as well as the WISEST team for their dedication to making this an amazing program. Every aspect of my summer has been an enriching experience and I would do it all over again in a heartbeat.

# Aiden Cottrell-Callbeck



***Supervisor:***
***Dr. Eric Rivard***

***Department:***
***Chemistry***

***Sponsor:***
***NSERC***
***PromoScience***

This summer, I was one of forty people chosen to take part in the WISEST Summer Research Program at the University of Alberta. I can definitely say that it was a life changing experience. I learned so much about women in science and about the challenges they have had whilst pursuing their dreams. I have met professors, graduate students, undergrads and more, yet every single person I have met this summer has made an extraordinary difference on my opinion about women in the field of science. All of my female supervisors in the lab and even the WISEST volunteers themselves are all great role models in my eyes. Their hard work and dedication proves to me that even if women are underrepresented in science, they can still do great things.

During my six weeks at the University, I was working in Dr. Eric Rivard's chemistry lab under the supervision of Olena Shynkaruk. Our project was working towards finding the most efficient way to synthesize the building blocks for compounds used in light emitting devices like cell phones or televisions. The first step was to set up the reaction. We would measure out all of the necessary reagents in a glove box and put the mixture into a microwave vial with our desired solvent. After that, we had to cap the vial and take it to the microwave reactor. Then we would input the temperature and desired time to heat the vial. After picking the vial up, we had to work up the reaction. This was a filtration method where we separated the organic phase from the aqueous phase. After the first separation, we would use column chromatography to further separate the unwanted compounds from our desired compound and used NMR (nuclear magnetic resonance) Spectroscopy to find out the purity of our compound. After collecting all of the data from the single experiment, we would change a factor (such as temperature, time etc) and repeat the whole process. Throughout these experiments, I have learned to set up labs that are not even taught until third year university courses. I am very grateful for the opportunities that the Rivard Group gave me this summer and I am certain that the skills I have acquired here will help me in university.

Despite encouraging less traditional roles for women, the WISEST program also organized weekly seminars in which all forty students learned a variety of different skills. The event that stood out most for me was the Networking Fair. In the short hour and a half that we were there, I had the chance to talk to women from a variety of different fields of science. We started out in meeting rooms where there were four 'advisors' and roughly ten WISEST students. In the time we were there, we talked about job opportunities and different classes that are offered at the University of Alberta. I learned many things about life in university that a lot of the fear I had for my future was gone. After about an hour, the small group session was over. Everyone returned to the main meeting room where everyone got to mingle. In that room, there were women who specialized in computer science, medicine and there were even a variety of engineers there. The Networking Fair really opened my eyes to the variety of careers I could choose from.

This whole summer was a fantastic experience for me; however, I could not have done any of this without all of the support I had. With this, I would like to thank the Rivard Research Group for allowing me to work with them for six weeks, I would also like to thank my sponsor NSERC PromoScience for funding my position and lastly, I would like to thank the WISEST Team without which, none of this would have been possible.

# Shaila Fleming

***Supervisor: Dr. Christopher Sturdy***

***Department: Psychology***

***Sponsor: Edmonton Area Council: Beta Sigma Phi***

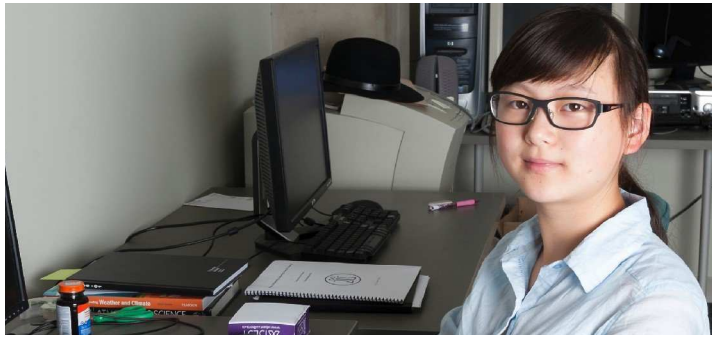

I found out about WISEST completely by chance. My chemistry teacher had a poster in his room about the WISEST Summer Research Program and I sat in the desk right next to it. During class, I read the poster and thought to myself, “This seems really interesting.” After researching the program more, I decided that I had to apply. I was very lucky to have been accepted to participate in the program and was very excited and nervous to begin.

I was placed in the department of Psychology in Dr. Christopher Sturdy’s laboratory. My work in the laboratory consisted of cutting and measuring notes from *chick-a-dee* calls of black-capped chickadees. Using SIGNAL analysis software, I went through pre-recorded calls of a number of chickadees and cut out each note. The notes were standardized and then measured for duration. I then used IBM SPSS to perform a linear discriminant analysis to found out if the features measured could be used to discriminate the birds as male or female. During the six weeks, I worked at a computer for most of the day, however, Lucy, another WISEST student working in the lab, and I were able to give the black-capped chickadees and zebra finches their daily supplements of either superworms or eggs. The work I did was at times tedious, but at the end when I was able to get results it became quite exciting. The results were small, but it was surprising to see that the analysis had some ability to distinguish the notes as male or female.

Aside from working in the lab, WISEST provided weekly Professional Development Seminars and Lunch ‘n’ Learn sessions. These were used to help us gain a better understanding of the diverse career and academic opportunities available for women. I enjoyed the University of Alberta Q&A Lunch ‘n’ Learn session. I received a lot of helpful information about applying for university, classes, and university life. The session made me more confident about university and has made the transition from high school to university less daunting. Another seminar I found really helpful was the Entrepreneurial Spirit seminar. This seminar told us about women pursuing science, engineering, or technology who have created their own small business. Even though I was not planning on starting my own business, I found this seminar very insightful and eye-opening. One thing that I will remember is the transferable skills I learned from the seminar like time management, work-life balance, and legalities. These skills will help while I am attending university, as well as, when I am finished university and go into the work force.

The WISEST Summer Research Program gave me wonderful opportunities to not only broaden my knowledge, but also to meet some great people. I have made some friends with the other students in the program and with other lab mates. Everyone in my lab was very welcoming and helpful. They were very willing to take time out of their work in order to answer any questions I had about the work or about university. I would like to thank Kimberley Campbell, Jenna Congdon, and Dr. Christopher Sturdy for allowing me to work in their laboratory. I would also like to thank WISEST, the University of Alberta, and my sponsor Edmonton Chapter Beta Sigma Phi for allowing me to experience this wonderful opportunity. I cannot forget about my teachers, Mme. Orchard and Mr. Sliwkanich, for writing reference letters and for having the poster of WISEST in their classroom. Without them I would not have known about the program and would never have gotten the opportunity to experience it. These six weeks have been amazing and is something I will recommend that others experience.

# Sherry (Xinhan) Gao



***Supervisor:***
***Dr. Paul Myers***

***Department:***
***Earth and Atmospheric Sciences***

***Sponsor:***
***Syncrude Canada Ltd.***

When I first heard about WISEST Summer Research Program from my science teacher, I was fascinated by the possibilities it could provide and decided to apply for it immediately. I had no clue what was waiting for me and how incredible it would be at that moment. When I received the information package with project details from the WISEST coordinator, I was shocked by the fact that I could not even fully understand the text. In the first few days, I found myself really anxious about working in a lab on things that I had no knowledge about. I was informed this project does not contain any hazards, but the fear of making mistakes and ruining the whole research perturbed me for days. Fortunately, after receiving constant support from the research team, all my worries vanished quietly. After spending a fantastic six weeks on campus, I was ensured that I am capable of doing things that I am passionate about.

I was placed in Dr. Myer's lab in the Department of Earth and Atmospheric Sciences, under the supervision of Dr. Holdsworth. Over the summer, we were tracking Arctic hurricanes with software developed by the direct supervisor. I determined their characteristics from atmospheric data. By looking at the wind speed and sea level pressure, I was able to distinguish the qualified Arctic hurricanes, select the center of the Arctic hurricane, and record the movement of them. The results of this research can be used to catalog Arctic hurricanes, heighten the meteorologist prediction accuracy, and contributes to oceanic studies. Though I knew nothing about hurricanes before the program, the supervisor was kind enough to answer all the questions I have and always try to help me understand the project.

As a high school student who plans to attend university, I found the WISEST weekly instructional meetings extremely helpful. Though I have already received countless information on science in the lab, the Monday Professional Development Seminars and Friday Lunch ‘n’ Learn sessions have opened a new world for me. Those meetings offered us the enchanting opportunity to interact with role models, broaden our horizon with lessons and experience from “the real world” which we will have to face eventually. Take the Networking Fair for example, networking is “a way to meet people with the same interests as you, share ideas, learn about other fields, and gain more knowledge about how to reach your goals” said WISEST. Personally, I am passionate about the environment and wish for more knowledge in this field and luckily I managed to talk to an environmental engineer, Lisa Brown, for about half an hour after the Networking Fair. The exchange of information inspires me so much that I cannot stop thinking about the conversation on my way home.

Being part of WISEST Summer Research Program was one of the best choices I have ever made. I would like to thank everyone who made this unforgettable summer possible. Dr. Paul Myers, Dr. Amber Holdsworth and other lab members’ patience and guidance is very much appreciated. Thank you to my teachers for encouraging me to apply to this program. I owe thanks to Syncrude Canada Ltd. for sponsoring me throughout the summer. My family and friends have been very supportive as well. My special thanks are extended to WISEST and their staffs for all the fun memories in this wonderful summer. Thank you!

# Aaron Grenke

***Supervisor:***
***Dr. Rhonda Bell***

***Department:***
***Agricultural, Food & Nutritional Science***

***Sponsors:***
***Faculty of Nursing***
***&***
***WISEST Golf Tournament***

To realize. No other word seems to have earned so much credit this summer, as it was both my hope and outcome of the WISEST Summer Research Program of 2014. Prior to the program, I was looking for an opportunity to make science more than just an index of knowledge and textbooks. I thoroughly enjoyed my classes, but I wanted to see how they fit into the scientific world outside of the classroom. Little did I know that it would be more than just science which I would realize, but the workplace and opportunity both inside and outside of the lab.

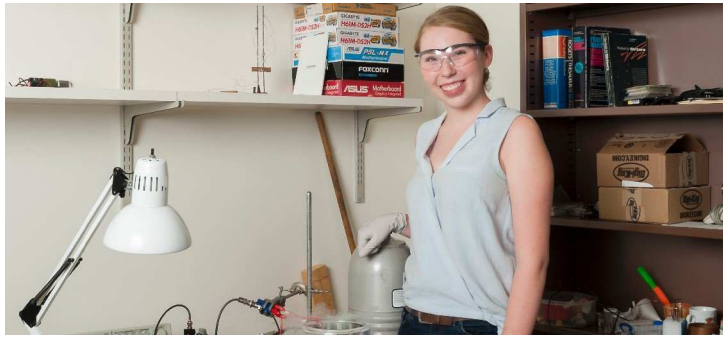
One of the first things I learned was how much effort goes into a research study. Before the program began, I had been notified that my lab was investigating the cholesterol-lowering effects of pulses (a type of legume such as a bean or pea), and I quite underestimated all of the involved variables. At the basics, our lab was partnering with the University of Manitoba to recruit 150 participants who would consume a specific amount of pulses five times a week for six weeks. With multiple routine questionnaires and blood draws, we not only tracked the participant's cholesterol, but everything from their glucose levels to their nutritional intake.

What made my job most interesting was the sheer amount of variety in my lab. On a regular workday, I could expect to be assisting in participant's visits, taking their anthropometrics, making blood draw kits, transcribing data, running blood to the processing lab, entering the heaps of collected data and measuring beans! But above all, I realized and began to appreciate the logistics which goes into a human-based research study. As my physics teacher would put it, in a perfect world our lab would recruit a line of 150 robots whose only manipulated variable in their entire life would be the amount of pulses they consumed. Yet such research would be exactly that—exceptional, not research very applicable to the real world. Thus, after six weeks in my lab I not only learned more about pulses and cholesterol, but about working with people for real results.

Although our intense work in the labs was full of memorable moments, our WISEST gatherings were no exception.  Although they were all noteworthy, two activities stand out. The first one,  was the Social Science Challenge when we worked in teams to build a hydraulic crane. Neither can I forget when another WISEST student Kirill and I met the Associate Dean of Nursing Research, Dr. Clark. Besides introducing us to his current research, his experience and passion seemed to effortlessly answer our diverse plate of questions. The session wasn't long (or as long as I wished), but by meeting such a highly respected academic, it didn't matter where we came from or where our interests lied—he inspired us.

Whether it was in or outside of the lab, this was a summer of realization. I would like to sincerely thank the Faculty of Nursing and all of those who participated in the WISEST Golf Tournament for making this summer a reality. It also wouldn't have been possible without the incredibly supportive research team I feel honoured to have worked with. In conclusion, without the patience and effort made by Dr. Bell, Janis Baarda, my sponsors and the countless other individuals who stood behind me in this journey, I wouldn't have been able to further realize how my small role could fit into such a vibrant scientific community; now that's priceless.

# Georgia Hajduk




***Supervisor:***
***Dr. Kim Chow***

***Department:***
***Physics***

***Sponsors:***
***Edmonton Area Council:***
***Beta Sigma Phi & Nexen***

My six week work position through the WISEST Summer Research Program was a very valuable learning experience. I had first-hand experience on conducting research in a lab as and also got to see what university life is like through the Lunch and Learn Sessions and the Professional Development seminars organized by WISEST. Participating in the Summer Research Program was a fantastic learning opportunity that I am very grateful to have had.

I was a student researcher in the Department of Physics working under Dr. Kim Chow who mentored me and taught me about his current research projects. I was also supervised by Jaechun Jeon and Mary Narreto who helped me conduct research and answered all the questions I had. I really felt part of the team because of the friendly and supportive environment. My project was on the effects that praseodymium doping has on the resistance and magnetic properties of manganites ($La_{1-x}Pr_x)_{0.8}Ba_{0.2}MnO_3$ (LPBMO). I used a 77 Kelvin system to measure the TMIT (transition from the sample acting as metal to acting as an insulator) and I used an Alternating Current Susceptibility (ACS) system to measure the Tc (transition temperature from the sample behaving as ferromagnetic to behaving as paramagnetic). I was also able to assist my supervisors with their projects and they explained the different machines and equipment in the lab. I was given the opportunity to see the different labs used including the Thin Film lab, Dr. Jung's lab, and the Machine Shop.

During the program we were able to attend sessions focusing on a variety of topics that would help prepare us for university and give us a better understanding of the many careers in the science fields. My favorite Professional Development seminar was the Networking session where students were able to meet and talk to women in many different science careers. It was a very useful session as leading up to it, we also attended a session where we learned the tools to network effectively. One of my favorite Lunch and Learn sessions allowed students to ask a panel of female University of Alberta students currently pursuing their education in the sciences questions about university life, classes, and job prospects relating to their specific field. It was very helpful to hear from current students, many who are past WISEST students, and were happy to answer all of our questions. There was also an on campus tour and an off campus tour for students. For the on campus tour I chose to tour NANOfab and for the off-campus tour I chose to tour Schlumberger where I got to see their lab, learn about the history of the oil service company, and hear from employees with different careers within the company.

The WISEST Summer Research Program was the best learning experience I have had. It was a valuable and practical learning experience that allowed me to work in a real lab with graduate and PhD students as well as my supervisors. I was able to conduct research and assist with different projects. I would like to thank Dr. Kim Chow, Jaechun Jeon, Dr. Jan Jung, and Mary Narreto for mentoring and supporting me during my time working with them as they made this experience one I will always be grateful for. Thank you to my sponsors for making this experience possible.

# Ibtisam Hassan

***Supervisor: Dr. Richard Fahlman***

***Department: Biochemistry***

***Sponsor: Faculty of Medicine and Dentistry***

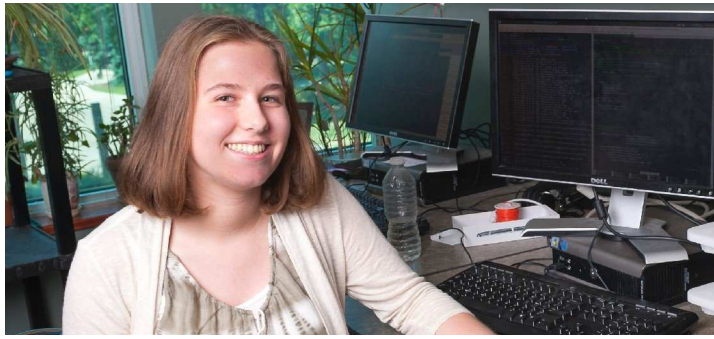
I came across WISEST through my school newspaper and fell in love with the whole concept. I applied shortly after because I was interested in getting research exposure and exploring new career options. Before I began the program I thought I would be exposed to research that was limited to what I learned in high school science, but that was definitely not the case. There was no limitation on what level the knowledge was, which was amazing. I was introduced to new terminology and concepts that were typical for first or second year university courses. I was doing research alongside undergrad and graduate students, something not many people my age can have the opportunity to do. Throughout the six weeks of the WISEST Summer Research Program I was exposed to knowledge outside of the classroom setting, and acquired social skills that can benefit me on a day-to-day basis. The program reaffirmed my love for biology and gave me a direction on what I want to study in university. It also opened up other career option I otherwise wouldn't know about. This definitely sets me apart from other individuals my age.

Throughout the duration of the program I had the opportunity to work in Dr. Richard Fahlman's lab, in the Department of Biochemistry. It was an absolute amazing experience. The first two weeks consisted of picking up the biochemistry jargon, really to understand my surroundings and how all the equipment worked. Once the foundation was in place I was able to do some research on a specific gene sequence called miR-210, which was found to decrease responsiveness to Tamoxifen treatment on breast cancer patients in high concentrations. I was working on the early stages of the research, where I was inserting a sequence of single stranded DNA that was specific to miR-210 into a plasmid, a small circular DNA. This can later be tested in a breast cancer cell line and with the use of a Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) system it can disrupt the miR-210 gene sequence. This experience really showed me what research was all about. It also made me more of a patience person. Due to the cases where your results may not turn out the way you want it and it requires patience and perseverance to continue to get results. Research has molded me into a better version of myself.

Not only were there amazing experiences in the lab, but also in the WISEST sessions. We had sessions where we were brought out of our labs twice a week to learn about different career pathways or social skills. One of my personal favorite was the University of Alberta Q&A session. It was through that session I was able to learn about university life, the importance of time management, also the importance of studying something you enjoy in university. It was so interesting to hear each individual's journey as they were past WISEST researchers as well. We also had the opportunity to tour Micraylne, one of the largest independent microelectromechanical (MEMS) foundries on the Research in Action session. I was able chat with a experienced engineers working at Micraylne and ask any question I had regarding the company.

The WISEST Research Program has taught me many skills and has made me a more driven person. I will take all I have learned from this program and apply it to my last year in high school. I would like to thank Dr.Fahlmann along with the all the lab members on allowing me to work in your lab this summer. Also I would like to thank WISEST on allowing me to take part in this program and a special thank you to the Faculty of Medicine and Dentistry for their generous sponsorship!

# Jaime Hicks



***Supervisor:***
***Dr. Abram Hindle***

***Department:***
***Computing Science***

***Sponsor:***
***WISEST Guest Lecture in honor of Dr. Maria Klawe***

My experience in the WISEST Summer Research Program allowed me to explore opportunities in science and technology fields as well as gave me confidence to pursue a degree in science. I applied to the program hoping to gain experience outside of the high school setting as well as to participate in an engaging research project that could be applied to real-world situations. My experience in the program went beyond these expectations because it enabled me to interact with women in various fields, which helped me to decide what I wanted to pursue in university and afterwards.

Due to my schooling and interests, I was placed in the Department of Computing Science, under the supervision of Dr. Abram Hindle and Joshua Campbell. When I arrived, there were already multiple research projects in process; however my research project was to sonify the electrical impulses given off by muscles in movement. The purpose of my research was so that the technique of sonifying the electrical signals of natural occurring events, such as storm and weather signals, volcanic activity detection and musical warnings, could be applied in other fields of study. Initially, I began with adding sounds to existing media, such as online games. Building upon this knowledge, I was able to extract the electrical impulses, otherwise known as Electromyography (EMG) traces, of my wrist and finger muscle movements using an electromyography machine. These signals would be later analyzed in a Computer Music Programming language called SuperCollider. SuperCollider is a programming environment which enables the public to create algorithmic sound, modify audio files, or process audio input. The electrical signals recorded from my muscle movements were converted into a WAV file, making it compatible with SuperCollider, which permitted me to process, filter, analyze, and detect features from the electrical signals collected. In relation to varying frequencies of the electrical signals, I was capable of outputting different sounds in correspondence to the variation in frequencies. Working alongside those who are pursuing the field of Computing Science, I realized that computing scientists do much more than just code.

During the WISEST Research Program, I had the opportunity of attending Professional Development Seminars and Lunch'n'Learn sessions where I gained knowledge regarding university life and what to expect in the departments of science and engineering. One session that stood out for me was the Networking Fair, where I was able to meet women who work in less traditional fields to ask them questions regarding their research and careers. At the Networking Fair, I met women in the fields of Mechanical Engineering, Civil Engineering, Marine Biology, Neural Engineering, Fluid Dynamics, Mathematics and Physics. Speaking with these women showed me the diverse job opportunities in science and engineering, which encouraged me to enter into one of these fields. The knowledge I gained from these sessions will benefit me in high school and in further schooling, since I now have a greater understanding and appreciation of the relevance of concepts covered in school now that I have seen first-hand their real-world applications.

The WISEST Summer Research Program has been an enlightening experience and everything that I will take away from this summer will greatly impact how I proceed with my further education and career paths. With great appreciation, I would like to thank WISEST Annual Lecture for funding my valuable experience with WISEST in honour of Dr. Maria Klawe. I would like to express my gratitude to Dr. Hindle and his team in the Software Engineering Research Lab for allowing me to be a part of their research group this summer.

# Sasha Jacob

***Supervisor:***
***Dr. Catherine Field***

***Department:***
***Agricultural, Food & Nutritional Science***

***Sponsor:***
***NSERC PromoScience***

When most students who have not had lab experience hear the word 'lab', the first ideas that usually pop into their heads are, using microscopes to look at bacteria and cells; wearing goggles, lab coats and gloves; and doing many repetitive tests. This summer, I worked in the Li Ka Shing building under the Agricultural, Food, and Nutritional Science department. After six weeks, I have discovered that research holds so many other amazing components than just white coats.

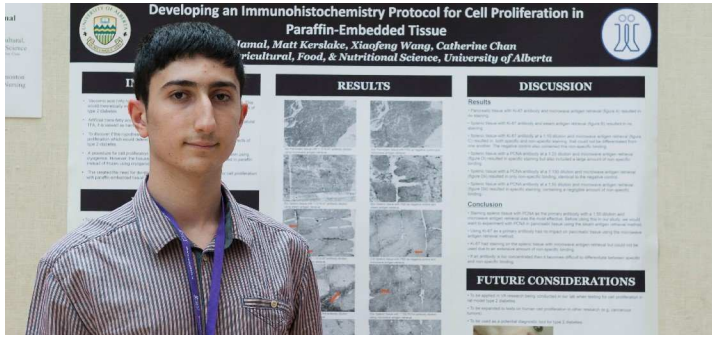
My project looked at the effect of varied amounts of three forms of choline in maternal diet and how it affects the offspring's immune response. During my summer, I spent the majority of time performing enzyme linked immunosorbent assays (ELISA). These tests are able to detect the presence of certain antigens by the attachment of a specific anti-body along with a color change. But when not performing those tests, I worked on so many other tasks including running blood samples, making many solutions, sorting and labeling samples, working with tissues and other interesting jobs around the lab. I was surprised at how in just six weeks, such inseparable friendships grew. My lab work was all the more meaningful with my lab partners taking every step, success, and failure with me.

I applied for the WISEST program because I wanted to have an incredible summer experience and I wanted to learn about the hundreds of doors that will be open to me when I go to university. I was aware of the unfortunate truth that it is uncommon for women to be in engineering programs, and I wanted to converse with other girls my age and women in engineering professions to prove to myself that my future aspirations could definitely be achieved. I applied to the program really hoping to get a position in an engineering lab, and when I was selected for the Agricultural, Food, and Nutritional Sciences department, at first I was a bit disappointed. However after these incredible six weeks, I realized that science is just as interesting and wonderful as engineering. The WISEST program helped me to widen my horizons and to think about all my possibilities.

I am so grateful for all the informative lunches, and the professional development seminars. These gave me great insight into what my future has stored for me, and what I need to do to prepare for it. I found the Research in Action an incredible experience that allowed me to hear women engineers talking not only about their few challenges, but their numerous successes. From listening to inspiring women speak, to pipetting blood samples, to learning about the importance of networking; the most valuable lesson I will forever remember is that no matter how impossible your goal may seem at first, never give it up thinking that it cannot be achieved.

I would like to thank NSERC PromoScience for funding my six weeks. I would also like to thank Catherine Field for providing me such an interesting project to work under. My supervisors and research team were extremely helpful and I am grateful for their encouragement, mentoring and the fun times we had together. The only thing I could wish for is a longer summer research program.

# Tymoore Jamal




***Supervisor:***
***Dr. Catherine Chan***

***Department:***
***Agricultural, Food & Nutritional Science***

***Sponsor:***
***Edmonton Area Council:***
***Beta Sigma Phi & Facult of Nursing***

I did not know how fun and challenging being in a lab could be until this summer. I found out about the WISEST program through a friend of my dad and since then it has made a huge impact on me. From first hearing about it until even now it's been filled with exciting and surprising events. It started out with the application; I got hooked on the idea of being a scientist for a summer and only being in grade eleven. How many other students my age could say that they have actually done meaningful research that directly affects fields of science? Well I know I can.

My project was to find out a staining method that could stain for cell division in paraffin-embedded cells. It wasn't always easy with great results. The procedures of staining would take quite a big portion of the work day and even when finished the staining, the results were not always what we were looking for. But I believe that is a great aspect of science that is not explored in other fields, for example if you write a bad Shakespeare essay in English class you can get a failing mark and that's the end. However, in science if you perform an experiment with results that differ from your hypothesis that's only the beginning. From all my results that were not expected I learnt how heavy the role trial and error plays in science and how to learn from failed experiments and make them into strong evidence of another hypothesis.

Before I began I was questioning if my research would actually make an impact on the field of research I would be in. I though that this program might have me only redoing research that has already been attempted and my results would hold no significance. Fortunately that could not be further from the truth. The research topic I was given (to find a method for cell proliferation in paraffin-embedded tissue) was needed for a larger research study which could potentially find a way to reverse type 2 diabetes. The results I gained would actually be used by post-docs and professors in the study and could contribute to their overall results. This made me feel like what I was doing in this program was actually useful for them.

This program also helped me with how I felt about post-secondary. Initially I was very nervous about going to a post-secondary and would hear quite a bit of rumors about how difficulty it is and how it's better to not go to a post-secondary. But with given the chance to work with students who actually attended university I was able to see how students really feel about university life and how to do well in university. This helped relieve a lot of stress and anxiety about going to a post-secondary. It also gave me an inside view which also took some stress off my shoulders. With all of this information I have gained about university life it makes me feel like I can make a stronger informed decision about picking a post-secondary and how to deal with certain situations which makes me feel a lot more comfortable in my future decision.

Most importantly I would like to thank the WISEST program for this amazing once in a life time opportunity and the people who work at WISEST for being one of the most caring and understanding people I have had the pleasure of meeting. I would like to thank my Principle Investigator Dr. Catherine Chan, my Direct Supervisor Matt Kerslake and the rest of the Chan lab for taking me in their lab and assisting me with my research. Finally I would be happy to thank my funders Beta Sigma Phi and Dr. Alex Clark because without their funding I would not be able to have this wonderful experience.

# Aiman Khan

***Supervisor:***
***Dr. Cynthia Paszkowski***

***Department:***
***Biological Sciences***

***Sponsor:***
***NSERC***
***PromoScience***


When talking about what first got them interested in science, most people usually go off into a tangent of a somewhat inspiring story involving various childhood adventures and aspirations. However, I was never quite the brainiac as I like to think I was and never really considered science as a career choice. Frankly, my only aspiration was to become a witch and spend my days flying around on a broom. Other than a few fleeting thoughts, I never thought of science as particularly “cool”. However, looking back now, I realize that, whether I knew it or not, I had always been surrounded by science and still am. Perhaps it’s just me but just hearing the word “science” sends a thrill running through my body. It may be a bit cliché but if I had not been introduced by the advancing world of science, I would probably still be at a loss for what I wanted to do and probably would never have had the chance to apply for the WISEST Summer Research Program.

Attending WISEST gave me the opportunity to experience new and different things that had been previously been far out of my comfort zone. There are many things that I have learned over the past few weeks by the various activities that occur on campus, from the Lunch ‘n’ Learn sessions to Ada’s Team lunches, one of them being the importance of networking. I had always believed networking to be something completely unrelated to me, after all, I wanted to pursue science not business. However, networking, as I later found out, is the art of speaking with deliberation and meaning and no career is separate from it. Not even science research.

I was assigned to the Department of Biological Sciences under Dr. Paszkowski as my PI and Kyle Welsh as my supervisor. Through them, I was introduced to the West Tiger Salamander (WTS) and the importance of aging and monitoring their population. Just like other amphibians, WTS are faced with loss of habitat as the environment around them changes drastically, making them a species of special concern. Due to their potential loss of habitat, it is necessary to monitor the ages of WTS in order to prevent a decline in the population.

Being a high school student, I had never been able to work with any advanced equipment. Subsequently, one of the first things I was taught was how to properly use a high powered microscope in order to view various WTS toe samples. Because of their yearly hibernation, WTS form lines on their bone called LAGs (Line of Arrested Growth) and just like trees, each LAG represents one year. With the process of skeletechronology, the age of the salamander can be determined by looking at the LAGs and determining the age of the sample. By using the ages of WTS, demographics can be made that could indicate a decline or an increase of WTS population and, in return, changes could be made in order to preserve WTS populations.

Through attending WISEST, I feel that I have been able to greatly as a professional and personally. I have learned how to become a leader, and more importantly how to use my imagination to my advantage. Now that the WISEST Summer Research Program is ending, I have realized how am grateful I am of all the teachers I have had for inspiring and guiding me through everything and introducing me to WISEST. Along with the WISEST team, I would like to thank NSERC Science and my research team for providing me with this remarkable opportunity.

# Nina Krawec

***Supervisor: Dr. Neda Nazemifard***

***Department: Chemical and Materials Engineering***

***Sponsor: Faculty of Engineering***

For me, the highlight of participating in the WISEST Summer Research program was being exposed to the numerous possibilities for women in non-traditional fields. Before I applied, all I really knew about my career path was that I wanted to become an engineer. Now, I realize that my opportunities are endless. Whether it's working my way up in the industry, or even starting my own business, I am confident in saying that as a female I can be successful in whatever I choose to do. WISEST has given me the tools I need to take on the upcoming challenges I will be facing in the world of science and technology.

During my time in the Summer Research program, I worked under the Principal Investigation of Dr. Neda Nazemifard in the Department of Chemical and Materials Engineering. I studied the physics of fluid mechanics, with my specific project being focused on how to make the pipelines of oil refineries more safe and efficient. At first, it was scary to think that, being a high school student, I would be jumping into a project that I really didn't know much about. I was truly in for a challenge.

My experiment was mainly focused on trying to prevent oil in water emulsions. Emulsions are created when minute droplets of a substance are dispersed in another substance. The problem with water in oil emulsions is that the water and salt can cause explosions in pipelines. These water droplets are difficult to separate from the oil because of particles found in the oil called asphaltenes. What these asphaltenes do is change the structure of the oil, making the water droplets stable and preventing the process of coalescence, which is the coming together of the water droplets. The objective of my experiment was to somehow make these asphaltenes precipitate and separate from specifically concentrated oil film (bitumen) samples, by adding a solution and then aging them. After this, we examined how it affected the viscosity of the bitumen by measuring it with a rheometer.

It feels amazing to know that at my age, I have been able to contribute in helping these oil refineries, and that I have put a piece into this big puzzle that is research. Now that I have done so much work in this lab, I feel proud to say that I know what I am talking about when I explain my research to other people. Every day in the lab was a new experience, whether it was working with a new device, or just reading a paper on the experimental subject matter. I have also been able to speak with many people, and have slowly begun to build a network.

One of my favorite parts about the program has been the Professional Development Sessions and the Lunch 'N' Learn seminars. The useful things that I have taken from these sessions are so numerous, that I truly don't know how I can thank the WISEST program enough. Now I feel confident when I need to take on a new challenge, like searching for a new job, or even how to properly speak to a professional and build a network for myself. Being able to interact with my fellow WISEST students was definitely the thing I looked forward to every time. Being a huge math nerd, I loved that I could talk to other people who were also passionate about it.

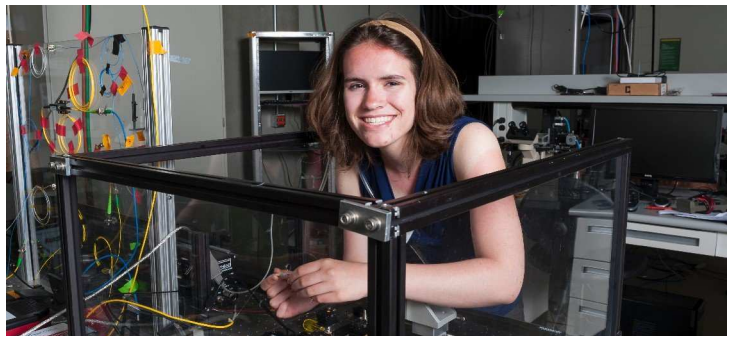
Although my time in the Summer Research program has come to an end, I truly believe that I will benefit from it in many ways throughout the rest of my life. I will never forget this summer, as it has been such a big stepping stone to the start of my career, and the beginning of an incredible journey of discovery.

# Brynn Lewis

***Supervisor:***
***Dr. John Davis***

***Department:***
***Physics***

***Sponsor:***
***Edmonton Glenora Rotary Club***



When I first heard about the WISEST Summer Research Program, I was intrigued. I've loved the idea of scientific research since I was little—it makes me think of an incredibly large and confusing jigsaw puzzle—and the program seemed like a perfect segue into what I might do later in life. Still, I've had niggling doubts about this career path. Would I like scientific research? What is involved? Would I even be able to mesh with a lab environment? What would happen if I headed down the research track, and then found out in the end that I absolutely hated it? It was my enthusiasm for science that inspired me to apply for WISEST, but it was this sense of confusion that actually ensured I got the paperwork in on time. It looked like the perfect opportunity to answer some of my questions. In the end I'm glad I took that leap—the experience certainly exceeded my expectations.

The lab I was placed in studies a specific branch of physics known as optomechanics, which focuses on the interaction between optical cavities and mechanical systems. My research revolved around optical fibers—more specifically, how to "taper" thin fibers that transmit visible 780 nm wavelength light. The unique properties of tapered fibers allow them to couple light into optical cavities, and they are often used in optomechanical experiments. Tapered fibers that transmit infrared light are common in the lab, but the type of visible light fiber I was trying to create is more difficult to manufacture. The thin diameter and fragility of the fiber proved to be formidable obstacles. I learned troubleshooting, physics, and a significant amount of patience during my project.

Physics was an intimidating subject to enter into because most of the math was far beyond my comprehension. I shouldn't have worried, though, as all of the lab (and especially my supervisors) went out of their way to explain challenging topics to me. The lab environment was amazing. Sure, lab work has its moments of monotony and frustration, but the enthusiasm of fellow lab members made me feel passionate about my project. Some of the fibers that I made were incorporated into other lab projects, and I suspect that my favourite part of this whole experience was feeling like a member of a team, helping the others progress with what they were working on.

It would have been enough for me simply to get the chance to do lab work, but that was only one of the many opportunities provided by WISEST. We attended professional development sessions, went on research tours, had a chance to socialize with other motivated people our age, and met mentors of widely varying backgrounds and careers. From resumes to networking, WISEST gave participants a solid grounding in different skills that will help lead to success. One highlight for me was the research tour of the University of Alberta's NanoFab facilities.

The WISEST program opened my mind to the many different opportunities in scientific research, giving me new skills and lasting memories. I would like to thank all of the dedicated people and organizations that have supported this program, including WISEST, Glenora Rotary Club, University of Alberta, and my entire research group. This whole experience would not have been possible without their help. Special thanks must go to Dr. John Davis, Allison MacDonald, and Bradley Hauer—I learned a lot under your guidance and wish you best of luck.

# Yjy Lim

***Supervisor: Dr. Kurt Konhauser***

***Department: Earth and Atmospheric Sciences***

***Sponsor: Faculty of Science***

On the night before Orientation I felt like I was making a big mistake. I was worried about living on my own for six weeks, about meeting the other WISEST students, and about being good enough for the program. Once I stepped into the Solarium the next day I felt the calm and confidence within the room and it took the edge off the nervousness I felt. As the day rolled along we all talked excitedly about our research projects and the fields of study we were pursuing. By the end of the day's events I was talking to another student about next year's physics curriculum. I had to do a mental double-take as I realized that it was summer and I was talking about school with another teenager. I was definitely in the right place.

I was assigned to the Earth and Atmospheric Sciences Department under Dr. Kurt Konhauser, Dr. Daniel Alessi and Yuxia Liu, my supervisor. My research project composed of culturing cyanobacteria in different growth conditions then eradicating them in order to analyze their surface chemistry after death. My contribution helped in environmental research efforts as bacteria are widely used in bioremediation and biorecovery of metals. At work I would transfer cultures, analyze titrations, and clean the used equipment. Washing dishes wouldn't normally be something I would mention but I had to wash everything at least six times! Apart from raising my already high expectations concerning cleanliness, the experience of working in the lab gave me confidence in working in professional lab and academia settings.

Outside of work I received valuable lessons with Professional Development Seminars and Lunch 'n' Learns and other activities that WISEST would pepper my calendar with. From those seminars I learned how to improve my public speaking, I gained contacts for if I ever needed help opening up a business, and I networked with people from professors in the university to engineers in Schlumberger. I learned the science that goes into a résumé worth remembering and a research poster worth reading all the way through. The SRP gave me indispensable knowledge that I will carry with me throughout my future careers. WISEST also allowed me to build strong friendships. I lived in residence during the latter half of the program, which gave me a glimpse of what university life was like. During my stay I was lucky enough to be paired with roommates who, thankfully, shared my sleep schedule. We went to West Edmonton Mall, to various festivals, and explored Whyte Ave. throughout the summer. We all had so much fun together that an often told joke was about how we should have stayed antisocial like how we originally planned.

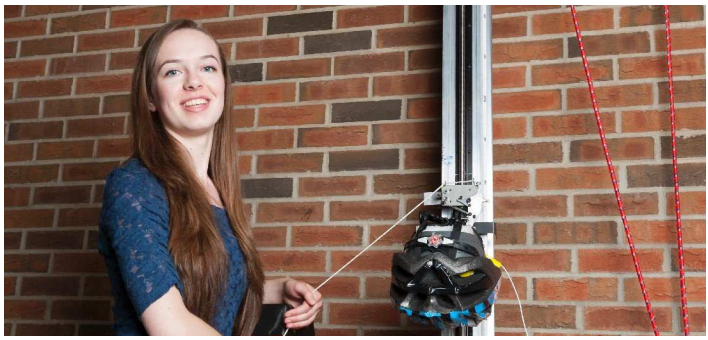
I would like to thank my teachers for encouraging me and my parents for supporting me throughout the program. I thank my research team for accepting me and the Faculty of Science for sponsoring me. Last but not least I would like to thank the University of Alberta and WISEST for setting this all up and allowing me to be here. When I first applied to the Summer Research Program I expected a job but what I got instead was an experience and, looking back, this was a life changing summer that I wouldn't trade for the world. I learned a lot about others and I learned much about myself. I have gained confidence in my abilities and I have developed a lot as a person over the six short weeks I was in the program. The idea that I had of giving up before the program even began, that this was just another summer job that would have look good on my résumé, that was a big mistake.

# Callie Lissinna

***Supervisor:***
***Dr. Christopher Dennison***

***Department:***
***Mechanical Engineering***

***Sponsor:***
***Nexen***



The average day in my mechanical engineering lab was quite the dramatic ordeal: crushing, cracking and denting helmets. Not long after Dr. Christopher Dennison welcomed me into his lab my supervisor, Brooklynn Knowles, was showing me their “graveyard” of destroyed helmets. The graveyard immediately got me interested in their research, and I have never lost interest since. The lab has a drop tower that is used to test helmets. Bicycle helmets are tested by being strapped to a headform and dropped from a height of two metres onto a steel anvil. The purpose of our lab’s testing was to investigate how helmet assessment criteria can be improved. Current pass/fail criteria for helmets ignore some important factors that are relevant to brain injury. To improve the criteria, we explored a New Severity Index (NSI) that accounts for many of these other important factors. We analyzed the potential of NSI as helmet assessment criteria by examining how it correlates with brain injury metrics (values that quantify tissue damage in the brain). By the end of the program I had become comfortable working with all the technical equipment and complex computer programs.

But during the first few days of work I felt completely overwhelmed by the technical language, the new environment and the expectations placed on me. However, my research team was very supportive and approachable so I adapted quickly to the intimidating environment. I cannot thank them enough for the knowledge, encouragement and assistance they gave me during my six weeks in the program. I would also like to thank my sponsor, an anonymous WISEST alumnus, for funding my participation. Without this assistance I would not have had the opportunity to gain skills and expertise that will carry me through to university and beyond.

In a guest lecture during the first week of the program, Dr. Margaret-Ann Armour stressed that circumstances in life change rapidly, which makes planning for five, ten, or twenty years into the future very difficult. She told us that it’s okay not to know what we want to do. Understanding that an expeditious decision is not necessarily a better decision was comforting for me. With application deadlines and big opportunities coming up for me in the next few years, this was exactly what I needed to hear.

That being said, by the end of the program its numerous sessions had largely prepared me to start making these intimidating decisions. My favorite professional development seminar was Research in Action, where I ventured off-campus to Micralyne Inc.to get a glimpse of an engineering workplace in industry. What made this session valuable was the chance to feel the difference in atmosphere between academia and industry. Atmospheric nuances between work places cannot be explained in an interview, article or presentation yet they can determine whether you love or dislike a career. Overall, the Summer Research Program succeeded in giving me a comprehensive sampling of possible career and education paths. It also succeeded in making my summer action-packed, because of all the crushing and destroying helmets. Though the past six weeks have diminished the amount of empty space in the helmet graveyard, they have expanded my interest in science and engineering immeasurably.

# Kirill Makhachev

***Supervisor:***
***Dr. Carol Boliek***

***Department:***
***Communications Sciences and Disorders***

***Sponsor:***
***Faculty of Nursing***
***&***
***WISEST Golf tournament***

By now, most of the reports you've read, have probably been written by female participants. So I am here to share the male perspective of the Summer Research Program. When I first found out about the program I was not at all interested. I had tons of schoolwork and was overwhelmed with sports; writing another essay for my application was not at all appealing. The other reason I did not want to apply was because Women In Scholarship, Engineering, Science and Technology (WISEST) is a well-known program for helping **women** become comfortable in areas where they are underrepresented. However, my mom and several family friends told me I would be making a big mistake not applying. So I triple checked the website to make sure girls **and** boys could apply, I wrote my essay, revised it with my English teacher and mailed it in. Throughout the course of the summer, I have not regretted that decision once.

WISEST had planned a lot of activities for us this summer, but I will not go into much detail about them because you can read about those activities in more detail in the other reports. As I said earlier, I am here to bring you the male perspective of the program. There were two events that the boys attended separately. For the first activity, we got a small tour of the new nursing building. There, we witnessed a life like doll that you could extract blood from and on which several incidents could be simulated. We then watched a class of nurses partake in the simulations as part of their education. After the simulations, we visited another room that had a pair of arms on 10 beds. The nurses here were practicing taking blood from life like arms. They then offered for us to try and of course we said yes. It was a lot of fun trying to find the veins and seeing if we hit it right. The overall experience was so new and exciting that I actually began considering nursing as a career. Sometime later we were invited to meet the Associate Dean of Nursing, Dr. Alexander Clark. Dr. Clark did an amazing job of answering any questions we had and providing us with insight on what university life was like.

The lab I worked in as part of the program was focused on speech rehabilitation. We were studying whether the Lee Silverman Voice Treatment (LSVT LOUD) method would help kids with speech disorders, specifically those with Cerebral Palsy (CP) become better understood. LSVT LOUD is an intensive voice treatment method focused on one-on-one sessions as well as homework practice. The subjects were tested the day before they began treatment, the day after the treatment finished and a follow up day, 3 months later. As part of this research, my job was to analyze recordings of the subjects holding Aaa and saying several phrases. I then had to record the duration of the vowels and the loudness of both as well as frequencies and other statistics and see if they improved over time. It soon became clear to me that, being better understood was not all about speaking perfectly; sometimes it's the little things that help us communicate.

Overall, WISEST is a great program for girls and boys. It was a fantastic experience from which I have acquired a lot of knowledge, experience and connections. I would like to thank the Department of Nursing and the WISEST golf tournament for sponsoring my research. A big thank you is for my mom who pushed me to take this opportunity at a time when I was extremely overwhelmed. I would also like to thank my research team that took me in, trained me and supported me in all aspects of my research. A last thank you is to all of the WISEST staff and students for making this an unforgettable summer.

# Trisha Mead

***Supervisor:***
***Dr. Jason Carey***

***Department:***
***Mechanical Engineering***

***Sponsor:***
***SPE Canadian Educational Trust Fund***

Being a high school student definitely isn't the hardest job in the world, but the decisions that come with it might just be some of the most difficult we will ever face. The task of choosing a career becomes even more pressing when we realize the costs of an education, both in time and money. Really, the only way to be sure about your path would be to get a taste of said career before making a definite decision.

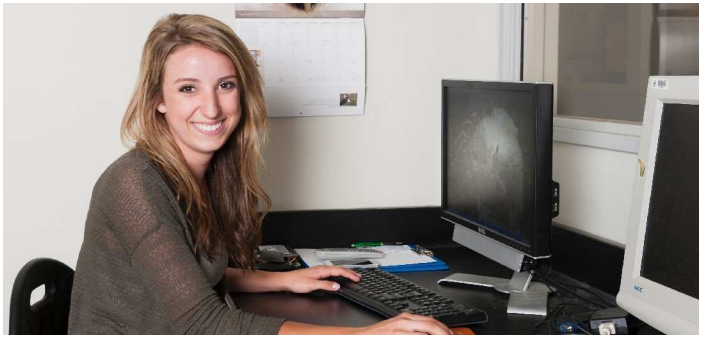
This is where WISEST (Women in Scholarship, Science and Technology) comes in. WISEST is able to present students with endless opportunities for exposure to various fields in science and technology.. For this reason, I decided that applying to WISEST would be a progressive step to take in my education, and decided to go for it. However, I was completely in the dark about what to expect from the program after I'd been accepted. It was this ignorance that allowed me to enter the program with a completely open mind and, essentially, get the most out of the experience as I possibly could.

My work placement at the University of Alberta was in a mechanical engineering lab under the supervision of Dr. Jason Carey. My project, which I would work on for the duration of the 6 week long program, was the design and construction of a small scale bicycle frame out of braided Kevlar tubes and 3D printed couplers. This project was great, not only because I had the opportunity to see my work come together in the form of a bicycle frame, but also because I was able to do both computer work and more hands on tasks.
I started the work on my project by educating myself about bicycle geometry and then paired this knowledge with simple bicycle dimensions in order to mathematically calculate the internal angles of the frame. Models of the couplers were then created using SolidWorks software. These models were then imported into the Cura software and sent to the 3D printer to be printed into a PLA (polylactic acid plastic) part. The Steeger braiding machine was also used to braid Kevlar fibers onto a mandrel, creating a tubular structure that was then cured into a strong thermoset rod. Lastly, the tubes were cut to length and combined with the couplers to successfully create a small-scale bicycle frame.

Another fantastic thing about my work placement was the number of tours the members of our lab took myself and the other WISEST student on. These tours ranged from trips to the paleontology and geology exhibits, to tours through the prosthetics and materials engineering labs, among many others. All of these tours were organized by the members of our lab, and were opportunities the other WISEST students didn't get. Through these tours I was able to see a large part of the University that some people never get to see, or don't realize exist, and that was really exciting.  I also got the chance to take part in an industry tour, informative lunch'n'learns, a campus tour, and many incredibly helpful professional development seminars. These events were organized to bring all 40 students together in their drive to learn, and were extremely memorable experiences.

In the end, WISEST was an incredibly impactful experience that fulfilled every hope I could have possibly had for it. I made memories I will never forget and am infinitely more prepared to make pivotal educational and career decisions. Thanks to WISEST, I now possess confidence I didn't have before and I would like to thank the Society of Petroleum Engineers Canadian Educational Trust for making my experience possible.

# Abbigail Menzies



***Supervisor:***
***Dr. Erin Bayne***

***Department:***
***Biological Sciences***

***Sponsor:***
***NSERC***
***PromoScience***

This summer I was given the spectacular opportunity to be a research assistant in a lab at the U of A in the department of biological sciences. Being accepted into the WISEST program was something that I had been striving to accomplish for virtually my entire grade eleven year. This program has given me a chance to explore an extremely wide variety of options in the science field. Being given access to this type of scientific exposure would not have been possible without the WISEST program. WISEST gave me an opportunity to expand my horizons and settle on a more concrete career path that I might not have found without this particular opportunity. Aside from everything that I've learned in the biology lab that I was placed in, I have been exposed to many other different types of options, and spoken with people who represent a wide variety of the occupations that I could get involved with. The program exceeded my expectations and resulted in a new confidence in my post secondary options and an awareness of the many possibilities that are open to me.

The research that I did under Dr. Erin Bayne and his graduate students was remarkable. I was given the chance to study the behavioral patterns of the threatened Ferruginous Hawk by watching video surveillance that was set up on over ninety nests across Alberta and Saskatchewan. Countless hours of this video footage was watched and recorded into a database for use in further studies. A secondary project was also incorporated into my time in the lab and it was a Birds and Windows study. This secondary study brought a lot of fieldwork into my time in the lab, which added a substantial amount of variety on a day to day basis. The Birds and Windows project was focused mainly on the influence that bird feeders have on window collisions. This biology focused work over the summer has confirmed my passion in this field and I feel confident in pursuing a career in this direction.

Along with providing me with a look into the biological sciences area, WISEST has provided frequent educational and motivational sessions. These sessions covered topics on resume writing to entrepreneurial spirit and everything in between, providing all students in the program with a wide set of useful skills that can be applied throughout their lives. With the newfound knowledge and inspiration that was given to me and my fellow students, I have certainly become more confident in areas which I hadn't thought possible. We as students will be able to enter the work and university environment well versed and better prepared for the academic and career challenges that will come our way.

The WISEST program is well known for turning out a number of well balanced and prepared females who are ready to take on the work force and further their educations without skipping a beat. After having participated in the program, I can certainly see why. I feel much more confident in myself because of the program. It has equipped me with countless tools that will be useful for the rest of my life. These skills that I have picked would not have been possible for me to access without the tremendous support of those at WISEST. The members of the WISEST committee have been amazing in every aspect. They are an encouraging and inspiring group of women. I have been given an immense amount of support from those that I work with in the Bayne lab as well. They have all been unbelievably supportive and have given me once in a lifetime opportunities that I am truly grateful for. The WISEST program is something that I would strongly recommend. It has been an unbelievable experience.

# Heidi Moulton

***Supervisor: Dr. Larry Unsworth***

***Department: Chemical and Materials Engineering***

***Sponsor: Weyerhaeuser***

I heard about WISEST from my Chemistry teacher in an off -hand announcement to the class. I applied as soon as I could. I had nothing to lose. When Kristy called to tell me that I made it into the program, I almost cried from excitement. But the anxiety came shortly after when I received my project description. I did not understand half of it. I was terrified that everyone would think I was dumb or something. But on my first day, I found out that no one expected me to know everything. Because above all else, WISEST Summer Research Program is a learning experience.

For my research project I worked in Dr. Larry Unsworth's lab in the National Institute of Nanotechnology building where I was under the supervision of Freya Hik. I assisted Freya in using a Quartz Crystal Microbalance to measure protein absorption on a polymer. My day would consist of preparing stock solutions and getting everything ready to start the experiment. This experiment had definitely taught me patience. Research requires some waiting and our experiment required three hours of waiting.

WISEST is much more than a summer job in a research lab. They coordinated Professional Development seminars and Lunch and Learns. Both are excellent opportunities to meet fellow student researchers and learn skills that prove valuable to all aspects of your life. My favorite Professional Development seminar was the Research in Action, where we visited companies and hear from women in underrepresented fields. I had the opportunity to visit Schlumberger to tour labs and meet employees. This Professional Development seminar allowed me to learn what career options could possibly lay ahead, as well as getting to hear about work from an actual female engineer. The Networking Fair was another Professional Development seminar that was very impactful for me. Meeting with women in science, technology and engineering fields really helped me understand all the options that lie ahead. While I was there I met women in industry and women in research. Some worked in the oil industry, and some worked in biomedical. Seeing the endless possibilities was priceless. I got advice on university, careers, and balancing these with life. I think that the Networking Fair Professional Development seminar was essential to my growth during my time with WISEST. Lunch and Learns have taught me many things about mentorship and team work, but the session that taught me the most was The Art of Networking. WISEST has definitely made me a more confident, and the Networking Lunch and Learn was a large part of it. It taught me numerous professional skills that I would have otherwise struggled with.

WISEST has given me a head start on my academic and professional careers. The Summer Research Program allowed me to get a glimpse of university life and the life of a researcher. I got to work in a real lab and manage my own time. Being a part of this program has given me such confidence and joy. I loved being able to connect with like-minded students and supportive mentors.

I would like to thank WISEST for creating this excellent program, the University of Alberta and the National Institute of Nanotechnology for letting me use their facilities. I would also like to thank Dr. Larry Unsworth, Freya Hik, and the Unsworth lab team for welcoming me and helping me through this process. Thank you to Weyerhaeuser for sponsoring my position in this program. Last but not least, thank you to my family, friends, and teachers for supporting me and encouraging me.

# Lauren Mullen

***Supervisor:***
***Dr. Brian Fleck***

***Department:***
***Mechanical Engineering***

***Sponsor:***
***Syncrude Canada Ltd.***

Feeling lost, nervous and a little bit confused, I had no idea what lay ahead of me when I arrived at WISEST Orientation six weeks ago. I had heard little about the WISEST program, but from what I head I knew it was an opportunity I did not want to see pass by. I hoped my application was strong but knew there would be many other high school students longing for the opportunity of spending six weeks in a University Laboratory. Dealt a very lucky hand, I am honored to say that I was a part of the 2014 WISEST Summer Research Program.

During my six week work period I was placed in the Department of Mechanical Engineering under the supervision of Dr. Rajesh Pillai and Principal Investigator, Dr. Brian Fleck. My research project was to Characterize and Compare Process Water Samples from In-Situ Oil Sands Extraction. As I spent my first few days reading publications and documents related to my project it was becoming clear that while the expectations were high, there would be was a limitless learning opportunity and I was eager to challenge myself. Dealing with Steam Assisted Gravity Drainage (SAGD) Process Water Samples from the Athabasca River region in Northern Alberta, I performed multiple analyses. Some of which tested pH, conductivity, Total Organic Carbon, Total Suspended Solids, Total Dissolved Solids as well as Color to name a few. My research was mainly conducted in the Lab; however I also collected data and interpreted it using computer programs like Excel and Origin. The objective of my research was to characterize and compare the results of the analyses. I observed certain results and learnt how they are incorporated into the bigger, broader picture of how the SAGD process actually works.

Among the many valuable experiences WISEST has provided, some of my favorite and most memorable are from the Professional Development Seminars and the Lunch ‘n’ Learn Sessions every Monday and Friday. While all are valuable in their own ways the Networking Fair, hands down, stands out the most. I was able to speak with Engineers, Physicists, Biologists and an Earth and Atmospheric Scientist. It was empowering to hear how these women are pursuing their passions in less traditional careers and fields of study. They shared their stories, explaining their confusion and uncertainty about what they wanted to do when entering University. Some even changed their Major multiple times before finding the path that suited them, and felt right. The Lunch ‘n’ Learn sessions provided insight and the most useful to me was how to write a resume from the Engineering Employment Center.

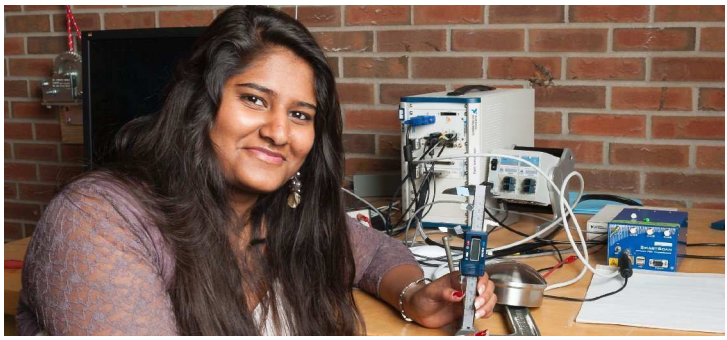
My WISEST journey is one I won’t forget. I would like to extend my thanks to Ms. Brandstadt and Ms. Booth for instilling a love of science both within and beyond the walls of their classrooms. To the WISEST Coordinators, thank you for seamlessly organizing everything from student placement to the Celebration of Research. Arranging discussions with role models and providing the opportunities for us to connect with fellow WISEST students has been an experience I will fondly remember. I also wish to thank Syncrude Canada for making my participation at WISEST possible. Finally, I pass on appreciation and thanks to my Principal Investigator, Dr. Brian Fleck, and Supervisor, Dr. Rajesh Pillai, for allowing me to work with them in their Lab. Their patience, willingness to answer all my questions and provide me an exciting and challenging learning environment has been invaluable. As I leave the WISEST Summer Research Program I am no longer lost, nervous or confused. I am confident, inspired to continue learning and excited about what the future holds.

# Salauni Patel

***Supervisor: Dr. Christopher Dennison***

***Department: Mechanical Engineering***

***Sponsor: Syncrude Canada Ltd.***



Usually when the last bell for school rings signaling the start of summer, everyone rushes out in joy of the end of a long school year, I however internally groan thinking that I'm about to sacrifice my days of sleeping in, to work in a lab at the university. Don't get me wrong, I was thrilled about the part of working in a lab; the only thing that upset me was not being able to sleep in, and staying away from my home for six weeks. Being a confused soul, I could not decide what I wanted for my future, and thought that the Women in Scholarship, Engineering, Science & Technology (WISEST) Summer Research Program (WSRP) would be a great opportunity to explore the fields of engineering, and clear up a bit of my confusion.

Through the course of the program, I had the opportunity to work in Dr. Christopher Dennison's Biomedical Instrumentations Lab. It was confusing at first, but my supervisor, an undergraduate student helped me through the project, and was very encouraging. The project that I was assigned was related to Spinal Cord Injury. When there is an injury in the spinal cord, it disrupts the signals that are being sent between the brain and the motor neurons in the spinal cord, which in turn prevents the function of the limbs below the site of injury. A neuroprosthetic technique known as Intraspinal Microstimulation (ISMS) can restore the movements of the paralyzed limbs after complete SCI. ISMS involves the implantation of micro-sized electrodes in the lumbosacral enlargement of the spinal cord, and electrical currents are sent to the motor neurons in the ventral horn to stimulate them. Since the microelectrodes tend to shift from their fixation points, it is possible for the lead microwires to dislodge from the spinal cord. Hence the usage of coils in the microwires is being explored to ensure mechanical stability. It was important to test the stiffness of the coils, for if the coil was too stiff then it could dislodge easily from its fixation point. I designed six different types of coils, and helped out in measuring the wavelengths (later converted to force) of the coils and analyzing the data.

The WSRP not only provided opportunities to work in university labs, but also organized weekly Professional Development seminars and Lunch'n'Learn sessions which were full of treasured knowledge and excitement. My favourite seminar was Exploring UofA Research, where we got to tour a lab of our choice. I chose the prosthetics lab, because prosthetics intrigued me. When I went to the lab, everyone was so enthusiastic, that it fuelled a passion within me for mechanical engineering. Another session that I really enjoyed was when Dr. Margaret-Ann Armor came and spoke about her passion of following her dreams, and her journey.

I came to the WSRP in hopes of narrowing down the options I could choose from for my future. But instead of the options narrowing, they increased. I learnt about all different kinds of careers out there that I never even knew existed, and realized that it's better to have a wide range of options compared to a limited range. The WSRP has been a wonderful experience for me; I can fortunately say that I'm returning with an infinite amount of valuable treasure. I'm really grateful to Syncrude Canada Ltd. for sponsoring my wonderful experience. I'd like to thank my PI Dr. Dennison, my supervisor Austin Azar, and Amirali Toossi for involving me in their project and the coordinators Kristy Burke, Cecilia Gee, and Angela Wilson for always helping out. I've had a thrilling summer this year.

# Natalia Rudolf

***Supervisor:***
***Dr. Kajsa Duke***

***Department:***
***Mechanical Engineering***

***Sponsor:***
***Faculty of Engineering***

I have been passionate about pursuing science for as long as I can remember. I heard about this program when my cousin first got accepted about seven years ago. As I got older and learned more about the program, I knew that the WISEST Summer Research Program (SRP) was something I wanted to be a part of so that I could experience research firsthand and explore engineering as a future career. Before I began the SRP, I thought I would be working in a lab with other WISEST researchers. I thought the research would be near a high school level with only a slight challenge. When I came into the program, I was in for a shock. I was working with only one WISEST Summer Researcher, Dana Andrishak, in an office space setting. The projects we were assigned were much more complex than a high school project and the end result was more than a good grade; it would help doctors and other researchers. Helping scientific research and making a difference in the science community has been an incredibly fulfilling experience.

This summer, I have been working under Dr. Kajsa Duke on a biomedical research project. My project deals with a 3D model of the pelvis on a program called SolidWorks. My goal is to take this 3D model and make it a solid body (which means it can be manipulated on the program) as well as adding anatomic planes to the model. I had to do research to understand the pelvis and find the best process to applying the planes to the model. The time in this lab has allowed me to extend my knowledge past a grade 11 level. I have learned a lot about pelvises, pelvic surgery and screw insertion through all the research I have done. Working in the mechanical aspect of biomedical research has changed my perspective on biomedical engineering. I have seen the different backgrounds involved in one type of research when I attended a scoliosis research meeting with Dr. Duke, where engineers worked alongside nurses and surgeons, all of whom shared similar goals.

The WISEST components gave me knowledge and insight that I could not have gained elsewhere. The networking session allowed me to step out of my comfort zone and meet others with similar interests, as well as to learn more about other career options. The UofA Q&A gave me the opportunity to ask questions about University life from the perspective of a current student. My favorite part of the WISEST program was observing the orthodontics lab and the prosthetics lab during the Exploring UofA session. Another intriguing seminar was Research in Action. I went to Micralyne, a company that creates Microelectromechanical systems (MEMS). In other sessions, I also learnt how to create a proper resume and many networking and presenting skills, that will help me through and beyond high school.

My time in the lab has helped me to grow and expand my knowledge, while assisting in scientific research that will make a difference in the scientific community. I am very grateful I had the opportunity to be a part of this research, and to learn so much through the summer. I will always treasure the many skills I have gained and the friendships I have developed during my time in the WISEST Summer Research Program, a program that has been more than just a summer job - it has been a challenging, captivating and satisfying journey. Thank you to Dr. Kajsa Duke, Dana Andrishak, and Ashwath Kumar for all your help on this project, and to the Faculty of Engineering for sponsoring me

# Carly Schultz

***Supervisor: Dr. Rajender Gupta***

***Department: Chemical and Materials Engineering***

***Sponsor: SPE Canadian Educational Trust Fund***

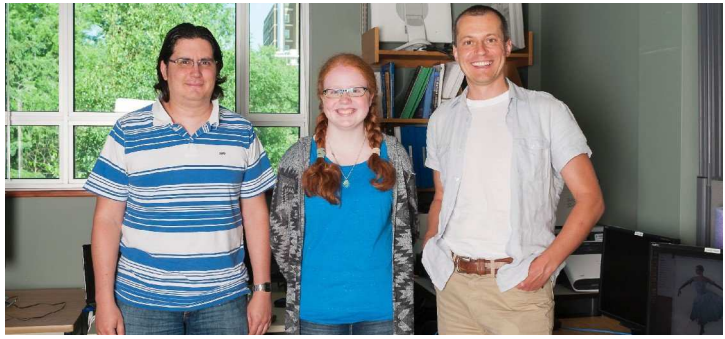
The future is a daunting and imminent reality that forces grade 11 students to decide what path to take for the rest of their lives. Overwhelmed by the possibilities, I applied to the WISEST summer research program in hopes of finding my passion and learning about the possibilities out there. Being accepted into WISEST was a fantastic opportunity that I am grateful to have received. Not only was I eager to escape my small town life for the summer, I was excited to kick-start my education and meet new people.

I had the opportunity to work in Dr. Rajender Gupta's Canadian Centre for Clean Coal/Carbon and Mineral Processing Technologies (C5MPT) lab in the department of Chemical and Materials Engineering. On the first day I was welcomed to a staff meeting in a big boardroom with huge chairs. I was scared, but everybody took turns introducing themselves and explaining their projects to try to accommodate me. I was involved in the carbon dioxide ($CO_2$) capturing project, and so my work consisted of synthesising a sorbent that would capture $CO_2$ from flue gas. After reading many papers and analyzing endless posters, I was able to understand the work I was given. I am grateful to Dr. Deepak Pudasainee, who guided me through the steps of my project and was there to answer all of my questions. I also got the opportunity to help with the coal gasification, oxygen separation and mercury capture projects thanks to the kind people in the C5MPT lab. At the end of the six weeks, I was asked to give a presentation to my entire lab on what I had accomplished. The experience was terrifying, yet great, and it helped me to prepare for the celebration of research.

The opportunities provided by the WISEST summer research program were endless. Monday Professional Development Seminars and Friday Lunch'n'Learn sessions allowed me to grow as a young woman in less -traditional fields. These experiences provided practical knowledge in a fun and engaging fashion. The Social Science "Hydraulic Challenge" brought forth our creativity by forcing us to accomplish a seemingly impossible task. It took perseverance, but my group was able to develop a working robot that could grab, lift and move a glass of water. One of my favorite Professional Development Seminars was the Networking Fair. I had the chance to speak with many established women who gave me advice on my future. However, the most exciting part of the summer research program for me was meeting new people. I made numerous friendships with girls from all over Alberta that will last a long time.

The WISEST summer research program has opened my eyes to many of the fantastic possibilities that lay ahead of me. I will never forget the amazing experience of being in a university lab for a summer. I would like to thank WISEST for organizing such an amazing experience. The WISEST team is truly an amazing group of ladies. I would also like to thank the Society of Petroleum Engineers Canadian Educational Trust for their sponsorship, as well as Dr. Gupta and the entire C5MPT lab for welcoming me so graciously. Special thanks goes to Dr. Gupta, Dr. Rahman, Dr. Deepak, Nitya Iyer, and Teresa Bisson.

# Allyson Shewchuk



***Supervisor:***
***Dr. Vadim Bulitko***

***Department:***
***Computing Science***

***Sponsor:***
***Weyerhaeuser***

For the last six weeks I have been working as part of the WISEST program and my experience can only be described as an adventure. When I applied for the program I was hoping to work somewhere that would help me decide what I want to do after high school. What I did experience was quite a bit different from what I expected. I have learned an incredible amount about working with other people, living in a dorm, conducting actual research and, thanks to my colleagues, about the marvel and DC universes. The WISEST program has given me opportunities I didn't expect and friends in unlikely places and thanks WISEST, I will be leaving a more educated and well-rounded person.

The project I worked on this summer was iGiselle, which is an interactive ballet video game being developed at the University of Alberta in the Department of Computing Science. iGiselle uses Microsoft Kinect and an interactive narrative planner to give each player a unique story experience while remaining on the same emotional path. The technologies currently being tested in this project will likely contribute hugely to the future of interactive gaming. While working on this project I was given the opportunity to edit audio files, compile images into scenes that will be used in the game and create a planning domain definition language (PDDL) plan. The biggest challenge was learning how to write PDDL, but once I was able to figure it out and write the plan it became the task I enjoyed the most. It also helps that I had an awesome lab team that was patient and also had a great sense of humor. Going into the program I had limited knowledge about computing science and what to expect, so what I have learned in the last six weeks has been massive for the short time frame.

Another great thing about the WISEST program is that it isn't all work. We were given the opportunity to go to Lunch n' Learn session and to Professional Development Seminars during the week. My favorite session was the Social Science Challenge. At that seminar, we were given the opportunity to interact with the other students while participating in some healthy competition. While everyone demonstrated their varying degrees of hydraulics knowledge we all got to know one another a bit better. We didn't exactly create life-long friendships but we did develop some bonds and social skills that benefitted us later in the program. I also loved going to the Ada's team lunches every week in the computing science building. Ada's team is a group of women in computing science and they encouraged the WISEST students to join their Tuesday lunch meetings to hang out and discuss things like cats and Harry Potter. Their lunches were one of the things I spent all week looking forward to!

My WISEST experience was truly an adventure. Now there are some certain people I need to thank for this opportunity. I would like to start off by thanking Weyerhaeuser, my sponsor. I also need to thank my principal investigator Vadim Bulitko and my direct supervisors Sergio Poo Hernandez and Emilie St. Hilaire. Also, Jesse Underwood and Luke Slevinsky, the two High School Internship Program Students in my lab who did similar work to me and deserve a big thank you for helping me time and time again. Finally, I would like to thank the WISEST team for providing me with this opportunity and helping me along the way. I had an amazing adventure over the last six weeks and if you or someone you know is considering applying for this program, I would highly recommend it.

# Grace Silver

***Supervisor:***
***Dr. John Vederas***

***Department:***
***Chemistry***

***Sponsor:***
***GlaxoSmithKline Foundation***

I honestly do not remember when I first heard about WISEST and the Summer Research Program (SRP). It seemed like a program for discovery, of science, of careers, and of one's own passions. As someone who has always excelled in science and math courses, people always told me that there were many career options available to me. However, I had no clue what was out there. The WISEST SRP sounded like the best way to gain insight and experience into my options. I heard more about the program from my teachers as I progressed further along in my schooling and this lead to my application. After waiting impatiently for weeks, I found out I was accepted and I was extremely excited and nervous. I had no idea what to expect, but I had approached it with an open mind, ready to soak as much as possible in.

My summer position was in the Chemistry lab of Dr. John Vederas. Very soon I found that I had nothing to be worried about as the entire lab group was welcoming and encouraging. My supervisor always explained things thoroughly and would quickly re-explain without judgement if I asked. The research I participated in over the summer was to perform the synthesis of molecules that are proposed as precursors to lovastatin, which is a cholesterol-lowering pharmaceutical drug. Lovastatin is made by enzymes in a fungus, and our research was to see if two molecules played a part in the formation. We grew the fungus and fermented it to extract a molecule that is known as the precursor. Then, we did a series of chemical reactions to make the heptaketide and octaketide molecules that were proposed. My daily work consisted of transferring solutions, running columns, assisting with reactions and helping with the fungus growing process.

Every Monday and Friday, we took some time away from our lab work to meet as the WISEST group and take part in professional development and learning sessions. These helped to enrich my skills in report and resume writing, research poster making, and networking. They allowed me the opportunity to interact with young women a few years further along their career path and this gave me valuable insight to consider for my own future. I really gained from the Networking Fair. The role models spoke about their careers and the path that lead them to their current position. This really helped to soothe my worrying, as many of them also had no idea what they wanted to do with their life when they were my age. Some of the other sessions gave me more insider tips and tricks for professional situations. The WISEST sessions assisted in making the SRP more meaningful as well as preparing me to succeed in future endeavors.

This summer has been a wonderful journey. I have learned so much about chemistry, scientific careers, and skills for my future. More importantly, I have learned more about myself and the world. I am a changed person now, and I owe most of this to other people. The GlaxoSmithKline Foundation's sponsorship of the WISEST SRP supported my involvement, and I am grateful for this. I would like to especially thank WISEST and my research team for allowing me the chance to experience this and for supporting me every step of the way. There is also the long list of teachers who encouraged me and nurtured my love of learning, as well as my family to acknowledge. Without these supporters, I would not be where I am now. The WISEST Summer Research Program was one of the most positive life-altering experiences I have had so far and I hope that it will continue to be a part of many others' lives in the future.

# Lucy Tertzakian-Harris

***Supervisor:***
***Dr. Christopher Sturdy***

***Department:***
***Psychology***

***Sponsor:***
***NSERC***
***PromoScience***

I honestly do not remember when I first heard about WISEST and the Summer Research Program (SRP). It seemed like a program for discovery, of science, of careers, and of one's own passions. As someone who has always excelled in science and math courses, people always told me that there were many career options available to me. However, I had no clue what was out there. The WISEST SRP sounded like the best way to gain insight and experience into my options. I heard more about the program from my teachers as I progressed further along in my schooling and this lead to my application. After waiting impatiently for weeks, I found out I was accepted and I was extremely excited and nervous. I had no idea what to expect, but I had approached it with an open mind, ready to soak as much as possible in.

My summer position was in the Chemistry lab of Dr. John Vederas. Very soon I found that I had nothing to be worried about as the entire lab group was welcoming and encouraging. My supervisor always explained things thoroughly and would quickly re-explain without judgement if I asked. The research I participated in over the summer was to perform the synthesis of molecules that are proposed as precursors to lovastatin, which is a cholesterol-lowering pharmaceutical drug. Lovastatin is made by enzymes in a fungus, and our research was to see if two molecules played a part in the formation. We grew the fungus and fermented it to extract a molecule that is known as the precursor. Then, we did a series of chemical reactions to make the heptaketide and octaketide molecules that were proposed. My daily work consisted of transferring solutions, running columns, assisting with reactions and helping with the fungus growing process.

Every Monday and Friday, we took some time away from our lab work to meet as the WISEST group and take part in professional development and learning sessions. These helped to enrich my skills in report and resume writing, research poster making, and networking. They allowed me the opportunity to interact with young women a few years further along their career path and this gave me valuable insight to consider for my own future. I really gained from the Networking Fair. The role models spoke about their careers and the path that lead them to their current position. This really helped to soothe my worrying, as many of them also had no idea what they wanted to do with their life when they were my age. Some of the other sessions gave me more insider tips and tricks for professional situations. The WISEST sessions assisted in making the SRP more meaningful as well as preparing me to succeed in future endeavors.

This summer has been a wonderful journey. I have learned so much about chemistry, scientific careers, and skills for my future. More importantly, I have learned more about myself and the world. I am a changed person now, and I owe most of this to other people. The GlaxoSmithKline Foundation's sponsorship of the WISEST SRP supported my involvement, and I am grateful for this. I would like to especially thank WISEST and my research team for allowing me the chance to experience this and for supporting me every step of the way. There is also the long list of teachers who encouraged me and nurtured my love of learning, as well as my family to acknowledge. Without these supporters, I would not be where I am now. The WISEST Summer Research Program was one of the most positive life-altering experiences I have had so far and I hope that it will continue to be a part of many others' lives in the future.

# Suzana Trac

***Supervisor: Dr. Larry Unsworth***

***Department: Chemical and Materials Engineering***

***Sponsor: SPE Canadian Educational Trust Fund***

As John Green said in his novel, The Fault in Our Stars, “Some infinities are bigger than others.” Though infinites may appear to be restricted solely to numbers, infinities are not defined, so knowledge, experiences, even life itself, can be considered infinities on their own. Everything in life is composed of infinities, which increases with what a person learns from their life experiences. Depending on the experience itself, the increase may be insignificant, or substantial. From my perspective, WISEST is one such experience that has significantly increased my infinity in ways I never imagined. When I applied to the WISEST summer research program, I wanted to see if I would enjoy a career in the sciences, and ultimately, to decide what career I want to work towards. Though WISEST has convinced me to pursue my passion for science, it has introduced me to the numerous careers science has to offer, and as such, made me even more confused as to what I want to do in the future. However, the WISEST program has taught me the skills I need to be successful regardless of the career I choose.

During this summer, I was given the luxury to work in Dr. Larry Unsworth’s lab at the National Institute for Nanotechnology (NINT) in the department of chemical and materials engineering. My research project focused on determining the concentration of dexamethasone (DEX) drug released by nanoparticles (NPs) formed from the peptide chitosan (CS), and a sugar known as sulpha butyl ether-β-cyclodextrin (SBE-β-CD). Upon gathering this information, I was able to calculate how efficient the CS/SBE-β-CD nanoparticles are at loading DEX into the nanoparticle, as well as the rate in which the drug is released. This in turn, will help me evaluate the potential for using a nanoparticle composed of such materials as drug delivery system.

Though much of my time during the program is spent primarily in the lab, or processing my data, I found the Professional Development Seminars and Lunch ‘n’ Learn Sessions just as interesting. I particularly enjoyed the Networking Fair where I was introduced to a wide range of careers I previously had not known existed. I was also able to broaden my understanding about the roles and responsibilities faced while working in such fields and disciplines. We were also given an on-campus tour of a research facility of our choice and I was thankful and excited that I was given the privilege to visit the greenhouse. The tour was very interactive, as we were able to touch the plants, and smell the scent given off by the leaves. The tour guide also described some key characteristics that define the plant, which I found extremely fascinating.

Throughout the WISEST program, I have been able to grow both as a student and as a person. Not only have I learned new lab skills, I also have a better understanding of the importance of being open-minded, confident, and motivated. As such, I would like to express my thanks to those who have made this experience possible. Thank you to Angela, Cecilia, and Kristy from the WISEST team, whose support and efforts have made the program as successful as it can possibly be, as well as the Society of Petroleum Engineers Canadian Educational Trust Fund for their generosity in sponsoring me. I would also like to acknowledge Dr. Unsworth and his research team, including Christopher, Freya, Kyle, Markian, Jennifer, Zoe, and my supervisor Lei, for making me feel welcome and for assisting my project. I thoroughly enjoyed the time I spent in the WISEST program and I hope it continues to give other students what they have given me: an experience that they can have fun, learn, and ultimately, one that can and will change their life.

# Ashley Vaughan


***Supervisor: Dr. Stephen Strelkov***

***Department: Agricultural, Food & Nutritional Science***

***Sponsor: NSERC PromoScience***

My WISEST journey began on the east coast of Canada. It began with a 17 year old who had little confidence and no idea what future schooling would hold. When I heard about the program from family members out west I was more than eager to dive in to all the benefits I knew this program would hold. I applied because I knew WISEST would put me one step further not only in my education but my social life. By simply looking at past student reports I knew that I would be exposed to successful men and women and finally be able to get hands on experience that was never made available, until now.

Soon after I had contacted my Principle Investigator and Direct Supervisor I started learning new and valuable information. In just a few short weeks I would start research in a real plant pathology lab working on real issues. As I started my journey some thousand kilometers away from home, the fear and excitement started to kick in and the questions I had began to boil over. Surprisingly enough, orientation may have been one of the biggest confidence boosters thus far. I made it a goal of mine to step out of my comfort zone and make friends and it was so easy. We became like a little family because everyone had the same goal in mind, to grow and prosper. I've never felt so welcome.

Once my summer kicked off I would be working with a plant pathogen known as Sclerotinia stem rot (S. sclerotiorum) which grows on canola and can cause a significant amount of yield loss if not controlled by fungicides. Although fungicide is effective at killing off stem rot it is expensive and sometimes over used when it isn't needed. My job in all of this was to test the accuracy of a new disease risk assessment tool. In other words, a new way to forecast disease levels of Sclerotinia is underway to help farmers spray more efficiently. My research tested this new way of forecasting.

The greatest thing I am taking away from my WISEST experience is the confidence that I am now flooded with. I have concurred so many fears, some fears I didn't even know I had until the program. I'm no longer afraid to give my say on a topic because I know now that alternate opinions are important in a lab situation. I know now from many of the Professional Development seminars and Lunch 'n' Learn sessions how to hold myself and be more confident in whatever circumstance I may be put in. To high school I will not only take back incredible memories and stories but I will also take encouragement and insight. The program has put my knowledge to the test and given me a challenge, a challenge that I find oh so encouraging. WISEST has shown me that hard work in high school pays off and that its not all just for a piece of paper saying you graduated.

I would first like the thank NSERC PromoScience who made my experience possible. Without their generous contribution I would never have been exposed to these new life skills, thank you again. I would also like to thank all the professionals that came and gave us insight into our future. Your words will stick with me as I go further in my schooling. To the people I worked with in the plant pathology lab, thank you so much for letting me become part of the team and for being patient with me until the end. To the WISEST team, you guys made this experience so welcoming and I thank you guys for being so accommodating. To the WISEST Team, you guys made this experience so welcoming and I thank you all for being so accommodating.

# Aishwarya Venkitachalam

***Supervisor:***
***Dr. Csaba Szepesvari***

***Department:***
***Computing Science***

***Sponsor:***
***Process Solutions***

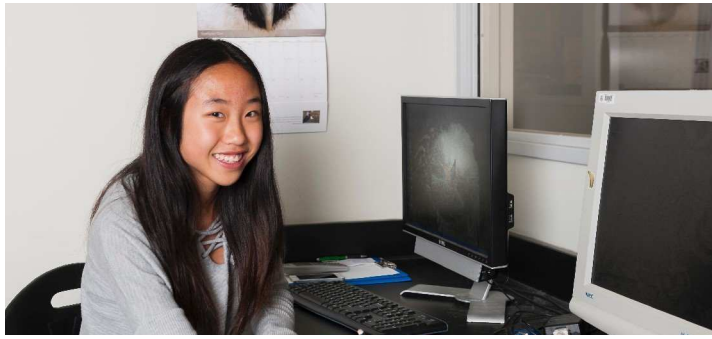
If there is one thing the WISEST Summer Research Program taught me – Wait, I can't answer that. The truth is, the WISEST program taught me so much more than just one thing. I was spending one lunch hour in particular with a few WISEST friends when we decided to find "Conversation Starters" for fun online. One of the questions we stumbled upon was "Do you believe in luck?", and I hastily answered "Yes". One friend said "No, I believe you have to earn what you get". What surprised me was my response: "I do, too, but I think it plays out that two people earn something, but one person is lucky enough to get it". I believe that this philosophy is what gave me the impeccable experiences I have gotten from WISEST. Right from the first acceptance phone call to the last poster presentation, I felt an inexplicable luck bestowed upon me.

This summer I worked in the Department of Computing Science investigating machine learning algorithms that deal with prediction with expert advice. Suppose you have many weather stations to choose from. The weather stations (our 'experts') give forecasts (predictions), and you (the algorithm) choose a station depending on elements such as weights (values assigned to experts depending on how adept they are), probability (of the expert being chosen), etc. The weather stations give predictions each day (each time step). Experts experience cost if they predict incorrectly in a time step, and the algorithm experiences overall regret (total cost of algorithm minus the total cost of best expert in hindsight). The goal of the algorithm is to learn from the environment and minimize regret. Initially, I spent my time practicing Python programming so I could code the algorithms for the project. It was definitely a steep learning curve as I had never done programming before, but I came across a newfound love for the structure and meticulousness of it. For the project, we compared two different algorithms: The Randomized Weighted Majority (RWM) algorithm and the Shrinking Dartboard (SD) algorithm. We investigated the regret of both algorithms and the number of switches between experts. From the results, RWM and SD were found to have relatively similar regrets, indicating the similarity of their performance levels. Along with programming, I learned about the uses of predicting algorithms in industry, statistical analysis, digital applications and the essence of computing science as a whole.

Aside from my project, I felt motivated by the Lunch and Learns and Professional Development sessions, which gave me opportunities to learn valuable skills, like resume writing, entrepreneurship, presentation tips, networking tactics, and many more. I have been exposed to and enriched by so many different university, research, and career paths. I enjoyed the environment I was in and connected with like-minded people. I am inspired to pursue careers in underrepresented areas to establish gender equality.

Everyone has "Aha!" moments. Sometimes they come unexpected; sometimes we are fed up of waiting for them. I am eternally thankful for the multitude of "Aha!"s WISEST has given me, and also the multitude of people who made my experience a reality: the WISEST Team for making the program possible, Process Solutions Canada Ltd. for sponsoring my participation in the program, the University Of Alberta Department Of Computing Science and my lab for being so welcoming and helpful, and Dr. Szepesvari for relentlessly supporting me through the entire project. The WISEST Summer Research Program has showered me with much knowledge through numerous "Aha!"s, given me all that I earned, and without a doubt taught me so much more than merely one thing.

# Mulan Xia



***Supervisor:***
***Dr. Erin Bayne***

***Department:***
***Biological Sciences***

***Sponsor:***
***Syncrude Canada Ltd.***

I originally applied for WISEST simply because, everyone in my school did. It was a spur of the moment decision: I liked science and my summer was looking despairingly empty. I thought it would be an exciting work experience, but beyond that, I had no expectations. Reflecting back, I realize that this experience was so much more. From the opportunities to explore the different research laboratories to the chances to network with people of various professions, WISEST has truly opened my eyes to the various opportunities available around me.

Walking into my lab, I was full of nervous anticipation and high hopes. Everything in the lab seemed foreign; I felt out of place. I worked in the Biological Sciences department of Dr. Erin Bayne with Cameron Nordell, investigating the effect of human disturbance on ferruginous hawks (Buteo regalis). He explained my task of watching the ferruginous hawk footage and recording their behaviour. The hard drives, he noted, were placed in bubble wrapped drawers for protection. I took it as a joke. The drawers were actually bubble wrapped. Watching the videos was exciting: I saw everything from a nestling`s first fledge to a decapitated ground squirrel. Initially, I was unsure of the significance of my contribution to the lab- it felt small compared to what the graduate students were doing. Yet as I worked through, I realized that the thousands of hours of footage, which was the basis of everyone's work, could never be watched in its entirety by a single person. It would take a team effort to complete the project.

I also had the opportunity to experience a different side of science through the Birds and Windows Project with Justine Kummer. Along with my lab partner, we took numerous road trips, setting up bird feeders and cameras to determine the factors which might cause a bird to crash into a window. This was a very different experience from the lab work I had expected. Instead of working with computers, I worked with hammers. Instead of watching video, I was setting up the cameras used to take video.

The numerous Lunch 'n' Learn and Professional Development sessions hosted for WISEST students each week were my favourite. They gave me a chance to talk to many different people, each with a slightly different background. These sessions gave me a new perspective. For example, I have always told myself that I would never want to work in the oil industry but I have simply never taken the time to fully explore the options available around me. Yet from networking with the people in WISEST, I have realized that there is no formula to get where I want to be.

I originally headed into WISEST, expecting to improve on my lab skills and learn. I have indeed learned, but in topics I never would have imagined. I now know how to properly introduce myself to a person, how to differentiate between a decapitated shorebirds and songbird, and what life in the lab is actually like. I have been exposed to numerous industries, faculties and perspectives. I also learned in the lab, that sometimes tasks do not proceed the way they are expected to, and neither do we. I would like to thank Dr. Bayne for this wonderful opportunity to work in his lab and have this experience. Furthermore, I would like to thank Cameron Nordell, Janet Ng, Justine Kummer and all the WISEST supervisors for their wonderful advice and the time put into guiding me through the research posters and lab work. And of course, I want to thank Syncrude for their sponsorship of my internship. My summer would not have been the same without this!

# Jessy (Xi) Xie

***Supervisor:***
***Dr. Jan Alexander Jung***

***Department:***
***Physics***

***Sponsor:***
***Kimberly Hauer, P.Eng.***
***& NSERC PromoScience***


When I first heard about the WISEST Summer Research Program (SRP) from my school's Career Center, I remember contemplating for some time if I really wanted to spend six weeks of summer away from family, friends, and familiar environment. I felt uncertain about what this summer would entail. Now that I participated in the program, I have to say, I am extremely glad that I took the initiative to apply and was given the opportunity to be a part of this amazing, unforgettable, enlightening experience.

I was placed under the Department of Physics with Dr. Jung and Dr. Chow's collaborated research team. The research in the lab was focused on the interesting changes in the properties of manganites when different variables, such as temperature and voltage, are applied. Perovskite manganites are composed of rare earth elements, di/trivalent elements and manganese oxide. While working, I made two manganite samples: LPCMO ($La_{0.3}Pr_{0.4}Ca_{0.3}MnO_3$) and LSMO ($La_{0.7}Sr_{0.3}MnO_3$). Samples were studied using a cryostat - a cooling machine that can maintain a vacuum. For analysis of data, graphs were plotted to determine the metallic and insulating transition temperature and to distinguish the changing metallic domains of the sample. The study of manganites are of high interest in solid state physics due to its wide variety of potential applications such as: memory storage in electronic devices and its use as sensors. Truly, it is unfathomable to think about all that is taking place within the centimeter sized sample on a nanoscale.

The Professional Development Seminars and Lunch'n'Learn Sessions organized by WISEST were great chances to learn new skills, meet great people and gain greater knowledge. One of my favorite seminars was the Research in Action where I went to Quantiam Technologies. It gave me a greater insight into manufacturing and uses of nanotechnologies. Learning about and seeing the Scanning Electron Microscope was also a highlight. The tour showed me what types of jobs were available if I were to pursue an industrial engineering career. The UofA Q&A Session answered all my questions regarding university life. It also gave me extra tricks and tips for first year adjustments that I know I will carry with me when I start university. Through all these sessions, we were given a myriad amount of opportunities to ask questions and to gain greater understandings about other fields.

When I applied for the WISEST SRP, I thought it would simply be a summer job. However, it has proven to be so much more. The program enabled me to make new friends, meet many mentors, and create networks while having tremendous fun. These six weeks went by fast in between hands-on work, lunch time activities and learning more about anything - whether it was about the project I was working on, the various shortcuts on campus or the life of other student researchers. Overall, being in WISEST has increased my confidence, knowledge of university life, and real life work skills.

Working with the research team was a great experience filled with learning and joy. Special thanks to my supervisors, Mary Narreto and Jaechun Jeon for all of their time, mentorship, patience and teachings. Sincere thank yous goes out to Dr. Jung and Dr. Chow for allowing my addition to their labs and making me feel like a part of the research team. Also, thanks to the rest of the research team for their friendliness and assistance. Thanks to NSERC PromoScience for sponsoring my position as a summer researcher making my participation possible. Last but not least, thank you to WISEST for having this outstanding program and helping me gain the most out of this summer.

# Daena Yra


***Supervisor: Dr. James Harynuk***

***Department: Physics***

***Sponsor: GlaxoSmithKline Foundation***

From human body systems in biology to acid-base titrations in chemistry, the sciences have always been my favorite to learn about in school. Despite this, their applications in school as opposed to real life have always seemed galaxies apart. When I first heard about the WISEST Summer Research Program from my grade 10 science teacher, I was thrilled. The opportunity to finally bridge the gap between those two worlds had finally arrived. As well, I would be able to live the life of someone working with science, engineering and technology day to day, so I could really see if a career in those fields was right for me. Having gotten the call that I had been chosen as one of the few lucky students, I expected to deepen my understanding of the subjects that I have always loved, discover different careers in STEM fields, and learn what it was like to work in a research lab.

I was delighted to hear that the next six weeks of my summer would be spent in the Department of Chemistry in Dr. James Harynuk's lab. The big picture of this research was to help arson investigators by developing a chemometric model that could identify ignitable liquids in fire debris. My research project involved burning household materials under pyrolysis conditions (thermal decomposition without oxygen). The volatile substances from the pyrolysed products were then extracted to be separated and analyzed using Gas Chromatography (GC). We wanted to see if pyrolysing the household materials at different temperatures and different rates would affect the chromatograms generated by GC.

During the first couple weeks, it seemed as though I was bombarded with explanation after explanation in the lab. I knew I was interested in the subject, but the sheer amount of new information to remember was intimidating. Admittedly, I did make quite a few mistakes. From incorrectly preparing a sample to forgetting to turn on an instrument, I had a hard time transitioning from my high school science skills to the higher caliber skill set that a graduate student would have. Regardless, I appreciated that every mistake made was a new opportunity to learn. My mistakes challenged me to reflect on my actions, and I found myself improving with each new trial.

Besides scientific research, WISEST also introduced me to new skills, careers, and people during the weekly Professional Development Seminars and Lunch 'n' Learn sessions. One of my favorite things we did was Exploring U of A Research, where I was able to visit the university's Dino Lab. It amazed me that there was still so much more to be discovered in the world of paleontology. As well, I loved talking with women who were in non-traditional fields during the Networking Fair. The answers regarding career options and paths were diverse as well as eye opening. Hearing many of the women say that they found success and joy in their jobs by focusing on what they enjoyed really encouraged me to reflect on myself too.

I feel so fortunate to have participated in the WISEST Summer Research Program. Not only did I deepen my understanding of science, engineering and technology, but I also built friendships and connections to many inspiring women who I can truly look up to. I would like to thank Dr. Harynuk for allowing me to take part in his research, my supervisor, Chantel Lee, for her hard work in mentoring me, and GlaxoSmithKline Inc. for generously sponsoring me. I look forward to sharing my experiences from this unforgettable summer and encouraging other young women to look beyond the boundaries and pursue their dreams in STEM.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