

**DEPARTMENT OF PHYSICAL AND  
ENVIRONMENTAL SCIENCES**

A photograph of two female students in a stream. The student on the left is wearing green waders and a black long-sleeved shirt, holding a long metal pole with a silver device at the bottom. The student on the right is wearing a purple hoodie and glasses, also holding the pole. They are both smiling. The background shows rocks and green foliage.

# DPES

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**Cover Photo:**

EESB02 Field Trip, Highland Creek  
Chai Chen

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Aneesah Rahaman

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[uoft.me/dpesdigest](https://uoft.me/dpesdigest)



*“I (we) wish to acknowledge this land on which the University of Toronto operates. For thousands of years it has been the traditional land of the Huron-Wendat, the Seneca, and most recently, the Mississaugas of the Credit River. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.”*

- University of Toronto,  
Land Acknowledgement





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# INTERNATIONAL DAY OF PERSONS WITH DISABILITIES

*by Aneesah Rahaman*

**The International Day of Persons with Disabilities**, often referred to as the National Day for Persons with Disabilities in some countries, is observed annually on **December 3rd**. This day is recognized by the United Nations and aims to promote awareness and understanding of disability issues and mobilize support for the dignity, rights, and well-being of persons with disabilities.

Each year, the day has a specific theme that focuses on different aspects of disability rights and inclusion. This year's theme was centered on unifying in action to achieve the **Sustainable Development Goals** for, with, and by persons with disabilities.

Since the inception of the 2015 Sustainable Development Goals, only 15% of the SDGs are on track to be achieved by 2030. The **1.3 billion** persons with disabilities around the world are amongst those who are most negatively impacted by this limited progress.

The day provides an opportunity to celebrate the achievements and contributions of persons with disabilities and to raise awareness about the challenges they face. It also serves as a platform for advocating for the full inclusion of persons with disabilities in all aspects of society, including education, employment, and social and political participation.

Manifesting from last year's International Day of Persons with Disabilities, **UTSC** is preparing a resource that summarizes the findings from the National Dialogues and Action for Inclusive Higher Education and Communities. This resource aims to offer guidance and assistance to post-secondary institutions across the country, aiding them in establishing key changes across the full range of their activities to make their operations more inclusive.

It is imperative that we change our world for the better to include those from all walks of life to ensure a fair and equitable future for all those living in it. The International Day of Persons with Disabilities reminds us of the progress made and vast progress that still needs to be made.

## **Resources/Sources**

<https://www.utsc.utoronto.ca/ability/welcome-accessability-services>

<https://people.utoronto.ca/news/recognizing-the-international-day-of-persons-with-disabilities-idpd-2023/#:~:text=The%20University%20of%20Toronto%20recognizes,both%20evident%20and%20non%20evident.>

<https://www.undp.org/speeches/international-day-persons-disabilities-2023/#:~:text=%E2%80%9CUnited%20in%20action%20to%20rescue,and%20by%20persons%20with%20disabilities.%E2%80%9D>

# TRANSGENDER DAY OF REMEMBRANCE

By Callie Andersen

A sincere thank you to Adeleine Oliver for her thoughtful proofreading of this article.

**Annually, Transgender Day of Remembrance is observed on November 20th** to honour and remember the lives of those who were lost due to acts of anti-transgender violence. Following Transgender Day of Remembrance is **Transgender Awareness Week**, a time dedicated to uplifting the visibility of trans people, addressing issues that the trans community faces, and recognizing the achievements and accomplishments of trans people. A vigil was held at UTSC on Monday, November 20th in recognition of the lives lost due to transphobic violence.

Founded by Gwendolyn Ann Smith in 1999, Transgender Day of Remembrance began as a vigil after Rita Hester, a Black transgender woman, was murdered in 1998. This vigil served to commemorate Hester and all those before her who were victims of anti-transgender violence.

The University of Toronto states, “As an institution that holds the protection of human rights at its core, our role is clear: we need to continue vital conversations and take action across our campuses to better support trans, nonbinary, and gender diverse members of the U of T community.” A way the university holds itself to this claim is by enabling student name and/or gender changes on ACORN, academic records, and display (uoft email, Quercus, etc.) without requiring legal documentation or any disclosure of reasons for the change. See more information about name and gender changes [here](#).

Anyone can support the trans community by calling out and addressing transphobic behaviour or speech, respecting everyone’s pronouns and names, and making campus a safe and belonging space to exist, creating a strong and diverse community during the process. Moreover, Transgender Day of Remembrance and Transgender Awareness Week also serve as a reminder of how crucial diversity is for defining and cultivating a beautiful, intelligent, and supportive community at the university.

It is vital to recognize that while transgender and nonbinary people deserve exceptional support during these times, fighting anti-transgender violence is an ongoing battle. Expressing grief and honour is incredibly important on Transgender Day of Remembrance and Transgender Awareness Week, but critical support must be extended beyond these dates. Transgender people have and will always be here; it is not only a day-long or a week-long experience, and support for the transgender community must reflect that. The University of Toronto would not be the same without transgender and nonbinary people, and providing ongoing support for these communities is one way that faculty, staff, and students alike can contribute to the fight against anti-trans violence.

## Support Services:

- [Sexual and Gender Diversity Office \(SGDO\)](#)
- [Sexual Violence Prevention & Support Center](#)
- [Equity, Diversity, and Inclusion Office \(EDIO\) at UTSC](#)
- Health and Wellness Center: call (416) 978-8030 to speak with a counsellor
- 24/7 U of T Telus Health Student Support: call 1-800-663-1142 for grief, stress, and trauma

## Sources:

- <https://people.utoronto.ca/news/recognizing-trans-day-of-remembrance-and-resilience/#:~:text=Across%20our%20three%20campuses%2C%20the,woman%20brutally%20murdered%20in%201998>
- <https://glaad.org/tdor/>
- <https://sgdo.utoronto.ca/events/trans-awareness-week/#:~:text=Monday%2C%20November%2020%2C%202023>



# HANUKKAH HOLIDAY

by Aakash Anil



**Students of Jewish faith across UTSC celebrated Hanukkah** starting from sundown on December 7, 2023. Hanukkah is a festival commemorating the rededication of the second temple of Jerusalem.

The word Hanukkah is derived from Hebrew and translates roughly to dedication. It is also commonly spelled as *Channukah*. In 167 BC, King Antiochus established an empire-wide repression of the Jewish community. The Second Temple at Jerusalem was pillaged and an altar was erected in the name of Zeus. After three years of tumultuous battle, a group of Jewish people liberated the temple and rededicated it. It is this important victory that Hanukkah celebrates.

According to the Hebrew calendar, Hanukkah is celebrated for 8 days starting on the 25th day of Kislev which usually falls around November or December. This year's festive season, Hanukkah ran from the evening of December 7 to December 15.

Hanukkah has also been called the *festival of lights*. The most widely recognisable aspect of the celebration is the nine-pronged candelabra, called the menorah, which is a major part of the traditions of this festival. One of the prongs of the candle is higher or lower than the others. This branch is used to light the other candles. The menorah is lit gradually over the days of the festival with one branch of the candle being lit each day. On the final day, all the candles are glimmering.

People celebrate by reading Psalms and scriptures. While the flames of the menorah are being lit, people recite a prayer, then sing traditional songs. Modern-day celebrations also include eating oil-based foods like *latkes* (potato pancakes) and *sufganiyot* (doughnuts). Children play a game of *dreidel* using the four-sided spinning top (*dreidel*) with letters inscribed in Hebrew. It is also customary to give children money gifts, referred to as "*Hanukkah gelt*" or "*geld*".

Sources:

[https://www.chabad.org/holidays/chanukah/article\\_cdo/aid/102911/jewish/What-Is-Hanukkah.htm](https://www.chabad.org/holidays/chanukah/article_cdo/aid/102911/jewish/What-Is-Hanukkah.htm)

<https://en.wikipedia.org/wiki/Hanukkah>

<https://www.britannica.com/topic/Hanukkah>

# DIWALI CELEBRATION

*by Aakash Anil*

**This year, the festival of Diwali fell on the 12th of November.** Diwali took on a new meaning when I celebrated it away from home. In Hindu mythology, it commemorates the day the God Ram and his company returned to his kingdom of Ayodhya ending a 14-year exile. Symbolically the festival is a celebration of the triumph of good over evil. The name of the festival is derived from Sanskrit and translates to row of lights. It is celebrated per the Hindu calendar and usually falls in the month of October or November. The day-long celebrations prominently feature fire-crackers and other forms of light displays. String lights are put up in houses, wicked candles and diyas (oil lamps) flicker in every household.

Diwali is a festival accompanied by much fervour. The days leading up to it are brimming with many traditions. It is customary to do a deep cleaning of the living spaces before the festival. Floors are usually adorned with hand-made art from powders of different colour pigments. This intricate art is called Rangoli.

All this preparation culminates in the day of Diwali as large celebrations. People drape themselves in traditional attire, and in many places, the custom is to wear new clothes. Many deities are worshipped. Prayers are sung to the goddess of wealth and prosperity Lakshmi. Diwali would not be complete without Indian desserts or sweets called mithai. Different Types of mithai like laddus are generously shared with friends and family and even offered to god. Celebratory firecrackers are lit.

In UTSC, the Indian Student Association organised a Diwali night event complete with food catering and a Bollywood music DJ. The event started by saying a prayer to the gods as a candle was lit. It included a Photo Booth and a Henna station.

The first Diwali away from home is a tough one for everyone I suspect. For a large number of international students at UTSC, they were away from families. Nonetheless, in the spirit of community that I have come to realise is synonymous with UTSC; events were held throughout campus and the inclusive environment that bubbled was warm and welcoming. Diwali is about a simple yet powerful idea of light overcoming darkness. For me, the light came disguised in the form of belonging among a diverse cohort of students. As the academic year progresses, we will do well to remember that light can be found even in the dark.

# THE NATIONAL DAY OF REMEMBRANCE AND ACTION ON VIOLENCE AGAINST WOMEN

by Javeriar Laskar

**On December 6, 2023, Canadians and the University of Toronto recognized The National Day of Remembrance and Action on Violence Against women.** On this day, 34 years ago, the lives of 14 young women at École Polytechnique Montréal were viciously taken by a gunman with a misogynistic agenda. Those people were: Genviève Bergeron, Hélène Colgan, Nathalie Croteau, Barbara Daigneault, Anne-Marie Edward, Maud Haviernick, Maryse Laganière, Maryse LeClair, Anne-Marie Lemay, Sonia Pelletier, Michèle Richard, Annie St-Arneault, Annie Turcotte, and Barbara Klucznik-Widajewicz. This heinous act of violence has impacted everyone nation-wide and post-secondary institutions towards their efforts in fostering the success of women in STEM-related fields, in order to ensure their safety and security.

To this day, the Government of Canada is taking initiatives to combat gender-based violence. These include creating the **Missing and Murdered Indigenous Women, Girls, and 2SLGBTQIA+ People National Action Plan** and the **10 year plan to end gender-based violence**. Both of which have been introduced and in effect since 2021. That said, there is still a lot more work to be done, as a survey conducted in 2018 by Statistics Canada found that more than 70% of 2SLGBTQIA+ women with disabilities experienced intimate partner violence, since 15 years old. Statistics Canada also determined that gender-related homicide rates in 2021 for Indigenous Women and Girls was more than three times the overall rate of gender-related homicides.

The University of Toronto and UTSC are committed to provide ongoing support to women. On December 6, the Equity, Diversity & Inclusion Office at UTSC and UTM, along with several institutions in the university, hosted the *Care, Healing and Justice: Addressing Transmisogyny and Ending Gender-Based Violence for All* hybrid event, providing a space to honor the lives lost in the massacre and create dialogue towards eradicating gender-based violence.

If you or someone you know is in need of support or applicable resources, the list below will guide you in doing so:

UTSC Sexual Violence Prevention and Support Centre -  
EV141 - [sypscentre@utoronto.ca](mailto:sypscentre@utoronto.ca) - (416)-978-2266  
University of Toronto Scarborough Campus Safety -  
SW304 - (416)-978-2222 (EMERGENCY) - [safety@utsc.utoronto.ca](mailto:safety@utsc.utoronto.ca)  
Equity, Diversity, Inclusion Office (EDIO) - 5th Floor of Bladen Wing

## Sources:

<https://women-gender-equality.canada.ca/en/commemorations-celebrations/16-days/national-day-remembrance.html>  
<https://people.utoronto.ca/news/recognizing-the-national-day-of-remembrance-and-action-on-violence-against-women-2023/#:~:text=On%20December%206%2C%20the%20University,school%20%C3%89cole%20Polytechnique%20in%201989.>



# AWARD HIGHLIGHT

Dr Andre J. Simpson was born in 1974. He obtained his BSc, 1995, and PhD, 1999, at Birmingham, UK. He spent his career on the development of NMR spectroscopy for environmental applications. He co-founded the Environmental NMR Center in 2004 at the University of Toronto and currently acts as the center's Director.

He has received numerous prestigious international awards in both analytical chemistry and environmental chemistry, including the Joseph Black Medal (RSC), SETAC/RSC Environmental Science Award, Fred Beamish Award (CSC), W.A.E. McBryde Medal (CSC) and in 2011 was elected as a Fellow of the Royal Society of Chemistry (FRSC). He has published over 130 papers in the area of environmental NMR spectroscopy.



**Professor Andre Simpson is the recipient of the ACS Award for Creative Advances in Environmental Science and Technology (2024 ACS National Award winners).** The award recognizes an individual's creativity in research and technology or analysis methods. Andre received this award because he pioneered Nuclear Magnetic Resonance (NMR) development in “environmental research, unravelling soil’s chemical structure, understanding contaminant sequestration and explaining the chemical toxicity through real-time in-vivo NMR.” Another remarkable distinction for Andre’s research!!

**Our warmest congratulations Andre! Always proud of your success!**

# THINK LIKE A SCIENTIST

*by Aneesah Rahaman*

**On October 26, Professor Phillip Heron was invited to the iSPEAC Seminar Series to give a talk about his science outreach program “Think Like A Scientist”, and his experience teaching in prisons.**

Heron had a unique goal : To deliver a science outreach program in prisons. After receiving input from inmates who had been a part of a criminology course at Durham University, it struck him that making the course **relatable** would be key to making science relevant and engaging for his audience. He also knew that student inmates were excited about science but were hesitant to take a science class, so making the course as relatable and engaging as possible was key to its success.

Heron had to take into consideration numerous aspects when designing the delivery of the program. For example, he had to acknowledge and account for the higher percentage of **neurodiverse** individuals in prisons than in a typical educational institution. He also questioned : “How can this program engage students who have low confidence in themselves or in the education system?”

To address these, Heron introduced innovative and uncommon teaching and learning activities for his students. For example, he included **artistic mediums** as ways for students to engage with the content. He welcomed students to create visual art and music to connect with concepts in class such as climate change, and he found that art helped the students remember the material better.

The biggest things Heron learned from delivering this program was to learn to listen to students and incorporate their feedback, to understand that **failure is a part of the process** and to be ready to change and adapt. Finally, incorporating more access points to education through different mediums like art and music is key to engagement. Heron’s biggest challenge through this teaching journey was to be comfortable being himself by knocking down his own barriers and guards. He realized that he could never pretend to be someone else; he could only be his **authentic self**.

## **Sources:**

<https://philheron.com/think-like-a-scientist/>

# FACULTY PROFILE:

## CODY ROSS

Dr. Cody Ross is an Assistant Professor at the Department of Physical and Environmental Sciences. Previously, he served as an Assistant Professor at the Department of Geography, Geomatics, and Environment at the University of Toronto Mississauga, where he was responsible for courses in Physical Geography and Global Weather and Climate. He obtained his M.Sc. in Geological Sciences with a specialization in hydrology from the University of Manitoba, where he also acquired his Ph. D. in Geological Sciences with a specialization in hydrology.



**When did you start your position at the department?**

In July of 2023! That is when I started it.

**Would you mind share some of your work focus with us?**

Yes. Broadly speaking, I'm a teaching stream faculty now, this semester\* I am teaching EES1113 Groundwater Hydrochemistry and Contaminant Transport and a new course called EES1201: Environmental Science: Approaches and Methods in Research, and that is of course that is one of the required course offerings for the new MSc cohort. And I'm also a course coordinator for EES1100 Advanced Seminar in Environmental Science, which is the Advanced seminar in Environmental Sciences. It's a required course for the MEnvSc cohort, but most of the work in the fall for that course is done by the Internship Team because they're preparing the students for their job applications and things like that.

**Would you teach an undergraduate course?**

Yes, absolutely. My position is mostly in service of the graduate degrees here. But if the opportunity arose, I would definitely be interested in teaching undergraduate courses as well.

*\*the interview was conducted during the Fall 2023 semester.*



# FACULTY PROFILE:

## CODY ROSS

### **How did you find the passion in teaching?**

I think I have known that I like teaching for a long time. I've always been interested in teaching formally in the university setting, and also less formal workshops. When I was younger, I was a lifeguard, my sister's an educator, my mom is as well. It's something that I've been exposed to, and I really like teaching generally. So I don't have a moment when I realised that, 'yes, teaching is for me'. It has just always been a part of the work that I have been doing.

### **Before faculty positions, as a researcher, have you had any interesting experiences from field work?**

During my master's, I assisted a PhD student in fieldwork in the Prairie Pothole Region, north of Brandon Manitoba. This area has many wetlands dispersed across the landscape, and not all are easily accessible. So you have to be trekking. You also have to wear hip waders, as the environment is wet. You might have the water surface up to your chest for like 40 minutes, and then you would be bushwhacking for an hour, and then for another 30 minutes after that, you'd be kind of walking through a farmer's field you have permission to be on.

There are a few things from this site that are just atrocious. First, the number of ticks that were present. I had grown up in the Prairies and knew a lot about ticks, but I had never experienced them at this magnitude. You would go out for a day of fieldwork, say 8 hours, and probably remove between 100 to 200 ticks in a single day. It was just constant. Luckily, none of them latched for a significant period; I never got Lyme disease. But I was worried about it.

Another thing was that some of the wetlands were almost too deep to access. A couple of days after pretty heavy rainfall, I was walking into a wetland, and there was a big change in the bathymetry. I dumped my foot down much deeper than expected, and my hip waders filled with water. It wasn't threatening, but I had to drain out my hip waders in this tick-infested environment and walk back a far distance to our field vehicle. It's not like I had an extra pair of hip waders. So that was another scenario. This site was full of these unique tidbits.

# FACULTY PROFILE:

## CODY ROSS

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**I have seen you on the past MEnvSc Poster Day, have you worked with the student presenters?**

No, they were all from last year's MEnvSc program. I attended to get a sense of what type of work the research students had done, what type of positions the internship students liked, what their perceptions of the course offerings were, and what courses they felt they benefited most in their internship positions. I think the presentations were good, and they provided background on a whole bunch of different positions.

**How do you find the idea of a Poster Day for internship?**

At first, I was a little bit uncertain how it would go. But I feel that it is important for incoming students to have more concrete details matched to some of the different employment opportunities that might be available to them. I also think that it helps them form their decisions about what courses they want to take. Students that have already gone through the program can kind of offer insights that aren't easily accessed by new incoming students. I think that it is also interesting to hear about students who may have found out that they may be actually interested in different careers.

Being involved in an internship doesn't necessarily help you directly identify the pathway to a specific career, but it might help you identify what you don't want to do. So, it can work in both directions. I thought that was interesting and something that was conveyed in their presentations.

**Thank you very much Dr Ross for being here with us!**

# THE DAWNING OF THE ANTHROPOCENE?

## A FIELD TRIP TO CRAWFORD LAKE

*by Dr Karen Smith*

**On October 20, 2023** a group of Master of Environmental (MEnvSc) students taking EES1133, Climate Change Science and Modelling, travelled to Crawford Lake, a small lake near Milton, Ontario. This unassuming lake was recently chosen as the site of the “Golden Spike”, the geological marker denoting the beginning of a proposed new epoch – the Anthropocene. While still an unofficial unit of geologic time, the Anthropocene describes the recent period (~post-1950) when humans have had a profound and detectable influence on the Earth’s climate and ecosystems. Making sense of anthropogenic influence on the climate system is at the heart of EES1133.

The group was joined by Prof. Soren Brothers, a limnologist and the Curator of Climate Change at the Royal Ontario Museum, who has been involved in the research at Crawford Lake. He generously provided a guided tour around the lake and shared his insights on the Anthropocene Working Group.





# THE DAWNING OF THE ANTHROPOCENE?

## A FIELD TRIP TO CRAWFORD LAKE



Crawford Lake is also the site of a former Indigenous settlement and three longhouses have been reconstructed in the surrounding park. The juxtaposition between the dawning of the Anthropocene and the former Indigenous settlement at Crawford Lake provided students with an opportunity to reflect on the profound impact that Western cultures have had on the Earth system.

Samuel Hippard, an MEnvSc student who participated in the field trip, shares his reflections below:

“I think it is absolutely amazing that Crawford Lake is so close to Toronto and is the “golden spike” for the new Anthropocene epoch. I have heard of places where they serve as the best markers for changes in geologic time periods and are stamped with a “golden spike”, however I had never visited one of these sites up until now. Coming from paleolimnology and paleoclimatology undergraduate studies, it was nice to return to that field and talk more about how we can define changes in the climate using an incredible sediment archive from a meromictic lake. I also enjoyed talking with Soren Brothers and listening to what he had to say about Crawford Lake and the Anthropocene.

# THE DAWNING OF THE ANTHROPOCENE?: A FIELD TRIP TO CRAWFORD LAKE

One part of the field trip that resonated with me was spoken by Soren Brothers, which was the process that he and his colleagues had to go through to core the lake one last time. Since Crawford Lake is meromictic, its sediments provide an incredible resolution of annual climate data and as a result many scientists have cored this lake removing much of the limited sediments. The final coring of the lake had to be approved by the Indigenous elders of the Wendat tribe who have lived in the area surrounding Crawford Lake. I believe that this approval process is integral to not only the preservation of the lake but also to the recognition of the Indigenous peoples' original home that we have taken from and exploited without proper care. From my short experience in research in the US, much of the field work and data collection does not pay tribute anywhere near this extent to the Indigenous lands of which we are possibly hurting.

I did not acknowledge the Indigenous cultures whose land I used for research in my undergraduate thesis. That is my one sole regret from taking part in my undergraduate research and I wish I could go back and pay tribute. I believe moving forward as a scientist, especially an environmental scientist, it is important to recognize and deeply consider the Indigenous implications of my research.”

-Samuel Hippard

# EESB15 FIELD TRIP TO PORT COLBORNE QUARRY

by Javeriar Laskar

Photo Credit: Harry Xu

**On October 21 and 22, 2023, Professor Heidi Daxberger's EESB15: Earth History class went on a field trip** around the Port Colborne Quarry in Port Colborne, Ontario, to discover the type of rocks and fossils in the vicinity.



During the Devonian Period in the Paleozoic Era (some 380 million years ago), a warm, shallow sea covered the majority of Ontario. As such, some aquatic life was present, including Tabulate and Rugose Corals, Crinoids, Bryozoans, Trilobites, Gastropods and Brachiopods. There were also chert nodules and glacial striations, which indicate the direction of ice/water movement.

As part of the fossil identification and scavenger hunt group assignment, students were given the opportunity to identify fossils present across 5 different locations/stages in the quarry and note down their respective observations. Students were also given the opportunity to use compasses as means of identifying the location of glacial striations in each stage. The TAs were there to provide assistance and clarifications to students, in the event they needed any.





# EESB15 FIELD TRIP TO PORT COLBORNE QUARRY

by Javeriar Laskar

Photo Credit: Harry Xu

Although waking up early in the morning on a weekend for such a long trip is not the usual for many students, this field trip was a breath of fresh air and provided a sense of serenity for many. This provided them with a mini-mid-term break since not only did they enjoy the peace, tranquility, and diverse nature of the quarry, but it simultaneously provided them with hands-on experience in such an area, for aspiring geologists and for those keen on being involved with a related field.

Students got to experience the real-life joy of the course, rather than becoming fully accustomed to the typical lectures-style content throughout the entire semester. Instead of questioning all the time about confusions around concepts, there was a proper management of productivity and banter, which was evident across the smiles on students' faces.



Special thanks to Professor Daxberger and her TAs, Lava, Phillip and Syed, for working so hard to provide such a fulfilling experience to the students. The amount of time and dedication taken to make this trip will not go unnoticed.

# PGO INFO SESSION + MIX & MINGLE

By Callie Andersen



**DPES** partnered with the **Professional Geoscientists Ontario (PGO)**, who generously sponsored a PGO Info Session and supported the subsequent Industry Mix-and-Mingle with Department of Physical and Environmental Sciences (DPES) Faculty, Staff, and students! With the Environmental and Physical Sciences Students Association (EPSA)'s support, this event was packed with excited and inquisitive minds.

PGO is the organization responsible for licensing and regulating Ontario's Geoscientists and reporting to the Minister of Mines. Geoscientists provide professional advice and make decisions in the interest of the public across multiple domains, including mineral resources, geo-hazards, infrastructure projects, water, the environment, ecosystems, and public health. PGO is entrusted by the government of Ontario to register geoscientists, admit only qualified persons, maintain ethical and practice standards, respond to complaints, discipline when necessary, and encourage continuing professional development.

Hearing the speakers from PGO encouraged students to learn more about geoscience, ask questions to those in the field, and think about the options open to them in their futures.

The PGO session reached a wide audience, from students in their first year of undergrad to PhD students. Inspiringly, there was a strong turnout of the eagerly engaged Master of Environmental Science (MEnvSc) students, who represented more than one-third of the room!

Photo Credit: Harry Xu

Source:

<https://www.pgo.ca/about/about-pgo>



# NOVEMBER CONVOCATION



**On November 9, 2023**, the Physical and Environmental Sciences Department witnessed a joyous celebration as graduating cohorts of both undergraduate and graduate students enjoyed the culmination of years of their dedication and academic achievement. Amidst a backdrop of accomplishment, students, faculty, and proud families came together to honour the journey of these scholars. The convocation not only marked the end of an educational chapter but also the beginning of the new graduates' promising careers. Please explore the captured moments of triumph in the attached photos!

*Photo Credit: Chai Chen*





# NOVEMBER CONVOCATION



*Photo Credit: Chai Chen*



# NOVEMBER CONVOCATION



*Photo Credit: Chai Chen*



Warmest congratulations to our newest graduates! Armed with knowledge, passion, and a commitment to making a positive impact, these accomplished individuals are poised to embark on a journey of innovation and discovery, contributing to the advancement of science and the well-being of our planet. Cheers to a bright future filled with endless possibilities!



# MENVSC PRE-CONVOCATION CELEBRATION

*By Callie Andersen*

*Photo Credit: Chai Chen and Harry Xu*

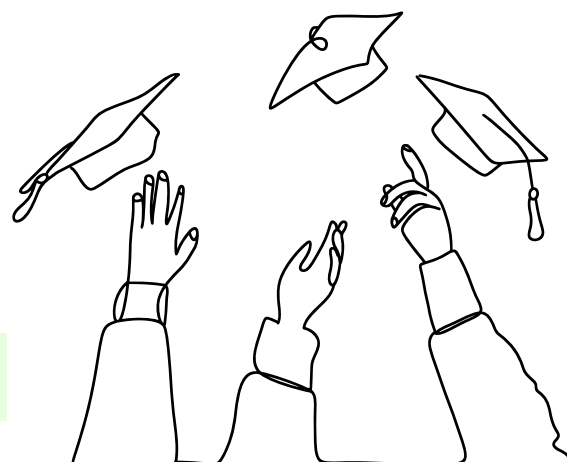
To celebrate all the achievements and hard work of the 2022-23 Master of Environmental Science (MEnvSc) cohort, the Department of Physical and Environmental Sciences (DPES) held a Pre-Convocation social night for the outgoing students. The evening before they crossed the stage in November 2023, the MEnvSc graduates celebrated with food, drinks, ping-pong, and a photo booth!

After their 12-month program, including a 4-month summer internship, the MEnvSc students got to celebrate and connect with each other, as well as their faculty and staff supporters. They had the opportunity to look back on their rigorous year of studies and internships, and look ahead to their exciting futures!



Closing the night with a touching message from the Department and Graduate Chair, Dr George Arhonditsis, the bittersweet goodbye filled the room with misty eyes, warmed hearts, and proud smiles. Upon graduation, these students joined over 1,000 UTSC MEnvSc Alumni. Annually, the MEnvSc program at UTSC has the privilege of extending well wishes and congratulations to an incredibly talented group of students as they step out into their futures. This is a tremendous accomplishment, and the DPES Graduate family is so proud of each and every one of the MEnvSc graduates.

**Warmest congratulations to 2022-2023 MEnvSc Students!**





# UNITED NATIONS INTERNATIONAL EXPERIENCE

By Callie Andersen

In partnership with UNA-Canada, The University of Toronto Scarborough (UTSC) provides an International Internship Programme for Students (IIPS) through which, students have the opportunity to complete a 6-month internship abroad while working for United Nations, earning the title of Junior Consulting Professionals (JPCs). Speaking to the magnitude of this experience's value, an internship with UNA Canada is the only international and the only unpaid internship that is available to the Department of Physical and Environmental Sciences (DPES)'s Master of Environmental Science (MEnvSc) students to apply for. MEnvSc students can work across the globe, with teams such as the International Organization for Migration (IOM), UN-Habitat, UN Industrial Development Organization (UNIDO), and the Food and Agriculture Organization (FAO) to name a few!

Previous MEnvSc students have completed their internships in Switzerland and Vietnam, with other JPCs commonly working all across continental Asia and Africa. This international opportunity is made possible by the dedication of students, scholarship awards, and guidance from the UNA Canada team every step of the way.

The DPES Graduate Internship Team is anticipating sending 2-3 MEnvSc internship students abroad for the 6-month Summer 2024 roles and hopes to continue doing so through UTSC's partnership with UNA-Canada for many years to come. The MEnvSc Internship team would like to highlight two students who just graduated November 2023 who participated in this international UNA Canada experience! In this issue of the DPES Digest, we will be sharing Evan V's story. Tune in to the next DPES Digest issue to hear about Anannya's experience too!



Evan's personal travel around Switzerland. Photo by Evan V.



UNDP-Viet Nam 45th anniversary. Photo from Anannya (sixth from the left).

# UNITED NATIONS INTERNATIONAL EXPERIENCE: ANANNYA SAHADEV

By Callie Andersen

Anannya has successfully graduated this past November 2023, from the University of Toronto Scarborough (UTSC)'s Department of Physical and Environmental Sciences (DPES), with a Master of Environmental Science (MEnvSc) in the Terrestrial and Aquatic Systems field of study. The MEnvSc program is a 12-month course-based graduate program in which students complete an internship work term (or research experience) typically in the summer semester. Since 2019, UTSC DPES has established a partnership, exclusive for MEnvSc students, with the United Nations Association in Canada (UNA-Canada) through the IDDIPs - University Division: International Internship Programme For Students (IIPS). Through IIPS, MEnvSc students, such as Anannya, can vie for competitive Junior Professional Consultant (JPC) internship positions at various United Nations entities around the globe. To help you get to know Anannya a bit better, some fun facts about Anannya are that she knows six languages and plays the flute! Anannya's robust learning prepared her to thrive in the dynamic UN environment, which calls for adjusting on her feet and learning new skills.

Anannya landed an internship as a Junior Professional Consultant (JPC) through a partnership between UNA-Canada's International Internship Program for Students (IIPS) and UTSC. This is an incredible accomplishment; every year, DPES selects 2-3 students from the MEnvSc cohort for this highly coveted experience. In her role, Anannya provides professional input to the United Nations Development Programme (UNDP) to strengthen the development and management of their biodiversity, forestry, and agriculture portfolio. Her professional inputs are constructed and provided in the form of drafting and viewing reports, concept notes, policy mapping documents, and presentation materials regarding positive climate action. Additionally, Anannya works to "establish strategic partnerships and working relations with counterparts and consultants," all while also maintaining a supporting role in the logistics of national and international conferences hosted by UNDP.

BES-NET Triologue Event at the Green One UN House (Anannya's workplace) in Vietnam.

*Photo by Anannya Sahadev.*



# UNITED NATIONS INTERNATIONAL EXPERIENCE: ANANNYA SAHADEV

*By Callie Andersen*

After securing her JPC position, Anannya received generous financial support from UTSC Department of Physical and Environmental Sciences, which included a MEnvSc Relocation Assistance Award to help offset the cost of international travel, and a MEnvSc Internship Award. While completing her JPC 6-month term, she was also the recipient of the 2023 Choquette Scholarship for IDDIPS-IIPS from UNA-Canada. Additionally, Anannya was selected as a Center for International Experience (CIE) Award recipient.

Anannya found confidence in her role from her prior experiences at UTSC, finding the Internship Poster Day presentations of the previous year's MEnvSc cohort very helpful. This gave her a better idea of what types of internships were available, consequently, helping her to identify what aligned with her interests and empowering her to orient her job search accordingly. During Internship Poster Day, Anannya "was immediately drawn to the UN internship and started networking with the previous cohort." Additionally, she found the networking events and mentorship program activities that were held during her MEnvSc candidacy provided her with "the opportunity to meet (...) alumni and many other environmental professionals. This proved invaluable to prepare [her] for this internship, and to introduce [her] to other related jobs and positions which I can explore further in the future," she added.

On the topic, a piece of advice that Anannya gives to current MEnvSc students is that networking is key. "While you are working on your upcoming networking assignments, try to reach out to the people who are working in the companies where you would like to do your internship. I initially reached out to a variety of environmental professionals but realized in my second semester that it would have been more prudent to target my time and energy towards reaching the people in my target organization," she explained. Through networking and personal experience, Anannya found that the UTSC courses most helpful for her current role were EES1122 Global Environmental Security and Sustainable Development , EES1136 Climate Change Adaptation , and EES1100 Advanced Seminar in Environmental Science . These equipped Anannya with highly relevant skills and knowledge for the internship. Recognizing the importance and rapid growth of the environmental and climate change field, Anannya assures students that there are many exciting work opportunities out there! **"Every organization/company must pay attention to the environmental and climate change impacts, mitigation measures etc. for our world to move in a more sustainable direction,"** proving that there is no shortage of work, and MEnvSc students will have a large pool of career journeys that they can explore.



# UNITED NATIONS INTERNATIONAL EXPERIENCE: ANANNYA SAHADEV

By Callie Andersen

A common concern with participating in UNA-Canada is difficulty with learning a new language. This is something Anannya can relate to, “It is challenging to get a complete picture of the project details and challenges when meetings are in Vietnamese. I rely on English transcripts or live translations when possible.” However, this language challenge is not a barrier. “Fortunately, all the UN staff speak English, so I am not unduly hindered.” Anannya was able to seek help and support from her team, enabling her to reach her full potential. UNA-Canada prides itself on supporting its JPCs every step of the way, and this is no exception.

Synonymously with Evan (whose story was shared in [DPES Digest 2023 Volume 4](#)), Anannya finds that the rewards are worth the challenges that come with being a JPC. Anannya lists many rewarding aspects of her internship, such as networking with national and international staff of UN agencies across the world, learning about future career opportunities with the UN, a multitude of training and development opportunities, “[supporting] the international cooperation that expands Vietnam's sustainable development and the conservation of the environment,” and last but definitely not least, Vietnam and its beautiful culture! Some of her favourite foods she’s tried are bún chả, phở, and bánh trung thu (mooncake). Some scenic tourist locations that she highlights are Cát Bà, Hạ Long Bay, Ninh Bình, and Sa Pa, Hội An. Building on the many rewarding aspects of her internship, the UNDP also seems to offer a wonderful work-life balance. “The work-life balance at the UN is very good. We utilize the hybrid work system with three days in office. There are also many avenues for staff to take care of their health and wellbeing, including optional daily yoga sessions, dance sessions, and other mental and physical health services.”



Noddle Soup- Phở  
Photo by Anannya S.



Lunch at the office cafeteria  
Photo by Anannya S.



Mango Yogurt  
Photo by Anannya S.

# UN INTERNATIONAL EXPERIENCE: ANANNYA SAHADEV

*By Callie Andersen*

To conclude sharing her adventures, Anannya leaves us with inspiration to go after what you are passionate about. When we asked her where she sees herself in 10 years career-wise, she told us, “I am still exploring my options, but I enjoy working in the environmental sector at the national and international level, so I see myself with the UN, or a related organization, and working with governments and other stakeholders to enact positive change.” Learning this during her role at UNDP, once again captures the value of her experience as a JPC. Anannya teaches us that if you know what is meant for you, you should go out and get it; you can make your ambitions within your reach, and you can follow your passions.



BES-NET Trialogue Event, day 2, near the scenic Van Long wetland nature reserve.

Photo by Anannya S.

The UTSC DPES Family is very excited about Anannya’s next steps, and we are incredibly proud of Anannya for all that she has accomplished this year!

## Sources:

Sahadev, A. (2023, August). DPES Digest Alumni Profile Questionnaire. Questionnaire form. DPES Graduate Team.

Mungai, A. (2023, October 18). UNA-Canada Information Session.

Presentation, Zoom meeting. University of Toronto Scarborough.

# ENVIRONMENTAL AND PHYSICAL SCIENCES STUDENTS ASSOCIATION (EPSA)

Material provided by EPSA:

## Who Are We



## Other Services

### Lab Coat Rental

Forgot your lab coat at home?  
Never fear, EPSA is here - come by our office.



### Chemistry Aid Center

We offer free tutoring for  
CHMA10/11, CHMB41/42, and more!



### Physics Aid Center

We offer free tutoring for  
PHYA10/11 and PHYA21/22!



### Environmental Aid Center

Coming soon!



# ENVIRONMENTAL AND PHYSICAL SCIENCES STUDENTS ASSOCIATION (EPSA)

*Material provided by EPSA:*

FROSH- what an amazing opportunity to be able to connect and meet a lot of incoming first year students! We're also in the process of hiring for two first year representatives to act as a liaison and share with their peers all that EPSA has to offer.

On a larger scale, we are also gearing up for our DPES Mix and Mingle on Wednesday November 1st from 5-7PM in the EV atrium. This annual event has proved to be a pivotal community building activity and a great way to learn more about our DPES professors, staff, and graduate students (you'll never guess who plays the drums, has the voice of an angel, etc - but come and find out more!).

We appreciate all the support we've received in the past from students and DPES faculty, and can't wait for another outstanding year together!

## Who Are We

As a Departmental Student Association representing the Department of Physical and Environmental Sciences here at UTSC, EPSA aims to foster meaningful connections between students and faculty through services like lab coat/goggle rentals, and both academic and social events.

We also provide resources like our Chemistry, Physics, and -brand new- Environmental Science Aid Centres. Here you will find upper year tutors that are available to help with questions and explaining key concepts.

This year, EPSA hopes to continue carrying out this goal, as well as reestablishing their presence on campus with new and exciting events for all students. And now... meet our new executive team!

# ENVIRONMENTAL AND PHYSICAL SCIENCES STUDENTS ASSOCIATION (EPSA)

*Material provided by EPSA:*

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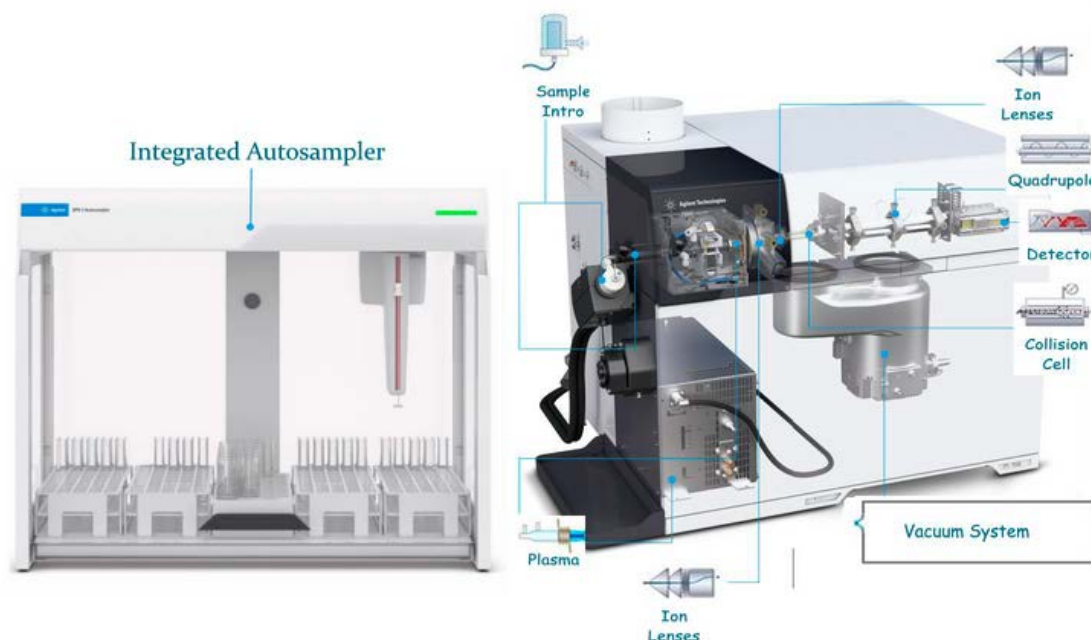
Environmental and Physical  
Science Students' Association

# FROM THE TRACES CENTRE

## WATER ANALYSIS AT THE TRACES CENTRE

**THE** importance of sustainable management of water resources around the globe has never been more critical than at present. Access to safe drinking water, agriculture, sanitation and the protection of both rural and urban infrastructure all rely on this management which is necessary to support a healthy and growing population. Effective management for the protection of freshwater and oceans and their ecosystems, as well remediation and reclamation of impacted aquatic systems, leans heavily on the information and conclusions gathered from interdisciplinary study and research. The foundation of study and research is data and the TRACES Centre is committed to producing quality measurements in support of the complex analytical needs of the DPES research community. TRACES has both upgraded and expanded its analytical capabilities for the analysis of water whether it be for the assessment of nutrients, quantifying toxic compounds, or investigating substances of emerging concern. This article provides a brief snapshot of some of the key instrumentation that TRACES offers in aqueous testing.

### ICP-MS (New Addition)





# FROM THE TRACES CENTRE

## WATER ANALYSIS AT THE TRACES CENTRE

**ICP-MS (inductively coupled plasma mass spectrometry)** is an elemental analysis technique that uses an argon (Ar) plasma to convert the sample into ions that are then measured using a mass spectrometer. It can be used to quantify heavy metals such as Cr, Cd and lead in drinking water for example. In comparison to flame atomic absorption spectroscopy (FAAS), ICP-MS is not only capable of lower levels of detection (low ppb), but also multi-element scans (>20 metals) in a single run. This is in contrast to single element analysis (one at time) with the FAAS system. The ICP-MS system in the TRACES facility also has built-in EPA methods such as US EPA Methods 200.8 and 6020 for drinking water and other waters.

### IC



**Ion chromatography** is a staple measurement technique for the analysis of anions and cations and weak organic acids in the analysis water (drinking water, groundwater, etc.). It allows the user to determine the identity and amounts of dissolved ions such as chloride, phosphate, sulfate, calcium and ammonium at low ppm levels.

# FROM THE TRACES CENTRE

## WATER ANALYSIS AT THE TRACES CENTRE

### FAAS & GFAAS



**Flame (FAAS) and graphite furnace (GFAAS)** atomic absorption spectroscopy is a technique that measures the concentrations of elements at ppm and ppb levels respectively. Much like the ICP-MS, FAAS is an elemental technique that can be used to quantify heavy metals in aqueous samples. Instead of using a plasma to convert the sample to ions and mass spectrometry for detection, FAAS uses a flame to convert the sample to atoms and spectroscopy for detection. While the ICP-MS can achieve lower limits of detection and multi-element scans, the FAAS is more cost-effective and easier to use than the ICP-MS. It is well suited for small batches of samples with only a few elements of interest and where budget is a constraint.

# FROM THE TRACES CENTRE

## WATER ANALYSIS AT THE TRACES CENTRE

### ITOC Analyzer



The **TOC (Total Organic Carbon) Analyzer** uses oxidative combustion IR analysis to measure the concentration of dissolved carbon in aqueous samples. The instrument has the versatility to **determine total carbon (TC), total inorganic carbon (IC), total organic carbon (TOC) and total non-purgeable organic carbon (NPOC) in both fresh and seawater samples** at high ppb levels. The TOC Analyzer is also capable of **measuring total nitrogen (TN) in water samples** via chemiluminescence analysis of N<sub>2</sub> (g).

#### TRACES NEAR-FUTURE GOALS:

##### ACCREDITATION

- Capitalize on instrument investment to generate external revenue via testing services
- Most external users of environmental testing services require testing to be accredited
- Accreditation provides confidence in results
- ISO/IEC 17025 is the standard
- TRACES is preparing for accreditation
- CALA is the accrediting body have joined





# DPES PROGRAMS SUMMARY

## UNDERGRADUATE PROGRAMS: 18

### CHEMISTRY

Chemistry (Specialist)  
Environmental Chemistry (Specialist)  
Medicinal and Biological Chemistry  
(Specialist)  
Biochemistry (Major)  
Chemistry (Major)  
Environmental Chemistry (Major)

## CERTIFICATE PROGRAM: 1

### PHYSICS AND ASTROPHYSICS

Environmental Physics (Specialist)  
Physical and Mathematical Sciences  
(Specialist)  
Physics and Astrophysics (Specialist)  
Physical Sciences (Major)  
Physics and Astrophysics (Major)  
Astronomy and Astrophysics (Minor)

### ENVIRONMENTAL STUDIES

Environmental Studies (Major)  
Certificate in Sustainability

### ENVIRONMENTAL SCIENCE

Global Environmental Change (formerly  
known as Environmental Biology)  
(Specialist)  
Environmental Geoscience (Specialist)  
Environmental Science (Major)  
Applied Climatology (Minor)  
Environmental Science (Minor)  
Natural Sciences and Environmental  
Management (Minor)

### CO-OP

Chemistry (Specialist - Coop)  
Environmental Chemistry (Specialist - Coop)  
Medicinal and Biological Chemistry  
(Specialist - Coop)  
Biochemistry (Major - Coop)  
Chemistry (Major - Coop)  
Environmental Chemistry (Major - Coop)  
Global Environmental Change (formerly known as  
Environmental Biology) (Specialist - Coop)  
Environmental Geoscience (Specialist - Coop)  
Environmental Physics (Specialist - Coop)  
Environmental Science (Major - Coop)

## COMBINED DEGREE PROGRAMS: 3

## COOP PROGRAMS: 10

### COMBINED DEGREE PROGRAMS

HONOURS BACHELOR OF SCIENCE / MASTER OF ENGINEERING

HONOURS BACHELOR OF SCIENCE / MASTER OF ENVIRONMENTAL SCIENCE

HONOURS BACHELOR OF SCIENCE OR HONOURS BACHELOR OF ARTS / MASTER  
OF TEACHING



UNIVERSITY OF  
**TORONTO**  
SCARBOROUGH

# DPES DIGEST IS LOOKING FOR YOU!

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Interested in assisting with the DPES newsletter?  
Have any great ideas you want to see come to light?  
Send us your resume!

Email:

**[xxxharry.xu@mail.utoronto.ca](mailto:xxxharry.xu@mail.utoronto.ca)** or

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