

7

IRON WARRIOR



MEET THE TEAM

Editor-In-Chief

Jeremy Bijoux

Iron Inquisition Lead

Yash Gunturi

Members

Yasmin Abu-Narr

Tin Chi Cheung

Amara Damji

Kara Lee-Kwen

Yoghashri Karthikeyan Srimathi

Caelan Winmill

Matthew Wymer



Iron Warrior

Waterloo Engineering Society

DWE 3520A

University of Waterloo

Waterloo, Ontario

N2L 3G1



Table of Contents

02

Highlighting Alumni Voices: TextNow
Reaches \$1B in Cumulative Revenue

Jeremy Bijoux

04

Waterloo's Terry Fox Run Raises \$90,000:
But Why is He Still Important 45 Years On?

Caelan Winmill

06

Cosmic Voids: Pockets of
Emptiness in the Universe

Yasmin Abu-Narr

08

The University of Waterloo's
Militarist Shift: A Broad Overview

Matthew Wymer

10

3 Tips on Midterm Preparation

Tin Chi Cheung

11

OWeek Photo Contest Winners

12

Special Announcement!

13

Eng Prof Quotes
Iron Inquisition

14

Crossword

Highlighting Alumni Voices: TextNow Reaches \$1B in Cumulative Revenue

Jeremy Bijoux, 2B Chemical

Hello Waterloo! I hope everyone is having a wonderful Fall term so far!

Continuing our "Highlighting Alumni Voices" series we started early this year (check out our interview with 3e8 Robotics in W2611), I got the chance to interview the CEO and co-founder of TextNow, Derek Ting (CE '10), whose company reached \$1 billion dollars in cumulative revenue a few weeks ago!

Q: What is TextNow, and how does it stand out from other mobile providers?

Derek: TextNow is an app that you can download so you can get free phone service. There's a couple of ways you can use it. One way you can use it is if you just want a second phone number, and you don't want to pay for it, you can download our app and you can get a second local phone number. Another way people use it, like folks that don't want to pay for phone service, is as their main phone number. You can install an eSIM on your phone and then use our app to text and call, and it has nationwide coverage and you can use it instead of paying for phone service. Talking and texting is free, and if you want to add data, we have affordable data plans you can add on. However, the eSIM is only available in the US, not available in Canada yet.

I think what's unique about our service is you can flex up and down. You can get by with a free phone service most of the time, and when you need data, then you can pay. When you don't need it, you can flex out at the free service.

A lot of our customers have low or unstable income, so some weeks or some months they can pay and then certain weeks or months they can't; with our flexible plans, we don't want them to worry about their phone service being shut off if they can't pay.

Q: What was the original spark behind TextNow, and how did the company grow into what it is today?

Derek: We actually just started by wanting to make our own co-op term. It was my last co-op term, and I didn't want to go somewhere far away. I wanted to stay close to campus and do something fun. So we decided to spend one co-op term building apps, and TextNow was one of them. How TextNow came to be was that I just didn't want to pay for text messaging; I thought it was a rip off. So then I decided to make an app that makes text messaging free. So at the very beginning, that's all it was: an app that made text messaging free.

The "aha" moment was that we found out that 90% of our customers were using it to turn their iPod touches into phones because they didn't have phone service. They were using the iPod touch to install our app to text, and that was kind of our "aha" moment that it wasn't text messaging we needed to provide to them; it was actually phone service. That began our multi-decade obsession to figure out how we can make phone service free.

(Fun fact: It all started in a student apartment on King Street!)

Q: What does the \$1B milestone represent for you personally, and for the company's next chapter?

Derek: It's been a long journey. We started from something really small, really simple, which was just to make our own co-op term and make enough money to pay rent (and pay for pizza). We originally did not have the ambition to make it this big, so reaching \$1 billion... it's just incredible to see how far we've come, having started so small, and it's incredible to see if you just keep at things for a long time, have fun, how much progress you can make.

It's inspiration for us to keep going because the journey isn't done. There's

still a lot of things we want to do, a lot of new products we still want to build.

Q: On that note, what are the next steps or major objectives for TextNow as you continue scaling?

Derek: The biggest problem we're currently working on is figuring out how to make mobile data free, not just talking and text.

Our big ambitious goal right now is we want 1 in 10 phone numbers in the US to be TextNow phone numbers. Our vision is that one day, when you go to a party and you talk to somebody, you'd be shocked if they're paying for phone service. We want phone service to be ubiquitous and free, just like email.

Q: What were the toughest challenges in scaling TextNow from a startup to an international platform, and how did you navigate them?

Derek: It's hard to pick one challenge. When businesses grow, a lot of problems just kind of happen at once. When you're running the business day to day, you [have] got to deal with growing the team and installing leaders to lead the team. Every day, you're solving a new problem, and the challenge is that you're overwhelmed with problems, but you need to be able to sort through them, pick the most important problems and focus on each one at a time.



Photo Credits: TextNow. TextNow unveils Équilibre Oblique to celebrate \$1B in cumulative revenue.

Q: Why is it important for you that TextNow stays independent?
Derek: We decided to take a different path from a lot of companies. A lot of companies raise a lot of capital, and burn through much of it early on before they figure out their business model. We started the company wanting to be ramen profitable* on day one, so that's part of our DNA; our DNA is that we're here not just to build products and build cool things, we're also here to build a business.

It fits what we love doing, which is building businesses, building products, and for us, it's more rewarding to build a business, it's more rewarding to build a product than to build PowerPoint presentations. The reason we haven't raised a bunch of money is because raising money is a lot of work, but you're also building PowerPoint presentations and it's not as fun, not as rewarding.

Another thing is that it is a blessing not taking investor money because it allows us to build things at our own pace and it allows us to take risks that we want to take and make mistakes, whereas some companies don't have that luxury. When you innovate, when you build new things, a lot of things won't work, which can be costly. And when you have investors, they may not have the patience when things don't work. Being in charge of our own destiny means we can try as much as we want, as long as we need, as long as it takes to follow through on an idea that may not work the first few tries. So I think that is a blessing and we wouldn't have it any other way.

Q: Any advice for Waterloo students/recent grads looking to start or continue building their own company?
Derek: My advice is pick something fun, pick something you're interested in. Don't pick something because it's hot or it makes money. A lot of people do that; they design their business or their product based on what they think investors will fund, and I don't think people should do that. I think people should do what's interesting to them, do what is fun, because building a business is a grind and it takes a long time. You've got to enjoy what you're doing to keep at it long enough to find success.

Équilibre Oblique
To mark the \$1B milestone, TextNow unveiled a permanent sculpture by Phillipe Pallafray, Équilibre Oblique, in Waterloo's Research and Technology Park (which I highly recommend checking out in person, it looks amazing!)



Photo Credits: Jeremy Bijoux. Check this sculpture out at Research and Technology! It's just a brief walk from the ION station.

The sculpture is composed of 3 distinct forms representing the progression from ideas to startups to scaled companies, and is meant to reflect the entrepreneurial journey that has helped make Waterloo one of Canada's most recognized technology hubs. The steel in the center acts as a mirror, designed to inspire other founders to see themselves in TextNow's story.

When asked about the sculpture's design and why the team chose a sculpture to mark the milestone, Mr. Ting explained:

"I think the sculpture represents that anything is possible if you just start small and you have fun while you do it. It reflects so you can see yourself through the ball, and that's kind of like, the theme behind it: anyone can do it and you can see yourself doing it. Art is something that last forever, meanwhile an event is just one day, and then it's gone. Installing something there [at the park], it lasts forever and it looks nice."

Thank you so much to Derek Ting for his time, and Brianna Clyburn for arranging the interview! If you're interested in learning more about TextNow and their services, check out their website: <https://www.textnow.com!>

Wishing everyone a relaxing Reading Week and good luck on midterms! WE WILL COOK!

If you are a student or alum who would like to be featured in *The Iron Warrior*, reach out to us at theironwarrior@gmail.com!

*Ramen profitable: a startup makes just enough revenue to cover the founders' basic living expenses.

		4			7	5		
8	3							2
7			3	6		4		8
		8			3		1	
1			5		6			7
	7		4			8		
3		6		5	4			9
4							8	5
		9	6			3		

SUDOKU
#2026-16

Waterloo's Terry Fox Run Raises \$90,000: But Why is He Still Important 45 Years On?

Caelan Winmill, 2A Mechanical



Photo Credits: Globe and Mail.

On the morning of Sunday, September 20, over 1,000 people gathered in Waterloo Park to run several kilometers each. The run was done in Terry Fox's legacy, with runners encouraged to donate to the cause of cancer research. In all, 1108 people donated \$90,410 to the Fox Foundation – smashing their goal of \$72,700.

The run was one of over 500 organized across Canada under Terry Fox's name – all with the goal of raising money for innovative cancer research. The Terry Fox Foundation has supported 859 cancer researchers across 269 funded projects. They explore innovative therapies ranging from precision treatment (dynamically targeting specific cancers with tailored treatments) to AI-backed ultrasound technology (which will hopefully be able to get much faster results on the effectiveness of chemotherapy).

Why is Terry Fox called a 'Hero'?

Terry Fox was 19 years old when he developed osteosarcoma (the most

common bone cancer often starting near the knees) and was prescribed above-knee amputation – ending his time as an athlete as he had known it. During his cancer treatment, two things stood out to him.

The first was the value of cancer research. At age 19, he was given chemotherapy and a 50% chance at survival. Grim. But he was told that just two years earlier, his chance of survival would have been just 15%. This statistic stuck with him, and he later cited it as a reason he chose novel cancer research as his mission.

The second was the paltry funding that cancer research received. He was well exposed to this lack of investment during his time in the cancer wards. The tiny cancer research budget was so stark that it infuriated him, and ignited a passion that would later fuel one of the greatest feats of human perseverance on record.

What set Terry Fox apart from most was how he handled these setbacks. After 16 months of brutal chemotherapy, most would be ready to rest, recover and celebrate. Not Terry:

"I soon realized that that would only be half my quest, for as I went through the 16 months of the physically and emotionally draining ordeal of chemotherapy, I was rudely awakened by the feelings that surrounded and coursed through the cancer clinic. There were faces with the brave smiles, and the ones who had given up smiling. There were feelings of hopeful denial, and the feelings of despair. My quest would not be a selfish one. I could not leave knowing these faces and feelings would still exist, even though I would be set free from mine. Somewhere the hurting must stop ... and I was determined to take myself to the limit for this cause."

– Terry Fox, 1979, in a letter to the Canadian Cancer Society asking for support

Galvanized by his time in the hospital, Fox was determined to make a difference. After 3 years playing wheelchair basketball

(for which he was named an All-Star player in 1980), Fox began what I can only describe as a string of inhuman feats.

It begins with the planning for his run. At the time, Dick Traum was being celebrated for running the New York Marathon with a prosthetic leg. This inspired Terry to try to run a marathon. Every single day. For almost a year straight (although he tragically never achieved his full goal). This would be akin to learning about a world record and planning to break it 1000-fold. I can only describe this as an inhuman feat of optimism.

Once he knew he was serious, he told his family about his plan – and was met with discouragement (his mother later felt guilty). Despite this he continued, recruiting his friend Doug Alward (who cooked and drove behind him), and securing sponsors to provide the van, leg and shoes. The legendary Marathon of Hope thus began. In the first days of his run, he was met with a snowstorm, heavy rains, and gale-force winds. Undiscouraged, he continued without breaks for 143 days (bar a single two-day pause to time a fundraiser with Canada Day). Far worse for him was the disheartening lack of support and acknowledgment in the early days of the run (His first large donation would be just before leaving Newfoundland). He often fought with his companion Doug, and they were barely on speaking terms by the time they reached Nova Scotia. Later upon entering Quebec he was met with a harsh language barrier, and aggressive drivers who would force him off the road. This was an inhuman feat of perseverance.

Everything about this run is impressive, but the physical and athletic accomplishments are no laughing matter either. He ran 143 consecutive daily marathons, stopping only once to time his arrival into Ottawa. He did all this running on an old prosthetic: he had to hop-step the entire way to let the springs settle, and throughout he had blisters, bruises and intense pain which would become

tolerable only after 20 minutes of running. Every day, he began running at 4:30 AM and would sometimes go all the way to 7 PM. Near the end, he faced advanced lung cancer on top of all these challenges. I can only describe his run as a herculean athletic feat.

All the while, Terry took every opportunity he could to raise money for cancer, speaking to businessmen, civilians, press, other athletes and more. During his run, he had raised \$1.7 million (\$6 million dollars today) for cancer research, and others have raised far more in his name. By the time he reached Ontario, he was considered a national hero. Tragically, he died a martyr to advanced lung cancer, ending his run in Thunder Bay.

We finally have an answer to our question: Terry Fox was a hero because he had an altruistic dedication to his cause so intense that he pulled off a preternatural feat of optimism, tenacity and endurance. Furthermore, he brought incredible awareness and funding to a lifesaving cause, saving countless people from one of the world’s worst type of diseases.

Why do we still do Terry Fox runs today?

In 1937, the Canadian Cancer Society had an annual budget of \$14,000 (\$325,000 today). Today, the organization has a budget of \$130,000,000, of which nearly \$50,000,000 is spent on lifesaving research. The increase is simply the most easily seen impact of the awareness Terry Fox raised on cancer. Furthermore, the Fox organization has separately raised a cumulative \$1,000,000,000 over the years. It is hard to say exactly how much of this would have gone to cancer research without Terry Fox’s work, but it is undeniable that he has saved thousands of lives from cancer, and the research continues to save lives even today.

Another notable result is that Terry Fox reframed conversations about disability. He frequently refused to be labelled as “disabled,” saying that his circumstances instead made life more “challenging yet rewarding,” and has made lasting impacts on the perception of disability in Canadian society.

Whether it is done to pay homage to a great Canadian hero, or if it is done to inch cancer closer to its last malignancy – Terry Fox runs continue to embody a noble cause and are a wonderful addition to any community. Terry's story is a lesson to us all about the tremendous value of determination, and of the power of a single citizen for positive change.

Donations can be made to <https://terryfox.org/> or <https://cancer.ca/>, and next year’s run is on September 19th, 2027.

Unscramble the following four words, related to autumn.

RUNABU	
TEULSR	
XQNUOEI	
LIRAPCRETAL	

UNSCRAMBLE
#2026-A

Cosmic Voids: Pockets of Emptiness in the Universe

Yasmin Abu-Narr, 2T Mechatronics

Our universe is made up of the cosmic web, a large-scale structure made up of interconnected filaments and sheets of matter [1].

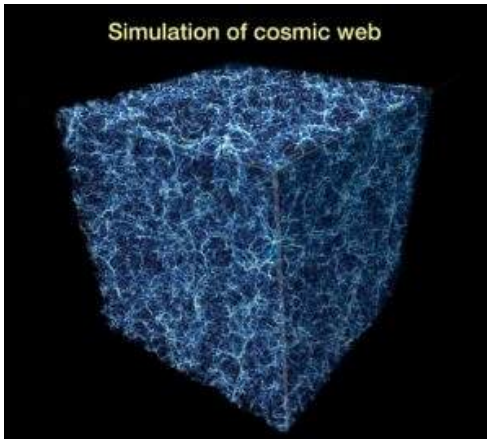


Photo Credits: NASA.
<https://science.nasa.gov/mission/hubble/science/science-highlights/mapping-the-cosmic-web/>

This image shows the cosmic web on a cubic scale. The blue filaments represent the matter (mostly dark matter, which is invisible to the eye), and the dark regions in between represent the cosmic voids [1].

The cosmic web is the largest known structure, but astrophysicists begin the organization of the universe at the stellar level. Stars are organized into galaxies. Galaxies then form galaxy groups; groups form galaxy clusters and superclusters; these make sheets, and finally, walls and filaments at the largest scale. These walls and filaments are separated by large voids, in the web-like mesh known as the “cosmic web.”

The largest known matter structure in the universe is the galaxy filament. Galaxy filaments are threadlike structures formed of walls that contain galaxy superclusters. They form the boundaries of voids.

Galaxy filaments are usually between 50 to 80 megaparsecs in length, however the largest confirmed galaxy filament, the Quipu, is 400 megaparsecs. The Hercules–Corona

Borealis Great Wall, a proposed, unconfirmed, galaxy filament would be the largest structure in the known universe, measuring an unimaginable 3 gigaparsecs (3000 megaparsecs) in length [2].

To provide context on the size of these cosmological objects, one parsec is approximately 3.26 light-years or 30.9 trillion kilometers [3]. The light-year is a measure of the distance light travels in one year. In one second, light travels 300,000 kilometers, and in one year it travels an astronomical 9.46 trillion kilometers [4]. For context, our Solar System is about 3.17 light-years or 0.97 parsecs in diameter (Note: parsecs are used to measure the distances between objects in our solar system and those outside our solar system; that is why our Solar System's diameter is less than one parsec) [3][5]. Our Solar System lives in the larger Milky Way Galaxy, which is approximately 100,000 light-years, or 30,660 parsecs in diameter. The alleged Great Wall filament would be almost 100,000 times the size of our galaxy, and 3 trillion times larger than our solar system!

Cosmic voids exist between these massive galaxy filaments. These abysses of empty space are enormous, between 10 to 100 megaparsecs in diameter. Although the definition of a cosmic void is still disputed, most researchers agree that cosmic voids are under-dense regions of space containing very few or no galaxies at all. This means that they have very low Mean Cosmic Densities (MCD) [6].

MCD refers to the idea of measuring the average density of matter in a region of space. This is found by counting the galaxies in a region, adding up their masses, and dividing that by the volume containing them (there is more complexity involved in this, however it is too time-consuming to discuss all the limitations). This value is important in understanding the critical density. The critical density is the minimum density needed to halt the universe's expansion. This value relies on

the Hubble Constant, a value that describes the universe's rate of expansion. For a Hubble Constant value of $H = 71$ km/s/Mpc (Unit: kilometers per second per megaparsec), the critical density is roughly 10^{-26} kg/m³. This number is tiny! It gives us an understanding of the emptiness of the universe. It is equivalent to 4 or 5 hydrogen atoms in a cubic meter of space. Comparably, it's equivalent to the density of a single grain of sand alone within the volume of the Earth [7]. Critical density is calculated with the following formula:

$$\rho_{crit} = \frac{3H^2}{8\pi G}$$

The critical density is proportional to the value of the Hubble Constant squared. This means that a larger density is needed to halt the expansion of the universe.

Cosmic voids are vastly under-dense. When the concept of critical density is applied to these vast regions of space, it is clear that they would be expanding at a faster rate than the rest of the universe. They coalesce with other voids and continue to comprise most of the universe.

The existence of cosmic voids is important to astrophysics and the study of the universe for various reasons; one being the (still disputed) existence of dark matter and dark energy. It may seem that cosmic voids are empty pockets of nothingness, but they are home to large concentrations of dark energy. Dark energy is a crucial component of the Big Bang Theory, and is integral to understanding the expansion of the universe [6].

Furthermore, voids exhibit properties of effective antigravity. The density of the matter at the edges of the void gradually pulls particles out of the void, creating a gravitational hill at the centre of the structure. The expansion of the void contributes to this antigravitational effect [6].

Additionally, a large mystery of cosmic expansion and the age of the universe may be understood by cosmic voids. The aforementioned Hubble Constant, named after the astronomer Edwin Hubble who discovered cosmic expansion in 1929, is an important factor in understanding how our universe expands. The relationship between how far away an object is and how quickly it recedes from us is known as the Hubble Constant. Multiplying this value by the distance yields the velocity of the expansion. For years, the age of the universe was estimated to be between 9.7 billion years and 19.5 billion years. However, the observations by the Hubble Space Telescope narrowed that region down to a single number: 13.8 billion years. This value has an accuracy of almost one percent, providing an incredibly precise prediction of the universe's age.

The Hubble Space Telescope measured expansion by observing two celestial phenomena in particular: Cepheid variable stars and Type 1a supernovae that have known brightnesses. These phenomena are distant from Earth, but since they have known brightnesses, scientists are able to measure how far they are. To do this, they compare the observed brightness to the actual brightness. NASA gives the analogy of observing the headlights of a car in the dark—if you know how bright the headlights should be, their distance can be calculated from how bright they appear.

The other way to determine the Hubble Constant is through analysis of the cosmic microwave background (CMB) of the universe. The CMB is the first radiation to travel through space following the Big Bang, and it is still detectable as a faint background radiation glow.

Both methods allow for the calculation of the Hubble Constant, but curiously they both result in different answers. Space telescope measurements find a Hubble Constant, or expansion rate for the universe, of around 70-76 kilometers per second per megaparsec

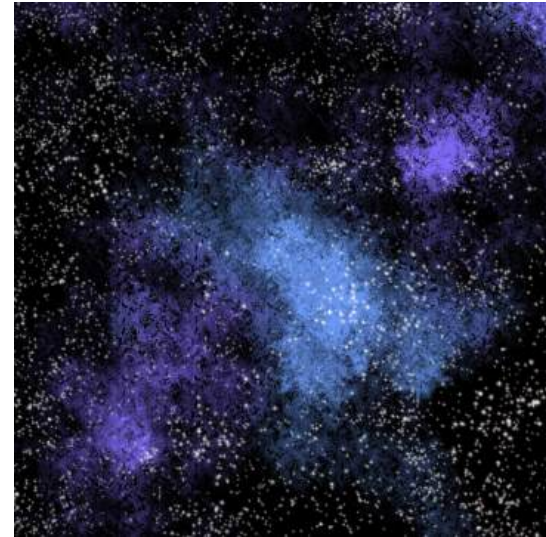
(which gives an age for the universe of about 13.8 billion years). Conversely, measurements derived from studying the CMB provide a Hubble Constant of about 67-68 kilometers per second per megaparsec. At first thought to be measurement error, it has since been determined to be a fundamental problem in our understanding of physics. Scientists call this discrepancy the "Hubble Tension." The Hubble Tension is an active topic of debate, and no conclusion has been reached as of yet, making it one of cosmology's largest mysteries of the present day [8].

One proposed solution to the Hubble Tension relates to cosmic voids. Our galaxy sits in the Local Group, a galaxy group that lies adjacent to the Local Void. This region of space is confirmed to exist, meaning the regions near our neighbourhood are under-dense. However, it is proposed that our galaxy, the Milky Way, resides in the KBC Void, also known as the Local Hole. The Local Hole is a supposed region of space that is roughly spherical, and approximately 2 billion light-years, or 600 megaparsecs, in diameter. Its existence is disputed, and there is still more research that needs to be conducted to understand our place in the universe—however the Local Hole could account for the discrepancy in the Hubble Constant.

As previously mentioned, objects are repelled from voids, and galaxies inside voids would experience a gravitational pull from outside of it. Since our galaxy resides in a void, it would experience a larger gravitational pull from the outside, resulting in a larger local value for the Hubble Constant. This is consistent with the value that the Hubble Space Telescope found [9].

There are many other theories pertaining to the Hubble Tension, however there isn't a generally accepted solution yet. The more we learn about our universe, the more we understand how much we do not know.

The next time you look at the night sky, consider that we live on a planet



floating in an enormous sea of a galaxy, floating in the nothingness of a void. Let it be a reminder to our smallness in the vast ocean of the universe, and let it guide you into a new understanding of our feebleness as humans.

References:

- [1] "Mapping the cosmic web - NASA Science," NASA Science, <https://science.nasa.gov/mission/hubble/science/science-highlights/mapping-the-cosmic-web/> (accessed Sep. 28, 2026).
- [2] "Large-scale Structure of the Universe," Wikipedia, https://en.wikipedia.org/wiki/Large-scale_structure_of_the_universe#Cosmic_Web:_walls,_filaments,_nodes,_and_voids (accessed Sep. 28, 2026).
- [3] "Parsec," Wikipedia, <https://en.wikipedia.org/wiki/Parsec> (accessed Sep. 28, 2026).
- [4] "What is a light-year? - NASA Science," NASA Science, <https://science.nasa.gov/exoplanets/what-is-a-light-year/> (accessed Sep. 28, 2026).
- [5] Unistellar, "How Big is the Solar System?," UNISTELLAR, <https://www.unistellar.com/blog/how-big-is-the-solar-system/> (accessed Sep. 28, 2026).
- [6] "Void (astronomy)," Wikipedia, [https://en.wikipedia.org/wiki/Void_\(astronomy\)](https://en.wikipedia.org/wiki/Void_(astronomy)) (accessed Sep. 28, 2026).
- [7] "Mean Cosmic Density," Teach Astronomy - Mean Cosmic Density, <https://www.teachastronomy.com/textbook/Cosmology/Mean-Cosmic-Density/> (accessed Sep. 28, 2026).
- [8] "Hubble Constant and Tension - NASA Science," NASA Science, <https://science.nasa.gov/mission/hubble/science/science-behind-the-discoveries/hubble-constant-and-tension/> (accessed Sep. 28, 2026).
- [9] "Local Hole," Wikipedia, https://en.wikipedia.org/wiki/Local_Hole (accessed Sep. 28, 2026).

The University of Waterloo's Militarist Shift: A Broad Overview

Matthew Wymer, 4A Mechanical

Editor's Note: This article is a thought-provoking piece. Views expressed in this article are those of the author and do not necessarily reflect opinions of The Iron Warrior or of the Engineering Society.

The University of Waterloo, along with the Kitchener-Waterloo Region, is rapidly militarizing. This is as the Federal government hurries towards spending 5% of GDP on 'defence' by 2035, as part of the Canadian Defence Industrial Strategy (CDIS) and NATO's Defence Investment Pledge [1]. This means increasing defence spending by over \$100 billion dollars yearly between 2026 and 2035! (For reference, it is expected that a Toronto-Quebec City high-speed rail line would cost \$60 to \$ 90 billion [2]. By the same token, the Office of the Parliamentary Budget Officer estimated in 2024 that chronic homelessness could be reduced by 50% with an annual investment of approximately \$4 billion annually [3].) Importantly, one of CDIS' aims is "...to better connect universities and colleges to defence priorities", and the University of Waterloo is positioning itself to be the prime recipient of funding for R&D projects concerning military & weapons technology [4].

The University of Waterloo (UW) is lobbying the Federal government primarily using two vehicles: the Canadian AI Adoption Initiative (CAIAI), and the Institute for Quantum Computing (IQC). Through the former, UW has been pushing the Federal government to invest in dual-use AI since as early as June 2025 [5]. This means the conversion of AI products from civilian or non-military use cases to military ones. Secondly, UW has been directly lobbying Federal MPs most involved with intensified Canadian militarism. This includes both Minister of National Defence, David McGuinty, and Minister of Defense

Procurement, Stephen Fuhr, the former of whom announced \$900 million dollars of funding for "defence innovation and quantum technology" on campus [6], [7]. Additionally, one of UW President Rosehart's first LinkedIn posts as president was about him discussing Waterloo Region's defence capabilities with Minister of Industry, Melanie Joly [8]. There is a clear and intentional mobilization of the University of Waterloo towards weapons spending, and that funding is being justified through the lens of sovereignty, innovation, and soft nationalism.

Militarist mobilizations can also be seen through regional organizations, but also university-interested organizations which are national in scope. Take U15 Canada, for example, which has the stated goal of working "...to optimize research and innovation policies and programs that advance knowledge, develop highly qualified leaders for all sectors, and mobilize knowledge for the benefit of all Canadians" [9]. The organization is based upon the top 15 research Universities in Canada, and the organization's CEO, Robert Asselin, has dedicated a significant amount of his time to military spending and military research. Asselin stated in an interview with Public Policy Forum that just as the Defence Advanced Research Projects Agency (DARPA) had a leading role in bolstering the modern U.S. weapons industry, Canada's research ecosystem should follow in parallel [10].

The University of Waterloo's militarism is not new, but it is intensifying. This is reflected primarily through the University of Waterloo's investments and weapons-related research funding, and through the promotion of weapons technology development throughout Waterloo region conferences and start-ups. The latter component of this reflection should be investigated further in a separate article.

When analyzing the University of Waterloo's Endowment & Pension Funds,

which comprise the majority of overall investments, a disproportionate increase of investments into weapons manufacturers can be observed. Some of those companies include General Dynamics at 33.6%, Raytheon at 74.3%, a 176.9% increase in the Israeli weapons company Elbit Systems, and a whopping 198.1% increase in Palantir Technologies [11], [12]; a quick Google search about Palantir will reveal all kinds of dystopian quotes by the company's CEO, Alex Karp. This can also be said about the aggregate increase of 25 of the weapons manufacturers that the University is invested in. While the total dollar value of the University's Endowment & Pension Funds grew by 9.59% from 2025 to 2026, the University increased its investments in those 25 weapons manufacturers by 56.2%.

With regard to weapons research, a majority of such projects are undertaken through the IQC. As reported in Waterloo News in March, the National Research Council (NRC) announced \$161 million towards "Canada's leadership in quantum technology for defence and security applications" [13]. More funding towards defence & dual-use tech was announced in July, as part of a \$7.1 million dollar 'Discovery Grant' [14]. Moreover, the University is expected to stimulate hundreds of thousands of dollars in defence and dual-use research through Canada Impact Research chairs and Canada Impact Research Training Awards (CIRTAs) [15]. In conjunction with the fact that the University of Waterloo has lobbied the Federal government for weapons spending five times in 2026, its position within the militarization of the economy becomes clearer.

Terminology such as defence & dual-use technology is euphemistic at best, and dishonest at worst. Secretary-General of NATO, Mark Rutte, said that NATO "is a platform for the United States to project power on the world stage" [16]. He reiterated this in September, stating that

more than 5000 planes had taken off from European bases in the United States' war of aggression on Iran, known as "Operation Epic Fury" [17]. Thus, Canada's militarization is interlinked with NATO's Defence Investment Pledge, which in turn serves as a platform for U.S. power projection.

The University of Waterloo's militarization is a symptom of Canada's expanding military-industrial complex to support, through NATO, the United States' power projection. In practice, this looks like Canadian-owned companies such as Streit Group supplying military technology to the Rapid Support Forces in Sudan, "a Sudanese paramilitary force that stands accused of genocide" [18]. It looks like Canadian eagerness to support the U.S. war of aggression on Iran, which Prime Minister Mark Carney said was 'worth it' [19]. Finally, it looks like Canadian companies exporting military goods, both directly and indirectly, to a state committing genocide in Gaza [20]. On September 16th, 2025, the United Nations Human Rights Office of the High Commissioner stated: "It is clear that there is an intent to destroy the Palestinians in Gaza through acts that meet the criteria set forth in the Genocide Convention" [21].

As stated in the Professional Engineers of Ontario's (PEO) 2013 Code of Ethics, "...professional engineers have a clearly defined duty to society, which is to regard the duty to public welfare as paramount, above their duties to clients or employers" [22]. As engineers at the University of Waterloo, we should be very conscious about exactly what and where our labour power is being devoted to. Our duties towards clients, employers, and even projects pertaining to national 'interests' or 'priorities' are being superseded by our duty to public welfare. It might be argued that if an engineer doesn't take up a job in weapons manufacturing, that someone else will. However, the engineer who does take that opportunity should know that their labour may be inextricably bound to companies and projects which run counter to their paramount duty as a professional engineer. In conjunction with the fact that the companies involved in Canada's military-industrial

complex are devoted to ever-increasing corporate profits through the successful marketing of their weaponry above all else, the likelihood that the engineer abrogates their paramount duty grows significantly.

Readers should determine whether it is necessary for the University of Waterloo to militarize, or demilitarize.

References:

- [1] "Canada joins new NATO Defence Investment Pledge." Prime Minister of Canada, Jul. 10, 2025. <https://www.pm.gc.ca/en/news/news-releases/2025/06/25/canada-joins-new-nato-defence-investment-pledge> (accessed Sep. 28, 2026).
- [2] "How much will Alto's high-speed rail cost Canadians and how is it funded?" Alto. <https://www.altotrain.ca/en/faq/how-much-will-altos-high-speed-rail-cost-canadians-and-how-it-funded> (accessed Sep. 28, 2026).
- [3] B. Segel-Brown, "Federal spending to address homelessness." Parliamentary Budget Office, May 22, 2024. <https://www.pbo-dpb.ca/en/publications/RP-2425-005-S--federal-spending-address-homelessness--depenses-federales-matiere-itinerance> (accessed Sep. 28, 2026).
- [4] "Canada's Defence Industrial Strategy", Government of Canada, Feb. 2026. <https://www.canada.ca/en/departement-national-defence/corporate/reports-publications/industrial-strategy/security-sovereignty-prosperity.html> (accessed Sep. 28, 2026).
- [5] J. Blit, D. Goldfarb, P. Samson and S. Tapp, "Recommendations." <https://www.aiadoption.ca/recommendations> (accessed Sep. 28, 2026).
- [6] Office of the Commissioner of Lobbying of Canada, <https://lobbycanada.gc.ca/app/secure/ocl/lrs/do/advSrch?searchCommand=navigate&time=1790880442324> (accessed Sep. 28, 2026).
- [7] "New federal funding set to reinforce Canadian quantum tech and innovation | Institute for Quantum Computing | University of Waterloo." Waterloo News, Mar. 11, 2026. <https://uwaterloo.ca/institute-for-quantum-computing/news/new-federal-funding-set-reinforce-canadian-quantum-tech-and> (accessed Sep. 28, 2026).
- [8] B. Rosehart, "It was a pleasure to join the Honourable @Mélanie Joly and the Honourable @Bardish Chagger at the Accelerator Centre today..." LinkedIn, Jul. 08, 2026. https://www.linkedin.com/posts/bill-rosehart_it-was-a-pleasure-to-join-the-honourable-ugcPost-7480741218109464576-6N8S/ (accessed Sep. 28, 2026).
- [9] "About us - U15 Canada," U15 Canada, Nov. 12, 2024. <https://u15.ca/about-us/> (accessed Sep. 28, 2026).
- [10] Public Policy Forum, "Robert Asselin on the race to build top Canadian talent | WONK with Amanda Lang," YouTube. Apr. 16, 2026. [Online].

Available: <https://www.youtube.com/watch?v=nxY6lHMqsw> (accessed Sep. 28, 2026).

See 24:30

[11] "Pension investment list | Finance | University of Waterloo."

<https://uwaterloo.ca/finance/pension-investment-list> (accessed Sep. 28, 2026).

[12] "Endowment investment list | Finance | University of Waterloo."

<https://uwaterloo.ca/finance/endowment-investment-list> (accessed Sep. 28, 2026).

[13] "IQC showcases research and innovation during Defence Minister visit | Institute for Quantum Computing | University of Waterloo." <https://uwaterloo.ca/institute-for-quantum-computing/news/iqc-showcases-research-and-innovation-during-defence> (accessed Sep. 28, 2026).

[14] "Waterloo researchers awarded more than \$7.1 million in funding | Waterloo News | University of Waterloo."

<https://uwaterloo.ca/news/waterloo-researchers-awarded-more-71-million-funding> (accessed Sep. 28, 2026).

[15] "Canada Impact+ Research Chairs program at University of Waterloo | Research | University of Waterloo." <https://uwaterloo.ca/research/find-and-apply-funding/find-funding/canada-impact-research-chairs-program-university-waterloo> (accessed Sep. 28, 2026).

[16] Newsmax, "NATO Secretary General: There is widespread support for Trump's Iran actions | The Record," YouTube. Mar. 04, 2026. [Online].

Available: <https://www.youtube.com/watch?v=ELN15s42KjM> (accessed Sep. 28, 2026).

See 7:00

[17] Chicago Council on Global Affairs, "The Chicago Council on Global Affairs Hosts a Conversation on NATO's Future with Secretary General Mark Rutte and Ambassador Matthew G. Whitaker," Chicago Council on Global Affairs, Sep. 22, 2026. <https://globalaffairs.org/chicago-council-global-affairs-invites-you-conversation-natos-future-secretary-general-mark> (accessed Sep. 28, 2026). See 52:08

[18] G. York, "Armoured vehicles from Canadian-owned company deployed in Sudan's war zones," The Globe and Mail, Aug. 26, 2025. [Online].

Available:

<https://www.theglobeandmail.com/world/article-sudan-war-armoured-vehicles-canadian-owned-company/> (accessed Sep. 28, 2026).

[19] R. Rafique, "Carney again praises U.S.-Iran peace deal after calling war 'worth it'," CBC, Jun. 19, 2026. [Online]. Available:

<https://www.cbc.ca/news/politics/carney-calls-iran-war-worth-it-9.7240579> (accessed Sep. 28, 2026).

[20] A. Cosh, "Canada exported \$14.6 million of military goods to Israel in 2025," The Maple, May 29, 2026.

<https://www.readthemaple.com/canada-exported-14-6-million-of-military-goods-to-israel-in-2025/> (accessed Sep. 28, 2026).

[21] "Israel has committed genocide in the Gaza Strip, UN Commission finds," Sep. 16, 2025.

<https://www.ohchr.org/en/press-releases/2025/09/israel-has-committed-genocide-gaza-strip-un-commission-finds> (accessed Sep. 28, 2026).

[22] "Code of Ethics," Professional Engineers Ontario, <https://www.peo.on.ca/licence-holders/code-ethics> (accessed Sep. 28, 2026).

3 Tips on Midterm Preparation

Tin Chi Cheung, 1T Architectural



STUDY UNTIL THE JAR IS FILLED WITH TIPS

3M @ 15 hrs ago 0 Live

30K | 1 | 1

1 GET ENOUGH REST



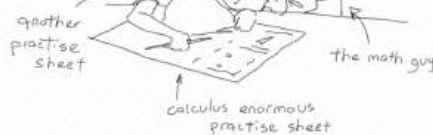
1. use a heavy duvet super

(that has one side significantly longer than the other)



2. do some maths?

Poor kid, must be tired. Let's help you stay warm.



3. Visit WUSA sleep centre (which exists, appear)

HARD 99%
USEFUL 100%

book appointment



2 STUDY SMARTER, NOT HARDER

BUT HOW?



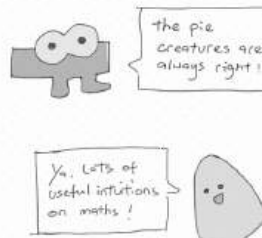
1. eat some smarties

what's sponsored by smarties?



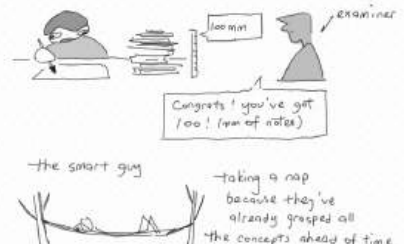
2. explore great resources

there's hundreds of great contents on YouTube!
like 3b1b (math), Primer (game theory), Chubbyemu (medicine), etc etc...



3. Practise with intention

dummy: practises for a higher stack of wastepaper.



3 STUDY, PLAY, STUDY!

According to a renewed study, the ones who participate in multiple types of activities usually get better in some commitments than those who only focus on one thing!

On the right shows the subjects of the study! their skills are rated in 10.



sleeping — 10
swimming — 10
academic — 9
badminton — 7
piano — 9
reading the 1000th book — 10
socialising — 9
painting — 8
goose-hunting — 10



academic — 6
reading the 1000th book — 7

Editor's Note: The WUSA Sleep Centre doesn't exist. However, the Waterloo Sleep Institute does! Check them out at <https://waterloosleep.ca/>

OWeek Photo Contest Winners!



Photo submitted by: Sana Huang (SYDE '31)



Photo submitted by: Evelyn Goossens (BME '31)

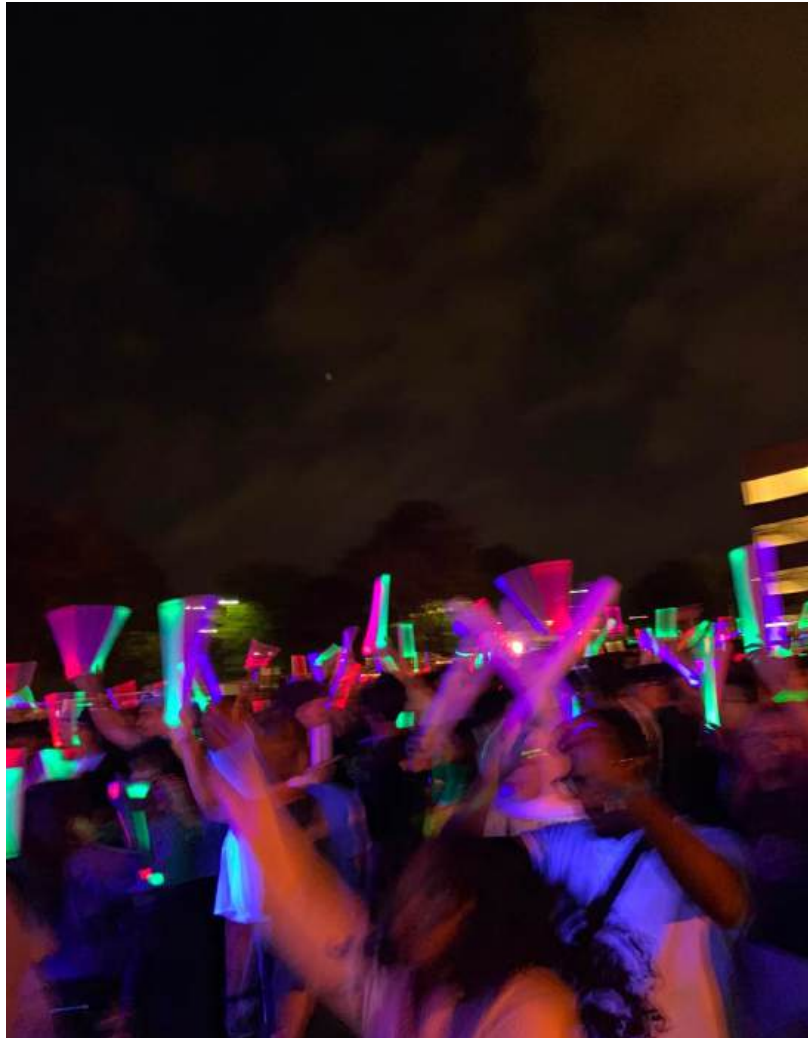


Photo submitted by: Dhyhan Patel (ME '31)

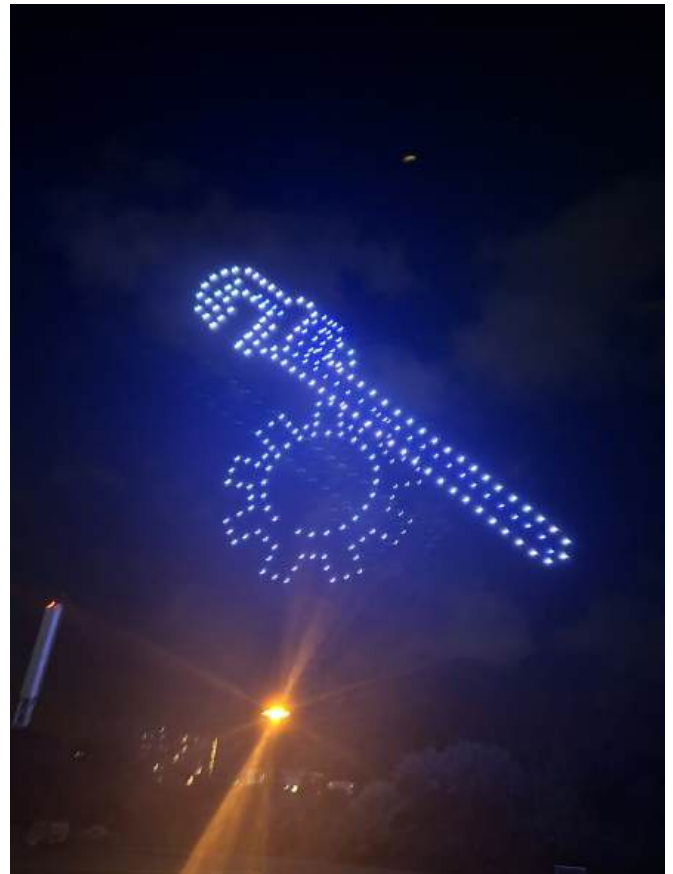


Photo submitted by: Anne Marie (SE '31)

**Calling all *design
teams + engineering
clubs!***

GET FEATURED IN THE IRON WARRIOR!

**Fill out the form in bio to
request an interview.**



THE IRON WARRIOR

Eng Prof Quotes!

[response to a student asking a valid question on Teams] "What's the rule?"

Marc Aucoin, CHE 180

"If you don't remember this equation for the exam, you're cooked."

Patricia Nieva, MTE 203

"If I'm attracted to you and you're attracted to me, I'll make sure you get good grades."

Hamed Shahsavan, CHE 102

"Are you sure that's the right density? Ask ChatGPT."

Hamed Shahsavan, CHE 241

"You get accolades or they throw eggs at you."

"You don't want to be an evil engineer right?"

"Me, myself and I. That's your team. And AI!! Claude or GPT."

Krzysztof Czarnecki, SE 101

"Degrees are made up nonsense, radians are cool, and is where it's at."

"The next proof is one of my favourites and I like to present this as a very cute proof."

Sachin Kotecha, MATH 117

"What is a model? Not me in fancy clothes." *dances*

"Am I the last guy today? Oh my God" *blushes*

Krzysztof Czarnecki, SE 101

"I liked it better running with long hair cuz then like, the wind would blow in your hair but happy wife, happy life yknow?"

Douglas Harder, NE 112



To submit Eng Prof Quotes, use this QR code or go on our website: <https://iwarrior.uwaterloo.ca/>



"What do you love most about the fall term?"



"I like that fall in Waterloo feels like a reminder that change can be beautiful. The leaves change, the air gets colder... There's something comforting about it, and it's analogous to a new start."

ARIC, BME 4A



"It's been a blast reconnecting with friends that I haven't seen in so long after our longer internships! Also loving the weather currently."

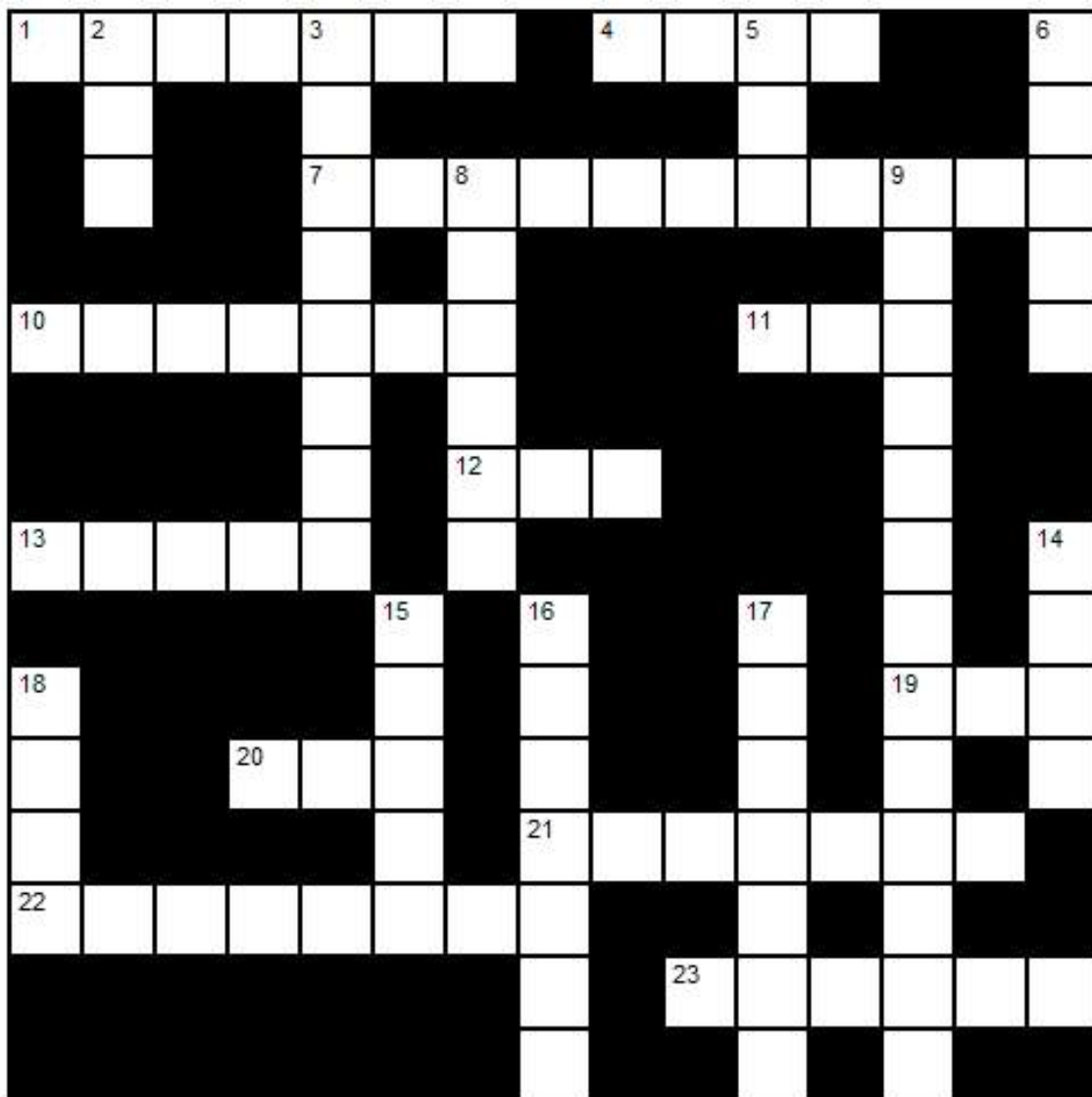
VANESSA, BME 4A



"My favourite thing about the fall term is the weather getting just to the right temperature to wear sweaters but it also not be too cold outside."

AKIL, TRON 4A

F26I2 Crossword



Past Sudoku/Crossword Solutions ->



Across

1. Common software utilized in first year CAD courses
4. Residence tied for having the most floors
7. Design Team established in 1988, with a focus on solar-powered electric vehicles (two words)
10. A subset of physics problems which most engineers must go through at some point
11. Organization that awards you your P. Eng, hopefully! (acronym)
12. Residence tied for having the most floors
13. Last name of the current Engineering Dean
19. Number of buildings on campus with the word "Languages" in it
20. First thing you draw when solving a physics problem (acronym)
21. Number of Undergraduate Engineering Programs within the Faculty of Engineering (including Architecture!)
22. GradComm's Prom equivalent
23. Business school wedged inside PSE

Down

2. The trenches of first-year residences
3. PHYS 115 professor associated with the phrase "If I throw my keys!"
5. Location of the Arch Eng Studio
6. Best floor of Dana Porter to study on (or highest, at least)
8. GradComm event in October which involves drinking an entire bar dry!
9. Chemistry concept involving the balancing of products and reactants
14. Endowment Fund Associated with the Engineering Faculty (acronym)
15. Longest Serving Engineering Dean
16. Design team focused on innovative water and wastewater solutions across southern Ontario
17. The Sixty-inch triple chrome-plated adjustable pipe wrench's nickname (two words)
18. Professional Engineering license, colloquially!

Want to join our team?
Come to our meetings! See Discord for info!

LOCATION:
Douglas Wright Engineering (DWE)
Room 3520 & Online



THE IRON WARRIOR



@theironwarrior_uw

theironwarrior@gmail.com