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THE IRON WARRIOR

THE NEWSPAPER OF THE UNIVERSITY OF WATERLOO ENGINEERING SOCIETY

VOLUME 36 ISSUE 12 | WEDNESDAY, OCTOBER 21, 2015

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Waterloo Produces Engineering Emmy Winner:

ECE Professor Wins Emmy for Development of Video Quality Measurement Tool

NINA FENG
4A ENVIRONMENTAL

Zhou Wang, an ECE professor here at the University of Waterloo, has won an Emmy award for his work developing the Structural SIMilarity (SSIM) Index, used for the measurement of video quality. The co-founder and Chief Scientist of SSIMWave Inc., along with his co-creators from NYU, the University of Texas, and Samsung, will receive the award on October 28 in Los Angeles, California. The ceremony will be fittingly hosted by Josh Brener, who plays Bighead on HBO's Silicon Valley.

According to The Television Academy, the award is presented only to those who have contributed to developments that significantly improve the transmission, recording, or reception of television. This year, there are two more recipients of the Engineering Emmy, which includes EdiCue, a workflow software that helps to sync sound cueing systems, and SpeedTree, a way to facilitate the design and creation of trees and vegetation by artists. The SSIM algorithm family, invented more than a decade ago by Dr. Wang, is used for predicting human perception of video quality. It makes use of neuroscience-based models of visual systems in the human brain in order to refine video quality. It is capable of being applied in real-time and with relatively simple computation and little need for additional hardware.

The algorithm is now the most widely-used tool for television broadcasting and post-production, with Wang's papers, most notably the ones pertaining to structural similarity, being the most frequently cited sources in the image processing field all over the world. The applications are also ever-growing, as it is predicted that within the next two years, video-based material will account for more than three-quarters of internet traffic, a dominant source of video data. Furthermore, it can also be used in medical imaging and satellite transmission. The use of this software improves the visual experience for viewers, minimizes bandwidth use, and therefore improves streaming quality and speed.

Professor Wang is not only the recipient of an Emmy; the IEEE fellow also received the E.W.R. Steacie Memorial Fellowship Award from NSERC (Natural Sciences and Engineering Research Council of Canada). Nowadays, his team at SIMWave Inc., a spinoff company operating at the Accelerator Centre in David Johnston R & T Park, serves to further develop tools for video quality monitoring, diagnosis, and compression.

Professor Wang's achievements are truly remarkable, and the university is fortunate to have him imparting his knowledge and furthering research within these walls.

Waterloo Stories, uwaterloo.ca

Professor Wang's research has wide applications beyond increasing your video streaming experience.

Laurier University Locked Down

Online threat sparks intensive sweep of WLU Waterloo Campus

Wilfred Laurier University

LEAH KRISTUFEK
4A CHEMICAL

Staff and students at Wilfrid Laurier University were told to stay away from campus last Friday as authorities combed the area surrounding the WLU science building for five hours before lifting lockdown at 11:30 am. The response, which included helicopters flying over the university, was prompted by an online threat in what is turning out to be a bizarrely international incident. It was the FBI which alerted WLU authorities after finding a message on an anonymous 4chan forum resembling that made by the gunman responsible for the Oregon community college which claimed nine lives on October 1. The information was passed on as more of a 'Heads up', as Supt. Pat Dietrich of the Waterloo Regional Police Service (WRPS) told media. Authorities have since arrested a 22-year-old man living in London, England in connection to the online threat.

For Waterloo students, many of whom may have received concerned messages from parents or noticed the heightened police presence, the threat may have seemed a little confusing. Especially since the majority of WLU students were enjoying a prolonged Thanksgiving break thanks to their fall reading week. The theory that a student may have called in a prank threat to get out of a scary exam was considerably less likely.

As a woman studying engineering the news of the threat immediately made me think of the 1989 École Polytechnique Massacre which took place in Montreal, Quebec. A 25 year old man shot 28 people, killing 14 women. Although it seems like campus shootings are increasingly common these days, at the time, the massacre, which focused on female engineering students because they were 'feminists,' shocked the world. Had this been a real threat, it is hard to say what the story might have been. Mental health issues and increased exposure to violent video games might have been brought up, as was the case for the Oregon shooter.

Undoubtedly university can be an enormously stressful time. Success in post-secondary school opens doors for life after school and failure is a very real possibility. To achieve that lofty goal of succeeding you must make it through a barrage of assignments, projects and exams. In addition, students may be wrestling with a sense of identity and belonging as they adapt to the university social sphere and living away from home. All these factors can combine to put students under incredible stress.

In this technological age, many people who feel isolated seek contact over online sites. Admittedly anonymous online communities allow people to vent their frustrations, however there is little framework available to help people when they are away from those online communities.

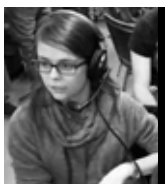
The types of content posted online can vary significantly and the tone of a message is not easily conveyed. (Like saying 'bomb' in an airport. It is not clear if you are jokingly saying 'bomb' or actually frantically shouting 'BOMB').

Authorities looking for threats online do not have a convenient tonal converter. In the case of the post which threatened the WLU science building, it gave the impression that the poster wanted to warn a select few not to go near the science building to ensure they wouldn't get hurt. The message was eerily similar to that of the Oregon shooter and suggested some sort of large impact event. It is also a message which has been jokingly emulated for other less malevolent uses. What is concerning here is the anonymity of the Internet. Although in retrospect the person who posted the threat may very well have been referring to somewhere much closer to (his/her) home, it was nevertheless incumbent on local Waterloo authorities to react. Tracking down the person who posted the message was a joint effort on the part of WRPS, RCMP and the national cyber-crime unit.

Given the high price that could be paid if a legitimate threat went ignored, no one can blame WRPS's speedy response. After all, as Supt. Dietrich said, "it is always better to err on the side of safety." Next time you see someone who seems overwhelmed by school stresses or just a little left out of the crowd take a moment to say hello and let them know they aren't alone. It's a big world, but we can make our tiny part of it a safe and welcoming community.

Letter from the Editor

Change, Culture, and The Number Twelve



MEAGAN CARDNO
EDITOR-IN-CHIEF

Welcome back, dear readers, and forgive the clichéd introduction. Last issue, it was the end of September and term had only just entered full swing, and I wrote to you about the promise of the future and how the autumn season always fills me with a feverish desire to do as much as I can. With our second issue, we approach the end of October, and the term has just crested into the inevitable accelerating mess of a downhill slide as we enter the clutches of Hell Week.

To the first years that have already begun their good fight with the rapid wash of midterms, keep strong! You can and will get through this, just keep your head above the water, and remember that sleep, eating, and breathing are generally advisable for survival. To the upper years that still await their own midterms… I think you all already know more than I can advise. May the Forsey be with you.

This issue is – if I may say so myself – a real gem. Donovan will let you in on a few of uWaterloo's best-kept secrets (unless you are a wise and informed *Iron Warrior* reader), while Raessa goes in-depth on the nature of the niqab controversy, and its political significance. You can also look more into Caitlin and Cameron debating the benefits and consequences of delaying assignment deadlines.

In the way of columns, aside from the continuations of the series you have all come to know and love, we have four brand-new columns to look forward to! Donovan begins flexing his critiquing muscles in *From Page to Page*, where he reviews the Sci-Fi time-travelling comic book epic, *Chrononauts*. Meanwhile, David gives you a few pro-tips on how to carve an appropriately festive pumpkin for the Halloween season in his new *How-To* column. Finally, Tina gives her own playlist of jams to check out in *On Replay*, and Donovan reviews some local draughts in *Broskies on Brewskies*.

Speaking of Donovan and Caitlin, shoutouts to both of them for all of their content this issue. They are both the unofficial Iron MVPs for this issue. And, as always, thanks to Nina and Leah for sticking around the majority of the weekend and helping me do all the things that need to be done. You all gain my non-refundable seal of approval!

Last issue, I spoke somewhat briefly on how autumn is, in my opinion, the season of change. I have given it further thought in the past three weeks (over a plentiful meal of turkey, I might add. I hope you all enjoyed your long weekend), and found myself pondering the nature of change in itself, and how we as people seem to, as a general rule, oppose change, as if following some skewed version of Newton's third law.

It's a matter that has even earned itself its own fancy Latin phrase— we are told to maintain the status quo before bringing out unnecessary change. And, of course, this mentality of choosing, by default, to oppose change has its own benefits, as trivial changes that elicit no real benefit are typically nothing but a waste of time and resources (just imagine the excess cost associated with constantly changing, say, the colour of your bedroom walls every week).

But at what cost is this default? Allow me to give an example.

One topic (of many) that gets me excited in conversation is the idea of the dozenal numerical system, to replace our base-10 decimal system with one using a base-12. While initially it seems like such a trivial change, I have no doubt that it would inherently benefit us as a culture to have a system favouring divisions of two, three, four, and six rather than simply two and five, as five is (both literally and theoretically) a rather odd number.

In fact, I would go so far as to argue that only reason five is a significant number at all is because of the decimal system we have chosen. Aside from it being one of only two factors of ten, it is itself both odd and prime, and occurs naturally only in a select few locations— primarily, as the number of digits we (and many other animals) possess on our hands and feet. Three, four, and six are all far more common numbers that we observe naturally.

We as a society have also developed systems that benefit inherently from a dozenal system— imperial units that contain 12 inches in a foot, and 144 things in a gross. We package many things (not simply eggs) in dozens, for the convenience of having either 4x3 or 6x2 grids available. Even our time system even clearly favours a dozenal system, with 60 seconds in a minute, 60 minutes in an hour, 24 hours in a day, 12 months in a year. This isn't even addressing how common fractions, such as 1/3, 1/6, and 1/9, are no longer ugly to write out in digit— they become 0.4, 0.2, and 0.14, respectively. Now, isn't that convenient?

But alas, for all the added convenience and logic that would come from replacing our rusty, inefficient decimal system for the all-around superior dozenal system… I know that there is almost no chance of society making the swap, at least not in my foreseeable lifetime. Why? Obviously, because the perceived hassle greatly outweighs the conveniences that would come from the change. Centuries of using the decimal system have understandably made us rather fond of it. And from a logistical perspective, even if we could convince all of the countries of the world to make the switch, the required costs to replace and erase any device or process that utilizes the old decimal system would be gargantuan.

So, you might be asking: "why all the bitterness, Meagan?". Well, aside from the fact that this is a matter that I would wholeheartedly support, given the opportunity, it also represents something that I see happen far too much in society as a whole— a defaulting disdain towards change that is seen, in some regard, as "not valuable enough". Even if something has merit as an improvement from status quo — potentially minor, yes, but still a notable improvement — the general opinion on the matter is to dismiss the idea.

Frustratingly, at times it feels as though this is primarily a matter of laziness within ourselves. If we know two routes to lead to the same end result with little or no added benefits or consequences, chances are that we would opt to take the easier route. Thus, any perceived additional effort to change will often result in the potentially beneficial opportunity being dismissed— even if the associated "cost" in effort is less than the potential benefit.

To draw the analysis to chemistry (which I will do in any situation a heartbeat), there is still an associated activation energy for the reaction to occur, even if the products are energetically more favorable. In this analogy, there has to be sufficient perceived reward in order for change to come about— the reaction is not instantaneous.

You might say "Well Meagan, what else did you expect? Nothing comes free." Well, yes and no. I don't expect large changes to come free of charge— but, the fact that even minor changes, ones that should be intuitive to accept, are far more difficult to initiate than necessary and, as a result, are worth.

What causes this high metaphorical activation energy? Is it because we are simply that lazy? Do we have some sort of inherent fear of change that causes us to shy away from change?

Perhaps what upsets me most is how much this can lead to the thought that progress, change, even exploration can be viewed as an inconvenience. Innovation— the word that we as engineers should salivate at the sound of— could be seen as 'not worth it.' Too much of a hassle. After all, if it isn't broke, don't fix it, right?

Well, that's not a mindset I can bring myself to support. And I hope it's one that some of you can recognize and criticize yourself. After all, if we are to bring about any true improvements in the world, we first have to be willing to face the difficulties and complications that come with trying to make a difference.

Issue #2 Deadline: Friday, October 16 at 6:00pm for publication on Wednesday, October 21, 2015
Send your submissions to *iwarrior@uwaterloo.ca*
Fall 2015 Publication Schedule: September 30, October 21, November 4, November 18, December 2

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The Newspaper of the University of Waterloo Engineering Society

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The Iron Warrior encourages submissions from students, faculty and members of the university community. Submissions should reflect the concerns and intellectual standards of the university in general. The author's name and phone number should be included.

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Mail should be addressed to *The Iron Warrior*, Engineering Society, E2 2347, University of Waterloo, Waterloo, Ontario, N2L 3G1. Our phone number is (519) 888-4567 x32693. E-mail can be sent to *iwarrior@.uwaterloo.ca*

Niqab: "Weapon of Mass Distraction"

RAEESA ASHIQUE
1T ELECTRICAL

I, for one, am frustrated with the ongoing niqab discussion, and I apologize in advance if you share my sentiment.

The niqab is a face veil worn by a small minority of Muslim women which is currently drawing a lot of controversy due to the Conservative government's strong opposition to it, and finds a woman named Zunera Ishaq caught in the middle of the storm. I will let Ishaq introduce herself:

"I am a mother. I am university educated. I believe that the environment needs saving and I try to do my part by joining campaigns to plant trees. Chasing my boys in the snow is one of the things I love most about winter. I believe we should strive to give back to others, and for me that means volunteering: at women's shelters, for political candidates or at schools.

I also wear a niqab. And according to my prime minister, that is all you need to know about me to know that I am oppressed."

In 2011, then immigration minister Jason Kenney implemented a policy banning the niqab during the public oath component of the citizenship ceremony. Since then, Ishaq is one of only two women who have refused to oblige.

The 29-year-old came to Canada in 2008 from Pakistan, and has been eligible for citizenship since last year. However, she refuses to compromise her religious beliefs and "will not take [her] niqab off at that ceremony for the sole reason that someone else doesn't like it, even if that person happens to be Stephen Harper."

Here is what many people do not know: the public oath is purely ceremonial. Ishaq has willingly agreed to remove her niqab in a private room before the oath ceremony in order to be identified, and has done so before for "security and identity reasons", such as for a driver's license photo or when going through airport security.

Last year, Ishaq challenged the legality of the niqab ban which she won in federal court. The Conservative government appealed the ruling, but Ishaq won again last month. Then, two weeks ago, the Federal Court of Appeal dismissed a government request to suspend the ruling. On October 9, Zunera Ishaq became a Canadian citizen, swearing the oath with her face covered. She will be able to vote in this year's election. Whether or not this ruling is sent to the Supreme Court will likely depend on the elected party.

For the record, Ishaq is a strong, independent woman with a mind of her own. When discussing her decision to start wearing a niqab, she clearly stated, "It was my personal choice. Nobody has ever forced me." She comes from a family in which women do not cover their hair, let alone their face. In fact, her parents tried to convince her not wear it as a teenager, and her husband was of the opinion that she should comply with the law and remove her niqab for the ceremony. However, Ishaq's desire to "live on [her] own terms" caused her to stand up for her religious rights. I think it is pretty clear that the only ones telling Ishaq what to do or how to dress are Harper and Kenney.

I love Ishaq's comment on the matter: "I am looking, however, for Mr. Harper to govern according to the law of Canada and not according his own personal preference."

This should have been one woman's legal triumph against the government, but the niqab issue has attracted a huge amount of attention since it came up in the final leaders' debate on October 2. NDP leader Tom Mulcair, Liberal leader Justin Trudeau and Green Party leader Elizabeth May all oppose the policy, but Bloc Québécois leader Gilles Duceppe sides with the Conservatives, along with 82% of Canadians as public polls indicate.

Harper also announced that, if re-elected, they would examine banning public servants from wearing the niqab. When asked why the government should have a say in what women wear, he responded that it is important to promote the idea that Canada is a "society of openness and of equality" and kept arguing that they're "on side with public opinion on this". However, the general public is likely not aware that Ishaq allowed herself to be identified prior to the ceremony, and therefore cannot be labeled as a security risk. I wonder how the public would have responded in the poll had they known the whole story.

Alex Urosevic for the National Post

Zunera Ishaq has made headlines across Canada for refusing to remove her niqab during a Canadian citizenship ceremony.

Ishaq's lawyer, Lorne Waldman, said that Ishaq was troubled by the way her case was politicized in this campaign. Most noticeably, the Conservatives have enjoyed a major jump in popularity since Ishaq's case. They have moved from third place in the polls, to enter a close race in first, with the NDP lagging. So why could a series of Conservative court losses boost their support?

Mulcair is calling the niqab issue a "weapon of mass distraction"; it is causing division in society and diverting attention from real problems. People are focusing their attention on an invented issue: whether or not a woman should be granted citizenship if she chooses to swear the oath with her face covered. They forget about everything else going on in this country.

If Harper believes himself to be an advocate for women's rights, why don't we talk about missing and murdered Aboriginal women? Why don't we talk about equal wages in this country? If he wants to promote "openness", why don't we talk about the Syrian refugee crisis? (Aside: if anyone needs an education or needs to realize that others have it worse, go check out Humans of New York. They did a series on refugees migrating across Europe.) Why don't we talk about the atrocities going on in Palestine and the Middle East? While we're at it, there are so many real issues that are not getting as much publicity, such as the economy, health and child care, and Bill C-51, which, by the way, is an infringement on our rights. Instead, we are spending our time talking about an issue which affects a very tiny minority of Canadians. Let me tell you, there are a lot more Aboriginal women and Syrian refugees and innocent Palestinians who need our help.

I do agree that this is a non-issue. Who cares what mine or anyone else's opinion is on the matter: there is no point discussing it to this great of an extent. As Mulcair said, "The courts have ruled in this case and once the courts have ruled, it's no longer a question of what you like or what you don't like."

However, I do not think the real tragedy is that we are wasting time talking about the niqab. I am going to be cynical and assume that many Canadians are not clear on the different parties's platforms, and it is unfortunate that this has become the hottest topic at the tail end of the campaign. I think the real tragedy is that people will base their vote on the one topic they know about when the election's outcome should not be affected by something so irrelevant.

By the time you are reading this, the election will be two days past. Until then, all I can hope is that people do a little bit of research. I think it's a shame that some will waste their vote when they have no real idea what they are vot-

US to Reduce Offshore Drilling for Oil and Gas in the Arctic

NINA FENG
4A ENVIRONMENTAL

LEAFY THOUGHTS

The US Department of the Interior has declared that it will no longer be selling leases or extending current ones for offshore drilling projects in the Arctic. The announcement comes after Shell's withdrawal and cessation of their drilling program in September, due to "disappointing" results. The company has not yet found resources in large enough quantities to financially warrant further exploration.

The message was well-received, as it greatly decreases environmental risks for wildlife such as polar bears in the area. However, Shell itself does not entirely agree with the termination of the leases, believing that current leases should still be extended and that the opportunity to continue exploration should still be present. Alaska's Governor has also lobbied against the cancellation, believing that the state's economy will be adversely affected by the decision. A couple of sales slated to begin in 2016 and 2017 were also cancelled.

In the past, Canada has attempted Arctic drilling in its waters, which also did not yield enough oil or gas for further development. It was also expensive and difficult to achieve, and much of the oil has been transformed into gas, which dissipated over time.

Despite the technical difficulty, increasingly rapid depletion of Earth's petroleum resources, recent technological advances, and the ever-high demand for oil have sparked great interest in Arctic oil. The US Geological Survey estimated that 13% of the world's undiscovered oil lies within the Arctic, specifically near Alaska, in the Amerasian Basin, and off the eastern shore of Greenland. This is on top of an estimated 30% of natural gas resources that may be found in the area.

Alaska Oil Drilling

An exploratory oil well in the Beaufort sea forshadows what might come.

With the demand for oil increasing with each year, it is likely that the decision is only temporary and will last only a few years. The development of the drilling technology needed to feasibly explore the Arctic will eventually serve to help in the discovery of the oil necessary for the justification of long-term extraction programs.

Manufacturing Potentially to be Back on the Rise in Canada, Thanks to General Electric

TIFFANY CHANG
1A CHEMICAL

On September 28, 2015, General Electric Co. announced that it would invest $265 million USD in Canada to construct "a new state-of-the-art 'Brilliant Factory.'" This factory would be directly involved in operations under GE Power and Water, Oil and Gas, and Transportation business lines. Construction is projected to be completed in twenty months.

In June 2015, the lending authority of the United States's federal export credit agency, the Export-Import Bank (Ex-Im), expired. Instead of renewing Ex-Im's authority to lend export credits to American companies, Congress voted to cut off funding to the Export-Import Bank on July 1.

On the other hand, Canada's own export credit agency, Export Development Canada (EDC), was willing to finance GE's future Canadian endeavours.

After hefty consideration, GE calculated that their company would greatly benefit by shutting down their factory in Waukesha, Wisconsin – intended for making gas-powered engines – and shifting operations to Canada.

Not only will this new plant "be a flexible production facility," but it will also be able to "support manufacturing requirements for other GE businesses."

GE's decision to move into Canada may come as a surprise to many, but according to Jeff Connelly, vice-president of the company's global supply chain at GE Power and Water, Canada was an obvious option. GE has had operations in Canada for 124 years, and the company is fully confident in its Canadian operations' future development and success.

The challenge now lies in an important decision on GE's part: where will the company construct this new plant? The final location will encompass the consideration of "local supply networks, access to transportation, and the availability of skilled workers."

Yet regardless of where GE chooses to build its new plant, it would mean 350 new jobs in Canada, which just may be enough to catalyze the resurrection of Canada's manufacturing industry.

Before we get ahead of ourselves, GE's decision might be of particular interest to Waterloo Engineering students. Considering how large a company GE is, even it requires some government-backed financial support in its bidding on projects, which was worth a substantial sum of $11 billion USD in 2014. Perhaps medium- and small-sized American corporations might have no choice but to begin following suit for the sake of their very survival.

In other words, other companies currently based in the United States owning global operations could also consider transferring certain divisions or units to Canada to receive export credits from the EDC.

While it is understandable that U.S. Congress wants to save money in the short-term, it is entirely possible that the U.S. will lose its competitive edge in the global manufacturing industry. This concern has been voiced by exporters and suppliers alike, but to this day, Congress has not receded its decision to terminate Ex-Im funding. As a result, the United States is the world's only major economy without an export bank.

Waterloo had already been called "Canada's feeder school to Silicon Valley" in Bloomberg Business back in 2013. Could our school's engineering students contribute to reviving manufacturing and further diversifying the economy right here at home?

With GE acting as a potential catalyst to a wave of American companies finding their way onto Canadian soil, we engineering students have much to look forward to in the future in terms of seeking co-op placements, full-time work upon graduation, and careers in one of the most important sectors of any nation's economy.

Teenage Mutant Ninja Turtle Spotted; Biofluorescence and one Very Special Reptile

BRYAN MAILLOUX
2A MECHATRONICS

Ok, I lied. There's nothing "teenage" or "ninja" about this turtle. But "mutant" certainly applies, if you consider all animals that glow green and red to be mutants.

Last July, a group of scientists led by David Gruber, a marine biologist for National Geographic, were studying bioluminescence in small sharks and coral reefs when they stumbled upon something even more remarkable: the first biofluorescent turtle yet discovered by humans.

The turtle in question, a hawksbill sea turtle, was described by Gruber as an "alien spaceship" as it swam by, emitting red and green light from its shell. This is an especially exciting discovery, as biofluorescence has never been observed in reptiles before.

Fluorescence is the phenomenon by which light is absorbed from an external energy source and re-emitted in a different colour (not to be confused with bioluminescence, which is when an animal generates light by itself). Biofluorescence has garnered quite a bit of attention recently, as the phenomenon can provide some insight into the inner workings of cells.

Scientists have already proposed several hypotheses as to why the turtles have evolved their biofluorescent ability. Perhaps it's a method for the turtles to attract prey, or to communicate with other turtles. These tactics are quite effective for sea creatures, since the ocean absorbs most light that is not blue, thus making most things appear blue, and so the red and green light emitted by the turtle stands out. More likely, it could be a method of camouflage for the turtles, who typically live in habitats populated by other biofluorescent animals.

Unfortunately for any biologists who want to study these creatures, the hawksbill sea turtle may not be around for much longer. Hawksbills are on the critically endangered species list, threatened mostly by the planet's changing climate.

According to Gruber, "there's a sense of urgency to protect and understand these species while they are still here".

National Geographic

Hawksbills sea turtles are unique in that they are the only known reptile to be biofluorescent.

New Growth Techniques Make Graphene Devices More Viable

RATAN VARGHESE
2A ELECTRICAL

Over the past few decades, computers have radically changed the way we work, play, communicate and live. At the base of this revolution are semiconductors: materials that can act as either conductors or insulators depending on the energy applied to them. Silicon is the world's predominant semiconductive material, but science marches on and researchers are excitedly searching for another, superior semiconductor to control the next generation of technology. A recent development by Professor Edward Conrad at the Georgia Institute of Technology could place graphene in that exalted position.

Graphene has ten times the conductivity of silicon, and is already used in some electrical contacts. However, in ordinary graphene samples this conductivity cannot be 'turned off', so to speak. To be a capable semiconductor, a material must possess a "band gap": a significant difference in energy needed to excite a valence band electron into the conduction band.

Generally graphene has no band gap: it is much too easy for a valence band electron to enter the conduction band. Some researchers have created graphene in microscopic ribbon shapes with band gaps of 100 meV; however, this is not significant enough to use in circuitry, and the ribbons are too thin to produce at scale anyway.

Prof. Conrad and his colleagues took a different approach, utilizing "epitaxial growth". They heated silicon carbide (SiC) to temperatures of 1360°C. Some of the carbide decomposes into graphene, in layers bonded to the carbide substrate. Conrad's team investigated an electrically inert "buffer" layer, and observed band gaps of over 0.5 electron volts.

There has been previous research into this technique of growing graphene, but with several key differences. Most teams focused on electronically active layers of graphene, rather than the buffer layer on which Prof. Conrad observed the high band gap.

Professor Alessandra Lanzara in the University of California at Berkeley attempted a similar study in 2006, but ended up with a much lower band gap. "It turns out that crystalline order is extremely important to get this band gap, and they didn't have that" says Conrad. Tight control of the growth temperature was necessary: at 1360°C there was a band gap of 0.5 eV, but at 1380°C there was no band gap at all.

Prof. Conrad's colleagues at Georgia Tech are already attempting to construct graphene transistors. Of course, it may be while until a graphene-based computer arrives on your desk. Further experiments must be conducted to fully understand the role of temperature on graphene growth. The cost of producing these graphene sheets also must be considered.

Conrad is optimistic though, saying that "The first [silicon] transistors they sold were $1,500. The point is, you get the device first, and you worry about the cost later."

Secret Things on Campus (feat. 3 things you didn't know about East Campus Hall)

DONOVAN MAUDSLEY
2A MECHANICAL

The University of Waterloo campus is a dense maze of buildings, passages and patios, many of which are unknown to the casual visitor. While there are the obvious hot spots such as the E5 – E3 skybridge or POETS, many students can go their whole stay at Waterloo without discovering everything there is to know about campus, or even one building. For example, yesterday I found out that there are vending machines all the way upstairs in E5. I had been walking all the way to E2 all term just for a drink. In the following article, I'm going to cover some essentials for anyone who wants to use campus effectively: where to get coffee, where to study and meet with groups, where to shower, how to shortcut properly, and what exactly East Campus Hall, the most obscure building on campus, is.

Everyone has been there. Walking to that 8:30 class and knowing that the line at Tim's will take at least 20 minutes so you don't even bother. It's just not worth it. There is another way, though. Campus is actually riddled with little cafes and coffee shops where you can get your early morning after Bomber Wednesday/late night working with a student team/been doing a work term report for 12 hours straight caffeine fix. The obvious locales are the campus Tim Horton's (SLC, DC, SLC again, SCH, UWP, DC again) and don't overlook the one in Modern Languages over in the arts quad, as it is small but mighty. Next most obvious would be the actual Food Services locations like Pastry Plus (B.C. Mathews Hall, Needles Hall, or The Tatham Center, but only during interview season), Liquid Assets Cafe in Hagey Hall, Eye Opener Cafe in Optometry (well played Food Services), Browsers Cafe in DP, the CIET cafe near the dinosaurs, and the Modern Language's coffee shop. Most locations even accept debit. There's more, though. Willam's has a location on the ground floor of EV3, and is in the plaza right next to E5. Last up are some people's favourite places in the world: the departmental Coffee&Doughnut stores. EngSOC's store is in CPH beside POETS, MathSOC runs theirs out of the third floor of MC (right next to their awesomely comfy lounge), and SciSOC's is in Biology 1 or 2 right by the door under the overpass to Earth Sciences. Finally, there is a small cafe in Environment 1, on the first floor. It's pretty sweet.

But coffee has no real meaning without somewhere to study with it. It may seem like there's never enough room to study on campus, but you just need to know where. There are the obvious choices like the libraries and computer labs, but they're always busy and sometimes way too loud (looking at you Gear Lab). The Tatham Center and Environment 3 both have rooms available to rent for studying, but they can get filled up fast. MC, that big building you hate from all those first year climbs up its stairs, actually has some really nice areas to work up above the fourth floor. There's even a rooftop garden up there in the summertime. EIT is also a hotspot for studiers in the museum area with the dinosaurs. There's comfy chairs and lots of space. Lastly, for group meetings the PAC has a good reputation. The areas up high have tons of seating, and no one cares if you're loud at all because it's the gym.

Waterloo also has a surprising amount of showers in case of emergency. Whether you got attacked by a goose (it happens to everyone), slipped trying to take a shortcut in the rain, or just skipped your morning routine when you woke up 2 minutes before a lecture started, Waterloo has you covered. E3, E6, M3, the QNC, CIF, and the PAC all have showers in them; you just have to find them.

Another kind of shower Waterloo endures frequently is rain showers, but these can be easily avoided if you know how. For those with a knack for navigating the tunnels and bridges throughout campus, it's possible to get almost everywhere. For those without, there's an app for that. WATisRain is a great, student made tool for getting around campus. Somebody actually went out and did all the research for you and made a totally accessible android app for those who aren't a living map. It has maps and directions to get you to where you need to go. The only thing better would be a personal guide around campus.

Lastly, I have five things you probably didn't know about East Campus Hall, the strangely useful building way out there. Firstly, it exists. There's more out past E5 than just E6. That building that you didn't really notice at first, that kind of blends in to the parking lot, and doesn't look at all like its neighbours, that's ECH. ECH houses many administrative offices for UW, from shipping and receiving to various financial offices, but it's also home to a few really cool things. Every month they hold a surplus sale, including computer parts and various office supplies. That new monitor you want might not be entirely out of reach. The details can be found online. ECH is also home to Waterloo's fine arts department, and they have an art gallery (UWAG) on the first floor of ECH. The office for independent studies is also on the first floor, just down from the art gallery. Finally, ECH has an overflow student machine shop, which will be opened to take overflow from the E5 machine shop once it gets busy this fall.

The UWaterloo campus is definitely a maze, but it's a maze that many of us love coming to and that we love to be lost in. Hopefully, some of the secret things presented here will make your time here that much more enjoyable.

The locations of just a few of uWaterloo's many coffee shops, for all of your caffeine and baking needs.

Panda Cubs and Politics

DEVIKA KHOSLA
2A NANOTECHNOLOGY

Early morning on Tuesday October 13th, the Toronto Zoo welcomed two new panda cubs into the world. It was a historic moment – these are the first panda cubs to be born in Canada. The first was born at approximately 3:31 am and the second around 3:44 am. They came into the world squalling, hairless, pink, and approximately the size of a stick of butter; a far cry from the giant black and white pandas they will become. The cubs weighed 187.7 grams and 115 grams respectively.

The public won't get to see the panda cubs in person for a few months. According to the zookeepers this is a critical time in their survival. The zoo is posting pictures and updates on social media to keep people informed on their progress.

However the cubs are only guaranteed to stay in Canada for one year. Technically, even though the pandas were born in Canada, they are Chinese. Their mother, Er Shun and another male panda named Da Mao are on loan from China, and one of the clauses of that loan was that any cubs born during the pandas' stay in Canada would belong to China.

The Chinese practice of loaning pandas is called panda diplomacy. It traces back to the custom of gifting pandas to other countries, and since then has evolved into loans. In fact China uses these pandas as a political tool – researchers have found correlations between panda loans and trade deals with other countries. Remember back in 2013 when Stephen Harper personally welcomed the pandas into Canada? It was about more than just cute animals and environmental conservation, it was a symbol of China strengthening relations with Canada and it just happened to coincide with a trade deal for uranium.

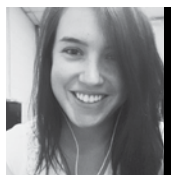
Moreover, the pandas can just as easily be used to exert political pressure. For example in 2010 President Obama met with the Dalai Lama on a diplomatic visit, despite China's warning not to as it would strain relations between them. A few days later they took back 4-year old Tai Shan, a cub born in the USA. This was the only time China permanently repatriated a panda in the modern era.

The pandas don't come cheap either. In addition to all the fees associated with taking care of the pandas, the zoo must pay an annual $1 million conservation fee, plus an extra $100,000 a year for each of the cubs.

It may not seem very fair to the countries who get the pandas, but in a way it is also good. Pandas are an endangered species, and a portion of the money China gets from the loans is earmarked for giant panda conservation efforts. Further, countries who get the pandas are obligated to take very good care of them to maintain positive relations, and raising cubs only helps this. Pandas are notoriously difficult to breed, as females only ovulate a few days a year, and even then might not be interested in having kids. Most zoos, like the Toronto Zoo, have to artificially inseminate pandas to get cubs. Certainly it would be better if more money went towards conservation (not just part of the money), and there really should be more focus on breeding pandas in the wild, rather than just in captivity, but it's better than nothing.

Will Canada get to keep its panda cubs? That's up to China to decide. But since Canada is taking good care of them (and it's pretty lucrative for China if we keep them), it looks promising. For now though, the zookeepers are just trying to make sure those cubs survive.

You Are Not Alone.



HANNAH GAUTREAU
PRESIDENT

It took me a long time to figure out what I wanted this article to be about. I know a lot of us feel like school is getting out of control, lots of us are feeling homesick, and generally most of us are under a lot of stress. Midterm week is always a time that is tough on our mental health. This might be the first time that you are going through a challenging time with your mental health, or this might be the 100th time. If you get anything from this article, I hope it helps you realize that you are not alone.

I have struggled with my mental health for as long as I can remember, and I have since been diagnosed with clinical depression. Although it is under control now, it took a couple of hospital stays, a couple of months of group therapy, and one on one counselling, and too many years of ignoring the fact that something was wrong for me to get here. I know how lonely it can get inside your head, and even though I am not going to say that "I know how you feel", I can definitely relate to how you are feeling.

We live in a society where we aren't supposed to talk about how we are feeling. We are supposed to put on our happy face and pretend that everything is ok. I think this is completely ridiculous; all it does is makes us feel alone.

If you need to talk to someone, there are so many places where you can do just that. You can head over to Counselling Services in Needles Hall, Engineering Counselling in CPH 1320, or you can reach out to someone you trust. There is also Good2Talk, a help line for university students. Their phone number is 1-866-925-5454.

If you need advice in how to navigate the mental health system, if you have questions about mental health and mental illness, or if you just need to talk, don't hesitate to find me in the Orifice (CPH 1327). Just remember, you are definitely not alone.

When you know you're Canadian, eh?

LEAH KRISTUFEK
4A CHEMICAL

A couple of weeks ago perhaps one of the most Canadian news stories I've seen in a while popped up on my Facebook news feed. (Don't worry; I don't get all my news from Facebook.) This particular article brought news from a small Saskatchewan town where Goliath the goat took refuge in the entranceway of the town Tim Hortons. The goat, at that time nameless, spurred a door to door canvassing of nearby farmers and eventually the RCMP took the goat into custody. It turns out that Goliath was not a local; he was one of three goats being used as part of a University of Saskatchewan student rodeo cabaret at a nearby country bar.

In the end maybe it wasn't the most Canadian news story. It was the involvement of the RCMP and a Tim Hortons that made it so Canadian.

It got me thinking though: what makes us so different from our southern neighbours? Is it the fact that a couple of days after reading that article I heard an intense conversation about realizing there was no maple sugar in the house for pancakes? Is it holding doors for people when they aren't directly behind you? Apologizing when someone bumps into you?

Over my co-ops I have lived in Whitehorse, Ottawa and Edmonton, all capitals in one way or another. I grew up in cottage country just outside of the GTA where winter festivals and winter sports made winter my favourite season. I have skated on the Rideau Canal, eaten beaver tails, lived beneath the midnight sun and ventured beyond 911 coverage.

What I have found is that Canada is a country of small towns composed of a patchwork of immigrants. Whether it was the promise of farmland, the lure of gold or simply seeking refuge from a hurting homeland, we have all been pulled here by the lure of citizenship - the idea that no matter where we come from we can belong here without having to give up the cultural background that shaped us.

As Canadians we look after each other, and I'm not just talking about free health care. Our geological vastness and relatively small population shapes us. However, it is our experiences against the elements, especially harsh winters that seem to bind us together as Canadians.

Canadians have some quirks. We can buy bags of milk in our grocery stores and put copious amounts of maple syrup on our pancakes. We can survive in the woods and revel in our fresh water lakes and rivers. In small towns people seldom lock their doors, and not just because in some places you might need them to hide from polar bears!

Now, it's not easy to travel so far north that the sun never sets, and if you are in Toronto you may never see moose or beavers. However, if you are new to Canada here are some quintessential Canadian things you can try right here in the KW region!

1. Timbits. These bite sized pieces of doughy goodness are sold in all Tim Hortons. Because they are less fattening than doughnuts, you can try lots of different flavours before even beginning to consider your waistline!
2. Poutine! I have been assured by French people that these gravy covered cheese curd infused fries are uniquely French Canadian not French.
3. Watch a hockey game! Growing up hockey is all around us, in outdoor and indoor rinks and on streets in the winter. Partake in a game rink side, preferably while eating poutine and timbits.
4. Wear red plaid flannel and a toque. You may feel like a lumberjack, and that is pretty awesome!
5. Use the outdoors as your personal freezer. At one Ottawa University, engineering students hang their lunches out of the windows in the winter to keep them cool.
6. Watch some good old Canadian programming on CBC. For that matter check out the news every once in awhile, the stories might amuse you!

Well, I hope you enjoy at least one of these Canadian things in the near future. Even if you just got here we're all a little bit Canadian, eh?

More Support for Girls in STEM: WiS

GABRIELLE KLEMT
1A GEOLOGICAL

Last Friday, October 10, the first meeting of Women in Science (WiS) was held on our very own Waterloo campus. Since 1992, Waterloo's Women in Engineering (WiE for short) has been providing resources, opportunities, and programs for girls to encourage more females to take engineering in university, and to succeed in the program.

Over the years, WiE has developed successful events like Go Eng Girl for female students in grades 7-10, and Engineering Badge Day for Girl Guides. Today, most students are aware of WiE and what it does to increase the number of girls studying engineering at the post-secondary level at Waterloo.

Yet somehow, even after all these years of great goings-on with WiE, Waterloo still had no resource for female science students. No safe place where they could gather and chat about science, books, or sexism in the workplace. This finally came to an end when a female student with a PhD in physics, now the first ever chair of WiS, and a few other passionate women, recognized the need for this resource. In response to this need, they campaigned to receive funding for a program that would encourage and support women in science, and they were successful!

At the inaugural meeting, after the election of the chair, interested upper-year science students talked about what they could do to make WiS as effective as possible. As so often happens when many girls gather, a lot of high-rated brainstorming took place under the umbrella headings of academic/career support, community building/emotional support, advocacy/education/Outreach. Their great ideas included having workshops, bringing in prominent female scientists, creating mentoring programs between upper-years and first years, creating faculty-specific reps and events, having fun community socials, and engaging male scientists in awareness.

In the past decade or so, there has been a major push to get more girls to study STEM (Science, Technology, Engineering, and Math) programs in university and to get rid of the sexism that abounds in these fields. In creating WiS, Waterloo has taken the next step towards making our university a more equal environment for both sexes.

If you're interested in this great new group, there are upcoming monthly meetings and there will definitely be events! To get involved, like their Facebook page Women in Science: UWaterloo. Or, get involved with WiE at Women in Waterloo Engineering on Facebook; after all, we all have the same goals. Go girls!

US Bombs MSF Hospital in Afghanistan

CAITLIN MCLAREN
3B CHEMICAL

On October 3, a Doctors Without Borders hospital in Kunduz, Afghanistan was bombed by an American gunship. Before the attack, which rendered the hospital unusable, it was the only active medical centre in the immediate area. Afterwards, injured staff and patients. Reportedly, 22 people were killed and more than 30 injured, with over 30 still missing. Many are arguing that the incident should, in fact, constitute as a war crime.

The attack occurred at around 2 a.m. local time, and continued for about an hour. After a few minutes, hospital staff contacted both NATO and Washington, but the attacks continued nonetheless. In fact, the hospital had informed all parties of the hospital's location beforehand, and indeed, the hospital was supposedly in the "military database" of restricted sites, which are not to be attacked, even if enemy forces are present.

The attack occurred during the ongoing Battle of Kunduz; the city of Kunduz was attacked by Taliban forces in April. In late September, the Taliban captured the city, but on the 30th, Afghan government forces pushed back with American support, and have been largely successful in expelling the Taliban presence that existed there.

It is still not entirely clear why the strike was carried out, with the different parties involved playing the "blame game." Initially, it was reported that Afghan forces had requested the airstrike, and that the hospital was collateral damage in an effort to protect US ground troops, but later the Resolute Support Mission commander, General John F. Campbell, confirmed that the decision to bomb the hospital had been an American one; however, he stated that it had been a "mistake."

Médecins Sans Frontières

Doctors helping wounded civilians at the MSF hospital in Kunduz, Afgahnistan prior to the airstrike

The Afghan Interior Ministry reported that there were ten to fifteen Taliban insurgents hiding in the hospital, which Doctors Without Borders denies; the Taliban also deny this. Be that as it may, even if it were true, under international law it would not justify an airstrike on the hospital.

The UN's high commissioner for human rights, Zeid Ra'ad Al Hussein, has stated that the attack was "utterly tragic, inexcusable, and possibly even criminal."

US President Obama offered his condolences, and the Department of Defense is investigating the incident; NATO and the Afghan government are launching their own respective investigations.

However, Doctors Without Borders is not satisfied, demanding an independent investigation by a neutral body. Furthermore, there has been more criticism following the arrival of a joint investigations team; according to Doctors Without Borders, the team arrived in a military vehicle unannounced and forced their way into the hospital, damaging property and potentially destroying evidence.

To the victims of the airstrike, whose fault it was and why it occurred makes no difference. It can only be hoped that the outrage sparked by the incident will help to prevent such tragedies in the future.

Prof Personalities

Peter Teertstra

ASHLYN LOW
2A NANOTECHNOLOGY

PROF PERSONALITIES

Ever wondered who was the director behind the Sedra Student Design Centre located at E5? Well, it's none other than Professor Peter Teertstra! Completing his Bachelor's degree at Calvin College in Michigan, Professor Teertstra then came to the University of Waterloo to complete his Master's and PhD, eventually transitioning from a research engineer in the Mechanical Engineering department to a full time lecturer and now director of the Student Design Centre.

This issue, the Iron Warrior was able to squeeze some time into his busy schedule to get to know this fantastic professor a little more personally.

Which courses do you teach?

This semester in particular I am teaching two math courses, so Statistics for 2A Mechatronics and Calculus for 2A Mechanical. I've been teaching the stats course for about 4 years now, and that one I will continue teaching. I've also just started last summer, teaching the first year mechanical students their 1B engineering concepts course, so stressing the design method and how to go through the steps of the design process. And it was really neat, their project was a lego robot. We saw drink dispensers, robot color sorting machines, all sorts of different applications. It was really fun to teach that so I'm looking forward to doing that again next summer.

Why did you choose to pursue a career in Engineering?

In high school, my two paths were either going to be engineering or computer science, which was really sort of a starting-out field at the time. I chose engineering because I didn't want to spend all day sitting at a desk. The irony is of course now I am spending all day sitting at a desk, but I think we all do. But really, I enjoyed designing things, and when I found out I could actually have this career as an engineer and do what I love doing, that sort of sealed it for me.

What did you do prior to becoming a lecturer?

I worked for 4 months at Ontario Hydro in a research position between completing my Master's degree and coming back to work here, but it was understood that it was a temporary contract, and they were laying off people left, right and center at the time so there was no opportunity to continue there. But I went from that to coming back to Waterloo and working as a research engineer in in the Mechanical Engineering department in a heat transfer lab while doing my PhD part time, for a period of 10 years, so I was a full time staff member at the university. After that was done, I came on to faculty as a lecturer.

What is your favourite part about being a lecturer? What is the most challenging?

I love taking courses that are historically boring, and not well understood, and are not very applied and trying to make them interesting and applicable. It's partly why I love teaching statistics; it's historically taught in a very mathematical way and not well connected to what engineering students are actually doing. So I love taking courses and making them real.

The challenging part is keeping up with changing technology and the changing ways of presentation. I think the students we see now are very much used to having very fast access to a lot of information very quickly. So as a lecturer you have to sort of adapt to that, that if you are not able to offer the information and have it in front of the student so that they can readily access it, they are very quickly going to be heading elsewhere for further information, like Google or YouTube.

What is your teaching philosophy?

I like communicating information clearly and making it as simple as possible to understand without oversimplifying it. So I like teaching by examples. In Calculus for example, I will very quickly move past derivations of formulas and proofs, and very quickly move into examples of it being used. So I think my philosophy would be to try and make it as practical and example driven as possible.

What do you do as the director of the Student Design Centre?

My role here is to oversee the physical building, and that can be from making sure that there's safety equipment in place, to helping to stage events that are happening at the Design Centre, and working with student teams to make sure that they can access the space available, that they have the safety equipment or other equipment that they need, and also mentoring new teams.

We started here 5 years ago with 10 student teams that were previously in E3, and we just added our 30th student team. Those 20 teams that have been added in the past 4 years, are mostly as a result of mentorship. So a student comes into my office and says "Hey, I've got this great idea for a team," and then it's a matter of meeting with the student and the team that's being built for a series of meetings over a series of months, and coaching them that this is what you need to do.

What do you think is the biggest benefit of student design teams?

It gives learning opportunities in a wide variety of disciplines and areas that we can't teach in a classroom. I can lecture on project management, I can show you what the work breakdown structure looks like, I can show you how to make a Gantt chart, but until you are physically faced with a completely open-ended team based project, where you have 8 months and a limited budget and it has to be done at this date, you really don't appreciate project management until you are in that situation. So that's what I mean by learning opportunities; it's one thing to teach it in a classroom, it's a whole other thing to experience it. So it really emphasizes experiential leaning, it emphasizes hands on skills, it emphasizes working in teams.

It also emphasizes marketing and branding, like how do you position yourself, how do you take your organization and look at its outward facing persona and see how it is perceived by the public or by your sponsors. So it's all these neat things that we either can't teach in the classroom or don't do a real good job of teaching, but yet the teams are able to learn by doing, and they do a really good job of teaching junior members to do these things.

What is something most students would not know about the Student Design Centre?

I think just the fact that everybody is welcome to come here and to join a team. I don't know if people know that to get involved with a team, you just walk in the door. My door is always open, most of the team work bays are open, the team emails are accessible, and all of these teams want people to join. They are not exclusive clubs, they are not for engineers only; they are open to all students from any faculty. And in fact, some of our more successful teams are teams that have realized that engineers may be really good with the technical details of a project, but if you wanted to do business and marketing, or web design, or graphic arts, there are probably other students in other programs that are very capable and are good at that kind of thing.

Also, anyone can be involved in a team by committing an hour per week or two hours per week. So it's not going to consume your life, it's not going to cause your overall grade point average to suffer, you are not going to fail midterms. If you get over-committed you can go that way, but it doesn't have to be a big time commitment, and the benefits are amazing.

What was your most memorable experience as an undergraduate student?

There were two experiences; one was that the school that I went to had what was called an interim, which was a month long course between semesters that you took all day long for an entire month. I was involved in a project course that focused on designing and formulating strategies for helping inner city people in terms of job creation and accessing resources. We did presentations back and forth in the class and somehow I got elected to be the leader of this student group and we had an opportunity to go in to Chicago and got to visit a soup kitchen in an urban area. So it was a really great experience to be leading an upscale project like that with a lot of students involved.

The other would be my capstone project; we built a machine that ground up milk jugs, so we were sort of on the cutting edge of recycling technology at the time, but just that whole fourth year design project of again having an open ended project, lots of uncertainty, lots of teamwork, lots of personality showing up, it was really a neat experience.

Do you have any hobbies?

Lots of hobbies, not as many as I used to have. I'm still an avid camper, I love camping, I did a lot of canoe tripping in Algonquin before my kids came along, so we do campground camping now. I love snowmobiling, so I've got two snowmobiles and as soon as the snow is on the ground, I disappear. And also just working around the house, I have a fixer upper house that has about 20 years of projects in it.

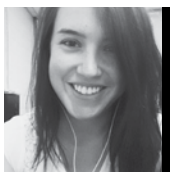
Do you have any advice for your students?

Take advantage of opportunities, like being part of teams, being part of groups. I think the more successful students are typically the ones that get out of their dorm rooms or basement of the library and actually go out and experience things. Just working with other students and putting themselves in situations where they can be mentored by senior students so they are not isolated.

But at the same time there's the balance; so you should get involved and have relationships with other students and sort of form this culture that can support you, but at the same time, don't lose sight of the fact that this is really hard. You need to pay attention to the fact that there's significant hard things that are going to be required of you as you go forward, so don't just check out for a couple weeks and cram at the end. Treat it a bit like a job, that you have a responsibility everyday as a student.

Peter Teertstra acts as director of the Student Design Centre in addition to his full-time lecturing duties.

Midterm Updates!



HANNAH GAUTREAU
PRESIDENT

Hello there lovely people of Waterloo Engineering! I know it's really hard to believe, but we're already halfway through the term!

CRC Meeting

The Council Review Committee, which was formed at Joint Annual General Meeting this summer had our first meeting. We discussed the current state of council, and started doing research. The committee will be getting feedback from current and past executives, the Board of Directors, other Engineering Societies, and councils external to engineering. We will also be holding a feedback session at our next council meeting on October 28th at 5:30 in CPH 3607. If you want to provide feedback, make sure to come to the meeting!

SSO Workshops

We ran a brand new study skills workshop with the Student Success Office on Monday, October 5th. This workshop was extremely successful! Seven student volunteers helped to run sessions about time management, backwards planning, and test taking. Because it was so successful, we are looking into running another workshop after Midterms, so stay tuned!

Business Cards

Business Cards are now available for sale in the Orifice! If you are interested in purchasing them come in and talk to our friendly staff; you will have business cards before you know it.

Mental Health Initiatives

I have been working with the organizing committee for Mental Health Wellness Day on their whiteboard campaign. This campaign showcases students answering questions about mental health and wellness on whiteboards. We spent three days taking photos in engineering and we managed to get 100!

I also worked with Kristine Meier from Counselling Services to put together a presentation about Mood disorders and Engineering students. We presented this to the Faculty Operations Committee and it was very successful. We have been asked by the Chemical Engineering department to make the presentation again!

Best of luck in the chaos that is the middle of term!

Second Council Meeting Summary

We had our second EngSoc council meeting on Wednesday, October 7th. The Associate Dean of Teaching, Gordon Stubley, spoke about course critiques. They are currently changing their process to use an online system, so council had the chance to hear about the changes and provide their feedback on the process.

This meeting had two elections. We elected the members of the Sponsorship Committee and the Leadership Award Committee. The sponsorship committee is responsible for allocating $9600 to student groups within engineering. The Leadership Award Committee is responsible for collecting all of the applications for the award and managing the selection process.

For more information about council meetings make sure to check the EngSoc website, and subscribe to the mailing list! If you have any questions about our council meetings please contact executive.b@engsoc.uwaterloo.ca and we would be more than happy to answer your questions. The next meeting will be held on Wednesday, October 28th at 5:30 in CPH 3607.

Exam Bank Prizes and Co-op Numbers, Oh My

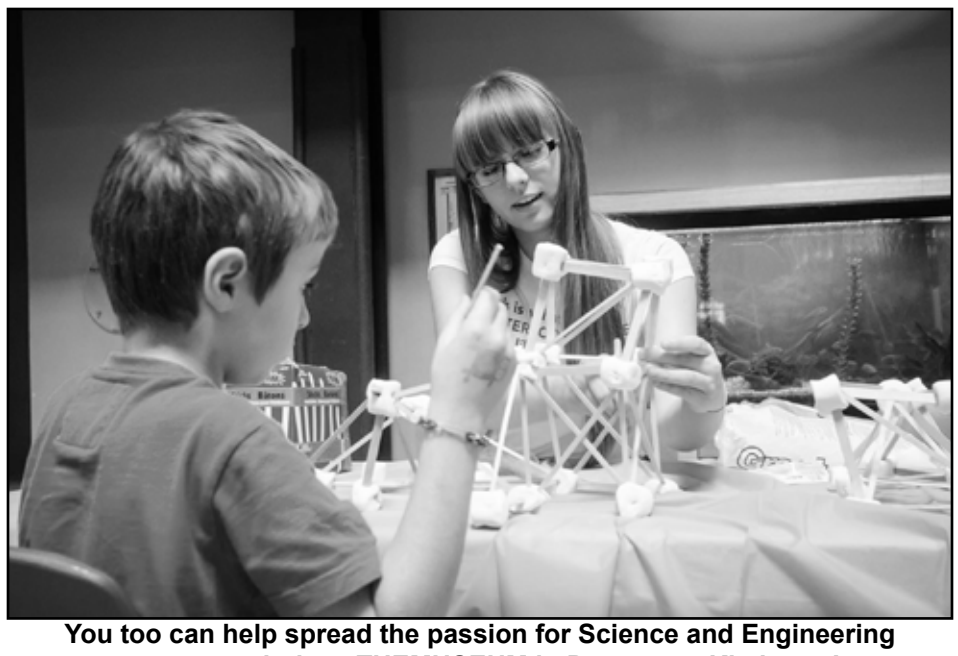
ANSON CHEN
VP EDUCATION

Hey everyone! Hope you're all staying afloat as we approach that midterm stretch.

Midterms generally aren't exciting, but this time I have an exciting announcement to make! This term we have started a new initiative to encourage submissions to the Exam Bank. For every exam you submit electronically or in paper to EngSoc, you will earn an entry to a raffle for a cool prize! (We budgeted for cool prizes, don't worry, they will be cool.) Bonus entry if your exam has solutions. Raffles will be held at the end of each month, and the winners will be contacted and announced on EngSoc social media. See the blog post on engsoc.ca for more details! Help us keep the Exam Bank up to date and usable as the powerful resource that students know it as.

Second, some numbers for your interest: 2408 engineering students are employed for the current Fall 2015 work term, at an employment rate of 99.0%. Keep in mind that this figure includes those in volunteer or research positions on campus. Job satisfaction, as surveyed by CECA during every work term, averages at 8.15/10 in engineering, just short of the average of 8.22/10 across all faculties. In general, students are finding their work terms rewarding and good learning experiences. Hope that encourages you as Jobmine main round continues!

I will be continuing to update engsoc.ca with blog posts regarding the various meetings I attend regarding academics and co-op education. If you ever have any academic questions or concerns, I'm happy to respond to emails at vpeducation.b@engsoc.uwaterloo.ca. Thanks and see you around!



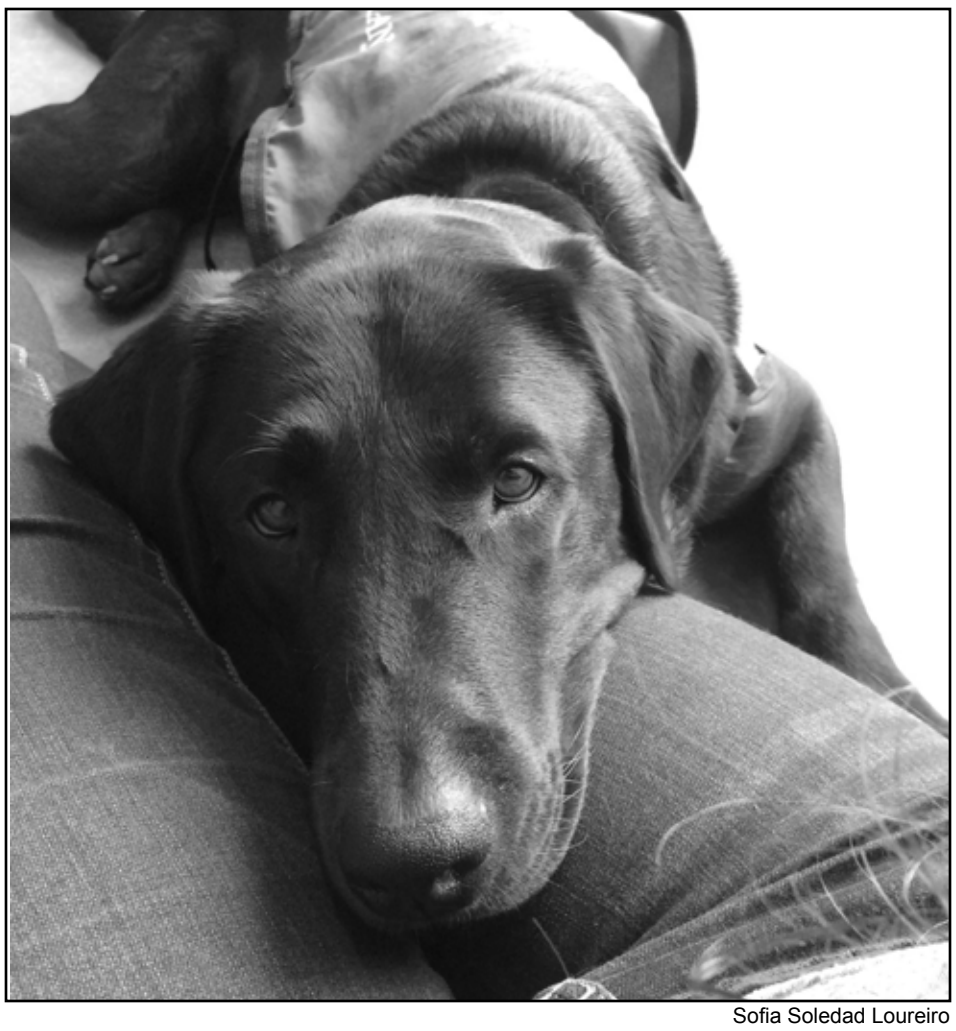
You too can help spread the passion for Science and Engineering to young minds at THEMUSEUM in Downtown Kitchener!

Upcoming Events Calendar

Wednesday October 21	Thursday October 22	Friday October 23	Saturday October 24	Sunday October 25	Monday October 26	Tuesday October 27
Leather Jacket Day 11:00AM - 3:00PM, SCH Puppies in POETS 11:00AM - 1:00PM, POETS **CCA** Success on the Job 2:30 - 4:00PM, TC1208	**CCA** Interviews: Proving Your Skills 1:30 - 3:30 PM, TC1208	First Year Fridays	Day at THE MUSEUM		Recovering from Midterms Workshop 6:00AM - 7:00 PM	Charity Grilled Cheese 12 - 1PM, Outside POETS FYM-BYOB Ice Cream 6:00 - 8:00 PM
Wednesday October 28	**Thursday October 29**	**Friday October 30**	**Saturday October 31**	**Sunday November 1**	**Monday November 2**	**Tuesday November 3**
Puppies in POETS 11:00AM - 1:00PM, POETS EngSoc Meeting 3 5:30 - 7:30 PM, CPH 3607 Lets Talk Mental Health 7:30 - 9:30 PM	Mental Health TED Talks 11:00AM - 1:00PM, POETS Spirit 2017 Board Game Night 6:00 - 8:30PM MacMaster Halloween Event 8:00PM - 12:00AM **CCA** Negotiating Job Offers 10:30AM - 12:00 PM, TC1208	First Year Fridays Halloween Movie Marathon 6:00 - 9:00PM **CCA** Career Interest Assessment 10:30AM - 12:00 PM, TC1214	Halloween! D&D 3:00 - 6:00PM	League of Legends Tournament 11:00AM - 4:00PM	Learn Leather Craft! 7:00 - 11:00PM LaTeX Workshop 7:30 - 11:30PM, CPH 1346 (Multimedia Lab) **CCA** Taking Initiative: The Employer Perspective 5:00AM - 7:00 PM, TC2218	TalEng 9:00 - 11:30 PM

Check out up-to-the-day event postings on the EngSoc website at *engsoc.uwaterloo.ca/event-calendar*

NEW FEATURE: CCA events being offered by CECA. See *uwaterloo.ca/career-action/* for details and to register



Sofia Soledad Loureiro

POETS will feature several of these cuties to help you de-stress during midterms week.

What Tu Do With All This Money?

DON TU
VP FINANCE

Hey everyone! It's Don again, coming at you from the pages of a brand new Iron Warrior article. A lot has happened since the last time I wrote!

If you haven't already heard, the Sponsorship Committee has been formed for this term and applications for funding are now open. Information has been sent out through the Engineering Society mailing list and is available on the Engineering Society website. Applications are due by November 1, so don't wait!

Next, I'd like to thank everyone who came out to Coverall Day. I was stunned with how many people arrived to order coveralls – the enthusiasm was awesome! Special thanks goes out to those who wore their coveralls in celebration, and some super special thanks goes out to everyone who volunteered to help size people and process orders. All in all, we received just under 100 orders, which is phenomenal. I think we may have beaten the all-time record for coverall purchases, but I'll need to double-check. At any rate, stay tuned for information regarding coverall delivery.

On a different note, if you've perused the shelves of RidgidWare or Novelties recently, you may have noticed that they're looking a bit bare. My diligent directors have been working to address this problem; new parts have just been ordered for RidgidWare, and we are discussing a new inventory for Novelties. Get excited!

And, last but not least, I've been hearing some feedback regarding the Student Deals program. Specifically, some have suggested that we make it more obvious where you can use your Student Deals sticker. As a result, we've made Student Deals posters and are in the process of putting them up in the appropriate storefronts. Stay on the lookout for these – and make sure to come by the Orifice to get your sticker!

As always, I'd love to hear your comments or feedback. You can contact me by e-mailing vpfinance.b@engsoc.uwaterloo.ca, or simply strolling into the Orifice every now and then. I hope you've had a good read!

Until next time,
Don Tu

Engineering a Community

KIERAN BROEKHOVEN
VP EXTERNAL

Hey everyone,

Second update from the VP External in town! Everything is carrying on as usual, we're keeping busy. Today I'd like to focus my article on how EngSoc interacts with the community around us since engineers often get an unfortunate and untrue reputation of ignoring everything outside each other.

For starters, our charities initiatives. This term we have four lovely charities directors: Hannah, Jon, Ramneet and Megan. They work hard to make grilled cheese and run events to raise money for Water.org, an organization that raises money to provide clean water to those without it. You can find out more information about it at www.water.org, or by emailing hannah.van.opstal@gmail.com. You can always come to the EngSoc office and donate, or come by CPH on Tuesdays at 11:30 to buy some grilled cheese!

A big outreach event that we do every term is our day the THEMUSEUM. Our Education Outreach directors, Nina, Jessica, Rohan and Iris are working hard to plan this event that is happening on October 24th. We gather volunteers from the society and spend the day doing science experiments with children down at THEMUSEUM in Kitchener. If you're interested in being involved you can find the Facebook event called "Volunteer at THEMUSEUM", or email nina.warrier@gmail.com.

We also have smaller events that change term to term. For example, this term we are doing group trips to the blood drive to make donating blood more accessible to our members. Some terms we run a bottle drive around the neighbourhood and donate the money to our chosen charity. Every year we run a charity headshave during orientation week that is always a huge success.

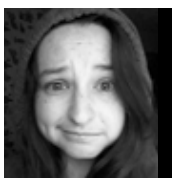
Finally, we participate in National Engineering Month! March brings us a few big outreach events. These events include the Charity Bus Push, Rube Goldberg machine-building with elementary school students, and CANstruction at Conestoga Mall. If you'll be around in the winter I highly recommend checking them out!

If you have any questions or you would like to get involved in EngSoc's outreach, you can send an email to our lovely outreach commissioner Liz at outreach.b@engsoc.uwaterloo.ca.

You can also always talk to me by dropping by the office or emailing vpexternal.b@engsoc.uwaterloo.ca.

Good luck! Bear down for midterms! (Why yes, that was a reference, nice catch).

VP INteresting



TERESA LUMINI
VP INTERNAL

Hey hey everyone! It's so hard to believe we're already half way through the term!

Midterm Season and Mental Health

With midterms coming up (or having already started for some of you) we're putting a focus on mental health by providing you with puppies in POETS! The National Service Dogs will be in POETS during the first year and upper year hell weeks to help you relieve some of that midterm stress during your study breaks.

Mental Health Awareness Week is also coming up, where there will be events like Let's Talk Mental Health, TED talks on mental health in POETS, Post-Secret Week and of course more puppies, so keep an eye out for that! Mental health is a big issue, especially in engineering, with all the projects, work, and general heavy load we have, so we're doing our best to provide you with the assistance that you need in order to perform at your absolute best.

Hardware Skills Workshops

This term we're trying to provide some more technical workshops on the hardware side of things, and we ran our first workshop on PCB Design! It was very successful, with over 30 students attending to learn the basics of PCB design. Definitely something to put on that resume. There will be more coming to you this term, including an Arduino Workshop. As always, if you have an idea for a workshop or event that you would like to see, don't hesitate to come to us in the orifice or email me at vpinternal.b@engsoc.uwaterloo.ca and let me know your ideas. We'll do our best to make it possible ☺

P**5 Points & Upcoming Events!

Did you know that every time you attend an EngSoc event, your class gets points towards winning money? Well, you do! At each event, there is a P**5 sheet, where you can sign your name and your class to earn participation points. At the end of the term, the class with the most points gets money for their class to do something together with, so come on out and earn points while having fun!

Speaking of which, TalEng, Semi Formal, Finger Painting, and many more workshops and events are coming up that you can win points for! See you there!

Engineering & Mental Health: It's Not You.

FILZAH NASIR
4A ENVIRONMENTAL

It's not you. It's not you. It's not you.

My 1A term in Engineering is something I don't like to think about too often, because the high levels of stress and alienation I felt are too easy to recall. But, as I've walked through campus this fall I've been finding myself inundated in conversations with younger students discussing exactly that experience.

Mental health is a buzz word on university campuses and increasingly midterm and exam time is equated with the full gamut of "mental wellness" services: de-stressing activities such as yoga, study tips, self-care tips, etc. These initiatives are offered at many different levels by university services, the Federation of students and student societies. The abundance of these services indicates an awareness at both university and student governance levels of the dismal state of mental health of the student body. But temporary initiatives to decrease stress aside, there are no conversations being initiated by either student governments or the university or Faculty of Engineering around the root causes of stress, anxiety and severe mental health illnesses which pervade university campuses.

The epidemic of mental illnesses in university campuses has been well-researched. A 2013 study by the Canadian Organization of University and College Health which surveyed over 30,000 reported that 90% of students reported feeling overwhelmed, 50% reported feeling hopeless and 9.5% reported having seriously contemplated suicide and 1.3% reported having attempted suicide (that's nearly 400 students at UW).

While anyone suffering from any form of mental illness undoubtedly has a unique mix of personal, academic and other factors contributing to their illness, the statistics make it clear that there are systemic problems in the university environment which contribute negatively to the mental health of its student population. Although there are many factors about university life which contribute to student stress levels (high tuition and other fees, co-op and job hunting) as it's midterm week, I'm going to specifically discuss academic life at UW.

The fundamental way in which the university impacts student life and thereby student health is through academics. Engineering at UW is really difficult. We love talking about how difficult it is. There is a strange pride associated with the difficulty of our degrees and a belief that it makes them more valuable. But the constant barrage of assignments, tests, labs, midterms also contributes to declining mental health in the student body. And we're told by the faculty, by our peers, by the culture that surrounds us that if we can't handle it, it's because we're not meant for Engineering. In my first semester at UW, there wasn't a single day where I didn't consider dropping out and believing I didn't belong in engineering.

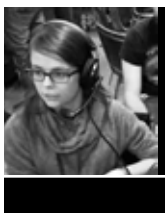
The mental health initiatives on campus are often full of study tips, implying that if we just had better study habits we wouldn't be so stressed by midterms. But this individualizes the issue of mental health and puts the onus on individual students, instead of recognizing it as a systemic issue in the Faculty or University.

In practice, there are simple changes that could be implemented across Engineering that would make university less stressful and decrease student stress levels. The Department of Civil and Environmental Engineering implemented a new curriculum this year which removed the first-year Physics course (PHYS 115) from the 1A curriculum. Most people who have taken that physics course can relate to the stress of having to take a course in which the midterm exam is openly designed to fail students, ostensibly to serve as an "introduction to engineering." If reducing student stress levels and anxiety is indeed a priority, why does this practice continue to take place in our faculty?

On a larger scale, MIT grades first year students on a pass/no record basis. This means that students will receive a pass regardless of their grade unless they fail a course, in which case their transcript will show no record of them having taken the course. The grading system allows students to adjust to the university environment without having high stress or anxiety about passing their courses. It's also an innovative educational practice that UW, which has often been called "MIT North" and is a big believer in innovation could implement which would have a significant impact on the student body.

If the abundance of mental health initiatives offered at UW are indeed a sincere attempt to address the epidemic of mental illness on university campuses, then we should also start addressing the systemic ways in which university life contributes to stress levels.

Viagra and Really Venomous Spiders



MEAGAN CARDNO
3B NANOTECHNOLOGY

ChemHistory

Now, as you might have noticed, I'm not male, but I am rather capable of sympathy for my Y-chromosomed brothers. I can imagine it must have been an – erm – frustrating time for men with erectile dysfunction before Pfizer developed the now eponymous Viagra pill, known as sildenafil.

Sildenafil was originally studied for the treatment of high blood pressure and heart pain associated with coronary heart disease (called angina pectoris, literally "strangling chest"), but clinical trials showed little benefits in this regard. However, it was noted to cause erections in male participants. Thus, sildenafil was researched, patented, and marketed by Pfizer as a treatment for erectile dysfunction.

To understand how the little blue pill works its wonders, we first have to analyze what exactly occurs when an erection takes place. Two particular regions of the penis, known as the corpora cavernosum, contain the majority of the blood that fills the penis during an erection. Release of nitric oxide within this region that occurs during sexual stimulus bind to guanylate cyclase enzymes, which are responsible for the synthesis of cyclic guanosine monophosphate (cGMP) from GTP (ATP's twin brother that is known for its specificity in activating metabolic reactions).

cGMP is responsible for the regulation of ion channel conductance, as well as the relaxation of smooth muscle tissues. This relaxation can lead to increased blood flow in blood vessels, such as the phenomenon previously described in the corpora cavernosum.

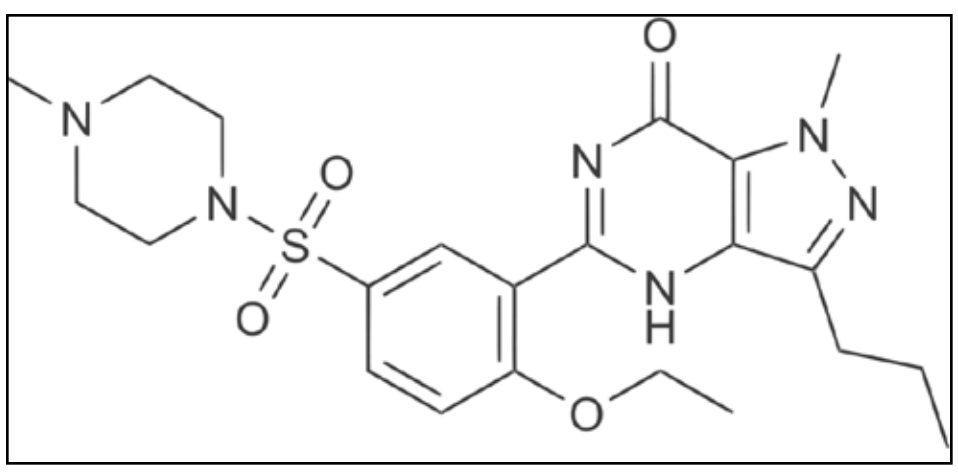
Logically, sildenafil helps improve this process by inhibiting the cGMP-specific phosphodiesterase type 5 (PDE5), which accepts and breaks down cGMP. Sildenafil has a similar molecular structure to that of cGMP, and so competes for the PDE5 binding sites, allowing for more cGMP to be present in the corpora cavernosum.

As the sildenafil itself does not cause the Nitric oxide-cGMP reaction that causes blood flow, sildenafil does not itself cause an erection, and sexual stimulus will still be required for an erection to occur.

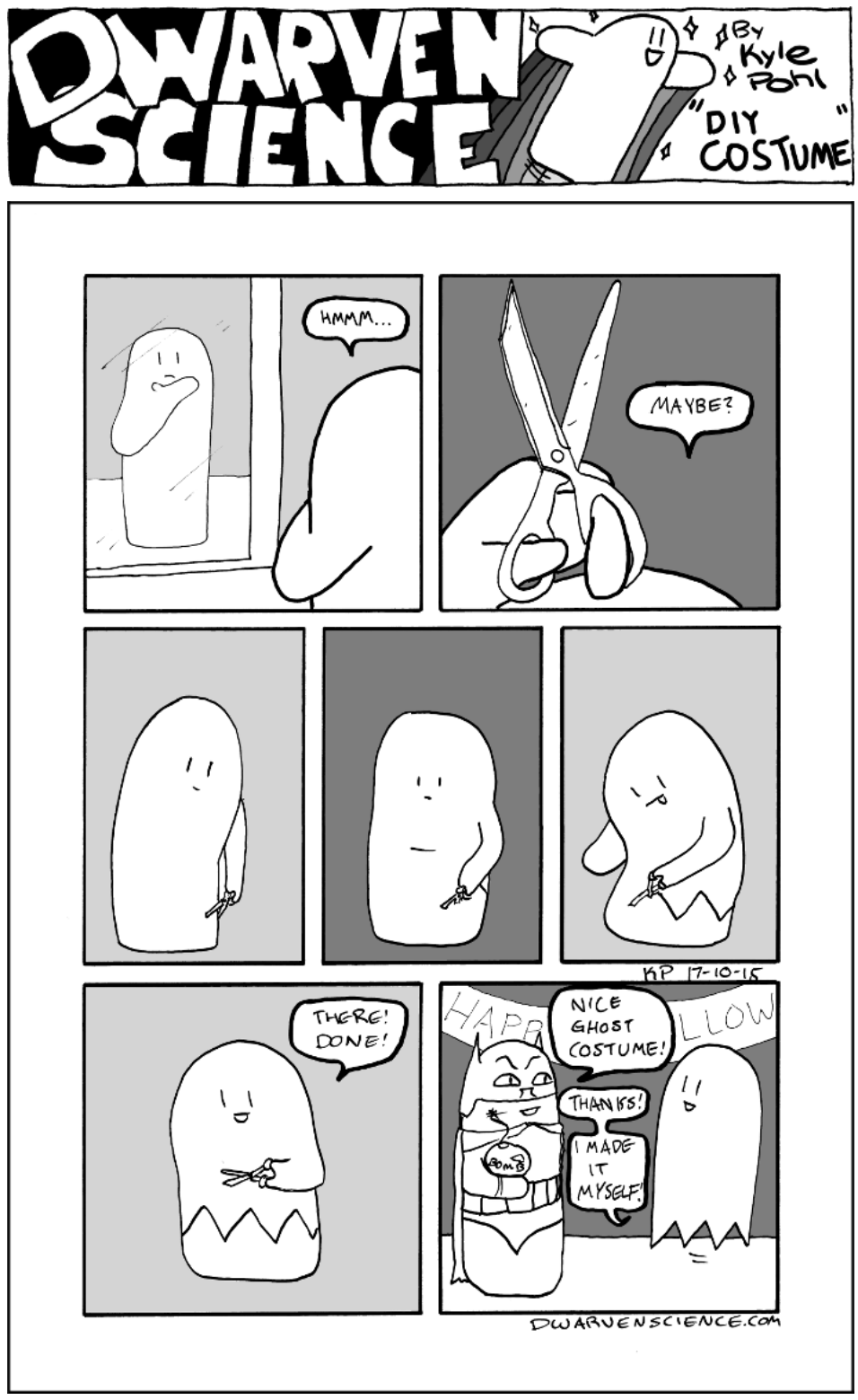
Interestingly enough, a similar mechanistic route of cGMP degradation occurs in the retinae. In the presence of light, phosphodiesterase is activated that degrades the cGMP. As the cGMP regulates the sodium ion channels in the photoreceptors, this allows for the modulation of the phototransduction in rods and cones, meaning that cones and rods are capable of adapting to light exposure.

Researchers have looked to interesting inspiration of a very unfamiliar nature—the toxin, Tx2-6, that is found in the venom of the Brazilian Wandering Spider, one of the most venomous spiders in the world, is also being researched in its viability as a chemical basis for erectile dysfunction. Unlike sildenafil, it operates by skipping the need for sexual stimuli for the release of nitric oxide. This effect was clear, as male victims of bites from the spider reported erections lasting for several hours.

This would likely mean that a medication developed by Tx2-6 would cause erections without stimuli—which could either be beneficial or more of an inconvenience, depending on the, uhm, intents of the user. However, no marketable product utilizing this toxin has seen clinical trials yet.



The structure of Sildenafil, the chemical popularly known as Viagra



Broskies on Brewskies

Reviewing Fine Ontario Craft Beer

DONOVAN MAUDSLEY & TRISTAN KEUHN
3B CHEMICAL & 2B SYSTEMS

Donovan and Tristan are two friends from humble beginnings in London Ontario. Off and on roommates and general guys who like beer, the following article follows them through a journey into the sometimes overcrowded world of craft beer, where they will try to find the best that Ontario has to offer.

This review was written while tasting the beers themselves, after a few name brand beers. It has been presented in the most unedited version possible in order to to preserve the accuracy of the experience.

We will be reviewing three different craft beers, each from different breweries. The first up is La Formidable, an IPA from the Gigantic Brewing Company in Vanleek Hill, Ontario. This beer was chosen for review purely due to the label design, as it portrays a giant robot holding a giant beer bottle, and that's pretty sweet. First impressions of La Formidable were favourable. An underlying hoppy taste is accompanied by a fairly light feel. Overall, it's a solid workhorse beer, and we give it 3 out of 5 stars.

Second up is Golden Rail, a Honey Brown Ale from the Cassel Brewery in Casselman, Ontario. This beer was picked completely randomly from the LCBO. The ale has a nice, sweet smell to it. It gives a solid first impression, with a very light taste. The honey in the beer comes through in a nice undertone. It's a very sweet beer. Super Troopers is a very good movie. The Golden Rail goes down nice and smooth, and we give it a 4.5 out of 5 stars. A seriously good beer.

Last on the docket is the Forked River Riptide Rye Pale Ale, from London, Ontario. We both hail from London and we've heard of the trouble that the Forked River Brewing Company has had setting up their own store, so we picked up a bottle. First impressions have it rated in the delicious category. Very similar in taste to the La Formidable, with the hops shining through and a medium feel, it shines through in pretty much every way that La Formidable fails. Overall, this beer is a local favorite and we are happy to give it a unanimous rating of 4 out of 5 stars.

As can be seen by the scores, this was a solid set of beers. La Formidable, at 6.9% (nice), was a solid but unexceptional IPA. Golden Rail, at 5.0%, was delicious: a ride on the rail comes highly recommended. Finally, Forked River, at 5.7%, was an uncommonly tasty pale ale that we thoroughly enjoyed.

Until next time!

Five Things You Don't Want To Know: Dinnertime Edition

CAITLIN MCLAREN
3B CHEMICAL

5 THINGS YOU DON'T WANT TO KNOW

Thanksgiving has just passed, so you have all probably had a lot to eat. I imagine that turkey was involved.

Let us all take a moment and give thanks that the following foods were not involved.

Maggoty Cheese

There are a lot of jokes about stinky cheeses, but most of them keep their bioactivity on a microscopic level. At minimum, the bacteria in cheese do not jump out at you. The same cannot be said for maggots, which are around a full centimetre long.

Casu Marzu is a type of cheese from Sicily that is made from fermented pecorino cheese. The cheese is allowed to be infested with maggots, which will jump out at you while you eat it, and hit you in the face. Oh, yes- if the maggots die off, the cheese becomes toxic.

If you are wondering why this is legal, the answer is: of course it isn't.

Fried Spiders and Various Insects

These are precisely what they sound like. Let that sink in. In some regions of Cambodia, fried spiders are a popular snack.

If that isn't bad enough, the spiders are actually farmed. They are fried until crispy on the outside and soft on the inside – apparently, if they are insufficiently cooked, the insides will be runny. Those who have eaten them say that they taste like chicken.

Of course, these are not the only creepy crawlies that people will eat. Grasshoppers are a popular food in Mexico – in fact, they are extremely good for you and are becoming more popular around the world.

Australian aboriginals ate a variety of insects, such as witchetty grubs (moth larvae the size of a Cheezie). These are good raw (when they taste like almonds), or fried nice and crispy. Another delicious Australian insect is the honeypot ant. These ants have a special class that is fed massive amounts of food, which they process and store in their bodies. They can swell with sweet liquid until they become the size of grapes. When food is scarce, they regurgitate the food to feed the worker ants. Some of them, however, are captured and eaten as sweets.

Eyeballs

Relax, not human ones. But people eat the eyes of all kinds of animals.

In the Middle East and Scandinavia, goat or sheep's head is eaten, eyeballs and all.

In England, there is Stargazy Pie, which is a pretty normal savoury pie with fish, eggs, and potatoes – except that the still-eyed fish heads are bursting out of the pie crust, a la Alien. The story goes that this pie prevented the Devil from coming to Cornwall, presumably because even he has standards.

Russians will make soup out of fish heads, which float to the top to get a good look at you.

Meanwhile, in Japan, people will eat tuna eyes – disembodied, not in the tuna head. Whether this is better or worse is left as an exercise for the reader. Would you rather be stared at judgmentally by an eye in a severed head, or just the eye?

Testicles (or just sperm)

Organ meat is fairly commonplace, but some organs are preferred over others. Testicles are one of the less desirable… bits of an animal.

Actually, if you don't eat these, your grandparents probably did – they are very widely eaten all over the world, and in the past were still more popular. All kinds are and were eaten- goat, rooster, cow, sheep, and all the other normal delicious animals.

However, this is the past we are talking about, and many people were too polite to say "testicles," even while eating them. Hence, while the Cambodians will proudly chow down on their fried spiders while announcing them to all and sundry, testicles have a variety of euphemisms, such as "stones" or "bull's eggs" (which make sense), "mountain oysters" (which makes no sense whatsoever), or "fries" (which might have potentially disastrous consequences).

China goes the poetic route and calls these dishes such things as "Dragon in the Flame of Desire" (yak) or "Head crowned with a Jade Bracelet" (horse). If you see these on a menu, don't order them! Or do – we aren't going to judge.

Russians, cutting straight to the chase, will eat straight-up herring sperm, which is breaded, fried and eaten on toast.

The Japanese, of course, manage to one-up everyone else by and eating codfish sperm raw.

Things That Are Not Recognizably Food

Some things are really not food in any sense. Birds' nests are an example. However, in China, swiftlet nests are made into soup. Don't worry, they are not made of sticks and mud. No, they are made of solidified bird saliva. This seems rather unfair to the birds, who presumably spend a good deal of time drooling to build a nest only to have it stolen and eaten. One note is that these are washed before consumption, which would be good culinary practice if the nest were made of quite literally anything except saliva.

What foreign substance is disgusting enough, even in comparison to bird spit, to require removal?

In Thailand, people might eat bat paste, which is bats, mashed up. This is not only conceptually gross, but can be full of diseases. Dracula was not available for comment.

Koreans might eat Sannakji, which is made of live octopuses, poor things. These fight back, and might even choke you with their tentacles.

In numerous Southeast Asian countries, people might drink wine… infused with snake venom, which seems like a rather unwise thing to do.

However, Canada has the record for the most horrible alcoholic beverage. In the Yukon, Sourdough Saloon serves drinks containing an amputated human toe. You are not supposed to eat it (if you do, you will be fined), although there is a rhyme: You can drink it fast, you can drink it slow, But the lips have got to touch the toe.

That was not the record, though. The Inuit have managed to find an easy way to make a drink: Grab a dead seagull, put it in a bottle of water, and leave it in the sun to ferment. Yes, it will make you drunk. Try it sometime.

Compelling Evidence of Water found on Mars

NINA FENG
4A ENVIRONMENTAL

NASA scientists have found what they believe is definitive proof of the existence of liquid water on the planet, in the form of dark streaks found in images on the surface of Mars. The images, taken from the Mars Reconnaissance Orbiter (MRO), depict what is believed to be seasonal rivers of brine appearing during relatively warmer weather, carving gullies into the surface.

The migration of salt has been identified by an image spectrometer, which has determined that a likely cause of the movement is flowing water. The origin of the flow, which is predominantly subsurface, has yet to be determined, with theories that it may originate from either the atmosphere or the Martian crust.

Unfortunately, NASA has not yet been able to investigate exactly whether or not the dark streaks are, in fact, water. The Curiosity rover, while only being about 50 kilometres away from the site, cannot legally approach the site due to fear of contaminating it with Earth-originating particles.

The Outer Space Treaty of 1967, of which there are 104 countries participating, serves to govern current space missions. It contains provisions for the prevention of contamination of extraterrestrial resources. As NASA cannot completely guarantee that the rover is at an acceptable level of sterilisation, it must be very cautious, especially concerning water.

For the time being, investigations must be carried out from afar. At the very least, the images provide insight on where to look.

The discovery of liquid water carries with it several implications. Thus far, the only planet on which it has been found is our own.

With the colonization of Mars becoming increasingly possible in the (relatively) near future, the discovery could help to determine prime landing points for development.

This Halloween season, you too can observe water on Mars, just like NASA!

Federal Election Results in Liberal Majority, The Return of Prime Minister Trudeau

ALEXANDER LEE
3B NANOTECHNOLOGY

Can you feel the change in the air? After one of the longest, most grueling Canadian campaign seasons ever, clocking in at 78 days, we finally took to the polls to vote on Monday October 19.

There were many ups and downs along the way, but after the dust settled, the Liberal Party of Canada appears to have won a convincing majority, and their leader Justin Trudeau looks likely to be sworn in as the twenty-third Prime Minister of Canada. Thus marks the end of nine years under the leadership of Stephen Harper and the Conservative Party of Canada.

At the beginning of the campaign, Thomas Mulcair and the New Democratic Party (NDP) looked to be in the lead for the first time in history, with some polls showing them having as much as 40% of popular support. Traditionally, the NDP have been far below the Liberals and Conservatives in popularity, but they gained considerable support in the last election at the expense of the collapsing Liberals.

However, as the campaign dragged on, support for the NDP began to wane, and the Conservatives took the lead. Even this was not to last, though, and by the last week before the election, the Liberals and Conservatives looked to be neck and neck, the Liberals just barely ahead in the polls.

The primary issues of the campaign were initially immigration and the economy. The government had just passed the controversial Bill C-24, which included a provision to possibly revoke citizenship from dual citizens convicted of terrorism, espionage or treason. Additionally, the economy has officially been in a recession since last quarter.

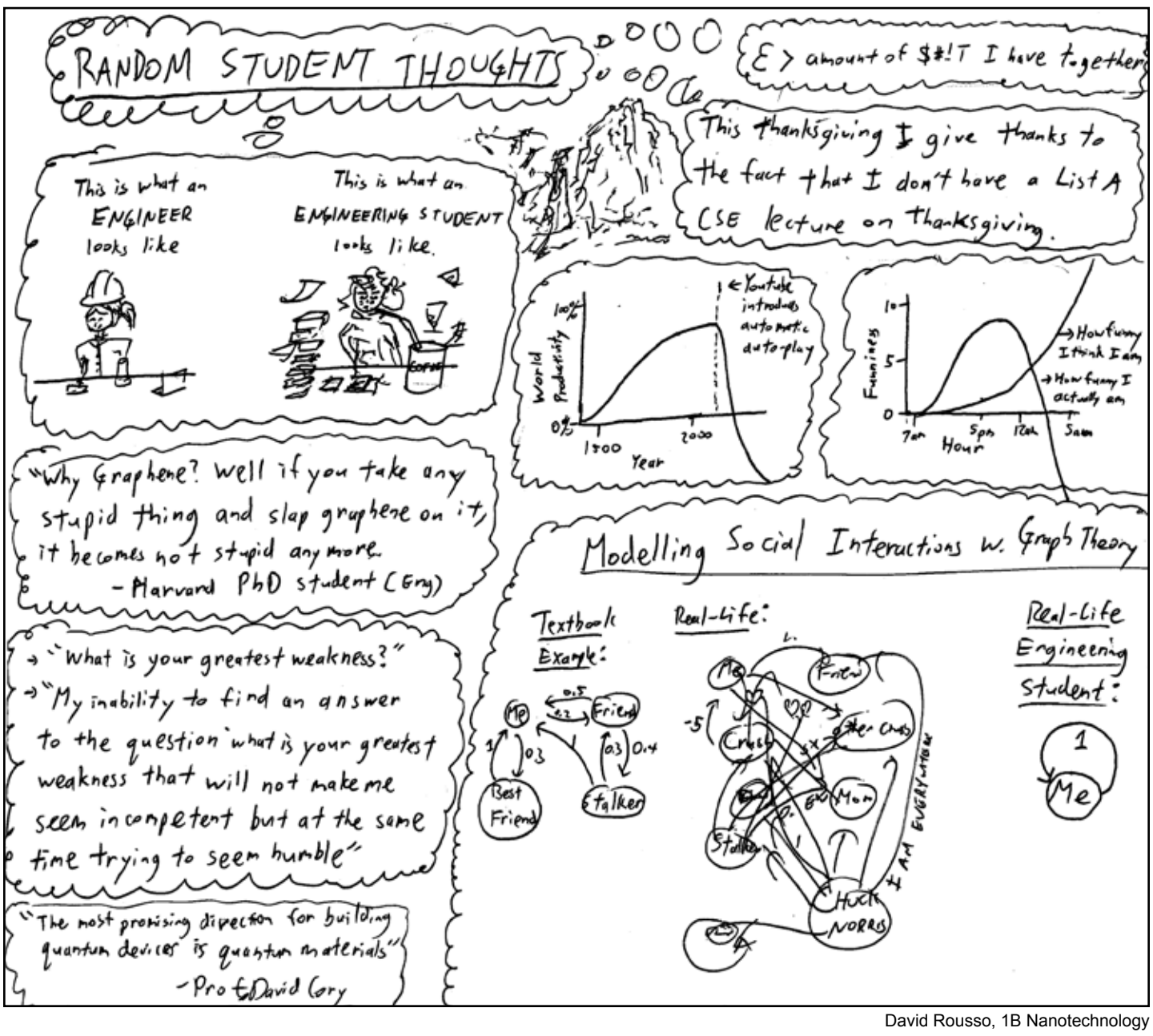
Another point of contention was the Trans-Pacific Partnership, a proposed trade agreement between Canada and eleven other countries on both sides of the Pacific Ocean.

By the end of the campaign, all of these issues had been supplanted in the public consciousness by the seemingly trivial question of whether new citizens should be allowed to wear the niqab, a Muslim female veil, during their citizenship ceremony.

Trudeau won the election on the back of a campaign built on a foundation of optimism and change. It appears the Canadian public has grown wary of Harper, and looked for a new face to lead the country. However, Trudeau faces large challenges that he will have to tackle now, such as an economy in recession.

Trudeau is the son of legendary Prime Minister Pierre Trudeau, but he himself is relatively new to the realm of politics. This newness allowed him to push his campaign of change, but he is untested and it remains to be seen how effective he will be in the Prime Minister's chair. He will have a cabinet to guide his decisions and faces no challenges in the House of Commons.

As the saying goes, out with the old, in with the new. In the coming years, we will see if Trudeau will be able to guide Canada in the right direction. I, for one, am cautiously optimistic.



David Rousso, 1B Nanotechnology

Point Vs. Counterpoint

Should Professors Allow for Extensions on Marked Assignments?

POINT

CAITLIN MCLAREN
3B CHEMICAL

Assignments: those things that prevent you from having a life. They have random due dates and often should be handed in to dropboxes on obscure parts of campus. No one likes them, but everyone has to deal with them. Sometimes, it is hard to finish and hand them in on time. Most of us have missed one, at some time or other. When we miss one, or anticipate missing one, the natural reaction is to ask for an extension. Some professors allow it; others, not.

One argument that those against extensions give is that assignments are all marked at the same time, and thus it would cause problems to have some come in later than others. This is, however, obviously nonsense. Everyone is aware that assignments are never returned until a long time after submission, and it is unlikely that some being a few days later would complicate anything for the marker. If it was the student's responsibility to hand it in directly to the marker when given an extension, there is no added onus on the marker. Moreover, many assignments are now submitted online, and thus it should make little difference when it is handed in, as the marker is not required to physically remove anything from a dropbox.

A more sensible argument is that solutions to assignments are often provided after the due date, and thus someone handing in an assignment late would have access to the solutions. However, most assignments for chemistry, physics, or other areas where problems have analytical solutions, have questions taken from textbooks with solution manuals. Even if this is not the case, most question types have solutions available readily online, though actual numbers may be different. In any case, it is not necessary to provide solutions immediately after the assignment's due date; for example, in some courses there is a "grace period" of a few days after the due date where an assignment can still be handed in, with a late penalty.

Some people have also said that students should be responsible enough to finish their assignments on time, and thus, if a student misses one, they deserve the resulting grade of zero. However, this is not necessarily fair. In some cases, students have heavier-than-average course loads and have assignments due in clusters, leaving little time for each individual one. Other times, there are unforeseen circumstances, such as illness or family emergencies. In these cases, asking for an extension is the responsible course of action. In such a situation, an actually irresponsible individual would simply miss the assignment. By asking for an extension, students show that they are actually willing to do the necessary work, despite having other priorities. Even if the student was simply lazy or wasting time until the last minute, a late penalty should suffice. After all, assignments are usually not important.

Again, there is an argument that students should not be given extensions because they will grow used to them, and will not have the life skill of meeting hard deadlines. However, this is completely absurd. In the first place, there are many hard deadlines throughout the academic year- midterms, exams, large projects, etc. Not every deadline in life is completely rigid, so why should every academic deadline be? Furthermore, even in the real world, and with a rigid deadline, it is usually better to finish something late than not to finish it at all. Being late is not a good habit to cultivate, but surely it is even worse to cultivate the mentality that if something is behind schedule, one should simply give up on it.

In general, assignments are worth very little of the overall mark for a course. Indeed, their main purpose is for students to show that they are learning the material, and to provide a study guide for exams while showing what kind of problems will be asked. None of these are affected by a due date. If a student hands it in late, they have still done the required work, and derived the intended benefit; if it is still within a reasonable period of time, it should not cause any extra inconvenience for the instructor or TA.

Ideally, an assignment should be finished by the due date. However, there are numerous valid reasons for a student to submit one late, and it is better to finish it late than not to finish it at all. Furthermore, the main purpose of assignments is not to receive marks, but to study, learn material, and demonstrate that one has learned it. If a student has not done this on time, they can easily be penalized, but there should be a distinction between students who are delayed, but are willing to work, and students who are unwilling to do it at all. If an assignment is submitted within a reasonable period of time, a student should get at least some credit for it. If a student asks for an extension in advance, that is a sign of responsibility, not irresponsibility. There is no good reason not to allow extensions on assignments.

Editor's Note:
Point Vs. Counterpoint is a feature meant to stimulate discussion on thought-provoking topics. The views and opinions expressed here do not necessarily reflect those of the authors, *The Iron Warrior*, or the Engineering Society.

Patricia H, on Flickr

Do extensions on assignments benefit the student, or simply encourage bad academic habits?

COUNTERPOINT

CAMERON SOLTYS
2T MECHANICAL

Projects are a core part of academia. Most courses have a large project or two, were you can apply the skills you've learned to some larger, complex problem. And projects are important; oftentimes, they are the only way you can get a marks besides the paramount midterm-and-final combo. So why is it that the deadlines for those projects—sometimes received before the semester even starts—are so often neglected or pushed back? When deadlines are extended, irresponsibility and poor planning are rewarded. Deadlines are important because it lets you create a plan. The fact that they can be fluid creates an expectation that one can get off scott-free. People need to know when they can get your contribution, and if you cannot make a deadline there are acceptable ways of dealing with the situation.

Deadlines are massively important. A few weeks ago, many moderators of reddit.com declared a victory in their fight with the site admins when the admins put forward a deadline for when they would produce new mod tools that the moderators so desperately needed. Why are deadlines so important? Because deadlines allow people to make plans, and to decide what they want to do. There is a reason that large automotive companies charge thousands of dollars per hour when a supplier doesn't make a shipment: the manufacturer is losing that much money because their plans are interrupted. Deadlines are the way people collaborate. Without them, nothing would ever get done because a hundred people each taking an extra day to do their thing would make the project months late.

What's the harm with a professor moving a deadline for you? He or she is the one affected. You just get more time and flexibility to finish the project. Nothing but good comes from it. I disagree. The wrong that comes from it is that not only is irresponsibility acquitted, but prudence and time-management are punished. How irresponsibility is acquitted is simple; you didn't get the project in on time, for which there are pre-described punishments. Except that the punishment is not doled out.

For the prudent, the punishment is in the form of the sacrifice that goes unnoticed. Maybe you skipped movie night with your friends to work on the assignment. And sure, you finished the project early, but not all time is equal. My friends have seen the movie now, I cannot go see it with them again. If I had known that the project would be due later, I would have gone to the movie and worked during what is now my free time. A deadline allots you a certain amount of flexibility. If you have more flexibility, you need less sacrifice. When the flexibility goes up at the last minute, you don't get retroactive sacrifice credits.

Now to be clear, I am not saying that deadlines are the be-all end-all of life. We are adults. We have free will. If you so choose, you could just not do the assignment at all, deadlines be damned. What I am saying is that a mass-extension of the deadline rightly creates disgruntlement for those who were done on time. Sometimes you cannot meet a deadline. There are busy weeks and extenuating circumstances. Which is when you go to the professor and ask for a personal extension, based on the merit of your need. This is a good balance. It means that everyone can expect a fair chance to do well on the project. At the same time, if the sacrifice you need to make to get the project in is too great, you have other options. The people who do not benefit from this are the ones who were irresponsible. They are the ones who put it off and don't have a valid reason for the extension, or who realized their predicament too late.

What if everyone is not ready? What if everyone would fail because they did not have enough time? Well, why does this happen? I can think of two reasons. The first is that not enough time was given when the project is assigned. This is a case where everyone has a legitimate grievance. This is the case where a member of the class should get up immediately and voice the class' concern. The other reason this might happen is because people expect it to. When it becomes engrained in everyone that the deadline can move on a whim, the deadline is no longer respected and the problem arises. Enforce the deadline, and the problem will go away.

Deadlines are an important part of life. The consequences of missing them can sometimes be enormous. And when they move, it is not only the professor that is affected; the students are affected too. Unfortunately, the effect is negative for the students who respected the deadline, and positive for the students who did not. The default for deadlines should be that they are firm, and exceptions only be made when you have the foresight to communicate with the professor about your circumstance. Deadlines are not the most important part of academia, but they are important. Their frequent violation is frustrating for those who try so hard to excel within the rules.

Fresh Alternative

TINA YAO
2T CHEMICAL

ON REPLAY

Who says you must sacrifice satisfying hooks and riffs for creative songwriting? Tap your pencils to these catchy, critically acclaimed, new tunes.

Sam Bruno-"Search Party"

At a glance "Search Party" seems to be about escaping on an adventure, which is fitting to the theme of Paper Towns as the lead single on its soundtrack. However, Sam Bruno has deftly disguised an earnest song of a couple's secret world under a breezy synth-pop swagger. The radiant riffs and hip-pop lean has whiffs of M.I.A's "Paper Planes", and its hook has the sing-along quality of a major pop anthem.

Troye Sivan- "Fools"

Clean beats and slick production are not uncommon in the flood of alt-pop on the internet. What makes "Fools" stand out at first listen is the Australian singer's strong vocals and lyricism. The hook, "I see swimming pools and living rooms and aeroplanes/ I see a little house on the hill and children's names/ I see quiet nights poured over ice and Tanqueray" is a breath of fresh air and evokes the feeling of lounging in an airy condo.

Florence and the Machine- "Caught"

The flamboyant English songstress is known for thunderous vocals and feminist undertones in her music, yet she is not afraid to show her vulnerability in a soulful ballad such as "Caught". The rising chorus, "And I'm caught/ I forget all that I've been taught/ I can't keep calm, I can't keep still/ Pulled apart against my will" throws caution to the wind while staying keenly self-aware at the same time.

The Arcs- "Stay in My Corner"

The Arcs is a side project recently started by Dan Auerbach (front man of The Black Keys), which will supposedly release him from commercial restraints. Their album's first single "Stay in My Corner" is a mid-tempo blues-rock tune featuring Auerbach's white-soul falsetto. Its lyrics are a contemplation on romantic need, while taking influences from the recent Floyd Mayweather-Manny Pacquiao bout. The lush instrumentals and vocals are also nostalgically reminiscent of The Black Keys' earlier work from Brothers.

Keyes-"Veins"

The 18 year-old Warwickshire soloist stuns with her promising debut "Veins." Its immediate catchiness is balanced by a subtle dark maturity. The vocals are full of restrained emotion as she croons over her passion. The hook "Cause you're running through my veins/ Every thought, every word now is stuck in my brain" is bound to keep the track running through your head.

Alessia Cara- "Here"

Ms. Cara refuses to glorify raging parties. The 19 year-old from Brampton, Ontario rose to the industry spotlight after releasing her stomping debut that sticks up for introverts and wall-flowers everywhere. "Here" is a loud and poignant single, with silky vocals and elegant R&B soul that describes the misery of being trapped in a haze of smoke and gossip.

Taylor Swift Curse: Have the Jays Shaken It Off?

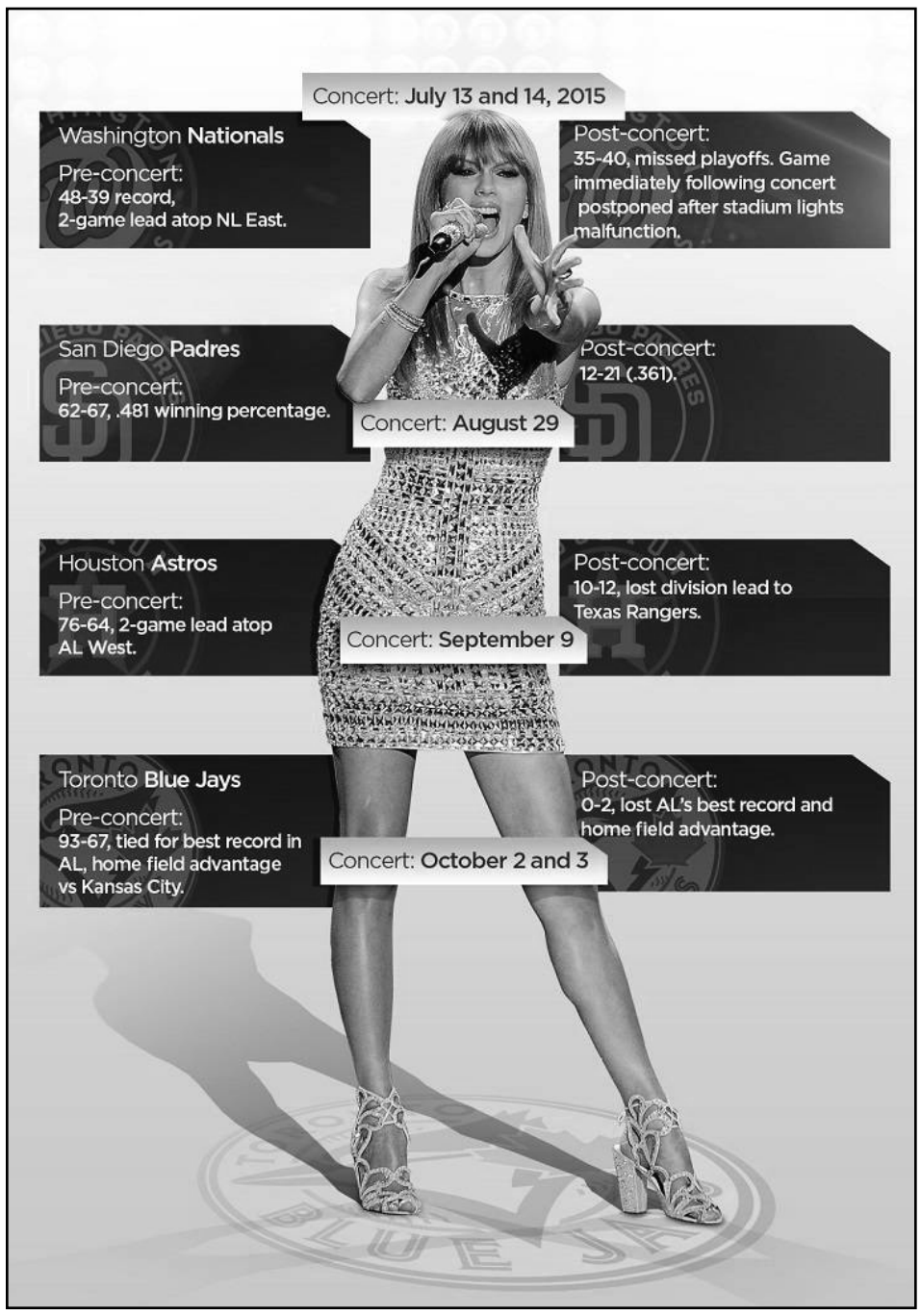
SARAH CHAN
2A NANOTECHNOLGY

The Toronto Blue Jays are currently the pride and joy of Canadian sports teams. They have clinched the American League East for the first time in 22 years. They have the best offence in the league, led by Josh Donaldson, Jose Bautista and Edwin Encarnación. They have a wicked defense including Kevin Pillar who always makes amazing diving catches. They have arguably the best pitcher in the league, David Price, supported by phenomenal performances by R. A. Dickey, Mark Buerhle and Roberto Osuna. The Jays were looking unstoppable. Until October 2, the day Taylor Swift came to perform in Toronto.

Taylor Swift is the biggest pop star on the planet today – perhaps in our generation. She knows how to put on an awesome show and always brings a celebrity guest for her fans. Everyone who goes to her concerts says she was phenomenal and incredible. However, T-Swizzle is known to be a bad luck charm for Major League Baseball teams. It's been noted that after Taylor performs in an MLB team's stadium, their team implodes and self-destructs. According to ESPN, the Houston Astros have suffered a 7-11 record since her concert, losing seven of the eight games immediately after her concert. Before her concert, the Astros had the top spot in the AL West division. They also just lost to the Kansas City Royals.In Washington DC, after T-Swift's concert, when the Nationals played, the lights went out in the stadium – not once, not twice but three times. Afterwards, the Nationals had a disastrous record and have been eliminated from the post-season after having the top spot in the National League East before her concert. Next, the pop princess performed in San Diego. The result? The Padres lost twenty-one of their thirty-three games since her concert and were subsequently eliminated from the playoffs.

Now, we haven't exactly conducted a proper experiment to determine whether the losing is caused by T-Swift or if it's merely coincidence. Also, the Jays did win the American League East Division so maybe the curse has been lifted. However, we can't ignore the stats and it seems to me that the correlation index between her performing and a team losing is pretty high. Perhaps the Blue Jays will prove the theory wrong and just "shake it off." Or maybe the curse is real. After her performances on Friday and Saturday, the Jays had lost the last two games of the regular season and then lost their first two games against the Texas Rangers. However, they pulled through and won the division title against all odds. Perhaps the Jays are the Chosen Ones of the Baseball Gods (who are probably the only ones able to uplift the curse) this year. But then again, they lost their first game against the dastardly Kansas City Royals so maybe the curse is coming back.

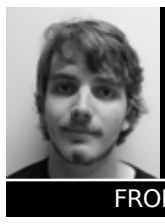
If the curse is real, Taylor Swift will be as unwelcome in Toronto as Meek Mill and she's going to have bad blood with a city that used to give her mad love. She should just stay in New York City and perform in Yankee Stadium. The Yankees need to lose anyway.



Global News

Is there a correlation between Talyor Swift and baseball performance?

Chrononauts



DONOVAN MAUDSLEY
3B CHEMICAL

FROM PAGE TO PAGE

Chrononauts is a limited series written by Mark Millar. For those who don't know, these days Mark Millar is kind of the man when it comes to graphic novels and series runs. The movie rights to Millar's stories typically get picked up before they even hit the shelves for their first issues. (Chrononauts is currently in development at Universal at the moment.)

Millar's original comic adaptations include Kick-Ass, Wanted, and Kingsman: The Secret Service, all of which were blockbuster movies in their own rights. Millar also penned many of the Marvel Ultimate Universe comics, including the Ultimates (the Ultimate Universe version of the Avengers) which served as the primary source material for Marvel's The Avengers. Yeah, I know that the Avengers have been around for forever, but Millar ditched heroes with over the top costumes, fighting crazy villains without any supervision in favour of a more grounded, government sanctioned team. Millar also wrote the backbone of Marvel's Civil War storyline, to be featured next year in Captain America: Civil War.

Chrononauts combines the time travelling antics of Back to the Future with the buddy adventure stylings of Lethal Weapon. In the near future archeologists keep rediscovering sites filled with modern technology, and the scientific community takes that as a hint that time travel is the way of the future.

After an unmanned satellite style mission, two geniuses, Danny Rielly and Corbin Quinn, are the first to take the plunge through time, but of course everything first goes wrong, and then goes so right. Who would've thought that giving two geniuses with personal issues power over time would be a bad idea?

By the third issue the boys have written Harry Potter and Breaking Bad, stolen legendary gangster Lucky Luciano's girlfriend and jammed with the Beatles (playing them their own songs). Of course nothing last forever and the house of cards starts coming down. After a chase through time and space our heroes are left with nothing but their wits to save the day.

Overall, Millar crafts a world full of light hearted adventure with excellent but fairly one dimensional characters. The emotional climax of the story is brought down by the length of the story, with audiences not having much invested in the characters after the four issues. Millar also forms continuity problems through time travel by not adhering to a specific set of rules when the past changes.

While not a must read for everyone, fans of Millar's work or time travel stories in general will certainly enjoy it. As a man who can recite almost the entire Back to the Future trilogy I give it two thumbs up.

Exercise keeps the grey matter happy

You can only study so much you smuck!

NATURE ENTHUSIAST
4A LEAFOLOGY

BE FREEEEEEEE

Here we are, the autumn chill is creeping in and enticing us to leave the great outdoors and cozy up by our imaginary fireplaces with a textbook in hand. Isn't it glorious?! So much of the time we might have once spent outdoors is now liberated for our use to study!

But beware! Although this season is fantastic for wearing sweatpants all day 'ery day, it is important that you occasionally use them for their original purpose – sweating! Too much cozying up to your textbook may cause stretch marks. They might not be visible like the ones around your midsection after all those C&D cookies you keep saying you'll stop eating. But trust me, they're just as deadly! The longer you sit the less oxygen your brain will get and eventually this will lead to unavoidable cell death.

There is a solution! Beat stress and feed the brain beast by getting some A-C-T-I-V-itay (hey! I didn't say I followed my own advice now did I?).

STEP 1: Venture outside. You can do it! Take those feet, put on some wool socks and fall time boots and leave your bedroom. Now maybe add a nice fluffy sweater, a scarf and some mittens. Maybe grab some nuts to feed squirrels as well. Chasing after squirrels to give them nuts is an excellent way to build cardio.

STEP 2: Find a leaf pile. This may involve traipsing through some woods to find leaves. Keep in mind, leaf piles do not exist in fields and leaf piles in woods likely have many sticks. Ensure the sticks are removed prior to step 3. Remember, you can do it! (Pro tip, if you can't find a pre-made leaf pile grab a rake and make one yourself!

STEP 3: Jump in leaf pile! Roll around a bit. You cover yourself in those leaves! Now everyone will now just how much outdoor A-C-T-I-V-I-T-Y you got! (Look at my laziness evaporating from all that exercise!)

STEP 4: Now relax, your brain oxygen is almost replenished, you can take it easy now!

Congratulations, you have enjoyed the Autumn AND exercised! I am very proud. This may be super silly but exercise is important! Make sure to take some study breaks every once in a while to enjoy some fresh air! I recommend games of Frisbee and scenic detours when walking to class. Happy exams everyone!

A How-To Guide: Carving Pumpkins

DAVID ROUSSO
2A NANOTECHNOLOGY

A HOW-TO GUIDE

Since Halloween is coming up, we thought it would be a good idea to give a quick, short, and educational how-to guide to carving your own pumpkin.

Your first step would be to acquire a pumpkin. Farms have pumpkins. Go locate your nearest farm. Go to the field and find a good pumpkin. Good pumpkins are big, orange and hard. The small red squishy ones that people put on salads are not good for carving. Once you have found a pumpkin that suits your fancy, try to remove it from the ground by pulling it. Now pick yourself off the ground after failing miserably at removing your pumpkin. Take out your engineer's multitool and attempt to cut it off from its stem. Good job, you can use sharp objects without injuring yourself. Now leave the farm with your pumpkin. It is likely that at this point the farmer has noticed and may try to give you some bullets as a gift for removing this pumpkin weed from his field. Unfortunately, the device he uses to pass you these gifts seems to make them travel towards you a bit too fast for you to catch. Vacate the area immediately to avoid injuring yourself and thank the farmer for the gift.

Now that you've escaped the farm and are now in the safe comfort of your parents' basement, you can now begin the carving process. First, look at your pumpkin, now back at me. Now back at your pumpkin, now back at me. Sadly your pumpkin is not me (especially if you were fancying stabbing me repeatedly with a knife by now).

Now, take your knife and insert it near the top of your pumpkin. Now remove the knife from your hand because you were so pitiful that you accidentally stabbed your own hand, and seek medical attention. When you return, continue cutting out the top of the pumpkin. Now, reach your hand in and remove the seeds. Now remember that you have 6 assignments due tomorrow and proceed to fail miserably at convincing yourself to do them, eventually resolving in procrastinating and watching Netflix for 13 hours straight trying to forget how f-ed you are for midterms.

Anyways, take a pencil and sketch on the surface of the pumpkin whatever design you want to carve. Now evacuate the house because you failed so miserably at drawing that you set your house on fire. After waiting for someone else to call the firefighters to put out the fire (because you are so pitiful that if you tried calling them yourself you would just set your phone on fire), take the remains of the pumpkin and give it to your one friend who can actually draw to sketch your design on the pumpkin.

Now find a drawn line on your pumpkin and try to insert your knife tangent to that curve (you're an engineering student. You should at least be able to do THAT correctly). Now, by moving the knife in and out from the pumpkin with a sawing motion, follow the lines that your friend drew. Now get intimidated by the large amount of lines your friend drew because they like realism too much and ask your buff roommate to carve the rest for you.

Just because you are carving a pumpkin doesn't mean you can't be reviewing photodiodes too.

Congratulations!!! You* have just carved a pumpkin!! Now place an ELECTRONIC candle (because the municipality of Kitchener-Waterloo no longer trusts you with any sort of fire-like thing) inside the pumpkin and place it outside your door and you're done! Just remember to check occasionally to make sure nobody has left any excrement in your pumpkin this year.

The Postseason: Hold On, It's One Hell of A Ride

ELIZABETH SALSBERG
3B NANOTECHNOLOGY

THE BENCHWARMER REPORT: BIRDWATCH!

Baseball fans of the IW unite! After a seemingly interminable yet action-packed three-week hiatus, BIRDWATCH returns. And boy, do we ever have catching up to do. As we anxiously await game 3 of the ALCS in Toronto this Monday, let's recap, regroup, and look ahead.

Recap

The Jays finished off their ALDS in a dramatic thriller over the Texas Rangers. Down 3-2 in the seventh inning, slugger Jose Bautista did what he does best, sending one out of the park for a 3-run homer. Assisted by three Texas errors, the Jays would put up a total of 4 unearned runs in the inning to take the lead and never look back. Young pitching dynamos Sanchez and Osuna closed down the Rangers in the eighth and ninth, and the rest is history. The Jays became just the third team in baseball history to come back after being down 2-0 in a five-game series.

Two days later, the Jays squared off against the defending A.L. Champs in the Kansas City Royals in game one of the ALCS. Marco Estrada was mostly solid through 5 1/3 innings giving up just three earned runs on six hits. Voloquez, the KC starter, was sublime, pitching his way out of trouble in the seventh. After issuing back-to-back walks to Donaldson and Baustista he cleaned up the garbage, sending Encarnacion, Colabello and Tulowitzki down in order to stymie any potential Jays comeback. The infamous bullpen then took over and KC went on to win it 3-0.

In game 2, things were looking good early on for the Jays. David Price was lights out over his first six innings, and the Jays had manufactured a 3-0 lead. A Donaldson infield single got things going: Bautista then walked, Encarnacion squeaked out a single and Troy Tulowitzki clocked a double to get the 3-0 lead in the sixth. The inning was the last for KC starter Yordano Ventura, and that bloody infamous bullpen would take things over in the seventh. Not a problem, the Jays had a 3-0 lead…

In the top of the seventh, a standard fly ball off the bat of Ben Zobrist fell awkwardly between Ryan Goins and Jose Bautista for a bloop single. Then all hell broke loose: The hot bat of Lorenzo Cain swatted a single. Eric Hosmer singled as well to score the first KC run. No big deal. But a fielder's choice and another single by Mike Moustakas tied things up at three with two outs. Alex Gordon then hit a double, giving KC a 4-3 lead, and Price's time was up. Sanchez inherited the situation, and unfortunately gave up another hit as the Jays fell behind two runs. And then the bloody infamous bullpen came in… Final score: 6-3 KC.

Regroup

Game 3 goes Monday in Toronto, with Marcus Stroman on the mound for the Jays. Stroman has been supreme in all of his starts since his return from a torn ACL, with two games in the ALDS, one of them the epic game 5 victory. This is one special starter, and the Jays will need him to perform on Monday if they are going to get back in this series. Though the ALCS is a best-of-seven, it will be very difficult indeed if the Jays manage to go down 3-0.

The big bats need to get going. That being said, if this lineup has shown us anything, it's that they can make the right adjustments at the right times. With Johnny Cueto getting the nod for KC, it's the perfect time for the bats to get out of this mini-jam. Cueto, though excellent in his start in the ALDS, has not been great against the Jays posting a palatable 4.05 ERA over three starts.

Nevertheless, Donaldson, Bautista and Co. will need to take advantage early, as the KC bullpen is a nasty piece of business (did I mention that yet?). The Jays will also need at least six innings out of Stroman. The only lefty in the Jays' bullpen is Aaron Loupe, whose pitching is comparable to pouring gasoline on a fire. If I'm John Gibbons here, I'd rather avoid him. With the Sanchez-Osuna duo available to work the eighth and ninth, the only question will be in the middle innings. If Stroman can even last one out into the seventh though, this should not be too much of an issue, as both Sanchez and Osuna are more than capable of getting more than three outs.

As far as game 4 is concerned, there is another pressing question: Who will start? R.A. Dickey is the only Jays starter to appear in the ALDS who will not have pitched in the ALCS. Gibbons will have a tough call on his hands, as the knuckleballer was excellent over the second half of the season, and was solid in game 4 in Texas. That being said, if the knuckler isn't dancing, KC hitters will probably knock it out of the launch pad Rogers Centre.

With Game 4 being essentially a must-win, I would not be surprised if Gibbons lifted Dickey in favour of Estrada, who has been so consistent, taking the must-win game 3 in stride in the ALDS. There is even a possibility that we see Price in game 4 on short rest, as he will have last pitched four days ago by Tuesday. That, or he could surprise us again and bring Price out of the 'pen as a lefty. But probably not. Regardless of what happens, it will certainly be interesting.

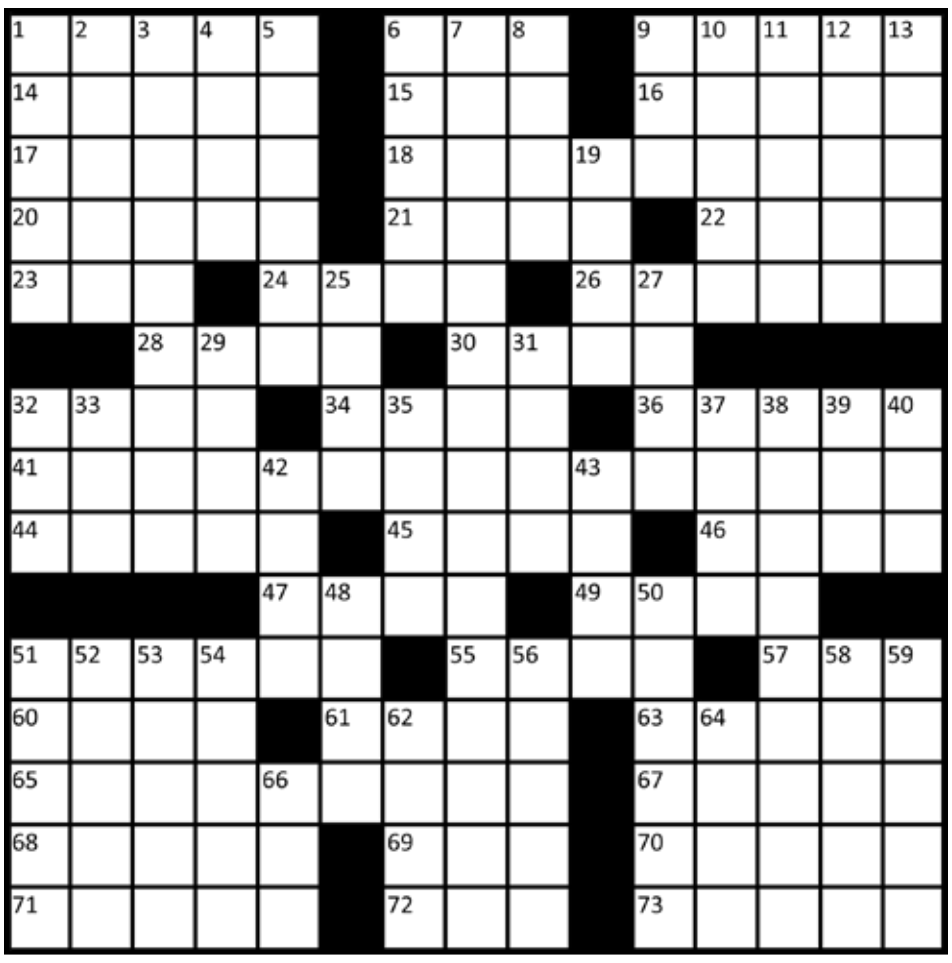
The Look Ahead

Following games 3 and 4, game 5 will also be played in Toronto. Games 6 and 7, if necessary, will be played in KC. Should the Jays go on to win the ALCS, they will meet the winner of the Mets-Cubs NLCS (National League Championship Series, Mets lead 1-0) in the World Series, beginning Tuesday October 27th. The American League team will have home field advantage because they won the All-Star Game back in July.

The Iron Crossword

You're a Wizard, Harry!

CAMERON SOLTYS
2T MECHANICAL



ACROSS

1: Owls and hawks, for instance
6: An exclamation of understanding
9: Prussian statistician who wrote 'On the Statistical Significance of the National Tongue'
14: Enchanted ones are useful for navigating the halls of Hogwarts undetected
15: The cartoon-esque visual style of the 'Borderlands' video game series
16: Company that took over 'Community' when it was cancelled by NBC
17: Something outstanding or unique of its kind
18: Hermione used aTime-Turner to get more of this
20: Holds canvas for the purpose of painting
21: Negative ones can be made by reduction
22: The estate version of the Fiat Duna
23: A technology that makes an entire disk unreadable to unauthorized users (abbr)
24: "__ is __ aisle", Barenaked Ladies (2 wd)
26: Godfather wrongly imprisoned
28: Feeling or mood
30: Could be turned into manure, perhaps
32: Japanese soup containing boiled eggs and other ingredients
34: Small vehicles for traversing rough terrain
36: The structure that contains female reproductive cells in plants
41: Lily's early-years friend (self-styled name)
44: A common response when you are the second person to desire something
45: Protagonist of the movie '10,000 BC'
46: Acronym for the European Institute of Personnel Development (abbr)
47: Unit of area equal to 1012 square meters
49: A round "tent" used for pseudo-camping
51: What Harry and Draco where doing when Harry learned he was a Parselmouth
55: The direction from which the sun rises
57: A week at some law schools where firms come to interview candidates (abbr)
60: Might be shot from a gun (abbr)
61: Sung to a god, perhaps
63: Dogs can be too _ _ learn new tricks (2 wd)
65: ___ ___ is used for brewing potions (2 wd)
67: Combination of 2 comic book punch sounds
68: Pet name for someone you think is attractive
69: Type of condition that includes pneumonia, whooping cough, and influenza (abbr)
70: Famously shoe-shaped country
71: Name meaning "son of Otto"
72: The airport code of Cape Dorset Airport
73: The supposed superior race of Nazism

DOWN

1: Following A
2: Hyundai commercial vehicle with a name that indicates one of the things you can do with it
3: President who died between Yalta and Potsdam
4: Confused
5: NASA's 1970s space station
6: The spell Harry uses to thwart the dragon
7: __ Who Must Not Be Named, or ___ (3 wd)
8: Computer scientist who died of cyanide poisoning
9: We's the __ who build the boats
10: Informal name for a western movie
11: Often spicy dish with a contradictory name
12: Type of kelp used in the Japanese dish Dashi
13: Astronomical Society of North Warwickshire, England (abbr)
19: Team led by Sun Wukong in the TV show RWBY
25: Loyal and faithful
27: Name of the protagonist in the 2008 film about a villain's sidekick
29: Offered by a Help Desk, for instance
31: The American Federal Department involved in teaching
32: Unit of resistance
33: Internet abbreviation that sarcastically polls to see if an opinion is unique
35: Used in code to designate areas that need work
37: A contest or struggle
38: International charity that focuses on poverty and homelessness
39: A measure that describes a banks short term assets versus their net cash (abbr)
40: An exclamation of surprise and disgust
42: Drill
43: Course code for classes dealing with the mathematical understanding of reality
48: A disorder in which suffers live in constant fear and mistrust of conventional wisdom
50: "Come to ____" message sent from far away in Dr Who
51: Pale-haired enemy of Harry Potter
52: Describes a more risqué version of a film,
53: Excel function that returns a date so many months after the current date
54: Loughborough University society for Muslim students
56: Orphan girl who gets to live big in New York
58: Italian early 1900s car manufacturer stared by Matteo Ceirano
59: A word for females that some feel is less misogynistic than the common spelling of the word
62: Response to the question "orly?"
64: Popular fantasy series that included several well-developed novel languages (abbr)
66: French word for the (plural)

Sudoku

#2015-12

MEAGAN CARDNO
3B NANOTECHNOLOGY

O.W.L.s

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

N.E.W.T.s

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

Solutions for previous crosswords can be found on *The Iron Warrior*'s website at *iwarrior.uwaterloo.ca/distractions*.

THE IRON INQUISITION

Leah Kristufek, 4A Chemical

"What is your favourite Trick or Treat?"

"Used Guitar Strings... in a KitKat."
Vince Magas, 2T Management

"Chopsticks are the best treat... they can make you a walrus!"
Jakub Dworakowski, 4A Mechatronics

"Putting shaving cream in someone's ear."
Bryan Mailloux, 2A Mechatronics

"Babies."
Taylor Lindblad, 2A Mechatronics

"Those little Mars Bars."
Eugene Zivkov, Mech Eng Grad Student

"I don't know, it's been like 5 years since I trick or treated."
David Muroloch, 2B Computer Engineering