Enrolment targets reached

University-wide student numbers stable on first day of classes

MEGHAN SIRED

Four years into the university’s third integrated plan, and student targets related to enrolment and diversity have been met and remain stable, according to Patti McDougall, vice provost of teaching and learning.

“It’s time to set new targets,” said McDougall. “With a new president coming in and the end of our third integrated plan, now is the ideal time to start thinking about what size of an institution we want to be in the next 10 to 20 years.”

As of the first day of classes, 19,754 undergraduate and graduate students registered for classes this fall—up 0.6 per cent from the previous year.

“At the beginning of our third integrated plan we set goals for our college enrolment numbers, and we are where we projected we would be by 2015,” said the vice-provost.

Overall, college and school enrolment numbers are stable, said McDougall. One college that has far exceeded its enrolment goals is the College of Agriculture and Bioresources. As of the first day of classes there has been an 11.5 per cent increase of undergraduate and graduate students in the college.

“Our programming is innovative and offered in a research-rich environment,” said Mary Buhr, dean of the College of Agriculture and Bioresources, who partially credits the increase in enrolment to the college’s hands-on approach to learning. “Our students see the real-world benefit our programs offer, and even before they graduate, they are learning the inner workings of the multi-billion dollar industries that are agriculture and agri-food.”

As of the first day of classes,
A lot can happen in half a century, and for the College of Medicine’s School of Physical Therapy a lot has. As September rolls around, the school is excitedly preparing for its 50th anniversary celebrations and reunion, which is helping to provide care to an aging population.

Since that first class of 20 students, the school has doubled its enrollment, undergone progressions in curriculum and evolved from a diploma program to its current model as a master’s program.

But perhaps one of the most fascinating, and lesser known, pieces of the schools’ history is more concrete in nature—or, more precisely, the first brick-and-mortar location of the school. "When the school was established there wasn’t space on campus, so (it) started in a hangar building out at the airport—where the children’s rehab was,” Harrison explained. "It made sense at that point to have the physiotherapy education program near the rehab centre. So students would spend some time on campus, because they would do other university classes like psychology, and then they would jump on a bus and head out to the hangar to do their physiotherapy classes.”

The school did not move into its current space at St. Andrew’s College until the early ’70s, and even then the plan was that they would only be there temporarily. But it will not be long until they move across the street into their brand new digs in the Health Sciences Building.

"We’ll be celebrating that as much as we’re celebrating this anniversary,” Harrison said with a laugh.

As for the future of the school, it ties back to first euphoric days in that hangar by the airport.

"Fifty years ago there was a serious need for physical therapy professionals and researchers to be a part of the health professional teams to help improve physical care for Saskatchewan citizens—that was the incentive.”

And that is a need the school will continue to meet. ■

Marg Sheridan is the online communications co-ordinator in the College of Medicine.
The new secondary logo system for the University of Saskatchewan has officially launched. Based on feedback from across campus that the old combined logo had too many limitations, the marketing and communications team devised a new, more flexible system.

The new secondary logo will work for our colleges, departments, centres and units,” said Ivan Muzychka, associate vice-president communications. “It lets those various units have a logo that is specific to them, while still retaining a strong tie to the University of Saskatchewan. It’s that consistency that is important to creating a unified brand for the university.”

The new logo system was shared with a number of groups on campus for feedback before going to the policy committee. It was discussed at University Council and ultimately approved by the Board of Governors.

While the secondary logo system is now university policy, Muzychka recognized that it will take some time for the rollout to be fully realized.

“In places where the new secondary logo can easily be used, it should be used right away. However, we feel careful and efficient use of resources takes priority over an immediate transition. We wouldn’t want anyone, for example, throwing away stationery that has already been printed because it had the old logo. We would rather they use it up and, when it comes time to order stationery again, use the new secondary logo that is appropriate for that college or department.”

There are some exceptions to the new policy. For example, the Edwards School of Business logo, developed in consultation with the named donor, will remain in place.

The secondary logos are available for download, and more information is available about the logos and their use, at communications.usask.ca.

Teri Parkhurst is a marketing specialist with Advancement and Community Engagement.
A sire call to create without limits pulled John David Graham through architecture—confined by physical limitations, clients and budgets—into fine art, a field for unfettered imagination.

“In art making, I discovered freedom I could not experience in practicing architecture,” said the assistant professor in printmaking and digital media. “Art making emphasizes process as much as product. Art making allows me to work with my hands in shaping ideas into form. Equally important, I can openly explore visually symbolic and mythological narrative storytelling.”

Graham grew up in Ottawa and Montreal. He completed his bachelor degree in environmental studies before earning a master’s degree in architecture, both at the University of Manitoba. He obtained a bachelor of fine arts from Concordia University in Montreal, then travelled to the University of Oregon for his MFA. He joined the U of S on a one-year term before joining the faculty full time in 2014.

“I have taught studio art in a variety of programs at universities and colleges in Canada, USA and Australia,” he said, explaining he was drawn to the Department of Art and Art History by its rich, pluralistic traditions.

In addition to mentoring students and his own creative work, Graham strives to address an underappreciated aspect of art: safety. He cites statistics that show artists lead shorter lives, in part due to toxic chemicals in their creative spaces such as paints and solvents.

“One colleague of mine died prematurely from cancer,” he explained, while pointing out a new isolation booth with a dedicated ventilation system he procured for the printmaking studio in the Murray Building. Graham urges his students to think of safety protocols as part of their toolkit, as essential to their work as pigments, screens and brushes.

“Good artists play, and when you play, you forget—you don’t have rules,” he said. “Artists need to play, but they need to be safe. I feel very strongly about this. They need to take care of their health. Once that’s become second nature, then they can play.”

With the launch of a new master’s degree in water security—the first of its kind in North America—students will learn how to tackle complex issues concerning water availability and quality.

“Our university has one of the strongest water research communities in the world that is examining issues from an interdisciplinary perspective—that’s the way we need to examine concerns such as drought, flooding and water quality,” said Andrew Ireson, assistant professor in the School of Environment and Sustainability (SENS) and the program’s director. “The program will train students to tackle these issues using a holistic approach that incorporates not only the sciences, but also the study of social dynamics and public policy.

The Master of Water Security (MWS) program—offered through SENS—is a project-based and profession-style master’s degree that trains students to investigate water security issues of regional, national and international significance.

“Certainly this summer’s drought, wildfires and algal blooms in our province has brought water concerns to the forefront, and a realization that our struggles are likely to continue with climate change,” said Toddi Steelman, executive director of SENS. “The MWS provides graduates with the tools to tackle the complex problems we are increasingly faced with.”

Incoming students will choose from three specialized tracks: hydrology, hydrogeology and socio-hydrology. While the first two tracks study the surface water and the groundwater cycles respectively, socio-hydrology studies the dynamics between human use, control, value and culture related to water and its place in the global community.

“Having three specializations allows us to provide in-depth training in one area of water, such as groundwater, while also having students participate in core courses that broaden their knowledge of other aspects of water management, current global issues and how we plan in an age of climate uncertainty,” said Ireson.

Graduates will be ready to become water scientists, managers and policy-makers in the consulting and government sectors. The first intake of students will begin September 2016, with applications accepted until mid-January.

Meagan Hinthor is a commu- nications specialist with the Global Institute for Water Security and the School of Environment and Sustainability.
Creating an inclusive and diverse campus

Her son, about six years old at the time, told her he didn’t want to be brown anymore.

It was during that car ride back from Debden, Saskatchewan, when Elizabeth Duret knew she needed to do all she could to address negative stereotypes regarding Aboriginal people.

“For my son at that age to think that it’s not okay to be who he is, was devastating,” said Duret, inclusion and diversity consultant at the U of S. “Children aren’t born racist; it is a behavior that they learn from friends, parents and media. It was at this pivotal moment that I knew I wanted to be an advocate for these issues.”

As a Métis mother of two, Duret knows first-hand the judgments that Aboriginal people encounter. So when she got a phone call offering a new position at the U of S dedicated to supporting a diverse workforce, she accepted the challenge without hesitation.

The endgame for Duret, who started her new position in April, is to increase the diversity of the U of S workforce through recruitment and hiring practices with a strategic focus on Aboriginal people.

With a background as a probation officer, human resource professional and life skills coach, Duret has seen inequity in the form of under-representation in the workforce and overrepresentation in the correctional system.

“Historically, the systems have negative biases and stereotypes attached to them,” she explained. “There are systemic barriers because of social constructs. We need to address issues that prevent marginalized people from entering the workforce.”

Because Aboriginal engagement has been a strategic priority at the U of S for some time, Duret said she is “coming into a rich opportunity. We are ready to engage in the process, all that is required is guidance, tools and a focused plan.”

But there is still a lot to do and the enormity of the task is not lost on Duret. At the top of her mind is the significant gap between Aboriginal representation on the U of S workforce—a figure that is currently 2.6 per cent—and the provincial target of 12.2 per cent set by the Saskatchewan Human Rights Commission.

While Duret stressed that “no one wants to be hired just because the university is trying to reach a number,” she said there are some relatively simple steps that will help make the university an employer of choice. She suggested that those involved in the hiring process attend cultural events and actively promote the U of S as an employer of choice.

To that end, Duret’s first priority is to create a safe environment on campus. “We need to create space to talk about stereotypes and biases. We all have them; I have my own. To face them you need to be honest with yourself. It’s not about blame or guilt, but about self-reflection and awareness.”

To help faculty and staff better understand biases, Duret holds workshops that tackle common stereotypes on everything from farmers, ex-cons and overweight people to Aboriginal people, gender and sexually diverse individuals, and people with learning disabilities and mental health issues.

“We explore stereotypes and how they play out in our work and personal life. We question where they come from and how they can be broken down,” she said. “Someone can be ignorant only one time because once you are aware of your biases, you make the unconscious conscious. This knowledge is powerful and can create a change in attitude towards diversity.”

It is a long road ahead, but Duret already has a picture of success in mind.

“We will know we are successful when we see increased recruitment, retention and success of Aboriginal students alongside the successful recruitment, retention and advancement of staff and faculty. I believe there is a strong correlation between the success of Aboriginal faculty and staff.”

Elizabeth Duret, inclusion and diversity consultant

Elizabeth Duret, inclusion and diversity consultant

Congratulations to the U of S School of Physical Therapy on celebrating 50 years!

medicine.usask.ca/pt

St. Andrews College

www.intervac.ca

VIDEO-InterVac Community Liaison Public Meeting

Tuesday, September 15, 2015
7:00 PM

McNally Robinson Bookstore

REFRESHMENTS TO FOLLOW

Kris Foster
Jamie Fast has the secret to re-creating the perfect Spock eyebrows—glue stick.

“Just rub it over your eyebrows and apply face powder on top,” she explained. “Then once it’s dry just draw them on, Vulcan-style.”

A mild-mannered student central officer by day, by night, Fast battles the evil empire as an avid cosplayer, a term that describes fans who dress up as their favourite characters from comic books, video games, movies and television shows, often from the science fiction or fantasy genres. Thanks in part to very dedicated online communities devoted to it and a rise in the number of fan conventions, cosplay—a blend of the words costume and play—has grown exponentially in recent years, not just as a hobby, but as an art form.

Fast got into cosplay after attending her first comic book convention in Calgary in 2012. She had always loved Halloween and making realistic costumes of her favourite comic book and video game characters. She was not aware, however, of those who did it the other 364 days of the year.

“I didn’t realize that it was a thing, that there were people who did that or even that there were comic conventions,” she said. “I think if I would have known what it was, I would have done it when I was younger.”

Impressed by the costumes and the warm, welcoming community, she decided to get more involved. She was nervous at first, thinking she might be too old to participate, but that anxiety faded once she hit the convention room. “I felt less stressed because I felt like I was in character,” she said. “You’re just expressing the fandom and are surrounded by other people who love it.”

Fast has two main cosplays. The first is Princess Leia from the first Star Wars film when she gets rescued from the Death Star—think white hooded dress and the iconic cinnamon bun pigtails. Her other cosplay is Lara Croft, heroine of the Tomb Raider mega-franchise encompassing video games, comic books, movies and amusement park rides. A long-time fan of the series, Fast was inspired to create a cosplay version in 2013 when the character was redesigned. “So many female characters, in the comic world especially, are very overly-sexualized. Her new design was much more realistic. I was like, ‘I need to do this now!’”

A self-described perfectionist, Fast’s attention to detail with her costumes is meticulous. She does a lot of costume research online, where kindred cosplayers are happy to help and offer advice. That said, she is well aware of her limits. “I’m a disaster with a sewing machine,” she said, opting to outsource the Leia gown to a friend who is a seamstress.

The result was worth it: while attending the Calgary convention last year she was approached by a woman whose daughter wanted a photo with Princess Leia. “It was adorable,” she said, “and it was exciting for me to think, ‘oh, I was a part of that, I made her that happy.’”

Though her work keeps her busy (she is also an assistant coach for the Huskies track team), she tries to attend as many comic conventions as possible, and is also involved in the local cosplay community.

“In Saskatoon, it’s really growing,” she said. “It’s that geek community that didn’t exist when I was younger.”

In past years, she also found time to volunteer for the Saskatoon Comic and Entertainment Expo, but this year she is taking off so she can attend with her nephew. She is still debating which costume to wear, but is leaning towards Leia for one very obvious reason. “William Shatner is going to be there, and he has a play feud with Carrie Fisher [who played Leia] and I think it would be hilarious if I could get a photo with him in my Princess Leia costume.”

Jamie Fast, student central officer

Jamie Fast shows her fandom by dressing up as her favourite characters, from Spock, Princess Leia and Lara Croft.
Data delivers student success

KRIS FOSTER

There is no shortage of data on campus, but finding a use for it is sometimes a problem.

With an eye to improving student success and retention, Jim Greer has found new uses for student data at the U of S.

“There is a ton of data available about our students,” said Greer, senior strategist on learning analytics. “We are developing projects that use the data we have on hand to make students’ lives better and improve their educational experiences.”

Greer, who was recently seconded by the Office of the Vice-Provost of Teaching and Learning to lead the development of learning analytics, said the university has been collecting student data actively and passively. Active data collection includes grades, addresses, demographics and high school information. Passive data consists of everything from signing into PAWS and checking email to using Blackboard or swiping a student card at the library or the PAC.

“We can use this data in two ways. We can look at supporting students in courses and we can try to improve our academic courses and programs,” said Greer. “There can be a ‘big brother’ element to all of this, so one of the first things we need to do is develop policies that prevent inappropriate use of student data.”

Looking past the privacy and policy issues, Greer explained that student data at the U of S fall into one of four categories: personal, academic, demographic and activity data.

“Personal information is no one’s business, but academic, demographic and activity data can be used to help predict if a student is likely to be successful or not,” explained Greer, former director of the University Learning Centre from 2006 to 2014. “This type of prediction can help identify students at risk so we can offer academic advising or other support.”

Greer is clear that caution must be used when profiling because stereotypes can lead to errors, but activity data can help in that regard.

One early alarm project from last year that leaned heavily on student data is the Student Advice Recommender Agent (SARA), which was piloted in a first-year biology course with about 2,000 students enrolled over two terms.

“Considering factors like expected grade, demographics and likelihood of attrition, SARA provided personalized weekly advice to each student in the class through Blackboard,” said Greer.

SARA might, for example, point a student struggling with a concept to online video resources, provide an encouraging message, or recommend Residence-based programs to students living in residence.

“There were half the number of fails and a third more A-grades than the previous year,” said Greer of SARA’s results. “It can’t take all of the credit for these improvements, but it certainly made a difference.”

SARA will again be used in first-year biology and will also be extended into certain first-year classes in the College of Engineering.

Greer said student data could also be used to improve courses and programs by identifying gaps and bottlenecks, and analyzing how students flow through programs.

“Sometimes classes are just scheduled at the wrong time. It could be as simple as changing the time a class is offered,” he said.

Although still in the infancy stage at the U of S, learning analytics have numerous applications, said Greer who is currently putting together a campus-wide team made up of data analysts, database specialists and learning and technology experts.

“There is lots of potential here and we know we can improve retention rates and better support our students. We are here to help colleges and departments thinking about how to use data to help students learn more. That’s good for everyone.”

The Reason You Walk a conversation with Wab Kinew author, journalist, hip hop artist

MONDAY, SEPTEMBER 21
1:00–2:30 pm, Arts 241 FREE!
Neatby-Timlin Theatre, Arts Building University of Saskatchewan
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You are invited to a reception celebrating
Interim President Gordon Barnhart.

The Board of Governors of the University of Saskatchewan invite you to join them for a reception celebrating the work of Gordon Barnhart during his tenure as interim president and vice-chancellor of the U of S.

WEDNESDAY, OCTOBER 7
4:30 – 6 PM
MARQUIS HALL
PROGRAM BEGINS AT 5PM
REFRESHMENTS AND HORS D’ŒUVRES WILL BE SERVED
RSVP TO ALUMNI.USASK.CA/EVENTS/REGISTER

BURNING DOWN THE HOUSE

A Dorm Burn demonstration was held on Sept. 3 in front of the Peter MacKinnon Building to show students, faculty and staff how easily a fire can start and how quickly it can spread.

The Saskatoon Fire Department and U of S Facilities Management Division, Safety Resources, Protective Services, Consumer Services and the USSU hosted the event as part of Welcome Week.
It has been a full circle experience for Jay Wilson, the latest recipient of the U of S Master Teacher award.

Wilson, department head of curriculum studies in the College of Education, received the university’s highest teaching award at spring convocation in June, and said he was lucky to be taught by past winners of the award.

“I look at the list of names on the Master Teacher wall, and there are people there who taught me,” he said, listing Robert Grogin, Angela Ward and Rick Schwier as those who inspired him. Besides now seeing his name alongside his mentors, Wilson feels a sense of accomplishment knowing that what he does meets the needs of his students and peers.

“The word that I’ve been hiding behind is ‘validation,’” he said. “You never know if what you do is making a difference. What makes it different and special for me is that validation of something I hold near and dear is valued by other people.”

He said that puts pressure on him, but in a good way. “You can’t hide in the weeds when you win a Master Teacher award.”

Wilson teaches both undergraduate and graduate courses, and has research interests in educational design, which involves creating and planning the best possible learning experience for students. “I use the term ‘throwing it into the wind,’” he said of the design process. “Sometimes it goes where we want, sometimes it gets blown back in our face. People don’t think of designing instruction as exciting, but it is. It has evolved into that notion of how we carefully plan the learning experience for students.”

Another area of interest for Wilson is the application of technology in the classroom, and since 2011 he has shared his knowledge and passion in this area as an Apple Distinguished Educator. This global team of teachers and professors work with the Apple education team to influence design to make their products more effective learning tools.

“We’re not product testers but we are sharing our knowledge and they are incorporating that into some of the work that they’re doing as far as design and accessibility,” he said, adding that getting free Apple products, unfortunately, is not a perk of the job.

Despite all the teaching accolades—including the Provost’s Outstanding New Teacher Award—and affiliation with one of the world’s biggest companies, Wilson knows how to keep his humility in check.

“I still had to go and clean the litter boxes the day after the Master Teacher award ceremony,” he said. “Those are the things that put life into perspective.”

Welcome back students.

Shop the Main Campus Bookstore and get all the essentials for back to school.

usask.ca/bookstore
Jim Grover has been reappointed as the chief strategy officer, learning analytics, in the Office of the Provost and Vice-President, effective July 1, 2015.

Bill Rafols, a sessional lecturer in St. Thomas More College’s Dept. of Political Studies, was elected to the Board of Directors for Amnesty International Canada.

At the beginning of our third integrated plan we set goals for our college enrolment numbers, and we are where we projected we would be by 2015.

Diversity of student body increases

From Page 1

a total of 2,072 self-declared Aboriginal undergraduate and graduate students and 2,238 international undergraduate and graduate students enrolled in fall term classes at the University of Saskatchewan.

“Atttracting and retaining motivated Aboriginal and international students is a priority for us,” said McDougall. “New inter-cultural gathering spaces like our under-construction Gordon Osakes RedBear Student Centre, will be a safe and welcoming place that respects the diversity of all people, and will play a large role in the retention of our diverse student body.”

A complement of supports are also offered by staff at the International Student and Study Abroad Centre, which helps students new to Canada acclimate to a new county, city and university.

McDougall said she expects the number of self-declared Aboriginal students to increase as the year goes on, as there is once again a self-declare campaign beginning in late September. “To help support and better understand the needs of Aboriginal students, each term we invite Aboriginal students, who haven’t already, to self declare their Aboriginal ancestry,” said McDougall. “We use this information to develop and maintain effective programs and services that support Aboriginal students’ academic and personal success.”

Meghan Sired is a communication co-ordinator in Student and Enrolment Services Division.
Edwards School of Business Executive Education
For more information call 306-966-8600 email executivedu@uwsask.ca or visit edwards.usask.ca/
Sept. 12, 2015. What the Non-Financial Manager Needs to Know About Financial and Management Accounting,
•
Sept. 15 – Dec. 8, Supply Management Training, Introduction to Procurement and Sourcing,
•
Sept. 30 – 2015, The Labour-Manage-
ment Relationship Certificate Program,
•
Oct. 24, The Business Analyst’s Certification Course – Sakatoon,
•
Oct. 1 – 2, 2015, Operational Excellence Certificate: Analyzing and Improving Office and Service Operations (Lean Six Sigma),
•
Oct. 5 – 6, Operational Excellence Certifi-
cate: Master Clinician on Solving Tough Problems – Saskatoon,
•
Oct. 7 – 8, Digital and Social Media Communities in the Workplace,
•
Oct. 8 – Oct. 10, 2015, Operational Excellence Certificate: Process Metrics, Management, and Controls – Saskatoon,
•
Oct. 11, Introduction to Digital and Social Media, “Marketing Your News” – Saskatoon, Oct. 12 – 23, 2015,
•
•
Oct. 18 – 20, Certified Coaching Training – Saskatoon,
•
Library Researcher Series
The Library Researcher Series provides workshops on interdisciplinary topics of relevance to the research of graduate students and faculty. All sessions are free and registration is not necessary. For more information, visit library.usask.ca/LibraryResearcherSeries.
Sept. 25, noon – 1 p.m, Murray Library, room 161, Introduction to the Comprehensive LI Rev Review – Part A,
•
Sept. 30, 1 – 4 p.m, Health Sciences Library, Endrith Desktop Seminar,
•
Oct. 6, 1 – 2 p.m, Murray Library, room 143, Introduction to the Comprehensive LI Rev Review – Part B,
•
Oct. 11, 1 – 4 p.m, Murray Library, room 161, Give Yourself a Campfire: How to increase your self-confidence as you develop your portfolio,
•
Textbook workshops are extra unless otherwise indicated.
•
Spanish Weekender Oct. 9, 11, 11 – 5 p.m, for the traveler who has little or no sp;
•
Today’s appearance is holding its fall coffee party
Women is holding its fall coffee party
North, The University of Saskatchewan Edwards Family Centre, 333 4th Avenue,
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For more information visit students.usask.
For more information visit students.usask.ca/events/fairs/campus-career-expo.php
Thanksgiving Family Dinner
Oct. 11, 7 p.m, bring the whole family for all of your Thanksgiving favorites.
Thanksgiving Family Dinner
For more information please contact Eliz Edwards at eliz.edwards@uwsask.ca.
For more information contact Sabrina Kohno at sabrina.kohno@uwsask.ca.
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For more information, visit languagel-
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Multilingual Conversational Language Classes from Sept. 21 – 25,
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Spanish levels 1 to 5 $275 (GST exempt)
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Japanese levels 1 to 4 $225 (GST included)
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Portuguese levels 1 & 2 $225 (GST included)
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German levels 1 to 5 $275 (GST included)
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Art and science at the foundations of the universe

MICHAEL ROBIN

At the very foundations of the universe, where even atoms are huge, there lies a bewildering menagerie of oddly named particles like leptons and quarks, baryons and gluons, and of course, the famous Higgs boson, all of which should be beyond our comprehension—but they're not.

As Tom Steele explained it, mathematics can encompass concepts impossible to express in any spoken tongue. Even the way that it is read differs from regular language, seeming to draw on both the logical areas of the brain as well as those more attuned to art.

"It amazes me that we can use mathematics to describe the physical world," said Steele, a theoretical particle physicist and head of the Department of Physics and Engineering Physics. "I don’t see any reason why this should be. Why should we even be able to formulate the complexity of the universe and physical phenomena with mathematics?"

To illustrate, he pulls a substantial-looking hardcover book from the shelf lining a wall of his office. He flips it open to a page covered with short paragraphs of English text sandwiched between much longer dense blocks of complex mathematical symbols. These describe concepts in graduate-level quantum mechanics.

Steele explained these blocks of math are not read left-to-right, top-to-bottom, like text. Rather they are read both as individual elements and as a whole, similar to how an art aficionado would take meaning from a painting.

The art analogy is also used in his own specialty, the exotic particles within the field of quantum chromodynamics (QCD). Here, quarks are assigned colours—a useful way to understand how their various charges "mix" together to form larger particles.

"Quarks are not literally red and green and blue, but it’s a good concept to describe how the actual charges come together," he said. "The underlying mathematics is a lot like the phenomena of colour, so that’s why it’s used."

Steele is particularly interested in the idea of colour confinement—that is, anything in nature should be made up of combinations of three "colours" of quarks (actually three colours and three "anticolours," since each quark has an antimatter cousin). An analogy would be a painter only being able to create certain hues from a limited set of starting pigments.

"Once you have the idea of colour confinement, there are a whole bunch of different things you can do," Steele said, citing various odd combinations of quarks and even "glueballs," which are conglomerations of pure gluons.

"I’ve been chasing those particles—their called exotics—all my working career," he said. A prolific researcher, Steele has been continuously funded through the Natural Science and Engineering Research Council for more than 25 years, producing more than 100 papers. The most recent, which came out in July, was inspired by an experiment at the Large Hadron Collider aimed at shedding light on why the universe is composed almost entirely of matter but almost no antimatter.

"It’s one of the big unanswered questions in physics," Steele said. "Why is the universe dominated by matter instead of antimatter? There’s a clear imbalance in the universe, it’s a big question and it’s unresolved. It’s the type of fundamental question that has kept Steele engaged for decades.

"Why shouldn’t we know what matter is ultimately made of?" he said. Steele suggested starting with something easily understood, like a table. We understand its chemistry, that is, what molecules the table is made of, and even the atoms that comprise those molecules. But beyond that, things become less certain.

"That leads us to all sorts of other questions, like how neutrons and protons interact with electrons, how quarks interact with each other—what are the basic principles of that that make matter the way it is?" Steele said.

One of the latest big questions in Steele’s mind is dark matter. Little is known about it, but astronomers observe gravitational forces in deep space where they can otherwise see nothing.

"The Higgs (boson) is supposed to impart mass to matter, and we know dark matter also has mass," he explained. "Because of this, we’re hoping the Higgs might give us a window into dark matter."

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Model behaviour

Malcolm Whyte wears many, many hats.

As a simulation technology specialist, he recreates medical and clinical scenarios for health science students in the interprofessional Clinical Learning Resource Centre (CLRC). This requires a delicate, tactful mix of skills and knowledge, ranging from information technology and audio/video to health care, education and theatrics.

“My day can go from putting makeup on a burn on a mannequin to setting up the medical scenario and getting supplies ready to scripting out what we’re going to say and programming a mannequin,” he said.

In total, he manages about 30 mannequins, which are used at distributed learning sites across the province. But these mannequins are no dummies. The most realistic, or high-fidelity, mannequins can be programmed to speak, bleed, sweat, blink, seize and respond physiologically to medical intervention. “They’re basically advanced computers with arms and legs,” he said. “They have different parts in them that mimic us.”

With such versatile technology at his fingertips, Whyte can let his creativity flow with certain simulations, especially if he’s providing the voice of the patient. “Sometimes I like to play a 40 year old who cut his finger on a tractor. He gets septic shock, and I like to give him a Southern kind of accent,” he said with his best low drawl.

While amusing, the dash of personality adds to the realness of the scenario and keeps the students engaged with their patient. “It helps people buy in because they realize, ‘oh, I’m not just looking at this plastic thing, this is an actual person and I have to treat him like an actual person.’” For Whyte, who has a background in IT, electronics and broadcasting, seeing that “lightbulb moment” is very rewarding.

He said that the main advantage of simulation technology is to give students a controlled place to practice and think on their feet. “We make things as real as we possibly can here so if you make a mistake—which in a way, is kind of encouraged—that this is a safe learning environment.”