

**University of Waterloo**  
**SENATE LONG RANGE PLANNING COMMITTEE**  
**Notice of Meeting**

**Date:** Monday, 30 October 2017  
**Time:** 1:00 p.m. - 2:30 p.m.  
**Location:** NH 3318

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<b>Agenda</b>	<b>Action</b>
1. Strategic Plan Fall 2017 Update (Daniela Seskar-Hencic, Jana Carson) a. Progress and Outcomes – Fall 2017 Update* b. Faculty Update Supplement – Fall 2017 Update*	Information Information
2. Minutes of the 22 September 2016 Meeting* and Business Arising a. Velocity Start January 2017 update* (Daniela Seskar-Hencic)	Decision
3. Other Business	
4. Next Meeting: Thursday, 4 January 2018 from 1:00 – 2:30 p.m. in NH 3318	

\*agenda material attached  
\*\* to be distributed separately

19 October 2017

Mel Knox  
Associate University Secretary

Kathy Winter  
Assistant University Secretary & Privacy Officer

Future Meeting Dates:

Tuesday 6 March 2018 from 1:00 – 2:30 p.m. in NH 3318

Thursday 24 May 2018 from 10:30 – 12:00 p.m. in NH 3318

Future Agenda Items:

- Presentation on Faculty Strategic Plan – Applied Health Sciences (Rush)

# STRATEGIC PLAN

2013-2018

*Progress and Outcomes | Fall 2017 Update*



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UNIVERSITY OF  
**WATERLOO**



# MESSAGE FROM THE PRESIDENT AND PROVOST



Over the last four years, the University of Waterloo has pursued the implementation of our strategic plan, “A Distinguished Past, A Distinctive Future” with focused determination.

Working closely with Faculties, stakeholders, and the Executive Council, and with engagement from constituencies across campus, we have made key investments, realigned resources, and made bold progress on our eight theme areas. Our leadership teams and Deans have been a key driving force behind the strategic plan to continually ensure that our strategic plan remains a living, vibrant document with robust monitoring and accountability elements.



In this update, you will find evidence of this unwavering commitment to our strategic plan, illustrated through:

- › four years of progress and impact measures;
- › highlights of some key initiatives implemented by our eight themes;
- › a focus on internationalization at Waterloo; and
- › updates from each of our six Faculties highlighting their efforts in strategic plan theme areas.

For more in-depth detail about each of our themes, and the progress we have made, you can visit our dashboards at: [uwaterloo.ca/strategic-plan](http://uwaterloo.ca/strategic-plan).

We are pleased with this progress, but there is still much work to do to fulfill our mission to be one of the top innovation universities in the world. In the next year we will complete the final year of our strategic plan and create a summative report to capture outcomes of the five year process. Between 2018 and 2019, this report, and other evidence, informed and prioritized through broad consultation of our stakeholders, will provide the foundation upon which we build the next cycle of our strategic plan. Our next strategic plan will be ready for launch with an action plan and an integrated accountability framework in 2020. A timeline outlining this work is featured at the end of this report.

As we look towards our fourth and final year of implementing this plan, we reflect with gratitude on the significant contributions of our previous Vice President Academic and Provost Ian Orchard, for his exceptional work in advancing this strategic plan. We also thank our campus community for their continued support and turn our eyes towards the final year of this vital initiative.

Sincerely,

**FERIDUN HAMDULLAHPUR**  
PRESIDENT AND VICE-CHANCELLOR  
UNIVERSITY OF WATERLOO

**D. GEORGE DIXON**  
INTERIM VICE-PRESIDENT ACADEMIC & PROVOST  
UNIVERSITY OF WATERLOO

# INTRODUCTION AND HIGHLIGHTS

This is the University of Waterloo's fourth annual report on Progress & Outcomes related to the implementation of our Strategic Plan. With just one year remaining in our current strategic plan cycle, we have met and exceeded important targets established by our themes, and identified initiatives that will advance our progress. Some of our progress is summarized here.

- › In **Experiential Education**, we have reimagined key facets of our mission and our organizational structure to deliver a new type of co-op experience (flex terms), a work-ready certificate for non-co-op students (EDGE), and a revitalized marketing and recruitment strategy for new employers to diversify the employer base. Co-op enrolment as a proportion of total enrolment grew from 63.4% in 2013/14 to 67.1% in 2016/17. First work-term employment rate grew from 91.4% to 94.5% and overall work-term employment rate grew from 96.6% to 97.7% for the same time period, exceeding the 95% target for the fourth consecutive year. The number of active employers increased by 13.6% over four years.
- › Creating an **entrepreneurial university** has resulted in significantly more entrepreneurial learning and development opportunities for students (67.6% increase in enrolment and 118.8% increase in the number of entrepreneurial for-credit and non-credit courses, workshops, and events), with significant investment in new entrepreneurial spaces (increased space in Velocity Science, Velocity Garage, and GreenHouse Social Impact Incubator), and new supports for hard tech in 2016/17. Investment funding for current students grew from \$3.9M in 2013/14 to \$21.0M in 2016/17. Among alumni, investment funding grew from \$97.9M to \$179.5M for the same period. The proportion of Velocity-based student ventures that are still active after one year increased from 84.3% in 2013/14 to 89.0% in 2016/17, well above industry benchmarks.

- › **Transformational Research** increased resources and supports to facilitate research at Waterloo. In 2016/17, Waterloo's total sponsored research exceeded the overall target by \$6.8M, a total increase since 2013/14 of 13.7%. Waterloo also increased internal supports to develop research proposals from a broader range of sectors, implement research projects, and facilitate nominations of Waterloo faculty for prestigious research awards and honours. Over four years, Waterloo has secured important major funding support for transdisciplinary research ranging from aging, quantum technologies, and water research to advanced manufacturing, actuarial science, and cyber infrastructure. Waterloo continues to develop and pursue new international research partnerships with elite institutions.
- › Advancing our **outstanding academic programming** remained a priority in 2016/17. The number of Waterloo subjects ranked in the top 100 Quacquarelli Symonds (QS) Subject Rankings grew from seven in 2013/14 to 13 in 2016/17. Sixty per cent (59.2%) more graduate students enrolled in professional skills workshops and a new Thesis Fundamentals workshop was developed. Waterloo exceeded the target for the number of online courses available annually in two of three years, with an overall increase of 31.1% from 2013/14 to 2016/17. There was an overall increase of 16.8% in enrolment in fully online courses since 2013/14 and three new fully online programs are now available. Waterloo developed 14 new or restructured programs (four undergraduate and 10 graduate). All Faculties are developing new Strategic Enrolment Management plans.
- › Waterloo's **international** ranking has remained relatively stable since 2013/14 and international research funding fluctuated overall but remained at \$17.4M in 2016/17,

the same as 2013/14. The proportion of undergraduate and graduate international students has increased steadily since 2013/14 by 4.6 percentage points among undergraduates and 3.6 percentage points among graduate students. The number of international co-op work terms have increased by 32.0% since 2013/14.

- › More progress has been made in the area of **vibrant student experience**. Consulting broadly with students, faculty, and staff, the Student Success Office has further developed the mobile student portal to integrate with LEARN and to include access to mental health resources. Between 2013 and 2016 the amount of new student study space available increased by 18.0%. The Student Services Centre and renovations to the Student Life Centre/Physical Activities Complex are both in progress. The President's Advisory Committee on Student Mental Health is underway with a report due in early 2018.
- › Under the **Robust Employer-Employee Relationship** theme, numerous new and ongoing improvements have been made to recruitment and retention processes and procedures since 2013/14. Waterloo has been recognized as one of Canada's Top 100 Employers.
- › Building on our **sound values**, Waterloo continues to support training and policy development activities related to equity, diversity, and inclusion. Annual goals of retrofitting and launching inclusive, single-use washrooms are being met and well received by the Waterloo community.

We have made important progress in 2016/17. Our next report in fall 2018 will provide a comprehensive summary of the outcomes that we have achieved over the five years of our strategic plan and will contribute important evidence for our next strategic plan cycle.

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# EXPERIENTIAL EDUCATION

Progress and Outcomes | Fall 2017 Update

## OBJECTIVE 1 | Educate outstanding and world-ready graduates whose skills are in high demand globally

MEASURES	2013/14	2014/15	2015/16	2016/17	WHAT DOES THIS MEAN?
<b>First work-term employment rate</b>  Source: Co-operative Education and Career Action (CECA)	91.4%	92.6%	92.6%	94.5%	> Employment rates indicate Waterloo's effectiveness in providing support in the first work-term application process. First work-term employment is an important indicator of future co-op success. > The proportion of first work-term students who are employed has increased consistently since 2013/14, with a total four year increase of 3.1 percentage points.
<b>Proportion of co-op graduates who reported skills learned at Waterloo were related to skills required for job at six months after graduation</b>  Source: Ontario University Graduate Survey (OUGS)	2011: 94.6%	2012: 94.8%	2013: 95.6%	2014: 95.7%	> Co-op graduates' perception of the skills they learned at Waterloo, compared to the skills they require for employment, is consistently high, and significantly higher than for non co-op graduates. > Besides the co-op work-term experience itself, another way that co-op students learn about and develop, soft skills that are required in the workplace, is through mandatory Waterloo Professional Development (WatPD) courses. <i>Note: The OUGS Survey is administered two years after graduation</i>
<b>Co-op graduate employment rate six months after graduation</b>  Source: OUGS	2011: 91.0%	2012: 90.7%	2013: 91.7%	2014: 88.7%	> Co-op graduate employment rate is one way to understand the relevance of graduates' education to work opportunities. > A key objective of co-op education is to provide graduates with the experience, skills, and networks necessary to gain employment after graduation. The rate for 2014 non co-op graduates was 83.3% at six months. > In addition to employment skills gained through the co-op program, the Centre for Career Action provides extensive resources for students in resume preparation, interview skill development, and preparing for the work world.

### WHAT WE DID IN 2016/17

- > In fall 2016, more than 20,700 full-time, undergraduate students were enrolled in co-operative education at Waterloo, an increase of 4.9% over 2015/16. Considered as a proportion of total full-time, undergraduate enrolment, co-op enrolment grew from 63.4% in 2013 to 67.1% in 2016.
- > Development of Co-op 2.0, the evolution of co-operative education, continued at Waterloo. Consultations with student groups to maximize the value and relevance of new Co-op 2.0 opportunities continued including flexible work terms, co-op specialization in research, first work-term fundamental experiences, and industry/academic partnerships.
- > As part of Co-op 2.0, co-op flex terms are being piloted. Any student may opt for a flexible work term to pursue an opportunity that involves humanitarian work, is a single work term with two different employers, or is consistent with that individual's career goals but may not fulfill normal credit-granting criteria for a work term. Flex work terms will be fully launched in fall 2018.
- > The third pilot of the Co-op Living Learning Community (LLC) fine-tuned activities and supports for students. Results to date indicate that co-op students who participated in the LLC gained first work-term employment earlier in the recruitment cycle, which can reduce stress in the academic term preceding the work term.
- > EDGE, a new experiential education certificate for non co-op students, was approved by Senate in May 2016. EDGE aims to improve graduate outcomes by assisting students in identifying and articulating the skills they develop during their undergraduate career. Students complete required workshops, participate in work or community-based courses, and develop a post-graduation career plan to achieve their EDGE certification. A pilot of the skills identification and articulation workshop was successfully implemented with two large first-year classes in the Faculties of Applied Health Sciences and Environment. The full EDGE program will launch in September 2017.

## OBJECTIVE 2 | Develop an innovative culture of Experiential Education at the University

MEASURES	2013/14	2014/15	2015/16	2016/17	WHAT DOES THIS MEAN?
<b>Overall work-term employment rate</b>  Source: CECA	96.6%	97.0%	97.3%	97.7%	> Work-term employment rates indicate how effective Waterloo is at ensuring students receive co-op work-term opportunities. A student may complete more than one work term each year. The employment rate reported here captures the percentage of scheduled work terms filled over the course of the entire year. > Between 2015/16 and 2016/17, the total number of co-op work terms increased by 2.5%, compared to 6.3% in the prior year.
<b>Number of co-op work terms</b>  Source: CECA	16,781	17,628	18,730	19,188	> The increasing number of work terms reflects increasing demand for work-related experiential education. > <b>TARGET:</b> Overall target for work-term employment rate is 95% each year. Over 6,000 students seek co-op employment each term. Maintaining this rate is an ongoing challenge due to significant increases in co-op enrolment and economic volatility.
<b>Total co-op student earnings (self-reported data)</b>  Source: CECA	\$191.2M	\$206.3M	\$225.9M	\$240.5M	> Co-op programs offer an opportunity for students to earn income while attending school and to make a contribution to the economy. > Work-term earnings have increased 25.8% since 2013/14 and 6.5% since 2015/16. > Numbers have been re-stated for all years as a result of moving to a different system (Job Mine to WaterlooWorks) and improved data integrity practices in 2016.

**OBJECTIVE 2 (continued)** | Develop an innovative culture of Experiential Education at the University

**WHAT WE DID IN 2016/17**

- > A small working group began to work on a model for co-op in graduate programs that is reflective of the knowledge level, research underpinnings, and career ambitions of graduate students.
- > The Co-operative and Experiential Education portfolio was introduced at the University in February 2017, under the leadership of the Associate

Provost Co-operative and Experiential Education, bringing together Co-op, the Centre for Career Action, EDGE, Waterloo Professional Development (WatPD) and the Waterloo Centre for Advancement of Co-operative Education (CACE). The new structure integrates existing units while aligning reporting structure level and accountability.

**OBJECTIVE 3** | Enlarge the resource base of professionally credentialized and/or discipline-relevant employers

MEASURES	2013/14	2014/15	2015/16	2016/17	WHAT DOES THIS MEAN?
<p><b>Number of active employers — hired at least one student in the previous three years</b></p> <p>Source: CECA</p>	6,093	6,384	6,706	6,919	<ul style="list-style-type: none"> <li>&gt; The number of employers who are active (hired at least one student) offers an opportunity to understand the level of employer involvement in the co-op program.</li> <li>&gt; Continued effective engagement with existing employers is vital to co-op education.</li> <li>&gt; There was a one-year increase of 3.2% in the number of active employers between 2015/16 and 2016/17, and since 2013/14 the number of active employers has increased by 13.6%.</li> </ul>
<p><b>Number of new employers — hired a student for the first time in the given fiscal year</b></p> <p>Source: CECA</p>	1,304	1,050	1,562	1,440	<ul style="list-style-type: none"> <li>&gt; Engaging new employers to hire co-op students is necessary to keep up with enrolment demands, new programs, and changing student employment needs for employers in a variety of disciplines.</li> <li>&gt; There was a decrease in the number of new employers who hired a co-op student (7.8%) in 2016/17. The number of new employers fluctuates over time. The decrease can be attributed to improvements in data integrity, more competition among the employer base, and organizational changes in employer recruitment. Despite this decrease, 2016/17 had the second highest number of new employers in the last four years.</li> <li>&gt; Marketing outreach and job development efforts guided by labour market data and analysis created a more targeted approach to job development for employment for students in programs that face challenging labour market conditions.</li> </ul>
<p><b>Employer rating of student performance as very good to outstanding</b></p> <p>Source: CECA</p>	93.1%	93.2%	93.3%	93.5%	<ul style="list-style-type: none"> <li>&gt; Students who achieve a rating above unsatisfactory receive credit for their work term. Students who fail work terms receive remedial action.</li> <li>&gt; Waterloo students continue to achieve a high standard of performance from their employers.</li> <li>&gt; Performance ratings are part of the students' job application packages; positive performance ratings improve student employability on subsequent work terms. The evaluations also provide a tool to help students identify areas of strength and areas that need development with respect to skills and competencies.</li> </ul>

**WHAT WE DID IN 2016/17**

- > New approaches to employer recruitment included organizational changes to distribute business development resources to the five regional teams across Canada (West, Central East, Central West, GTA, East), the addition of two business developers to marketing, and a new market researcher to provide data-driven strategic information to the team. This change facilitates a regional, labour-market driven approach to strategic marketing and job development, and shifts resources to where student employment need is greatest. Strategic

plans aligned to specific targets for each regional team will be in place for most regions by end of 2017.

- > Marketing outreach continues to identify, cultivate, and manage the strongest number of relevant prospective employer leads from attendance and participation in over 50 industry-based conferences and tradeshows a year. The number of prospective employer inquiries by email, phone, and web has increased over 300% in the past three years.

**OBJECTIVE 4** | Achieve a closer integration of research opportunities and co-op work terms

**WHAT WE DID IN 2016/17**

- > Waterloo's Senate approved a co-op specialization in research as part of its new co-op certificate program. The co-op research certificate recognizes students who choose to work in research-focused positions during at least three work terms and complete the research professional

development and capstone requirements. Plans are underway to develop a professional development course in research fundamentals for interested co-op students.

**OBJECTIVE 5** | Expand experiential education to include service-based activities and international programs

**WHAT WE DID IN 2016/17**

- > Both flex terms and the EDGE program will incorporate service-based and international activities as ways to fulfill either co-op or EDGE program requirements.
- > The EDGE program extends experiential education to service-based activities by allowing students to pair their volunteer experiences with the completion of a professional development course. Students enhance their learning, receive feedback on their performance, and reflect on the role that service-based experiences play in their personal and professional development.

- > Philanthropic contributions have provided opportunities for paid co-op work terms at the United Way.
- > The Canadian European Union (CANEU) Consortium Partners for Strengthening Transatlantic Student Mobility in Co-operative Education, known as CANEU COOP, is a partnership between the University of Waterloo, the University of Victoria, and two European institutions. It was recognized with an award for Outstanding Program in International Education, by the British Columbia Council for International Education.
- > Co-op maintained a steady level of international mobility last year despite the shifting socio-political landscape.



# UNIQUELY ENTREPRENEURIAL

Progress and Outcomes | Fall 2017 Update

## OBJECTIVE 1 | Enhance student opportunities to participate in entrepreneurial activities

MEASURES	2013/14	2014/15	2015/16	2016/17	WHAT DOES THIS MEAN?
<b>Student enrolment in both credit and non-credit courses, workshops, and events related to entrepreneurship</b>  Source: IAP + Student Entrepreneurship Measures Group	10,002	12,416	15,694	16,759	<ul style="list-style-type: none"> <li>&gt; Engaging more students in all forms of entrepreneurship endeavours is a key predictor of future entrepreneurship success of Waterloo students and alumni, and injects an entrepreneurial spirit across the University.</li> <li>&gt; Total enrolment in entrepreneurial activities increased by 6.8% in 2016/17 over 2015/16.</li> <li>&gt; There was an overall increase of 35.1% in the number of for-credit and non-credit courses, workshops, and events focused on entrepreneurship between 2015/16 and 2016/17. Considered by type of for-credit or non-credit activity, the number of for-credit courses increased by 13.5% and non-credit events and workshops increased by 28.1% and 58.0% respectively.</li> <li>&gt; Waterloo is steadily increasing the number of entrepreneurial activities available to students, making them more accessible, and increasing participation.</li> </ul>
<b>Number of for-credit and non-credit courses, workshops, and events related to entrepreneurship</b>  Source: IAP + Student Entrepreneurship Measures Group	239	291	387	523	

### WHAT WE DID IN 2016/17

- > Increased student access to the World's Challenge Challenge, an inter-university competition, and the Problem Pitch Competition, a new competition developed with the Problem Lab, to encourage entrepreneurs to focus more deeply on a problem before addressing solutions. More than 150 students from all Faculties took part in the competitions. Regardless of competition outcomes, Velocity works with all participating students.
- > The third cohort of the GreenHouse Social Impact Incubator co-operative education program placed 34 first-term co-op students with 27 regional social ventures.
- > GreenHouse hosted nearly 30 events and over 800 students participated in these entrepreneurship experiences. Greenhouse also launched a new credit course for its live-in social incubator, and a second course will be added in fall 2017. The majority of students (70%) participating in GreenHouse were from the non-science, technology, engineering, and mathematics (STEM) disciplines. The program also maintained gender-balanced representation among participants.
- > Twenty-two engineering students won a total of \$60K at the 2017 Norman Esch Entrepreneurship Awards for Capstone Design competition.
- > Engineer of the Future Fund awarded \$53K in micro-seed funding to Waterloo Engineering students to support entrepreneurial initiatives.
- > Program requirements for Conrad Business Entrepreneurship and Technology's (CBET) entrepreneurship minor program have been refined and three new courses developed for the upcoming year.
- > GreenHouse completed a \$10M capital expansion to provide new learning and discovery space. The new space will open in fall 2017.
- > Waterloo's student club Entrepreneurship Society (EntSoc) is now working with Startup Waterloo to increase awareness and exposure to entrepreneurship, including students not typically engaged in entrepreneurship activities.
- > Hosted six ConradConnect Live events to create and support a broader entrepreneurship community at Waterloo. Events were offered to all students, and 417 participated. ConradConnect also hosted workshops on a variety of themes of interest to entrepreneurial students.

## OBJECTIVE 2 | Build relationships and generate opportunities with entrepreneurial communities and agencies

### WHAT WE DID IN 2016/17

- > More than 10,000 people tour Velocity Garage each year. This includes politicians and business leaders, influencers, venture capitalists, university/college leaders, school groups, and community members.
- > Velocity secured an additional \$327K in Canada Accelerator & Incubator Program (CAIP) funding over three years to help grow hardware/science startups.
- > More than 1,000 students participated in the annual Hack the North hackathon, organized by Waterloo students and the Faculty of Engineering.
- > The Water Network and the de Gaspé Beaubien Foundation created a new annual AquaHacking Challenge to find solutions for Lake Erie water issues. More than 350 students participated in the Challenge.
- > Conrad Master of Business, Entrepreneurship and Technology (MBET) hosted three different international student entrepreneurship programs in summer 2017: Tec de Monterrey/Mexico, University of Santiago/Chile, and University of Strathmore/Kenya.

## OBJECTIVE 3 | Advance commercialization and other forms of utilization of leading-edge entrepreneurial research and intellectual property

MEASURES	2013/14	2014/15	2015/16	2016/17	WHAT DOES THIS MEAN?
<b>Investment funding of Waterloo ventures by student type</b>  Source: Entrepreneurship theme	<b>CURRENT STUDENTS</b>				<ul style="list-style-type: none"> <li>&gt; Investment funding secured for undergraduate and recent alumni entrepreneurial activities is one way to understand the scope and intensity of entrepreneurial activity at Waterloo.</li> <li>&gt; While the amount of investment funding secured by student-related ventures has fluctuated, there appears to be an overall upward trend in the amount of funding secured.</li> <li>&gt; Investment funding data is collected from surveys conducted with Waterloo student and alumni companies, one-on-one meetings with Waterloo-based companies, and media coverage. Variations in data reported may result from self-reporting and data gathering discrepancies.</li> </ul>
	\$3.9M	\$15.7M	\$4.4M	\$21.0M	
	<b>ALUMNI</b>				
	\$97.9M	\$173.1M	\$261.5M	\$179.5M	

**OBJECTIVE 3 (Cont'd)** | Advance commercialization and other forms of utilization of leading-edge entrepreneurial research and intellectual property

MEASURES	2013/14	2014/15	2015/16	2016/17	WHAT DOES THIS MEAN?
<p><b>Proportion of Velocity-based ventures that are still active after one year</b></p>	84.3%	90.7%	87.0%	89.0%	<ul style="list-style-type: none"> <li>&gt; New ventures' survival rates after one year (the number of ventures that are still active or have been acquired after one year) are an industry standard, and provides an opportunity to understand how Waterloo supports and advances commercialization for University-based ventures.</li> <li>&gt; Waterloo provides important supports for Waterloo-based ventures. These supports ensure that Waterloo-based ventures are well-positioned to survive at least one year.</li> <li>&gt; The proportion of Velocity-based ventures that survived one year has remained relatively stable over four years.</li> </ul>
<p>Source: Velocity</p>					

**WHAT WE DID IN 2016/17**

- > Expansion and renovations to Velocity Garage were completed in fall 2016. The new space is 37K sq ft and includes a science lab, assembly space, a workshop, a prototyping lab, co-working space, and meeting rooms. In 2015/16, Velocity housed 114 companies in Velocity Garage and 28 companies in Velocity Science.
- > Waterloo Commercialization Office (WatCo) delivered 16 intellectual property (IP) education and awareness workshops, referred to as IP 101, including approximately 100 students participating in Applied Health Sciences' (AHS) Hack4Health initiative. WatCo also developed and hosted a two-day workshop on IP and commercialization to students in the Natural Sciences and Engineering Research Council (NSERC)-funded Training toward Environmentally Responsible Resource Extraction-Collaborative, Research and Training Experience (TERRE-CREATE) program. The workshops incorporated a case study and work exercises.
- > Velocity has added more supports for science and hard-tech companies and is building connections to other ecosystem supports that enable hard-tech innovation (e.g., IndieBio, Biomedical Zone, Office of Research & Ethics, and Hospital Innovation Groups). This has also led to an increase in the number of Masters/PhD student thesis projects being converted into commercially-viable start-ups.
- > Velocity Garage launched new "Investor Meetings" to better connect incubator companies with investors. These meetings allow face-to-face interaction with potential investors who provide feedback and are a starting point for important founder/investor relationships.
- > Over this past year, WatCo continued to lead Waterloo's collaboration with the Accelerator Centre (AC). Through the AC JumpStart program, 12 Waterloo alumni-initiated startups received seed investments worth \$720K cash and \$120K in-kind mentoring.
- > Worked with Chinese investors to raise \$26M in venture capital funds for Waterloo startups co-locating in China.
- > WatCo developed a new presentation on Waterloo's creator-owned Intellectual Property policy and presented it to 300 students.
- > GreenHouse is developing an ad hoc research network between campus-linked accelerators (CLAs) to explore learning outcomes supported by entrepreneurship training.
- > WatCo continued providing assistance to a number of seed startup companies, including the following examples:
  - secured seed funding for the creation of a Hongzhou (China) startup to commercialize an Atomic Force Microscopy (AFM) tip, manufacturing technology developed by Professor Bo Cui;
  - licensed additional new technology to KA Imaging Inc. to support them in receiving a \$1M Grand Challenges grant for targeting developing world applications;
  - provided negotiation support for Wattech Power Inc., developer of a zinc-air flow battery technology and SSIMwave, developer of real-time video analytics software, to secure significant follow-on investment;
  - worked with Grand River Hospital to secure a license for software developed by Professor Helen Chen to enable the efficient transferring of patient data into government reporting and billing systems; and
  - licensed educational materials developed by AHS's Murray Alzheimer Research and Education Program (MAREP) to several not-for-profit agencies to use as resources for caregivers.

**OBJECTIVE 4** | Make entrepreneurship a key element of the Waterloo brand

MEASURES	2013/14	2014/15	2015/16	2016/17	WHAT DOES THIS MEAN?
<p><b>Waterloo's rank in Maclean's "most innovative university" category</b></p>	#1	#1	#1	#1	<ul style="list-style-type: none"> <li>&gt; Innovation is an important element of Waterloo's entrepreneurship brand. <i>Maclean's</i> "most innovative university" ranking is one way to understand how Waterloo's brand is perceived nationally.</li> <li>&gt; Waterloo was ranked #1 in <i>Maclean's</i> "most innovative university" category for the 25th year in a row.</li> <li>&gt; While important as an indicator of prestige, this indicator is dependent on the consistency of the survey methodology.</li> </ul>
<p>Source: <i>Maclean's</i> University Ranking</p>					
<p><b>Waterloo's rank in Venture Capital Pitchbook</b></p>	#16	#21	#20	#20	<ul style="list-style-type: none"> <li>&gt; Venture Capital Pitchbook created a ranking of the top international universities producing venture capital-backed entrepreneurs.</li> <li>&gt; Venture capital assessment and ranking is one of a very few objective indicators that allow institutional comparisons.</li> </ul>
<p>Source: Venture Capital Pitchbook</p>					

**WHAT WE DID IN 2016/17**

- > Fall 2016 and spring 2017 editions of *Waterloo Magazine*, with a circulation of more than 190K alumni, contained several stories that promoted Waterloo's entrepreneurial culture.
- > Multiple media mentions in national publications (*Globe and Mail*, *Financial Post* and *Huffington Post*) that link the University of Waterloo to entrepreneurship.
- > More than 30 stories published on Waterloo's homepage celebrating entrepreneurship.
- > The Waterloo Innovation Summit in September 2016 brought together some of the world's top private and public sector leaders to tackle the disruptive and defining trends that are driving innovation and entrepreneurship in Canada and globally.



# TRANSFORMATIONAL RESEARCH

Progress and Outcomes | Fall 2017 Update

**OBJECTIVE 1** | Be recognized internationally for excellence and innovation in research, scholarship, and education

MEASURES	2013/14	2014/15	2015/16	2016/17	WHAT DOES THIS MEAN?
<b>Research InfSOURCE ranking (comprehensive universities)</b>  <small>Source: Research InfSOURCE</small>	●	●	●	●	> Ranking of research and scholarship at Canadian universities is one way to understand research and innovation excellence. > Waterloo has maintained this top ranking for eight years, which is compelling testimony to the quality and impact of its research.
	#1	#1	#1	#1	

## WHAT WE DID IN 2016/17

- > Appointed an inaugural Awards Officer to work closely with Waterloo faculty to identify, pursue, and facilitate nominations of Waterloo faculty for prestigious research awards and honours. Importantly, in the *Maclean's* annual ranking awards category, Waterloo has risen from 14th in 2010 to 7th place in 2016.
- > Since 2011, Waterloo's International Research Partnership Grant (IPRG) program has funded 122 projects, with an investment of over \$1.6M and leveraged more than \$2.4M in matching funds, for a total in excess of \$13.3M in new grants awarded to Waterloo researchers.

**OBJECTIVE 2** | Enable conditions which support research excellence and impact

## WHAT WE DID IN 2016/17

- > Continued implementation of the Research Gateway Project. Kuali, a new ethics data system, is scheduled to be launched in February, 2018. The first phase of the Pure Researcher Portal will be launched in the spring of 2018, and Phase 2 is expected to go live in the early fall of 2018.
- > Continued development of the Research Metrics Framework to streamline the provision of bibliometrics data for major funding applications and to inform discipline benchmarking processes.
- > Hired a new manager to support foundation funding and non-profit public sector partnerships. Results from this new investment include a \$125K contract for research on affordable transit, a \$3M grant from the Canadian Frailty Network, and fulfillment of in-kind matching requirements for grants from the Canadian Institutes of Health Research (CIHR) and the Social Sciences and Humanities Research Council (SSHRC).
- > Technical positions in science, technology, engineering, and mathematics (STEM) established in 2015/16 continue to have a positive impact on facilitating the use of major research equipment and facilities. New project management and accountant positions are now available on a cost-recovery basis for principal investigators (PIs) and their teams to reduce administrative burdens on them.
- > The new *Role of the PI* resource is now available to support PIs understand and meet research project compliance obligations.
- > Review of Policy 73, Intellectual Property (IP) Rights, has been initiated.
- > Developed and implemented a new version of the web-based form for reporting IP and commercialization disclosures which is easier to complete and resulted in broader use of the form by the professoriate during 2016/17.
- > Created a Canada Research Chair Equity Action Plan Steering Committee to ensure Waterloo is an equitable, diverse, and inclusive community for those in the Canada Research Chair (CRC) Program, and the University at large.

**OBJECTIVE 3** | Increase interdisciplinary and trans-disciplinary research globally, nationally, and locally

## WHAT WE DID IN 2016/17

- > Submitted proposals for major funding in support of transdisciplinary research in additive manufacturing, climate change, adaptive robotics and machine intelligence, next generation cryptographic technologies, transformative quantum technologies, and global water futures. Funding was received for additive manufacturing, transformative quantum technologies, and global water futures. These are all areas in which the University demonstrates significant strength.
- > Central funding for four University research institutes has been renewed: Institute for Quantum Computing, Waterloo Institute for Nanotechnology, Waterloo Institute for Sustainable Energy, and the Water Institute. The Games Institute, the Centre for Bioengineering and Biotechnology, and the Cybersecurity and Privacy Institute were named as University Centres or Institutes in early 2017.

**OBJECTIVE 4** | Strengthen the relationship between research and teaching at the undergraduate level

## WHAT WE DID IN 2016/17

- > Continued to work with Faculties and Co-operative Education and Career Action (CECA) to enhance opportunities for undergraduate research experience (e.g., co-op specialization in research). Forty per cent of Waterloo first-year students surveyed hope to work with a faculty member on a research project at some point during their undergraduate program.
- > New co-op research certificate approved by Senate. Beginning in fall 2018, co-op students who have completed at least three research-focused co-op terms and a professional development and capstone requirement will be able to receive a co-op research certificate in addition to the co-op designation degree.

## OBJECTIVE 5 | Build greater awareness, nationally and globally, of Waterloo's research productivity and impact

MEASURES	2013/14	2014/15	2015/16	2016/17	WHAT DOES THIS MEAN?
<b>Proportion of U15 Tri-agency research funding</b>  <small>Source: Office of Research</small>	<b>NATURAL SCIENCES AND ENGINEERING RESEARCH COUNCIL (NSERC)</b>				<ul style="list-style-type: none"> <li>&gt; Tri-Agency data shown for 2016/17 are preliminary; official data will be available in fall 2017.</li> <li>&gt; NSERC funding and SSHRC funding for 2016/17 increased over the previous year by 1.3 percentage points and 0.3 percentage points (estimated), respectively, as a proportion of U15 funding.</li> <li>&gt; Minor fluctuations in the year-to-year proportion of U15 Tri-Agency funding held by Waterloo reflect, in part, grants that are ending and being replaced by new grants that may or may not be of the same value.</li> <li>&gt; These metrics should be viewed in the context that Waterloo is the only member of the Canadian U15 research intensive universities that does not have a medical school.</li> </ul>
	8.6%	9.1%	8.0%	9.3%	
	<b>SOCIAL SCIENCES AND HUMANITIES RESEARCH COUNCIL (SSHRC)</b>				
	4.1%	4.1%	3.4%	3.7%	
	<b>CANADIAN INSTITUTES OF HEALTH RESEARCH (CIHR)</b>				
	1.5%	1.5%	1.1%	1.1%	
<b>Total sponsored research</b>  <small>Source: Office of Research</small>	\$180.9M	\$181.2M	\$182.6M	\$205.7M	<ul style="list-style-type: none"> <li>&gt; Total sponsored research is a measure of the total research funding Waterloo receives for research from external sources (government, industry, foundations, and non-profits) and provides one way to understand Waterloo's research productivity and impact.</li> <li>&gt; <b>TARGET:</b> In 2016/17 Waterloo exceeded its target of increasing total sponsored research funding by 10% from the 2013/14 baseline by 2018. In 2016/17, Waterloo's total sponsored research was \$205.7M, 13.7% greater than the \$180.9M baseline. Achieving this target one year early is important; however, it bears noting that federal and provincial research funding environments are typically not stable.</li> </ul>
<b>Proportion of funding from industry partners</b>  <small>Source: Office of Research</small>	31.1%	31.0%	30.0%	30.3%	<ul style="list-style-type: none"> <li>&gt; Industry investment in Waterloo research is indicative of its industrial relevance and also reflects the strong partnership Waterloo enjoys with the private sector at many levels.</li> <li>&gt; The proportion of funding from industry partners remained stable at 30.3% in 2016/17.</li> <li>&gt; Industrial research funding can often be leveraged with Tri-Agency funding because a number of Tri-Agency programs require an industrial funding match. Indeed, matching funds from industry indirectly drive eligibility for research funding from a number of sources including the Research Support Fund, Canada Research Chairs, and the Canada Foundation for Innovation.</li> </ul>
<b>Proportion of publications with industry collaborators</b>  <small>Source: Centre for Science and Technology Studies (CWTS) Leiden ranking</small>	2014	2015	2017		<ul style="list-style-type: none"> <li>&gt; The proportion of Waterloo publications co-authored with industrial collaborators is a meaningful proxy for research productivity and impact that is relevant to the private sector.</li> <li>&gt; The proportion of publications with industry collaborators decreased by 0.7 percentage points between 2015 and 2017.</li> <li>&gt; Publication with collaborators from industry is an important vehicle for knowledge translation, helping to ensure that, as appropriate, Waterloo research and innovation have real world application.</li> </ul>
	6.4%	6.3%	5.6%		

### WHAT WE DID IN 2016/17

- > Hired four Research Partnership Managers (three in corporate research, one in non-profit/public sector) to increase the number of research partnerships and attendant funding.
- > Initiated a new annual publication, *Year in Review*, to highlight innovative research accomplishments. This publication will be distributed to Waterloo's stakeholders including current and potential domestic and international research partners, as well as key government leaders.

## OBJECTIVE 6 | Identify and seize opportunities to lead in new/emerging research areas

### WHAT WE DID IN 2016/17

- > Proposals for two additional Canada Excellence Research Chairs were submitted in late spring 2017; one in Adaptive Robotics and Machine Intelligence, the other in Next Generation Cryptographic Technologies.
- > Preparation for the submission of applications for Canada 150 Research Chairs in new and emerging areas of research was initiated. The submission deadline is September 2017.



# OUTSTANDING ACADEMIC PROGRAMMING

Progress and Outcomes | Fall 2017 Update

## OBJECTIVE 1 | Educate graduates uniquely prepared to address the challenges and opportunities of the 21st century

MEASURES	2013/14	2014/15	2015/16	2016/17	WHAT DOES THIS MEAN?
<b>Graduate student enrolment in professional and skills workshops</b>	<b>WORKSHOP OFFERED</b>				<ul style="list-style-type: none"> <li>&gt; Graduate student workshops offer opportunities for participants to develop a variety of professional skills beyond their academic degrees.</li> <li>&gt; Changes in the number of workshops and participants reflects organizational changes in how workshops are offered and new workshops being included.</li> </ul>
	704	900	744	754	
<b>Undergraduate first-year and senior students' perception of Waterloo's contribution to selected skills</b>	<b>SPEAKING CLEARLY AND EFFECTIVELY</b>		<b>WRITING CLEARLY AND EFFECTIVELY</b>		<ul style="list-style-type: none"> <li>&gt; National surveys offer an opportunity to understand Waterloo students' perceptions about their academic and skill development.</li> <li>&gt; Oral and written communications are important skills required by graduates, and will be monitored to understand changes. See the What We Did section for more information.</li> </ul>
	2014	48.3%	2014	54.7%	
<b>Source:</b> Graduate Studies and Postdoctoral Affairs (GSPA)		2017	50.4%	2017	57.3%
<b>Source:</b> National Survey of Student Engagement (NSSE) 2014 and 2017 Q17		Quite a bit, Very much			

### WHAT WE DID IN 2016/17

- > Completed the Strategic Enrolment Management (SEM) pilot project in the Faculty of Arts. A new strategic enrolment manager was hired to develop, refine, and implement plans with all Faculties as part of an institution-wide plan.
- > The Writing and Communication Centre (WCC) in partnership with Graduate Studies and Postdoctoral Affairs (GSPA) launched a new Thesis Fundamentals program for graduate students beginning the thesis and dissertation writing process. A three-day pilot academic speaking program for doctoral students was offered in July 2017, and will be delivered on a term basis going forward.
- > With funding from eCampusOntario, Waterloo has partnered with Carleton, Ottawa, and Ryerson to determine the need and possible formats for a provincially-available certificate program in online teaching. Recommendations will be submitted in fall 2017.
- > The *Business at Waterloo Programs* report was presented to leadership in January 2017. A key recommendation of the report is to create a Waterloo Business Hub that will serve as a creative collision space for business students and instructors, build synergistic opportunities with experiential education and entrepreneurial activities, and be a key differentiator for unconventional business education at Waterloo.
- > The Canadian Professional and Graduate Student Survey (CGPSS) data suggest that Waterloo prepares graduate students for a diversity of careers. Over 40% of respondents felt prepared to enter research (48.3%), non-academic (49.4%) or consulting (44.1%) jobs, while about 20% (19.7%) indicated their readiness for entrepreneurial opportunities.

## OBJECTIVE 2 | Enhance Waterloo's excellence in academic programs

MEASURES	2013/14	2014/15	2015/16	2016/17
<b>Subject Rankings</b>	<b>TOP 25</b>			
	Computer Science, Math	Computer Science, Math	--	Hospitality & Leisure Management Studies*
	<b>TOP 50</b>			
--	Geography		Computer Science, Geography, Math	Computer Science, Math
<b>Source:</b> Quacquarelli Symonds (QS) World University Rankings, by Subject	<b>TOP 100</b>			
	Civil Engineering, Electrical Engineering, Environmental Sciences, Geography, Statistics & Operational Research	Architecture, Civil Engineering, Electrical Engineering, Environmental Sciences, Mechanical Engineering, Psychology, Sociology, Statistics & Operational Research	Architecture, Chemical Engineering, Civil Engineering, Development Studies, Electrical Engineering, Environmental Sciences, Materials Science, Statistics & Operational Research	Architecture, Chemical Engineering, Civil Engineering, Electrical Engineering, Environmental Sciences, Geography, Materials Science, Psychology, Sports Related Subjects*, Statistics & Operational Research

\*New subject added in 2016/17

### WHAT WE DID IN 2016/17

- > In the 2017/18 QS Subject Rankings, Waterloo ranked in 25 of 46 subjects and was ranked in the top 100 in 13 subjects and top 50 in three subjects.
- > The Course Evaluation Project Team completed its three-year investigation of a best model for course evaluation at Waterloo. The report will be discussed at the September 2017 Senate meeting.
- > Over the fall term, the Committee on Teaching and Learning Spaces solicited feedback from the campus community on newly constructed and renovated classrooms, and rooms in need of renovation. A "best and worst" classrooms survey and tours with instructors and students were completed in December 2016. Plans for renovating two large classrooms are underway.

## OBJECTIVE 3 | Ensure teaching quality of the highest international standard

### WHAT WE DID IN 2016/17

- > The Centre for Teaching Excellence (CTE) built on existing programs to help instructors enhance their skills and knowledge in assessing student learning and developing courses that align learning outcomes, assessments, and instructional activities.

**OBJECTIVE 3 (cont'd)** | Ensure teaching quality of the highest international standard

- > St. Jerome's University Professor Steven Bednarski won the Society for Teaching and Learning in Higher Education's prestigious Desire2Learn Innovation Award in Teaching and Learning. This is the second year in a row that a University of Waterloo faculty member has won this award.
- > CTE's Fundamentals of University Teaching program was accredited by the national Educational Developers Caucus, part of the Society for Teaching and Learning in Higher Education.
- > Engineering Professor Gordon Stubley won the 3M National Teaching Fellowship award — the first for Waterloo since 2010.
- > CTE's annual Teaching and Learning Conference had more than 300 registrants, the largest number yet. Most were from Waterloo including faculty members and graduate students from all six Faculties, and more than 60 academic support unit staff members.

**OBJECTIVE 4** | Seek global awareness of Waterloo's teaching expertise

**WHAT WE DID IN 2016/17**

- > CTE continued to develop communication materials to promote awareness of teaching excellence at Waterloo, including three new CTE teaching stories.
- > CTE hired new staff to support external teaching award nominations, including developing resources to facilitate nominations and to help match nominees' strengths and experiences with external awards.
- > Waterloo's Teaching Fellows Program continues to evolve. In 2016/17 the Faculty of Environment appointed two fellows, and the Faculty of Applied Health Sciences appointed three new fellows.

**OBJECTIVE 5** | Expand Waterloo's footprint in the online learning market and provide leading-edge, technology-enabled learning opportunities

MEASURES	2013/14	2014/15	2015/16	2016/17	WHAT DOES THIS MEAN?
<b>Number of fully online courses in catalogue and number of classes offered, undergraduate and graduate</b>  Source: Centre for Extended Learning (CEL) + Institutional Analysis & Planning (IAP)	<b>IN CATALOGUE</b>				> CEL develops new online courses and revises existing courses every year. The number of fully online courses available and offered indicates the extent of online course offerings at Waterloo.  > <b>TARGET:</b> Waterloo will increase online courses available by 5% annually. In 2016/17 the number of online courses available in catalogue increased by 17.2%, well above the target.  > Online courses are developed by Faculties and made available through CEL. The number of fully online courses in catalogue, and classes offered, continues to grow. Available courses (or courses in catalogue) may be offered more than once during the academic year.  <i>*Note: Courses offered are dependent on departmental scheduling.</i>
	286	309 <b>TARGET:</b> 300	320 <b>TARGET:</b> 324	375 <b>TARGET:</b> 336	
	<b>CLASSES OFFERED*</b>				
	432	501	539	515	
<b>Enrolment in fully online courses</b>  Source: IAP	<b>UNDERGRADUATE &amp; GRADUATE</b>				> Enrolment in fully online courses continues to increase at Waterloo. Since 2015/16, enrolment increased by 3.1%, the smallest annual growth since 2013/14.  > The perceived disadvantages of online courses are being offset by increased quality of offerings.
	36,946	39,819	41,858	43,165	
<b>Number of fully online programs</b>  Source: CEL	<b>UNDERGRADUATE &amp; GRADUATE</b>				> Increased availability of fully online programs enables working professionals and students at a distance to complete a Waterloo degree.  > Waterloo added three new fully online programs since 2013/14 for a total of 21. Eight of these are undergraduate programs and 13 are graduate programs.
	18	19	19	21	

**WHAT WE DID IN 2016/17**

- > Through eCampus Ontario, Waterloo received \$330K to develop a new graduate diploma in Climate Risk Management (Faculty of Environment) and almost \$400K for four research and innovation projects. Two of these will specifically support projects in the Centre for Extended Learning (CEL).
- > The Ontario Centres of Excellence funded CEL, the University of Guelph, and Crowdmark to improve the assessment process in online courses. The project addresses how to improve delivery and return of exams to and from remote locations, and streamline the assessment processes for distance and classroom learners. An initial pilot of Crowdmark for a winter 2017 online course final exam was successful. Crowdmark enhanced their platform based on feedback for use in spring 2017.
- > The Canadian Association for University Continuing Education (CAUCE) recognized Waterloo with a 2017 Program Award (non-credit programming, under 48 hours category) for its *Opioid Education Partnership* online program, developed by the School of Pharmacy in partnership with CEL.
- > The first two Online Teaching Awards were awarded to Professors Edwin Ng (teaching) and Doug Cowan (course design), both of Renison University College.
- > CEL is examining the potential for expanding its course offerings into other markets, with a focus on lifelong learners, alumni, and others, online and developing new offerings (such as micro credentials) to expand enrolments.

**OBJECTIVE 6** | Expand the appropriate use of technologies to enhance students' learning experience

MEASURES	2013/14	2014/15	2015/16	2016/17	WHAT DOES THIS MEAN?
<b>Proportion of LEARN course offerings that use discussion forums</b>  Source: CTE	21.0%	20.2%	18.8%	17.2%	> Discussion forums are one type of technology that enhances students' learning experiences and is used as a proxy for understanding the use of learning technologies as a whole.  > Instructors are using a variety of educational technologies, including Maple TA and Piazza, to support student learning. Waterloo is currently only able to track usage of LEARN.  > The use of Maple TA and Piazza has increased since 2015/16.

**WHAT WE DID IN 2016/17**

- > VoiceThread, a collaborative, multimedia slideshow that allows students and instructors to create, share, and receive feedback on content in multiple formats (text, audio, and video). It is being piloted in select online and on-campus courses and will be evaluated for ongoing use in the fall.



# INTERNATIONALIZATION AND WATERLOO

A commitment to international action is vital to achieving Waterloo’s strategic plan, building on our exceptional research, innovation in experiential education, and entrepreneurial focus. This outline provides a high level overview of Waterloo’s focus on building internationalization to support our institutional goals.

## WHAT IS INTERNATIONALIZATION?

*“... the intentional process of integrating an international, intercultural or global dimension into the purpose, functions and delivery of post-secondary education, in order to enhance the quality of education and research for all students and staff, and to make a meaningful contribution to society.”*

- HANS DE WIT, international educator and higher education administrator

## WHY IS IT IMPORTANT?

At Waterloo, de Wit’s perspective of internationalization is taking root. We are motivated by a belief that internationalization is vital in the 21st century to meet the world’s most challenging problems, and to respond to its most profound opportunities. The critical issues of our times — artificial intelligence, climate change, social inclusion, and others — are issues that are characterized by complexity. They need multiple lenses employing, for instance, different disciplines and a variety of theoretical foundations. Moreover, world-changing learning and research requires a commitment to bringing in, connecting with, and welcoming international perspectives.

## MOVING FORWARD

Ranked as the 34th most internationalized university in the world, we have accomplished much, but have more work to do.

Internationalization contributes to the successful execution of all parts of Waterloo’s mission, as well as most of its strategic goals and objectives. Moving forward, internationalization will be vigorously pursued through multiple means: internationalization at home, internationalization abroad, and through international research and connections. Through these efforts — as is the Waterloo Way — potential synergies across these will always be top of mind.

## INTERNATIONALIZATION AT HOME

**What does this mean?** Waterloo’s campus community is home to a wealth of global perspectives: international students who study here, international staff and faculty who develop their careers here, and Canadian students with their own diverse international experiences. Active and robust information and communication technologies facilitate how the Waterloo community actively engages with the rest of the world.

**Why is it important?** Allowing all members of the Waterloo community to reap the benefits of global learning, a campus environment that is simultaneously locally-grounded and internationally-connected, is critical. Waterloo will continue to work to advance global engagement by catalyzing, celebrating, and coordinating international and intercultural perspectives.



Almost  
**1 IN 5 WATERLOO UNDERGRADUATE STUDENTS**  
are international

**2 IN 5 WATERLOO GRADUATE STUDENTS**  
are international

**OVER 50 STUDENT-RUN CLUBS**  
with an international focus



Participation in events and activities hosted by the International and Canadian Student Network grew by  
**43.6%**  
since 2015/16



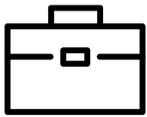
**OVER 50%**  
of Waterloo’s regular full-time faculty received a degree from outside of Canada

**Moving forward:** Waterloo will continue to be a global leader, integrating international experiences and opportunities to transform Waterloo into a vibrant, global-oriented community. Specific initiatives will include engaging international students in a broad range of on-campus activities, providing leadership opportunities for all students who have international experiences to share, celebrating the global diversity at Waterloo, and connecting to the broader international Waterloo community. Internationalization at home enriches our experiences with international perspectives and opportunities, while supporting our international students and faculty in an environment that celebrates and champions international diversity.

## INTERNATIONALIZATION ABROAD

**What does this mean?** Travelling abroad is an important part of Waterloo's internationalization agenda. Time spent in other countries inevitably makes individuals think differently as they bring their "home experiences" to bear in new settings. An international and intercultural mixing of ideas is thus unavoidable. "Internationalization abroad" refers to the opportunities for students, staff, and faculty to travel to another country.

**Why is it important?** International travel can be challenging, exhilarating, and enriching. Academic literature suggests that individuals benefit through increased cultural awareness and understanding, improved employment prospects, and enhanced language skills. Conversations with individuals who have spent time in another country often yield anecdotes of a more personal nature: increased resiliency, more appreciation for diversity, greater understanding of oneself, and a heightened gratefulness for one's home country. Waterloo will continue to offer multiple and varied opportunities for members to travel abroad.



**2,653**

international co-op work terms in 2016/17

Between 2014 and 2016,

**9 STAFF**

have visited

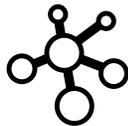
**9 COUNTRIES** as part

of the Staff International Experience Fund



**961**

non co-op international experiential learning opportunities



**68 ALUMNI**

volunteers in 17 countries help to globalize the Waterloo Brand

**Moving forward:** Waterloo currently provides and facilitates a diverse selection of education, learning, and research, including:

- > academic exchanges;
- > competitions and contests;
- > conferences and meetings;
- > cultural events;
- > field work;
- > internships; and
- > work terms.

Expanding these opportunities and making them more accessible, is a key focus of Waterloo's efforts.

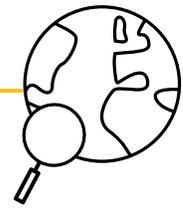
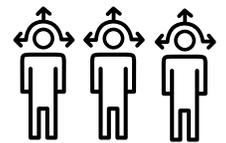
## INTERNATIONAL RESEARCH AND CONNECTIONS

**What does this mean?** Waterloo seeks and establishes international connections with world-leading institutions, government agencies, businesses, civil society organizations, etc to engage with and nurture intensive collaboration.

**Why is it important?** International connections provide opportunities for joint initiatives and collaborations that bring together diverse perspectives, leverage other funding streams, identify potential new projects, and offer the prospect to extend and leverage research and learning initiatives.

**51.3%**

of Waterloo's publications in 2016/17 were co-authored with at least one international author



Waterloo authors

**PUBLISHED MOST FREQUENTLY**

with researchers from the U.S. (19.7%), Europe (19.1%), and China (13.4%)

**OVER 60**

international delegations hosted during 2016/17, including ambassadors, heads of state, and university presidents



**40 JOINT ACADEMIC PROGRAMS**

with international partner universities

**Moving forward:** Waterloo's extraordinary research is central to our commitment to be a leader in finding solutions to tomorrow's problems. This requires that we work collaboratively and on multiple levels in our global community. Waterloo International provides a centralized focus for these efforts, sometimes providing leadership, sometimes coordinating initiatives, and sometimes connecting Waterloo and international networks to facilitate working together.



# GLOBAL PROMINENCE AND INTERNATIONALIZATION

Progress and Outcomes | Fall 2017 Update

## OBJECTIVE 1 | Be recognized internationally for excellence and innovation in education, research, and scholarship

MEASURES	2013/14	2014/15	2015/16	2016/17	WHAT DOES THIS MEAN?
<b>International students as a proportion of their respective populations</b>  Source: Institutional Analysis & Planning (IAP)	<b>UNDERGRADUATE</b>				> This measure monitors progress in attracting international students to the University. > The proportion of international students reflected as a proportion of their respective populations grew by 1.5 percentage points among undergraduates and 1.4 percentage points among graduate students between 2015/16 and 2016/17. > Steady increase in the recruitment of international students indicates Waterloo's desirability as an academic institution internationally.
	13.4% (3,809)	14.8% (4,256)	16.5% (4,797)	18.0% (5,398)	
<b>Number of Waterloo alumni living outside of Canada</b>  Source: Office of Advancement	<b>GRADUATE</b>				> The number of Waterloo alumni living outside of Canada increased by 4.7% between 2015/16 and 2016/17. This is consistent with prior years. > Alumni can be found in 150 countries around the world (outside of Canada). Excluding the United States, the top three countries where alumni live have remained the same over the last four years — China, the United Kingdom, and Australia.
	34.9% (1,468)	35.7% (1,493)	37.1% (1,558)	38.5% (1,668)	
<b>International research funding</b>  Source: Office of Research	15,000	15,764	16,377	17,154	> Research funding awarded by international sponsors contributes to achieving international recognition for excellence and innovation in education, research, and scholarship. > Research funding data is variable year-over-year and is not correlated directly with international research activity. As an example, in 2016/17 a multinational corporation changed the administration of a single large (\$2.1M) research grant from an international office to a domestic office, resulting in a major change in the amount of research funding received from international sources without any real change to overall research funding.
<b>World University Ranking results</b>  Source: IAP	<b>ARWU</b>				> International university rankings provide one way to interpret Waterloo's performance in excellence and innovation in education, research, and scholarship in an international context. > Ranking results have remained relatively stable in 2015/16 and 2016/17. > Many factors may affect ranking results, including changes in ranking methodologies, the composition of reputational survey participants, as well as university program mix and faculty composition (that is, the mix of early and later career stage researchers). Changes in ranking position are not necessarily the result of the changes in the University's performance. Waterloo's relative stability and ability to maintain its position is positive. > University rankings for fall 2017 are now available. Please see the Strategic Plan in Action website at <a href="http://uwaterloo.ca/strategic-plan-action">uwaterloo.ca/strategic-plan-action</a> .
	151-200	201-300	201-300	201-300	
	<b>QS</b>				
180	169	152	152		
<b>THE</b>					
226-250	251-275	179	173		

## WHAT WE DID IN 2016/17

- > Graduate Studies and Postdoctoral Affairs (GSPA) established a Graduate International and Admissions Specialist position, to create a more personalized application experience for applicants to the China Scholarship Council program and the Mexico CONACyT scholarship program. Personalized email communications helped increase the number of applicants from Mexico.
- > GSPA hosted a meeting with 16 current Mexican international graduate students to discuss their application experiences to the CONACyT scholarship program at Waterloo, to improve the application process, and to enhance recruitment activities.
- > GSPA had a virtual booth at the EDUFindme virtual graduate fair, where they connected with approximately 400 students from around the world and answered students' questions about attending Waterloo.
- > Waterloo co-hosted a tour of four research intensive universities in southwestern Ontario for international secondary school guidance counsellors. This initiative resulted in an increase in applications from the attending international secondary schools.
- > The University of Waterloo was selected as one of nine global destinations eligible to host undergraduate and graduate recipients of the Al Ghurair Science Technology Engineering Math (STEM) Scholars Program. Through this program, dozens of underprivileged Arab League country students will receive financial assistance to pursue their educational and professional goals with the University of Waterloo over the next seven years.
- > Thirty-four international secondary school students from 14 countries had a two-week interdisciplinary enrichment opportunity at the annual IDEAS Summer Experience program. Students created solutions to some of the world's most complex issues and learned from all six Waterloo Faculties to improve their problem-solving abilities, research skills, and communication.
- > The University of Waterloo won the gold award for the *Best International Student Recruitment Brochure* in the Creative Award Competition at the 12th Quacquarelli Symonds (QS) — Asia-Pacific Professional Leaders in Education Conference and Exhibition.
- > Waterloo developed a substantive partnership with the University of Bordeaux to create new joint research and education programs that are primarily self-financed by the universities.
- > The President of the National University of Singapore (ranked 12th by the QS World University Rankings), signed a Memorandum of Understanding for academic and research collaboration with the University of Waterloo following a visit that included discussions of Waterloo's co-op and cybersecurity programs and tours of the Water Institute, Velocity, and the Institute for Quantum Computing.
- > Eleven joint-research projects across several Faculties were funded through the International Research Partnership Grant program, in partnership with several leading Chinese institutions. Funded projects included financial risk analysis, sustainable transport programs, and

**OBJECTIVE 1 (cont'd)** | Be recognized internationally for excellence and innovation in education, research, and scholarship

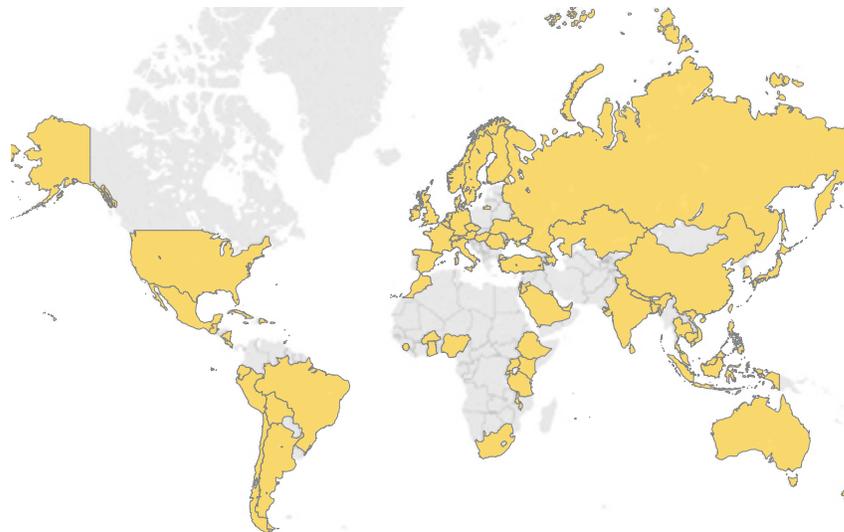
- energy efficient optical networks.
- > Facebook’s hardware development division announced a new partnership with the University of Waterloo and 16 other world-class universities (including Harvard and Princeton). It aims to allow swifter collaboration on technology research projects
- > At the World Congress Experience 2017, the Society of Automotive Engineers (SAE) International and General Motors announced that the University of Waterloo is one of eight North American finalists that will compete in the upcoming autonomous vehicle design competition, AutoDrive Challenge.™
- > At the 2017 Australia-Canada Economic Leadership Forum, President Hamdullahpur participated in a panel to discuss how institutions of higher education can serve as economic engines.
- > President Hamdullahpur travelled to South Korea in March 2017 to speak about the co-operative education model with the Korean National Assembly, participated in the Times Higher Education’s Asia Universities Summit, visited with alumni at an evening reception, and networked with local business leaders at a Canadian embassy event.

**OBJECTIVE 2** | Educate globally literate and world-ready graduates

MEASURES	2013/14	2014/15	2015/16	2016/17	WHAT DOES THIS MEAN?
<p><b>Number of international co-op work terms</b></p> <p>Source: Co-operative Education &amp; Career Action (CECA)</p>	2,010	2,319	2,698	2,653	<ul style="list-style-type: none"> <li>&gt; International co-op work terms are one way that Waterloo students can have an international experience.</li> <li>&gt; Since 2013/14, the number of international co-op work terms has increased by 32.0%. This upward trend reflects Co-operative Education and Career Action’s (CECA) focus on increasing the number of international experiential opportunities available for Waterloo students. In particular, CECA is trying to increase the number of work opportunities outside the sciences, technology, engineering, and mathematics (STEM) sector.</li> </ul>
<p><b>Number of outbound students participating in non co-op international experiential learning programs</b></p> <p>Source: Waterloo International</p>	312	658	629	961	<ul style="list-style-type: none"> <li>&gt; This measure captures the number of Waterloo students who travel internationally for non co-op learning.</li> <li>&gt; Waterloo changed how non co-op international experiential learning programs were identified and counted during the course of the strategic plan. Thus, data across years may not be directly comparable.</li> <li>&gt; Increased vigilance and data integrity measures may be partially responsible for the substantive increase in the numbers reported.</li> <li>&gt; Waterloo is building knowledge and awareness of international experiential learning opportunities while also increasing the amount and extent of funding support for them.</li> </ul>

**Outbound mobility map**

This map illustrates the countries where Waterloo undergraduate and graduate students are travelling as part of University-sanctioned international experiences. These include both co-op and non co-op opportunities.



Source: CECA and Student Success Office

**WHAT WE DID IN 2016/17**

- > Staff from Co-operative Education and Career Action (CECA) discussed international work terms at the Global Internship Conference (GIC), the Co-operative Education and Internship Association (CEIA) conference, and the Canadian Association for Co-operative Education (CAFCE) conference.
- > The Beijing Institute of Technology selected Waterloo as a recipient of the Study Abroad Scholarship and the China Scholarship Council Degree Scholarship. Waterloo undergraduate and graduate students across all six Faculties will have the opportunity to apply for and receive scholarships to study at the Beijing Institute of Technology during 2018.
- > Waterloo increased the number of International Student Experience Awards to support undergraduate and graduate students who engage in eligible study abroad programs, international co-op work terms, internships, or research experience outside of Canada. Donors were given the opportunity to have their donations matched by the University of Waterloo.
- > Six three-person student teams competed in the World’s Challenge Challenge at Waterloo to develop a solution to one of the United Nations’ Sustainable Development Goals. The winning team, the RAPTRS, won \$1K towards an international travel experience for each participant and advanced to the first International World’s Challenge Challenge competition in May 2017.
- > Waterloo hosted its second Model G20 2016 Conference, the only dedicated G20 conference in Canada. Faculty, staff, and students with an interest in global governance took part in the event, investigated global issues, engaged in specialized discourse, and listened to esteemed keynote speakers.
- > Twelve Waterloo students participated in the Explore Southern Africa program, a 25-day international program that gives students a non-Western perspective of poverty, education, and community development through experiential learning and travel. The unique itinerary exposed students to challenging conditions, including a visit to Namibia’s impoverished Katutura Township and Robben Island, the maximum security prison that held Nelson Mandela.



# VIBRANT STUDENT EXPERIENCE

Progress and Outcomes | Fall 2017 Update

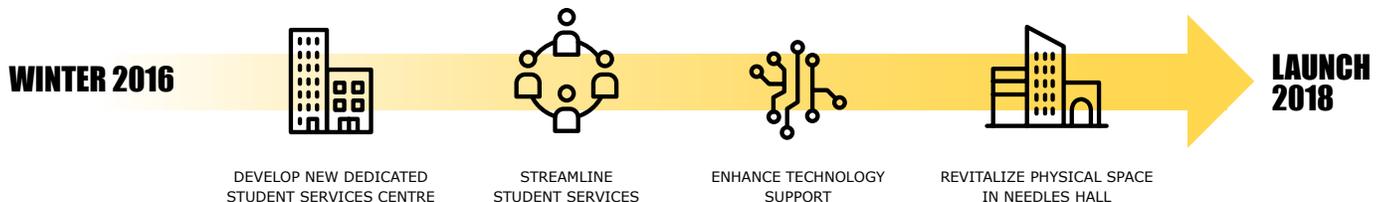
## OBJECTIVE 1 | Deliver excellent student services through an integrated student-focused approach

MEASURES	RESULTS	WHAT DOES THIS MEAN?
<p><b>Proportion of graduating students satisfied with concern shown by the University</b></p> <p>Source: Canadian University Survey Consortium (CUSC) 2012 and 2015 Q1</p>	<p>2012 50.3%</p> <p>2015 48.1%</p> <p>Satisfied, Very satisfied</p>	<ul style="list-style-type: none"> <li>&gt; This indicator provides an understanding of students' satisfaction with the care and concern demonstrated by members of the University community.</li> <li>&gt; Graduating students' perception of concern shown by the University has remained consistent. The difference between 2012 and 2015 is not statistically significant.</li> <li>&gt; CUSC Graduating Year survey will be implemented again in 2018.</li> </ul>
<p><b>Proportion of first-year and graduating undergraduate students reporting University emphasis on helping manage non-academic responsibilities</b></p> <p>Source: National Survey of Student Engagement (NSSE) 2014 and 2017 Q14</p>	<p>2014 31.7%</p> <p>2017 27.4%</p> <p>Quite a bit, Very much</p>	<ul style="list-style-type: none"> <li>&gt; Student perception of University supports is one way to understand how they are experiencing University support services.</li> <li>&gt; CUSC survey data for perception of concern shown by the University is typically used to assess this measure (shown above); however this survey will not be implemented again until 2018.</li> <li>&gt; The proportion of first-year and graduating undergraduate students who participated in the survey and reported that the University "quite a bit" and "very much" places an emphasis on helping manage non-academic responsibilities declined by 4.3 percentage points between 2014 and 2017. This difference is statistically significant.</li> <li>&gt; Student experience data is used on an ongoing basis to help Waterloo leadership provide better supports for students. Some of these efforts are described in the What We Did in 2016/17 section.</li> </ul>
<p><b>Proportion of graduate and undergraduate students reporting University interest in well-being of students</b></p> <p>Source: National College Health Association (NCHA) Survey 2016 Q67</p>	<p>2016 73.8%</p> <p>Agree, Strongly agree</p>	<ul style="list-style-type: none"> <li>&gt; Student perception about University interest in student well-being is one way to understand the effectiveness of student services.</li> <li>&gt; Almost three-quarters of undergraduate and graduate students who participated in the survey reported that the University shows an interest in the well-being of students.</li> <li>&gt; NCHA will be administered again in 2019.</li> </ul>

## WHAT WE DID IN 2016/17

- > The Student Success Office (SSO), Graduate Studies and Postdoctoral Affairs (GSPA), and the Registrar's Office used student and staff feedback to develop the new Student Services Centre, to be launched in 2018. The diagram below outlines the development of this new unit. It will provide many common student services more efficiently through online self-service or a single campus location including automated case management, appointment scheduling, and queuing supports to help students make the most efficient use of their time.
- > The Student Portal team successfully launched Waterloo's mobile student portal in fall 2016. Total mobile users now exceed 10K, based on iOS and Android devices. Students have been engaged throughout the development of this new platform. New features are being added, including integration with LEARN and orientation programming, and the addition of mental health resources.
- > In partnership with Institutional Analysis and Planning (IAP), a data analysis project has been initiated to create and use a survey framework incorporating five surveys and questions to better assess and understand the quality of the student experience.
- > IAP and SSO are leading an initiative with Faculties and other administrative support units to better understand and build collaborative efforts to address student experience data results from the National Survey on Student Engagement with the ultimate objective to improve student experience.

## Improved Student Experience



## OBJECTIVE 2 | Provide enabling experiences, programs and supports, including student leadership development opportunities, in order to develop student potential

MEASURES	RESULTS	WHAT DOES THIS MEAN?
<p><b>Proportion of graduating students reported University's contribution to leadership skills</b></p> <p>Source: CUSC 2012 Q15 and 2015 Q1</p>	<p>2012 50.6%</p> <p>2015 44.5%*</p> <p>Much, Very much</p>	<ul style="list-style-type: none"> <li>&gt; Students' perception of development opportunities for leadership skills provides an understanding of satisfaction with enabling opportunities. The ability to compare this data is somewhat limited because the wording of the question changed in 2015 from the University's contribution to leadership skill development to "ability to lead a group to achieve an objective."</li> <li>&gt; CUSC Graduating Year survey will be implemented again in 2018.</li> </ul> <p>*Note: Not comparable to other years due to changes in data collection</p>

**OBJECTIVE 2 (cont'd)** | Provide enabling experiences, programs and supports, including student leadership development opportunities, in order to develop student potential

MEASURES	RESULTS	WHAT DOES THIS MEAN?
<b>Proportion of first-year and graduating undergraduate students reporting University emphasis on providing social opportunities</b> Source: NSSE 2014 and 2017 Q14	2014 53.5%	> Becoming involved in student life offers an opportunity for students to develop their potential outside of classroom experiences. > CUSC data is typically used for this indicator; however CUSC will not be implemented again until 2018. In 2015, 71.6% of CUSC graduating respondents were satisfied with opportunities to be involved in student life.
	2017 49.1% <i>Quite a bit, Very much</i>	

**WHAT WE DID IN 2016/17**

- > The President and leadership, with student and staff stakeholders across campus, established the President’s Advisory Committee on Student Mental Health (PAC-SMH) to address the issue of student mental health within the larger societal context. The PAC-SMH established five supporting panels (Academic, Mental Health Experts, Student Services, Student Experiences and Community Partners) to conduct focused analysis on key topics. The panels will collect and review data and information to advise on the progress of mental health initiatives across the University, and examine root causes of student stress, anxiety, and depression, and how to mitigate them. A final report will be completed in early 2018.
- > Over 100 Student Leadership Program workshops were offered in 2016/17 with 468 unique participants. Average attendance at workshops increased by 29.6% between 2015/16 and 2016/17. Since 2013, over 500 students have completed the full program (over 70 in 2016/17) which includes 12 workshops, and received their Student Leadership Program e-certificate.
- > The Learning Services team collaborated with over 40 faculty and staff members from across campus. Together they developed 22 projects to support student learning and development impacting over 4,200 students. One partnership was the creation of six five-minute presentations that teach students study skills. These presentations are being integrated into key first-year courses.

**OBJECTIVE 3** | Develop strong partnerships within and between academic and non-academic units to enhance the positive student experience

**WHAT WE DID IN 2012/17**

- > Building on a recommendation from the Campus Wellness Planning Team, the Campus Wellness Coordinating Forum was proposed in December 2015. The purpose of this forum is to inventory existing campus student wellness activities, assess expansion opportunities, and identify gaps in approaches to student wellness. Initial meetings have scoped the breadth of the project. Work on this initiative will continue in 2017/18.

**OBJECTIVE 4** | Build a community of communities by providing an environment where students, faculty and staff can connect

MEASURES	RESULTS	WHAT DOES THIS MEAN?
<b>Proportion of graduate and professional students reporting quality of office space</b> Source: Canadian Graduate and Professional Students Survey (CGPSS) 2016	2013 69.3%	> Graduate student and professional student satisfaction with, and rating of, office space are ways to understand Waterloo’s ability to build appropriate community spaces and environment for all students. > It is anticipated that Waterloo’s focus on development of new space, and redevelopment of existing space, will impact this survey data. > The next CGPSS survey will be implemented in 2019.
	2016 70.1% <i>Good, Very good, Excellent</i>	
<b>Proportion of first-year students reporting quality of study space (2016)</b> Source: CUSC 2016	2013 77.4%	> Student satisfaction with, and rating of, study space can help to understand Waterloo’s ability to build appropriate community spaces and environments for students. > It is anticipated that Waterloo’s focus on development of new space, and redevelopment of existing space, will have important impact on this survey data. > The next CUSC First-Year survey will be implemented in 2019.
	2016 63.2% <i>Good, Excellent</i>	

**WHAT WE DID IN 2016/17**

- > Between 2013 and 2016, the amount of new student study space available, increased by 18.0%, based on the Council of Ontario Universities space study.
- > The Student Life Centre (SLC)/Physical Activities Complex (PAC) Expansion project is under construction and is projected to open in fall 2018. This 63,000+ square feet building will physically connect the SLC and the PAC and will add student study, social, fitness, dining, and collaboration space. See [www.uwaterloo.ca/aps/slcpac](http://www.uwaterloo.ca/aps/slcpac).
- > Student space was renovated in three important University buildings. This included:
  - tables, chairs, and lounge seating installed for eating and social activities in Hagey Hall;
  - lounge seating and fixed study tables and chairs with data and electrical capabilities in Burt Matthews Hall; and
  - in the Science Teaching Complex more lounge seating and fixed study tables and chairs with electrical capabilities for students’ use.

**OBJECTIVE 5** | Deepen the connections between students and the City of Waterloo community

**WHAT WE DID IN 2016/17**

- > Working together with the City of Waterloo’s Town and Gown Committee, Waterloo conducted a Student Housing Survey. Over 6,600 Waterloo students participated in the survey to better understand Waterloo’s student experiences in the community, expectations for housing, distribution of housing in the community, and student’s sense of belonging in Waterloo. Results show that among Waterloo students who responded to the survey, two-thirds (67.3%) reported that living off-campus improved their sense of belonging to the Waterloo community, and almost nine in 10 (89.6%) reported that their interactions with neighbours have been positive.



# ROBUST EMPLOYER-EMPLOYEE RELATIONSHIP

Progress and Outcomes | Fall 2017 Update

## OBJECTIVE 1 | Be a destination of choice for superior individuals seeking employment

MEASURES	2013/14	2014/15	2015/16	2016/17	WHAT DOES THIS MEAN?
<b>Overall employee turnover rate</b>  Source: Human Resources (HR)	3.7%	4.1%	4.8%	4.6%	<ul style="list-style-type: none"> <li>&gt; The turnover rate is the proportion of all employees who leave employment at the University, including those who leave as a result of retirement.</li> <li>&gt; The overall turnover rate is consistently low. Retirements account for less than half (44%) of the total employee turnover rate. With an average workforce age of 47 and 27% of employees under the age of 40, the loss of employees through retirements is not currently a significant organizational challenge.</li> </ul>
<b>Proportion of female staff hires</b>  Source: HR	56.8%	65.3%	58.0%	68.3%	<ul style="list-style-type: none"> <li>&gt; The proportion of female staff hires is one way to understand how the University's gender diversity reflects the community from which it recruits its staff.</li> <li>&gt; The proportion of female staff hires varies over time, but has an overall upward trend.</li> <li>&gt; Overall staff equity indicators, including equity among faculty, are found under the Sound Values theme.</li> </ul>

## WHAT WE DID IN 2016/17



**The University of Waterloo was selected as one of Canada's Top 100 Employers and one of Waterloo Area's Top Employers for 2017. Waterloo was recognized for its pension and benefit offerings, retirement preparation programs, vacation allotment for employees, and onsite amenities, among others.**

- > As part of a comprehensive technology renewal program, launched and/or selected new employee Human Resources (HR) systems, including:
  - a talent acquisition system, iCIMS, to support the hiring of staff. New functionality supports both external and internal candidates accessing job advertisements;
  - a pension system, Ariel, which provides plan members with an improved myPENSIONinfo portal equipped with a user-friendly interface, the ability to view beneficiary designations and annual pension statements, and a tool to generate estimated pension projections; and
  - a Human Resources Management System, Workday, was selected and is being implemented to address Waterloo's need for an upgraded Human Resources Management System and payroll system.
- > Developed a new onboarding website for managers, which includes detailed instructions for hiring and video tutorials to support manager development.
- > Continued to conduct exit surveys with all departing employees, launched an employee transfer survey, and developed a survey for new employees. These surveys help build understanding about why employees choose Waterloo, leave the University, and move between departments.
- > Increased participation in the Excellence Canada program. Human Resources, the Library, the Office of the Vice-President, Academic and Provost, and Organizational and Human Development achieved silver certifications in the Excellence, Innovation and Wellness (EIW) program. Moving forward, Waterloo is integrating the EIW Standard at the gold level for the University as a whole, as opposed to certifying each Faculty, office, and service unit individually. The Excellence Canada Advisory Committee has conducted a University-wide survey of employees and focus groups with staff, faculty, and Canadian Union of Public Employees (CUPE) employees to begin to assess the University against the EIW Standard.
- > Conducted a compensation review of administrative salaries on the USG scale, along with an independent review of the University's job evaluation process.
- > Conducted a University-wide Human Resources (HR) satisfaction survey to gain a better understanding of employees' satisfaction with HR services. Survey results establish a baseline upon which to measure its progress moving forward in supporting Waterloo's goal of becoming a destination of choice for talented and engaged employees.
- > Launched a new online presence for accessibility at Waterloo, which includes information about legislation, the University's accessibility services, and a directory of campus accessibility features including entrances, elevators, washrooms, and parking.

## OBJECTIVE 2 | Enable staff to fulfill their potential in a career at the University

MEASURES	2013/14	2014/15	2015/16	2016/17	WHAT DOES THIS MEAN?
<b>Employee participation in Principles of Inclusivity workshops</b>  Source: Organizational & Human Development (OHD)	577	287	407	389	<ul style="list-style-type: none"> <li>&gt; The number of employees who have completed at least one of the Principles of Inclusivity workshops provides an indication of how Waterloo is building an inclusive employee community.</li> <li>&gt; The number of employees who complete at least one of the Principles of Inclusivity workshops varies annually. To date, 31% of Waterloo's regular, ongoing staff have taken at least one of the University's Principles of Inclusivity workshops.</li> <li>&gt; All new regular Waterloo staff are highly encouraged to attend Principles of Inclusivity workshops as part of their onboarding process. Current staff are also encouraged to take the workshops. These workshops build an understanding of what inclusivity means, and how it is articulated, at Waterloo.</li> </ul>
<b>Number of managers who participated in leadership training</b>  Source: OHD	31	49	32	96	<ul style="list-style-type: none"> <li>&gt; The number of managers who participated in leadership training varies annually. Cumulatively, almost 30% of managers have participated in leadership training as of 2016/17.</li> <li>&gt; Leadership training workshops include Leadership Essentials, Leadership Foundations, and Mindful Manager.</li> <li>&gt; <b>TARGET:</b> 100% of managers will complete leadership training by 2018/19.</li> </ul>
<b>Proportion of internal staff hires</b>  Source: HR	45.0%	61.2%	49.0%	48.6%	<ul style="list-style-type: none"> <li>&gt; The proportion of internal hires provides an understanding of employee development.</li> <li>&gt; Similar to most prior years, about half (48.6%) of open positions at Waterloo were filled by internal candidates in 2016/17.</li> <li>&gt; Waterloo promotes internal mobility by developing its internal talent pool through leadership development training and secondment/reassignment opportunities.</li> </ul>

### WHAT WE DID IN 2016/17

- > Piloted the first cohort experience of Organizational and Human Development's (OHD) award-winning Principles of Inclusivity seven-workshop series. The Principles of Inclusivity series has been featured at the College and University Professionals Association (CUPA) Human Resources (HR) annual conference, the Guelph Accessibility Conference, and in a special topic webinar for CUPA-HR. The program has also been nominated for the CUPA-HR Inclusivity Award for 2017.
- > Reorganized the HR department to better support strategic priorities and the evolving needs of Waterloo's workforce. Changes include an increased focus on process improvement to support departmental continuous improvement activities, including the pilot of an internal Lean consortium to facilitate continuous improvement activities, and to facilitate greater collaboration across departments.
- > Increased support and resources to enable a healthy workplace, including:
  - launched a new Employee and Family Assistance Program (EFAP), which includes 24/7 access to confidential counselling services, a website with extensive health and wellness resources, and onsite workshops for employees;
  - delivered 21 workshops for managers as part of a nation-wide case study project with Mindful Employer Canada, sponsored by Ministry of Labour. This study, which began in 2015/16, will build capacity for positive workplace mental health;
  - supported healthy workplace initiatives through the Staff Excellence Fund, including subsidizing participation in the UW Fitness Program for Staff Association members; and
  - announced plans for a health and wellness day and a workplace accessibility day in 2017/18. These University-wide events will raise awareness of wellness and accessibility services and resources.
- > In support of the HeForShe 10X10X10 goals, facilitated discussions with faculty members on the development of an academic leadership framework.
- > Continued to provide core development workshops throughout the year for staff. All new staff members are now highly encouraged to take all four core development workshops – Integrity Matters, Exceptional Service, Principles of Leadership, Principles of Inclusivity – within their first 12-18 months at Waterloo.
- > Welcomed 1,400 employees to the tenth annual Staff Conference, which included a special anniversary event featuring Margaret Trudeau. New in 2016/17, OHD coordinated a Management Development Day, which was attended by 36% of employees in manager or supervisor roles.
- > Developed the concept for a Staff Enhancement Experience - Canada (SEE-Canada) Program to provide staff members with the opportunity to travel and engage in collaborative work with partner institutions within Canada. This program complements Waterloo International's Staff International Experience Fund, which was launched in 2014.
- > Coordinated the second cohort of OHD's Success through Mentorship program aimed at enhancing employee development through paired relationships. The program has been expanded and further developed. This year's program has been refined to include additional professional development and networking opportunities.
- > Continued to implement the OHD's leadership training programs to increase leadership capacity across campus through leadership training programs including Leadership Essentials, Leadership Foundations, and Success through Mentorship. To share Waterloo's approach to leadership development, OHD participated in a panel at the Network for Change and Continuous Improvement (NCCI) conference focused on how higher education institutions are responding to this challenge.



# SOUND VALUE SYSTEM

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## OBJECTIVE 1 | Develop a strong, vibrant and integrated community

MEASURES	2013/14	2014/15	2015/16	2016/17	WHAT DOES THIS MEAN?				
<p><b>Proportion of female undergraduate and graduate students at Waterloo</b></p> <p>Source: Institutional Analysis &amp; Planning (IAP)</p>	44.3%	44.7%	45.5%	46.2%	<ul style="list-style-type: none"> <li>&gt; Student demographic information supports planning and developing equity initiatives that meet the needs of Waterloo's increasingly diverse community.</li> <li>&gt; The proportion of female undergraduate and graduate students at Waterloo has consistently increased by 1.9 percentage points since 2013/14.</li> <li>&gt; This data assists with the development and planning of equity initiatives (see objective 3).</li> </ul>				
<p><b>Proportion of students registered with AccessAbility Services</b></p> <p>Source: AccessAbility Services</p>	5.1%	5.4%	6.1%	3.8%	<ul style="list-style-type: none"> <li>&gt; Waterloo has a diverse student body which includes students with disabilities.</li> <li>&gt; The proportion of students registered with AccessAbility Services fluctuates between 3.8% and 6.1% of the student body. In 2016/17, 3.8% of students registered with the office.</li> <li>&gt; Waterloo students register with the Office of AccessAbility, to provide information about their condition and identify their needs.</li> </ul>				
<p><b>Proportion of first-year students who self-identify as a member of a visible minority or racialized group</b></p> <p>Source: Canadian University Survey Consortium (CUSC) 2013 Q52 and 2016 Eth1-13</p>	<table border="1"> <tr> <td>2013</td> <td>61.3%</td> </tr> <tr> <td>2016</td> <td>63.4%</td> </tr> </table>			2013	61.3%	2016	63.4%	63.4%	<ul style="list-style-type: none"> <li>&gt; Waterloo attracts students from diverse backgrounds.</li> <li>&gt; A slightly greater proportion of first-year students (2.1 percentage points) identified as a member of a visible minority or a racialized group in 2016 compared to 2013.</li> <li>&gt; This data is self-reported through the CUSC survey.</li> </ul>
2013	61.3%								
2016	63.4%								

### WHAT WE DID IN 2016/17

> Continued to expand Academic Leadership Program to include associate chairs and associate deans in 2016. Plans for an integrated staff and academic leadership programs are underway. Both staff and academic

(faculty) leaders will be provided with the same set of foundational development programs, with specialized programming suited to their specific responsibilities to follow.

## OBJECTIVE 2 | Deepen and broaden the University's approach to integrity

MEASURES	2013/14	2014/15	2015/16	2016/17	WHAT DOES THIS MEAN?
<p><b>Number of staff members who participated in Staff Integrity Workshop</b></p> <p>Source: Organizational and Human Development (OHD)</p>	90	54	79	137	<ul style="list-style-type: none"> <li>&gt; Staff participation in integrity workshops provides one way to understand staff engagement with integrity.</li> <li>&gt; Over four years, 360 staff have participated in staff integrity workshops at Waterloo.</li> <li>&gt; The "Integrity Matters" workshop is slowly becoming recognized as a valuable session for all staff members.</li> </ul>
<p><b>Number of graduate students who participated in Academic Integrity Module</b></p> <p>Source: Office of Academic Integrity</p>	2,207	2,191	2,229	2,245	<ul style="list-style-type: none"> <li>&gt; The number of students who participate in academic integrity learning opportunities can provide an indication of the extent of student engagement with academic integrity at the University.</li> <li>&gt; The Academic Integrity Module workshop is required for all graduate students in their first term at Waterloo. This requirement reinforces the importance of integrity in work, study, and play at Waterloo.</li> <li>&gt; <b>TARGET:</b> By 2018, 100% of graduate students will have completed the Graduate Academic Integrity Module (Graduate AIM) within their first term at Waterloo. This target has been achieved. Measures are in place to ensure that all graduate students complete AIM.</li> </ul>

### WHAT WE DID IN 2016/17

> Continued to distribute integrity messaging (posters and digital screens) across campus. Other promotional items (post-it notes) were provided to all incoming undergraduate and graduate students.

> Partnered with Renison University College and received eCampus grant to develop and pilot a mobile application to introduce students to academic integrity (AI). The goal of the project is to develop an effective way to ensure that all new undergraduate students receive AI training.

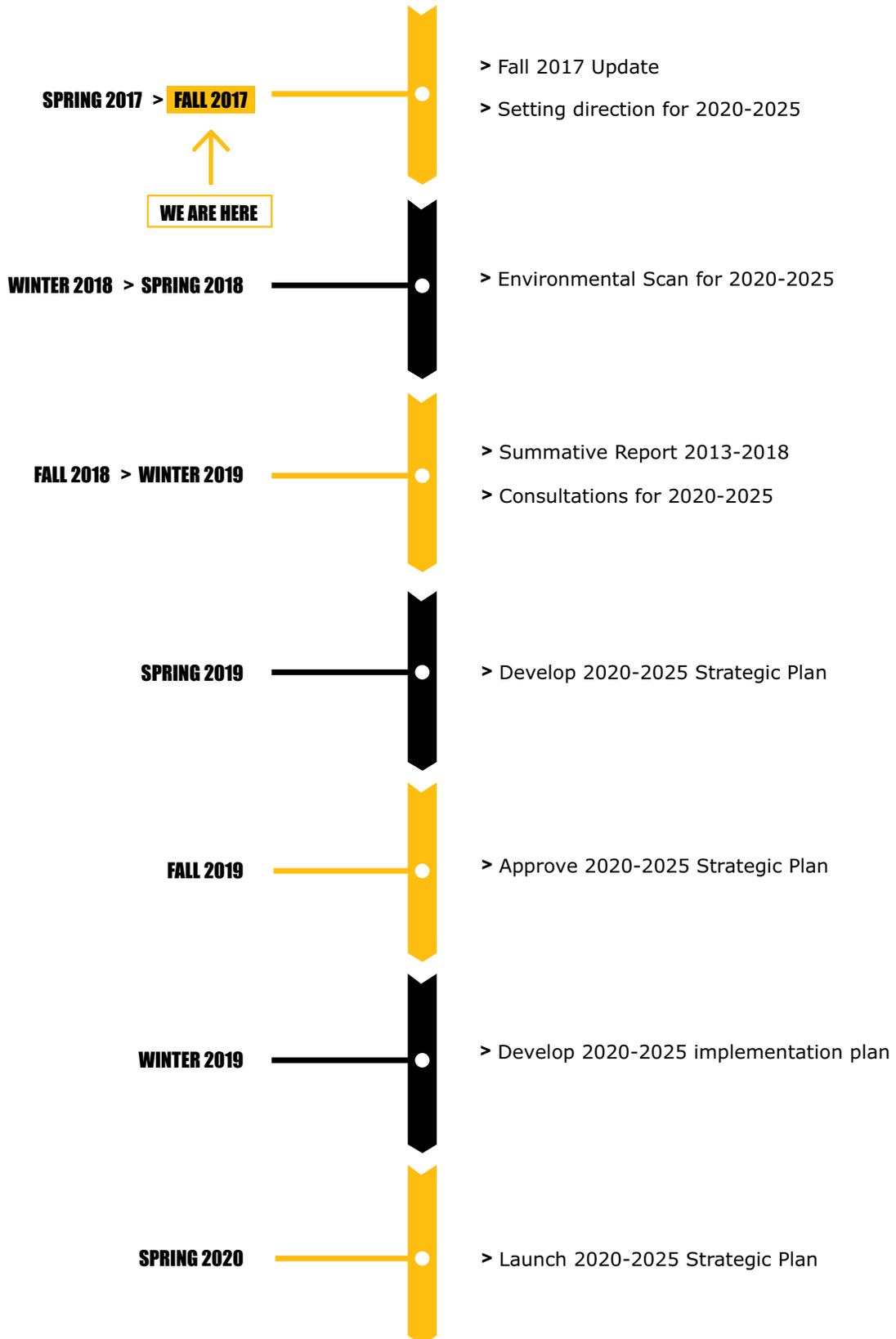
**OBJECTIVE 3** | Develop a supportive campus community that proactively articulates, promotes, and effects change to achieve equity for students, faculty, and staff through policies, programs, and practice

MEASURES	2013/14	2014/15	2015/16	2016/17	WHAT DOES THIS MEAN?
<p><b>Proportion of full-time, female staff</b></p> <p>Source: Human Resources Management System (HRMS)</p>	66.4%	65.7%	66.5%	66.8%	<ul style="list-style-type: none"> <li>&gt; The proportion of full-time staff who are female is used as an indicator for gender balance. Note that the data for the proportion of female new hires is reported under the Robust Employer Employee Relationship theme.</li> <li>&gt; The proportion of full-time, female staff has remained relatively constant, increasing only slightly by 0.4% since 2013/14.</li> <li>&gt; Demographic data informs the development of equity initiatives.</li> </ul>
<p><b>Proportion of full-time, regular female faculty</b></p> <p>Source: HRMS</p>	28.1%	29.4%	29.6%	29.8%	<ul style="list-style-type: none"> <li>&gt; For equity to thrive, a supportive campus climate is critical. Efforts are underway to increase awareness and support the promotion of equity campus-wide.</li> <li>&gt; The proportion of full-time, regular female faculty in 2016/17 was 29.8%, 0.2 percentage points greater than in 2015/16.</li> <li>&gt; The proportion of full-time, regular female faculty is used as an indicator for gender equity among University faculty.</li> <li>&gt; <b>TARGET:</b> The HeForShe campaign goal is to achieve 30% female representation in the faculty cohort by 2020. The University will continue its efforts to improve gender balance in the faculty cohort, even after the target has been achieved.</li> </ul>
<p><b>Number of participants who completed the Equity, Diversity, and Inclusion sessions</b></p> <p>Source: Equity Office</p>	2,122	3,251	3,262	<ul style="list-style-type: none"> <li>&gt; The number of participants who attend learning and development sessions can be an indicator of the extent of awareness of equity and diversity as well as the potential capacity for promoting equity at Waterloo.</li> <li>&gt; In 2016/17, 3,262 students and employees participated in equity, diversity and inclusion related learning and development sessions.</li> </ul>	

**WHAT WE DID IN 2016/17**

- > Developed, piloted, and began implementing equitable recruitment strategy for Canada Research Chairs (CRCs), including successful implementation of a tracking survey to assess diversity of the applicant pool.
- > Completed campus core values consultation in 2016. Revamped Survey on Core Values and Experienced Behaviours is ready for implementation in 2017.
- > Policy 42, Prevention and Response to Sexual Violence, was established for students, faculty, and staff, effective January 2017. The policy articulates Waterloo's commitment to address sexual violence. In the coming year the focus will be on providing education, training, and resources for individuals responsible for implementing the Policy.
- > Continue to develop additional components of the Making Spaces Program to create affirming spaces on campus.
- > Achieved annual goal of retrofitting and launching 29% (more than 60) inclusive, single-use washrooms in of 55 campus buildings. This initiative was well received by students, faculty, and staff. Additional retrofitting of washrooms to meet 50% coverage of 55 campus buildings is planned for the next year.
- > Consultations on the processes associated with Policy 33 on Ethical Behaviour by major resource groups (Human Resources, Health and Safety, Conflict Management and Human Rights Office, and Equity Office) are underway. The Policy drafting committee also delivered a preliminary report to the strategic plan steering committee. The report recommended the development of a centre for neutral advice on reporting breaches of ethical behaviour which will co-ordinate supports for individuals, and provide either references to support informal problem resolution, or to a formal complaint case management office. The committee also identified the need for a robust incident management system for tracking and managing concerns and complaints.

# TIMELINE AT A GLANCE



UNIVERSITY OF  
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# STRATEGIC PLAN

2013-2018

*Faculty Update Supplement | Fall 2017 Update*



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# HIGHLIGHTS

**Waterloo's six Faculties are vital partners to achievement in all areas of our Strategic Plan. Strategic Plan initiatives have supported Faculty leadership, particularly in the areas of Transformational Research and Outstanding Academic Programming.**



**Waterloo's Faculties reported tremendous success in accessing funding in strategic areas in 2016/17. University-wide efforts facilitated Faculty access to resources that support research. Some of these are outlined below.**

- › Waterloo research projects have real world impacts. Some of these include:
  - leading one of the world's largest and most comprehensive longitudinal studies of youth to reduce the future cancer burden in Canada using policies and programs;
  - creating tools for risk screening, care coordination, and patient engagement in decision-making, and implementing a standardized comprehensive geriatric assessment instrument in 10 Canadian hospitals;
  - responding to the Truth and Reconciliation Commission in partnership with the Waterloo Aboriginal Education Centre and Indigenous partners to raise awareness through The Mush Hole Project;
  - building a new facility for automotive research and testing;
  - expanding the Multi-Scale Additive Manufacturing Lab, to build new techniques and approaches for automotive and manufacturing processes;
  - approved testing for Autonomoose autonomous vehicle platform on all public roads in Ontario;
  - developing new, sustainable strategies for managing hazardous mine waste; and
  - exploring how bacteriophages can combat colon cancer.
- › Waterloo researchers also advanced international research activities to address critical multinational issues including developing public health informatics and institutional capacity for linking climate change and health, building data repositories for polar regions, the study of groundwater pollution in arid regions, and management of agriculture pollutants.
- › Three Waterloo researchers were named as fellows to the prestigious Royal Society of Canada: Professors Colin MacLeod (Arts), Jennifer Clapp (Environment), and Tamer Özsu (Math). Another three were named as members of the Royal Society of Canada,

College of New Scholars, Artists and Scientists: Professors John Turri (Arts) and Zhongwei Chen and John Yeow (Engineering).

**In 2016/17, Waterloo's Faculties continued to contribute to outstanding academic programming. Some examples of these academic programming successes are highlighted here.**

- › Arts teaching staff are implementing efforts to build English language competency skills across the Faculties of Engineering, Math, Science and Environment.
- › New undergraduate and graduate courses and programs developed in 2016/17 included a new course-based master's program in Recreation and Leisure Studies, a new course in Applied Health Sciences (AHS) for non-AHS students, a new minor in Urban Studies in Environment, two first-year Arts courses in Inquiring and Communication and Information and Analysis, and an online graduate diploma in Climate Risk Management. Senate approved a new undergraduate program in Data Science incorporating computer science and statistics.
- › Waterloo's Faculty of Math partnered with international institutions on a new dual degree doctoral program agreement with the Chinese Academy of Sciences, as well as a pan-African network of centres of excellence for postgraduate training, research, and engagement in mathematical sciences.
- › Several Faculties continued to improve online learning opportunities through the development of STEM-aware (sciences, technology, engineering, and math) course development platforms, integration of more interactive learning technology into online courses, and the use of augmented online testing and evaluation software.

**Faculties make important contributions to other areas of the strategic plan. These efforts enrich the University as a whole, and especially, student experiences. Some of these initiatives and activities are described here.**

- › New and renovated spaces in several Faculties enhance students' campus

experience including the AHS Expansion Building, Toby Jenkins Applied Health Research building, and the Faculty of Arts' Hagey Hall Hub.

- › All Faculties host or support entrepreneurial initiatives for students. This includes AHS's Hack4Health 2.0 hosted by the Murray Alzheimer Research and Education Program, Arts' stART up which provides education and mentorship opportunities, and several funds in Engineering to support Capstone Design competitions and student ventures.
- › Several Science and Engineering students won numerous external entrepreneurial competitions with their ventures, including Suncayr, Medella Health, Arylla, and Penta Medical.
- › Waterloo students across all Faculties participated in a range of experiential and international experiences. In Arts, the number of undergraduate students participating in international exchanges has doubled since 2012/13. Five students from four different Faculties (Arts, Engineering, Environment, and Science) participated in the Waterloo delegation at COP22, Conference of Parties to the United Nations Framework Convention on Climate Change.
- › International competitions offer opportunities for students to engage in problem solving in high pressure situations:
  - Waterloo's NanoRobotics Group captured first place at the Mobile Microrobotics Challenge at the International Conference for Robotics and Automation;
  - Applied Health Science, Arts, and Science students won the 2017 Hult Prize Regionals in London England; and
  - Math students finished sixth out of 568 institutions at the Putnam competition and 13th in the Association for Computing Machinery International Collegiate Programming Contest.
- › Creating a better environment for students means tackling difficult issues. The Faculty of Arts hosted a number of initiatives to help students and others develop critical awareness and action to end sexual assault and harassment on campus and beyond.

**LEARN MORE:** [uwaterloo.ca/strategic-plan-action](http://uwaterloo.ca/strategic-plan-action)

# FACULTY OF APPLIED HEALTH SCIENCES

*Faculty Update Supplement | Fall 2017 Update*

## STRATEGIC INITIATIVES:

### TRANSFORMATIONAL RESEARCH

- › The Faculty of Applied Health and Sciences (AHS) expanded its physical footprint with the opening of two new facilities: the AHS Expansion Building and the Toby Jenkins Applied Health Research Building.
- › Professor Scott Leatherdale was awarded \$1.6M in funding from Canadian Institutes of Health Research (CIHR) to continue the COMPASS study— the world’s largest and most comprehensive longitudinal study of youth focused on using programs and policies to reduce the future cancer burden in Canada.
- › The 2016 *Patterns and Trends Report*, published by the Propel Centre for Population Health Impact, included a special supplement on cannabis use in Canada. The report found that just as many teenagers use cannabis every day as smoke cigarettes, and there is a strong association between tobacco use and marijuana consumption.
- › Professor Paul Stolee is project lead on a \$2.6M grant from the Canadian Frailty Network to implement tools for risk screening, care coordination, and patient engagement in decision-making. Other AHS investigators include George Heckman, Jacobi Elliott, Samantha Meyer, and Justine Giosa.
- › In another grant from the Canadian Frailty Network, Professors John Hirdes, George Heckman, and Heather Keller received funding to implement the standardized interRAI Acute Care Comprehensive Geriatric Assessment instrument in 10 Canadian hospitals. They will also work with other Canadian partners on a cluster randomized trial of targeted advance care planning in nursing homes.
- › Quacquarelli Symonds (QS) ranked the University of Waterloo 13th in the world — and first in Canada — for Hospitality and Leisure Management Studies.
- › In September, the Faculty released its first Impact Report, *Health in 3D*. The 32-page publication highlights research contributions across three different dimensions of health and seven impact areas.
- › The Ministry of Health and Long-Term Care appointed Professor John Garcia to two task forces: the Executive Steering Committee for the Smoke-Free Ontario Strategy, and the Standards Implementation Task Force for Modernized Ontario Standards for Public Health Programs and Services.
- › Researchers from the Department of Recreation and Leisure Studies received a 2017-18 Social Sciences and Humanities Research Council (SSHRC) Connection Grant entitled “Canada 150: engaging leisure legacies/creating leisure legacies.”

**STUDENTS WALK IN THE NEW  
APPLIED HEALTH SCIENCES  
EXPANSION BUILDING.**



- › The Partnerships in Dementia Care Alliance (PiDC), led by Professor Sherry Dupuis and collaborators, performed nine shows of their research-based drama *Cracked: New Light on Dementia* — including one performance in conjunction with the Alzheimer Association International Conference in July. The manuscript for the play was also published in *ReView: an anthology of plays committed to social justice*.
- › The Professional Practice Center in Health Systems, led by Professors Ian McKillop and Helen Chen, has completed over \$1M in knowledge translation projects delivering IT solutions in settings such as dialysis, transplant, cardiac care, and public health. The process has also created new experiential learning opportunities for graduate students.
- › The Centre of Research Expertise for the Prevention of Musculoskeletal Disorders (CRE-MSD) was selected by the Ontario Ministry of Labour to lead the redevelopment of provincial guidelines for the prevention of musculoskeletal disorders. The two-year \$307K project involves multistakeholder, cross-industry sectors. CRE-MSD is also spearheading a national project to develop a Canadian standard to address issues related to paramedic equipment and emergency ground transport. Developed in collaboration with the Canadian Standard Association (CSA), Frontenac County, the Paramedics Association of Canada (PAC), and other industrial partners, the standard is the first of this kind in Canada. It received over \$600K in cash and \$500K of in-kind funding from Defense Research and Development Canada (DRDC).
- › Professor Kelly Skinner and colleagues from three universities received a four-year SSHRC Insight Grant to explore the multiplicity of food and social economies and experiences for Indigenous people living in the provincial north and urban centres in Manitoba and Ontario.
- › The Canadian Index of Wellbeing (CIW) launched its third national report: *How are Canadians Really Doing?* The report found that while Canada's economy has recovered from the 2008 recession, well-being has not. In 2014, household spending on culture and recreation was at its lowest point in over two decades and Canadians are spending less time away on vacation or participating in leisure activities.
- › School of Public Health and Health Systems (SPHSS) faculty members and graduate students participated in a successful Ontario Coalition Institute Workshop on Global Health in September. The Global Health Group, led by Professor Susan Horton, is currently preparing a proposal for a Global Health Institute based in Applied Health Sciences. This initiative builds on the School's existing strengths in the field. Current projects include the application of health informatics to enable local innovators to tackle challenges in Mongolia and building institutional capacity in Zambia to address linkages between climate change and health.
- › Professor Joon Lee was one of four researchers from the province to participate in the Ontario-China Young Scientist Exchange Program.

## STRATEGIC INITIATIVES:

### ACADEMIC PROGRAMMING

- › Three new teaching fellows (one from each academic unit) were appointed to raise the profile of teaching and learning in the Faculty. The fellows are responsible for overseeing the annual Applied Health Sciences Teaching Award, which was awarded to Professors Joe Quadrilatero and Elham Satvat in 2016.
- › On May 8, the Faculty kicked-off its 50th anniversary year with a special lunch and ceremony, followed by a Hallman lecture from the Hon. Anne McLellan. The lecture, which looked at the implications of legalizing marijuana in Canada, was hosted by the School of Public Health and Health Systems to mark their 40th anniversary. Over 225 people, including faculty, staff, alumni, and members of the general public attended the talk.
- › The new course-based master's program in Recreation and Leisure Studies welcomed its first cohort in September 2016.
- › More than 150 students from other Faculties enrolled in AHS 100, Foundations of a Healthy Lifestyle, over two terms. The new course, a complement to AHS 107 (which is mandatory for all AHS students), promotes the basics of health, wellness, and disease prevention.
- › With support from the Network for Aging Research (NAR), graduate students hosted the second annual Symposium on Aging Research (SoAR) to initiate trans-departmental collaborations and engage in conversations on aging research. This year, SoAR featured a keynote by NAR researcher John Lewis to open the day.
- › Over 100 high school students competed in the 9th annual Brain Bee competition hosted by the Department of Kinesiology. The event winner advanced to the Canadian Institutes of Health Research Brain Bee.
- › In November 2016, the Murray Alzheimer Research and Education Program hosted Hack4Health 2.0. The two-day event generated ideas for practical applications to improve the lives of those living with Alzheimer's disease or multiple sclerosis. Winning concepts included a low-profile bracelet providing a display of the current state of household devices (windows open, doors unlocked) and a personalized medicated transdermal patch based on specific medication plans.
- › A team of SPHSS students advanced as finalists in the Canadian Evaluation Society Student Case Competition in Vancouver and competed in the final round.

# FACULTY OF ARTS

Faculty Update Supplement | Fall 2017 Update

## STRATEGIC INITIATIVES:

### TRANSFORMATIONAL RESEARCH

- › Distinguished honours, awards, and research chairs awarded to Arts faculty and graduates, include:
  - Professor Jim Walker (history) was named Member of the Order of Canada for his influential scholarship on human rights and the role of Black Canadians in advancing racial equity;
  - John English, distinguished professor emeritus (history), was promoted to Officer of the Order of Canada for his contributions to Canada's political heritage;
  - Professor Colin MacLeod (psychology) was named a Fellow of the Royal Society of Canada;
  - Professor Heather Douglas was named a Fellow of the American Association for the Advancement of Science (AAAS);
  - Professor John Turri (philosophy) was named a member of the College of New Scholars, Artists and Scientists, Royal Society of Canada, and also a Social Sciences and Humanities Research Council (SSHRC) Tier 2 Canada Research Chair (CRC) in Cognitive Science;
  - Professor Ramona Bobocel (psychology) was named a Fellow of the Canadian Psychological Association;
  - Professor Linda Warley (English) won the 2016 Gabrielle Roy Prize for her co-edited book, *Canadian Graphic: Picturing Life Narratives*;
  - Gord Pennycook's (PhD '16 psychology) lead-authored paper, "On the Reception and Detection of Pseudo-Profound Bullshit," won an Ig Nobel Prize from Harvard University; and
  - Professor Chris Eliasmith (philosophy) was promoted to Tier 1 Natural Sciences and Engineering Research Council (NSERC) Canada Research Chair (CRC) in Theoretical Neuroscience.
- › Ashley Rose Mehlenbacher (English) and Igor Grossmann (psychology) each received an Ontario Early Researcher Award.
- › Jessie Thistle MA '16 history, supervised by Professor Susan Roy, is the first Indigenous student to win both a Trudeau and a Vanier fellowship for his PhD studies.
- › Professor Naila Keleta-Mae (theatre and performance) delivered the keynote, addressing race and gender issues in Canada, at the University's International Women's Day dinner.
- › Faculty and staff members in Arts collaborated with the Waterloo Aboriginal Education Centre, along with numerous Indigenous partners, to present The Mush Hole Project, a multidisciplinary performance at Canada's oldest former residential school in Brantford, followed by a conference, Integrating Knowledges Summit, held at Waterloo.
- › Arts and the Waterloo Aboriginal Education Centre have jointly launched the Indigenous Speaker Series, with two speakers presented in winter 2017.
- › Arts collaborated with University Community Relations and Kitchener Public Library to host two sold-out public panels: *Digital Dependencies: how we upload and offload ourselves* in fall 2016, and *Post-truth. Fake news. Alternative facts* in winter 2017.



**AMY ZHOU (BA '17) LED THE  
ARTS AND BUSINESS STUDENT SOCIETY'S  
STARTUP ENTREPRENEURSHIP EVENT.**



## STRATEGIC INITIATIVES:

### OUTSTANDING ACADEMIC PROGRAMMING

- › Arts continues to lead the Steering Committee, English Language Competency Initiative (SCELCI), with communications programming successfully implemented by Arts teaching staff and faculty in engineering, math, science, and in-progress in environment.
- › Arts First director and co-director are well on the way in preparing the September 2018 launch of required first-year courses (Inquiry and Communication and Information and Analysis), with a website currently focused on recruitment of multidisciplinary teaching faculty.
- › A working group of faculty and staff members developed an online quiz and related website to help current and prospective students find their best fit among the Faculty's undergraduate programs in digital media. The fun and informative quiz has been taken 4,000+ times.
- › Arts continues to offer and introduce courses that respond to our times. Examples include the English's Popular Potter, history's Digital History, and sociology's International Migration. Such courses are highly engaging while developing critical insights and understanding of current challenges, popular trends, and future employment competencies.

## STRATEGIC INITIATIVES:

### EXPERIENTIAL AND ENTREPRENEURIAL

- › Emma Vossen, a PhD candidate in English, was one of the five national winners of the SSHRC's annual Storytellers competition; her entry focused on First Person Scholar, a game studies website founded by Waterloo English graduate students.
- › A team of economics students, mentored by Professor Jean-Paul Lam, was among the finalists for the Bank of Canada's Governor's Challenge, where teams presented policy recommendations for keeping inflation low and stable.
- › A group of Global Governance graduate students presented their research insights and ideas by invitation to Global Affairs Canada.
- › A School of Accounting and Finance student and alumnus made up half the team who advanced to the finals of the Hult Prize competition for social justice and enterprise.
- › A Global Business and Digital Arts student team had their class project implemented in the real world as the redesigned Stratford Police website and mobile app.
- › Andria Bianchi, a PhD candidate in philosophy, won runner-up in the University's Three Minute Thesis competition for her presentation on ethical considerations for those with dementia and sexual consent.

## STRATEGIC INITIATIVES:

### TEACHING EXCELLENCE

- › Arts faculty members led a number of initiatives to help students and others develop critical awareness and action to end sexual assault and harassment on campus and beyond. These included:
  - the Faculty of Arts hosted a four-hour public Rape Culture teach-a-thon in September 2016 which featured 14 short lectures by professors from many departments, who addressed rape culture from their respective disciplinary perspectives; and
  - Drama and Speech Communication offered three fall courses with the shared theme "arresting rape culture;" the courses resulted in the winter term performance *Unconscious Curriculum*, an expert panel *Gendered Violence on Campus: Institutional Policy and Practice*, and an interactive art installation.
- › Professor Doreen Fraser's (philosophy) course, Quantum Mechanics for Everyone that focuses in part on leading research at Waterloo, became a regular course offering for any Waterloo undergraduate.
- › Professor Frankie Condon (English) won the Federation of Students Excellence in Undergraduate Teaching Award for 2017.

## STRATEGIC INITIATIVES:

### VIBRANT STUDENT EXPERIENCE

- › The Hagey Hall Hub opened in September 2016, just before Orientation Week. The three-story space represents the achievement of a critical strategic goal to enhance the on-campus experience of Arts students; it offers numerous study and social areas with comfortable seating, a coffee shop, and a bookable project room. The Hub's official grand opening with donors present took place on February 10, 2017.
- › Global Governance Master of Arts (MA) candidate Masroora Haque was a member of the Waterloo delegation at COP22, the Conference of Parties to the United Nations Framework Convention on Climate Change, held in Marrakech; she presented a research paper and contributed to action planning for the Paris Agreement.
- › The Arts and Business Student Society initiated and led an entrepreneurship event specifically for Arts students called startUp; it brought together a panel of five young alumni who are entrepreneurs to speak with current students about the ways in which an Arts education and skillset play a vital part in startup ventures.
- › The number of Arts undergraduate students participating in international exchange has doubled over five years: in fall 2011, **33** students spent their academic term studying at an international partner university by fall 2016, **64** students participated in study-abroad experiences.

# FACULTY OF ENGINEERING

*Faculty Update Supplement | Fall 2017 Update*

## STRATEGIC INITIATIVES:

### TRANSFORMATIONAL RESEARCH

- › Waterloo was ranked the number one school in Canada and 47th in the world for engineering by the U.S. News' Global University Subject-area Rankings. The University was ranked 60<sup>th</sup> in the world for engineering and technology by the 2017 QS World University Rankings by Subject.
- › Major research chairs and honours earned by Engineering faculty in 2016/17 include:
  - Professor James Craig was awarded a Tier 2 Canada Research Chair in Hydrologic Modelling and Analysis;
  - Canada Research Chair advancement from Tier 2 to Tier 1 was awarded to Professor Chris Eliasmith, cross-appointed to both engineering and philosophy;
  - Canada Research Chair renewals were awarded to Professors Raafat Mansour (Tier 1 in Micro and Nano Integrated Radio Frequency Systems) and Catherine Rosenberg (Tier 1 in the Future Internet);
  - Industrial Research Chairs were awarded to Professors Kaan Inal, Amir Khajepour, and Safieddin Safavi-Naeini;
  - Professor Sanjeev Bedi was awarded \$1M as the Natural Sciences and Engineering Research Council (NSERC) Chair in Immersive Design Engineering Activities (IDEAS);
  - Professors Zhongwei Chen and John Yeow were named Members of the Royal Society of Canada's College of New Scholars, Artists, and Scientists;
  - Professors Manoj Sachdev and Zhou Wang were inducted as fellows of the Canadian Academy of Engineering; and
  - Professional Engineers Ontario awarded medals in 2016 to Professors John Yeow (Engineering Excellence), Susan Tighe (Research & Development), and Lin Tan (Young Engineer).
- › Tri-Council research funding earned by Engineering researchers reached a record level (\$22.6M), as did total funding from industry sources (\$12.5M).
- › External research funding in 2016/17 for Engineering research projects was \$64.4M, an increase of about 10% from the previous year.
- › Three Engineering professors were awarded NSERC Strategic Partnership Grants totalling \$1.7M. Engineering researchers also earned 10 NSERC Research Tools and Instruments awards totalling \$1.25M.
- › Professors Amir Khajepour and Ehsan Toyserkani were each awarded \$4M from the highly competitive Ontario Research Fund - Research Excellence program.
- › The Federal Economic Development Agency for Southern Ontario (FedDev Ontario) awarded Ehsan Toyserkani \$8.9M to expand the Multi-Scale Additive Manufacturing Lab.
- › Professor Philip Beesley was awarded \$2.5M from the Social Sciences and Humanities Research Council (SSHRC) for his work in living architecture systems.



**SWIRVE, AN ENDOSCOPE USING INFRARED LIGHT AND A FIBRE OPTIC CABLE DESIGNED AS A CAPSTONE DESIGN PROJECT BY MICHAEL PHILLIPS, LEFT, AND PHIL COOPER, RECEIVED \$50K FROM THE PALIHAPITIYA/LAU VENTURE CREATION FUND AND \$10K AT THE 2017 NORMAN ESCH ENTREPRENEURSHIP AWARDS COMPETITION.**



- › Professors Mark Hancock, Pin-Han Ho, Ning Jiang, and Stephen Smith were awarded NSERC Discovery Accelerator Supplements awards in 2016.
- › Ontario's Early Researcher Awards were received by Professors Vijay Ganesh, Mark Hancock, Hyung-Sool Lee, and Stephen Smith.
- › The Green and Intelligent Automotive (GAIA) Research Facility for automotive research and testing officially opened in September 2016.

## STRATEGIC INITIATIVES:

### EXPERIENTIAL EDUCATION

- › In the past year, Waterloo Engineering students completed a record 8,435 co-op work terms, achieving a 98.4% employment rate. The proportion of work terms filled outside of Canada increased again in 2016, reaching almost 17.9%.
- › The Alexa Fund Fellowship, supported by Amazon, was launched to provide support for Waterloo Engineering students who are exploring new ways to apply a voice-activated virtual assistant system.
- › The University of Waterloo NanoRobotics Group, comprised of nanotechnology and software engineering students, captured first place in the Mobile Microrobotics Challenge at the International Conference for Robotics and Automation.

## STRATEGIC INITIATIVES:

### ENTREPRENEURIAL

- › \$60K was awarded at the fourth annual Norman Esch Entrepreneurship Awards for Capstone Design competition for Engineering students. The Esch Foundation committed over \$1M in renewed funding to support Enterprise Co-op awards, the Bridging Entrepreneurs to Students program, Master of Business, Entrepreneurship, and Technology scholarships, and Capstone Design awards.
- › Almost \$53K in micro-seed funding was awarded to entrepreneurial Engineering students through the Engineer of the Future Fund.
- › Waterloo Engineering helped facilitate \$400K in funding for three student and faculty-founded companies; Acerta, Elucid, and Knot. The program also offered students access to mentorship from faculty and Silicon Valley entrepreneurs and businesses.
- › The Palihapitiya/Lau Venture Creation Fund awarded \$100K to help Capstone Design projects SWIRVE and VivaSpire become startups.
- › Medella Health, co-founded by a nanotechnology engineering student, captured an international runner-up award in the 2016 James Dyson Award competition. The smart contact lens that monitors glucose levels was the third project with its genesis in Capstone Design to win a top prize in three years.

- › Matthew Bailey, Aaron Grant, and Stephen Lake, mechatronics engineering alumni who founded Thalmic Labs in their graduating years, were named to the prestigious 2017 Forbes 30 Under 30 list.

## STRATEGIC INITIATIVES:

### ACADEMIC PROGRAMMING AND TEACHING EXCELLENCE

- › As part of an ongoing process of improvement that reflects student and faculty input, many Engineering programs revised their curricula.
- › Total undergraduate enrolment and the enrolment of women in the Faculty of Engineering again reached all-time highs in 2016 with 7,865 students, of whom more than a quarter — 27% — were women. The proportion of women in the first-year class reached 31% for the first time, up from 22% in 2013.
- › Of the new first-year students registered in the Faculty of Engineering in fall 2016, 86% had incoming high school averages of 90% or higher and 39% had averages of at least 95%. In both cases, this was a slight increase over fall 2015.
- › Over 12,300 applications to Engineering programs were received for fall 2017, an increase of about 6% over the previous year. Engineering was unfortunately unable to make offers to over 3,000 students who applied with high school averages of 90% or higher.
- › For the 2016 calendar year, Engineering awarded 1,209 undergraduate degrees and 643 graduate degrees.
- › Teaching and profession awards earned in 2016/17 include:
  - Professor Sherman Shen was named a University Professor, the University of Waterloo's highest academic honour;
  - Professors Sanjeev Bedi and Dan Davison both received University of Waterloo Distinguished Teacher Awards;
  - Professor Gordon Stubley was awarded a 3M National Teaching Fellowship;
  - Engineering Graduate Studies established the Faculty of Engineering Award of Excellence in Graduate Supervision. The inaugural recipients were Professors Catherine Burns, Ali Elkamel, Carl Haas, and Susan Tighe;
  - Mohammed Nassar, electrical and computer engineering doctoral candidate, was awarded an Amit & Meena Chakma Awards for Exceptional Teaching by a Student; and
  - Associate Dean, Outreach, Mary Wells, received the Support of Women in the Engineering Profession Award from Engineers Canada and accepted an NSERC Science Promotion award for her leadership of the Ontario Network of Women in Engineering.

# FACULTY OF ENVIRONMENT

*Faculty Update Supplement | Fall 2017 Update*

## STRATEGIC INITIATIVES:

### TRANSFORMATIVE RESEARCH

- › In recognition of the significant impact of her career research in environmental politics and her outstanding contributions to the understanding of global food policy and security, School of Environment, Resources, and Sustainability Professor Jennifer Clapp received Canada's highest academic honour, being named to the Royal Society of Canada.
- › The Polar Data repository became the 100th member of the International Council for Science World Data System and was named Canada's National Antarctic Data Centre.
- › Geography and Environmental Management Professors Merrin McCrae and Claude Dugauy joined researchers from the Water Institute, the University of Saskatchewan, and other universities on the Global Water Futures initiative, the largest university-led water research program ever funded by the Canada First Research Excellence Fund.
- › For his outstanding contribution to the field of ecology, School of Environment, Resources, and Sustainability Professor, Andrew Trant was awarded the prestigious William Skinner Cooper Award. Trant's recent study found that 13,000 years of repeated human occupation by coastal First Nations enhanced temperate rainforest productivity.
- › The Intact Centre for Climate Adaptation forged several partnerships and created programs to enhance knowledge mobilization, including the Home Flood Protection Program with the City of Burlington, and a report of best practices for making new residential communities flood-resilient with Standards Council Canada.
- › School of Environment, Enterprise, and Development Professor Amelia Clarke gave international presentations at the United Nations Habitat III in Quito, Ecuador and the International Conference on Sustainable Development conference in New York City on the important role of partnerships in achieving the Sustainable Development Goals.
- › Environment welcomed Banting Fellow Olivier Roy-Baillargeon, who joined the School of Planning to study transit adjacent communities with Pierre Filion.
- › Two Environment professors were granted Ontario Early Researcher Awards: Knowledge Integration's John McClevey to study the development of free/libre open source software in massive inter-organizational collaboration networks, and geography's Derek Robinson who will use drones to better understand the impacts of climate, technology, and policy on Ontario farming.

**FOURTH-YEAR PLANNING STUDENT SURAN KETHEESWARAN GAINS AN INTERNATIONAL PERSPECTIVE ON THE 'KAKEHASHI' EXCHANGE PROGRAM IN TOKYO, JAPAN.**



- › Professor Sean Geobey of the School of Environment, Enterprise, and Development, and his graduate students partnered with the City of Kitchener through the Smart Region Initiative to pilot a participatory budget experiment.
- › In recognition of his pioneering research on tourism and climate change, Distinguished Professor Emeritus Geoffrey Wall was awarded the United Nations World Tourism Organization Ulysses Award for Excellence in the Creation and Dissemination of Knowledge in Tourism.
- › Helping Canadians to prepare, respond to, and measure a changing climate, Shawna Peddle, director of the Partners for Action Research Network, was a featured presenter at the 2016 Livable Cities Forum.
- › Widely respected lawyer and the newest faculty member to join the School of Environment, Enterprise, and Development, Marie-Claire Cordonier Segger was awarded the 2016 Justica Regonorum Fundamentum award for exemplary, outstanding achievement and professional activities carried out in the field of protection of human rights.
- › School of Planning professor Leia Minaker received a Career Development Award from the Canadian Cancer Society Research Institute for her work on lifestyle behaviours that prevent cancer in Canadian youth.

## STRATEGIC INITIATIVES:

### OUTSTANDING ACADEMIC PROGRAMMING

- › The Faculty of Environment broke all previous attendance records welcoming world-renowned economist and development expert, Jeffrey Sachs, as keynote for the 2017 TD Walter Bean Lecture in the Environment.
- › The Faculty of Environment hosted the largest Canadian Association of Geographer's — Ontario Division conference in the organization's history.
- › A testament to the quality of their education, three female Environment alumni were named to Corporate Knights Top 30 Under 30 for Sustainability: Morgan Book, Tahnee Prior, and Dana Decent.
- › The School of Planning announced a new minor in Urban Studies.
- › Challenging students to see sustainability through a different lens, School of Environment, Resources and Sustainability professor Rob de Loë offered the first-ever Photography for Sustainability course.
- › The Department of Geography and Environmental Management was awarded \$330K from eCampus Ontario to create an online graduate diploma in Climate Risk Management.

## STRATEGIC INITIATIVES:

### EXPERIENTIAL EDUCATION | VIBRANT STUDENT EXPERIENCE

- › The first cohort of young pilots trained under Sunwing Airlines' intensive cadet program — Cameron Fuchs, Spencer Leckie, Siobhan O'Hanlon, and Chelsea Anne Edwards — were hired upon graduation as First Officers. The successful cadet program was renewed for another year.
- › For the third year in a row, faculty and staff from the Faculty of Environment led a student delegation to the Conference of Parties (COP) climate change conference. The 2017 team attending COP22 in Marrakech, Morocco included five students from four different Faculties across campus.
- › Five School of Planning students were selected to travel to Japan as part of a nine day Japan Friendship Ties Program called 'Kakehashi'. The students visited the Earthquake Disaster Reconstruction site, met with students studying planning in Japan, and learned about the infrastructure and politics involved in the planning of a city the size of Tokyo.
- › The Faculty launched its Leadership Breakfast Series which provides an opportunity for current student leaders to meet, learn from, and network with, established alumni over waffles and coffee.
- › Alumni, students, donors, and the campus community came together to celebrate female entrepreneurship at the screening of *Dream, Girl!*; a documentary co-produced by alumnus Komal Minhas.
- › The TD Friends of the Environment Foundation donated seed funding for the Waterloo Urban Forest Revitalization Project to turn a "hidden gem" campus woodlot into a vibrant living laboratory for the campus and broader community.
- › Parlaying his passion for sustainable urban food systems, fourth-year planning student Michael Wideman founded Eggplantr. He joined St. Paul's Greenhouse, placed second in the Jack Rosen Memorial Awards, won a Velocity \$5K final, and has recently been accepted into Velocity Garage.
- › The Faculty of Environment hosted its inaugural Awards Banquet to thank donors and recognize hard working student scholarship recipients.
- › The 2017 Faculty of Environment holiday video was named one of the season's Best University Holiday videos by Higher Education Marketing and College Web Editor.

# FACULTY OF MATH

*Faculty Update Supplement | Fall 2017 Update*

## STRATEGIC INITIATIVES:

### TRANSFORMATIONAL RESEARCH

- › The University of Waterloo is recognized as a world leader in mathematics and computer science. In 2016/17, the QS World University Rankings by Subject ranked mathematics at Waterloo 34th and computer science and information systems 31st. The Times Higher Education World University Rankings by Subject ranked Waterloo 23rd in the world for computer science.
- › Faculty of Mathematics researchers earned \$6.7M in funding from the Natural Sciences and Engineering Research Council (NSERC) in 2016/17, including a record high of \$5.7M in Discovery Grants. NSERC funding to the Faculty increased by 13% since 2012/13.
- › Professors Jo Atlee and Nancy Day are part of the Autonomoose autonomous vehicle platform project, an interdisciplinary research project that received government approval in November 2016 to test their autonomous vehicle platform innovations on all public roads in Ontario.
- › Mathematics faculty continued to receive prestigious national and international awards, including:
  - Professor Raouf Boutaba was awarded a French National Institute for Computer Science and Applied Mathematics International Chair for 2017-2021;
  - Professor Ihab Ilyas now holds the Thomson Reuters-funded Research Chair in Data Cleaning from Theory to Practice;
  - Professor Tamer Özsü was named a Fellow of the Royal Society of Canada in 2016;
  - Professor Karen Yeats received a 2016 Humboldt Research Fellowship;
  - Professor Jo Atlee was named an Association for Computing Machinery Distinguished Member;
  - Distinguished Professor Emeritus John Brzozowski and Professor Ian Munro were recognized with Canadian Association of Computer Science 2016 Lifetime Achievement Awards;
  - Professor Lap Chi Lau won the CS-Can/Info-Can Outstanding Young Computer Science Researcher Award;
  - Professor Thomas Coleman was named a Fellow of the Society for Industrial and Applied Mathematics; and
  - Professor Stefan Steiner received the Brumbaugh Award from the American Society for Quality.



KEY INITIATIVES WITHIN THE SPACE IMPROVEMENT STRATEGY FOCUSED ON THE THIRD FLOOR OF THE MATHEMATICS AND COMPUTER BUILDING. NEW LIGHTING, FURNITURE, DISPLAYS AND MARKER-FRIENDLY GLASS WALLS HAVE CREATED A BRIGHT, WELCOMING, AND COLLABORATIVE SPACE FOR STUDENTS.



## STRATEGIC INITIATIVES:

### OUTSTANDING ACADEMIC PROGRAMMING

- › A new Mathematics undergraduate program in data science, a discipline requiring substantive tools from computer science and statistics, has been approved by Senate.
- › The Bachelor of Mathematics in Financial Analysis and Risk Management program (Finance Specialization) has been recognized by the Chartered Financial Analyst Institute.
- › The Faculty of Mathematics has made significant progress toward its strategic goal to increase online learning opportunities. Enrolments in online courses have increased by 87% since 2012/2013. In 2016/17, over 3,200 students enrolled in 44 online sections of 29 courses.
- › Building on its partnership with Maplesoft to build high school online courses on the Möbius platform, Waterloo has entered a new partnership to use Möbius to support teaching math at all levels. Möbius uses technology that keeps students actively engaged through interactive applications, visualizations, and immediate feedback.
- › Mathematics has introduced and piloted the use of Crowdmark to provide digital support for marking final examinations, tests, and assignments. Integrated with Waterloo's learning management system LEARN, Crowdmark makes marking faster, provides more immediate feedback for students, and includes quality controls. In less than two years, four million pages of assessments have been marked with Crowdmark.
- › Mathematics is incorporating more interactive learning technology, including Piazza, a STEM-aware (science, technology, engineering, and math) online collaborative question and answer platform. In fall 2016, there were more than four million views of Q&A threads on Piazza by students in Faculty of Mathematics courses.
- › Teaching Fellow Professor Brian Forrest has been recognized with two external teaching awards in recognition of his outstanding teaching and innovation in the classroom and online: the Mathematical Association of America's Clarence Stephens Distinguished Teaching Award and the Fields Institute Margaret Sinclair Memorial Award.
- › Professor David McKinnon won a 2017 University of Waterloo Distinguished Teacher Award.
- › Sessional instructor Michelle Ashburner won the Federation of Students Teaching Award.
- › 2016/17 marked record undergraduate and graduate enrolment, which have increased by 16% and 13% respectively over 2012/13. The percentage of women enrolled also reached new highs in 2016/17, with women comprising 35% of undergraduates and 29% of graduate students.

- › The Faculty of Mathematics' exceptional academic program quality is reflected in increasing demand by outstanding prospective students. The Faculty received over 14,700 applications for fall 2016 undergraduate admission, an increase of 62% since 2012.

## STRATEGIC INITIATIVES:

### VIBRANT STUDENT EXPERIENCE

- › A new institutional partnership with Thompson Reuters includes access to the Eikon financial analysis system for the Finance Lab, providing students with enhanced opportunities to apply financial theory to practice.
- › The Waterloo Black team — Andy Huang, Antonio Molina Lovett, and Jacob Jackson, with coach Troy Vasiga — placed 13th in the 2016 Association for Computing Machinery International Collegiate Programming Contest.
- › Gabin Urbancic was awarded the 2016 Daniel G. Wright Undergraduate Scholarship by the Canadian Meteorological and Oceanographic Society.
- › A record number of students participated in this year's Small e Math Contest organized by Professor J. P. Pretti.
- › Waterloo finished sixth out of 568 institutions (behind Carnegie Mellon, Princeton, Harvard, MIT, and Stanford) at the Putnam competition, with 26 students among the top 501 individual competitors. Waterloo team members were Daniel Spivak, Anzo Zhao Yang Teh, and Antonio Molina Lovett, coached by Professor Stephen New.
- › Colin Behenna was named Top Academic Canadian Interuniversity Sport All-Canadian. Colin is an exceptional varsity hockey player who is also a strong mathematics and business student.

## STRATEGIC INITIATIVES:

### GLOBAL OUTLOOK

- › The READI (Risk Management, Economic Sustainability and Actuarial Science Development in Indonesia) initiative is gaining momentum. An agreement has been signed with the Universitas Prasetiya Mulya to help create an actuarial science co-operative education program there. Sun Life also donated \$500K to establish a Fellowship in International Actuarial Science, awarded to Professor Ken Seng Tan.
- › The Faculty of Mathematics and the Chinese Academy of Sciences have signed a new dual degree doctoral program agreement.
- › The Faculty of Mathematics has entered into a bilateral agreement with the African Institute for Mathematical Sciences Next Einstein Initiative, a pan-African network of centres of excellence for postgraduate training, research, and engagement in mathematical sciences.

# FACULTY OF SCIENCE

*Faculty Update Supplement | Fall 2017 Update*

## STRATEGIC INITIATIVES:

### TRANSFORMATIONAL RESEARCH

- › Canada Excellence Research Chairs Philippe Van Cappellen and David Cory received more than \$90M in funding from the Canada First Research Excellence Fund for water and quantum research.
- › Chemist Linda Nazar developed a safe, high-capacity zinc-ion battery that costs half the price of current lithium-ion batteries, yet lasts twice as long.
- › Physicist Thomas Jennewein was the first to transmit a quantum key securely from a source on the ground to a receiver on an aircraft.
- › The School of Optometry and Vision Science opened a Brain Injury Clinic in fall 2016 and provides comprehensive care, assessment, and rehabilitation to all brain injury patients.
- › Optometrist and vision science doctoral student Emmanuel Alabi won the 2017 University of Waterloo Three Minute Thesis Competition. He is the third Science student to win the university level competition in five years.
- › Astrophysicist Mike Hudson captured the first composite image of a dark matter bridge that connects galaxies together.
- › An interdisciplinary team of biologists and earth scientists discovered Boreal Shield lakes are similar to oceans from the Archean Eon, a period more than 2.5 billion years ago.
- › Waterloo Science research has been featured by numerous international, national and regional media outlets including the *New Scientist*, *Motherboard*, *WIRED Magazine*, *Forbes*, *Newsweek*, *The Guardian*, *Macleans*, *Globe & Mail*, *Quirks & Quarks*, *CBC*, and *CTV*.
- › Several Science faculty received prestigious awards and honours this year:
  - chemist Linda Nazar was appointed University Professor for her career achievements in solid state materials and advanced battery research;
  - earth sciences Professor Emeritus John Cherry was the first Canadian to receive the prestigious Lee Kuan Yew Water Prize; and
  - chemist Marcel Nooijen was elected into the International Academy of Quantum Molecular Sciences (IAQMS) for his work in theoretical chemistry.



MINISTER OF SCIENCE KIRSTY DUNCAN (IN LAB COAT) LEARNS THE UNIVERSITY OF WATERLOO SECRET SCIENCE DANCE FROM A TEAM OF SCIENCE ORIENTATION LEADERS.



## STRATEGIC INITIATIVES:

### RESEARCH PARTNERSHIPS

- › Earth scientist David Blowes is leading a \$5.5M five-year initiative under Toward Environmentally Responsible Resource Extraction Network (TERRE-NET) to develop sustainable strategies for managing hazardous mine waste.
- › Waterloo scientists partnered with the International Development Research Centre and six international research collaborations through the Water Joint Programming Initiative to tackle Legacies of Agriculture Pollutants (LEAP) on a global scale.
- › Qatar and United Arab Emirates partnered with Waterloo earth scientists to study groundwater pollution in arid regions.
- › Chemist Juewen Liu partnered with the Ontario Ministry of Environment and Climate Change to develop DNA-based sensors to detect pathogens and contaminants in water.

## STRATEGIC INITIATIVES:

### INDUSTRIAL PARTNERSHIPS AND COMMERCIALIZATION

- › Chemist Scott Hopkins partnered with SCIEX and Pfizer to develop a new faster and cheaper method to help the pharmaceutical industry identify and test new drugs.
- › Biologist Brian Dixon collaborated with Cedarlane labs to produce and market 45 different antibodies last year.
- › Through their company Mediphage Biocuticals, Professors Roderick Slavcev and Jonathan Blay are working with global companies to explore how bacteriophages can combat colon cancer.
- › The School of Pharmacy partnered with Apotex Inc. to provide support for graduate students, potential co-op placements and research projects of mutual interest.
- › Pharmacy Professor Jonathan Blay partnered with Algae Dynamics Corp to research cannabis oils and explore the development and treatment of various types of cancer.

## STRATEGIC INITIATIVES:

### ENTREPRENEURSHIP

- › Two Velocity Science companies, Suncayr and Medella Health, won top prizes in the Unlock Your Big Idea Pitch Competition.
- › Medella Health won the National James Dyson Award and Velocity Science companies Arylla and Penta Medical were named Canadian runners-up.
- › Several Science students competed in the 2017 Hult Prize Challenge and Team Epoch won the London, England Regionals and will compete for \$1M at the International competition.
- › Velocity Science companies and science entrepreneurs won \$245K in funding at the Velocity Fund Final Competition this year.

## STRATEGIC INITIATIVES:

### ACADEMIC PROGRAMS

- › Through a partnership with Conestoga College, Honours Biology and Biomedical Sciences students are able to earn a one-year Biotechnology Technician Diploma during their third year of undergraduate study.
- › School of Pharmacy partnered with the Centre for Family Medicine Academic Health Team on the Health Sciences campus to offer the first primary care pharmacy residency in Canada that is not based in a hospital.
- › Waterloo partnered with Maplesoft to enrich Sciences, Technology, Engineering, and Mathematics (STEM) education. Chemistry will be using Möbius in their first-year courses in fall 2017.

## STRATEGIC INITIATIVES:

### EXPERIENTIAL LEARNING AND TEACHING EXCELLENCE

- › School of Pharmacy partnered with the McMaster University School of Medicine to develop TransEd, a free online educational module to assist health care students in learning how to deliver high-quality care to transgender patients.
- › Professor Michael Beazely and Lecturer Richard Epp each received the 2017 Excellence in Science Teaching Award.
- › Biologist Josh Neufeld used a variety of teaching strategies to make his new online Fundamentals of Microbiology course more interactive and personal for students.
- › The School of Pharmacy is piloting the use of ExamSoft for online examinations, which allows instructors to enrich test questions with videos and other unique elements.

## STRATEGIC INITIATIVES:

### COMMUNITY OUTREACH AND GLOBAL ENGAGEMENT

- › Pharmacy Professor Kelly Grindrod and graduate students partnered with local organizations to deliver e-health workshops to improve health literacy in seniors.
- › The School of Pharmacy hosted a public lecture to discuss opioid uses and misuse in the Waterloo Region.
- › The School of Pharmacy received the Best Community Outreach Initiative from the Canadian Council for the Advancement of Education (CCAEE) for educating parents, first-responders and health care professionals about opioids and the value of naloxone for harm reduction.
- › In April, the School of Optometry and Vision Science partnered with the Canadian Paralympic Committee to offer out-of-competition classification services for national para-sport athletes from across Canada.

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**University of Waterloo**  
**SENATE LONG RANGE PLANNING COMMITTEE**  
**Minutes of the meeting held 22 September 2016**  
**[in agenda order]**

**Present:** Jean Andrey, Annie Belanger, Jeff Casello, Sacha Forstner, Dennis Huber, Marios Ioannidis, Beth Jewkes, Bob Lemieux, Mungo Marsden, Rick Myers, Diana Parry, Ian Orchard, Doug Peers, Pearl Sullivan, Stephen Watt, Dan Wolczuk

**Guest:** Daniela Seskar-Hencic (2)

**Secretariat:** Mike Grivicic

**Regrets:** Hannah Beckett\*, Jeffrey Bunn\*, Tara Collington\*, Simon Courtenay, Shannon Dea\*, George Dixon\*, Feridun Hamdullahpur\*, Sharon Lamont, Jim Rush\*, Samantha Shortall

**Organization of Meeting:** Ian Orchard, chair of the committee, took the chair, and Mike Grivicic, secretary of the committee, acted as secretary. The secretary advised that due notice of the meeting had been given, a quorum was present, and the meeting was properly constituted. The agenda was approved without a formal motion.

### **1. MINUTES OF THE 5 JANUARY 2016 MEETING AND BUSINESS ARISING**

By consensus, members approved the minutes as distributed. There was no business arising.

### **2. STRATEGIC PLAN FALL 2016 UPDATE**

Orchard provided a presentation: performance update at third year of the five year plan; progress on a sample of indicators; greater depth of data is available on website; alignment of plan with differentiation framework; time horizon for current plan cycle, and potential for next strategic plan to commence in 2020. Members discussed: definition of international experience for students; increase in student space since 2013; initiatives to enhance female faculty representation; revisions to website to make it responsive; co-op retention issues, either in-term and over the course of students' programs, and regular turnover of co-op employers; graduate studies permeate many of the theme areas; co-op is being pushed at all universities, and Waterloo needs to educate governments of how difficult it can be to do co-op correctly; colleges are aiming to offer more engineering programs, and Waterloo will continue to develop and offer education that suits its interests and ambitions. Daniela Seskar-Hencic will provide detail at the next meeting on what Velocity Start is doing to foster involvement from non-STEM disciplines and for females.

**a. Strategic Plan 2013-2018 Progress and Outcomes – Fall 2016 Update.** Received for information.

**b. Strategic Plan 2013-2018 Faculty Update Supplement – Fall 2016 Update.** Received for information.

### **3. PRESENTATION ON FACULTY STRATEGIC PLAN – SCIENCE**

Lemieux provided a presentation including: profile of faculty, complement, and programs offered; research-intensive activity and cross-disciplinary breadth; significant contribution to university centres and institutes, and research spans from fundamental science to activity with commercialization potential; implementation of continuous curricular reviews in academic programming; new programs, articulation agreements and 2+2 arrangements; significant activity in experiential education, including Velocity Science; aim for flexible space allocation, and plans for new building; modernization of older facilities; strategic goals to increase visibility, reputation, and community within the Faculty.

### **4. OTHER BUSINESS**

**a.** Forstner inquired as to admissions strategies and noted the importance of recruitment to maintaining the reputation of the university. Orchard, Sullivan, Peers and Casello noted the priority given to recruitment and spoke to the varying practices between Faculties in pursuing top students.

### **5. NEXT MEETING**

The next meeting is Tuesday 10 January 2017 from 1:30 – 3:00 p.m. in NH 3318.

21 December 2016

Mike Grivicic  
Assistant University Secretary

**January 2017 update provided by Nancy Heide on Velocity Start initiatives for fostering involvement of individuals from non-STEM disciplines and for women:**

Velocity has been running targeted promotions in the faculties of Arts, Environment, and Applied Health Sciences since Spring 2016 to interest non-STEM students and women in considering entrepreneurship. Attendance at Velocity Start workshops has increased 18% in 2016, in part as a result of these efforts.

Velocity has brought in women entrepreneurs for their Speaking Startup speaker series, which is designed to more specifically appeal to non-STEM students, and has also been focused on bringing in more women judges and speakers into their program as a whole. Velocity staff have met with staff in the faculties of Arts and Environment as well as ARBUS (Arts Students Society) to learn more about students' interests and motivations — more discussions to come.

A Velocity staff member is a campus advocate on the UW HeForShe committee. Velocity has partnered with Housing on the WERC program (Waterloo Entrepreneurship Residence Connection) a low-barrier/intimidation program with the goal of attracting all types of entrepreneurially-minded students including women and non-STEM students.

Velocity continues to have a strong partnership with UW Entrepreneurship Society. In Winter 2016, Velocity added a full-time Business Advisor to its staff to provide greater expertise on the development of social entrepreneurship businesses, which are typically of significant interest to non-STEM students.