6

World Recognition by Rankings

We evaluate our position among global leaders in engineering research and education through a comprehensive series of metrics that include the quality of applicants to our programs and the awards and honours earned by our faculty members. International rankings are another measure of excellence, capturing our performance in terms of research influence, learning environment, knowledge transfer and other factors.

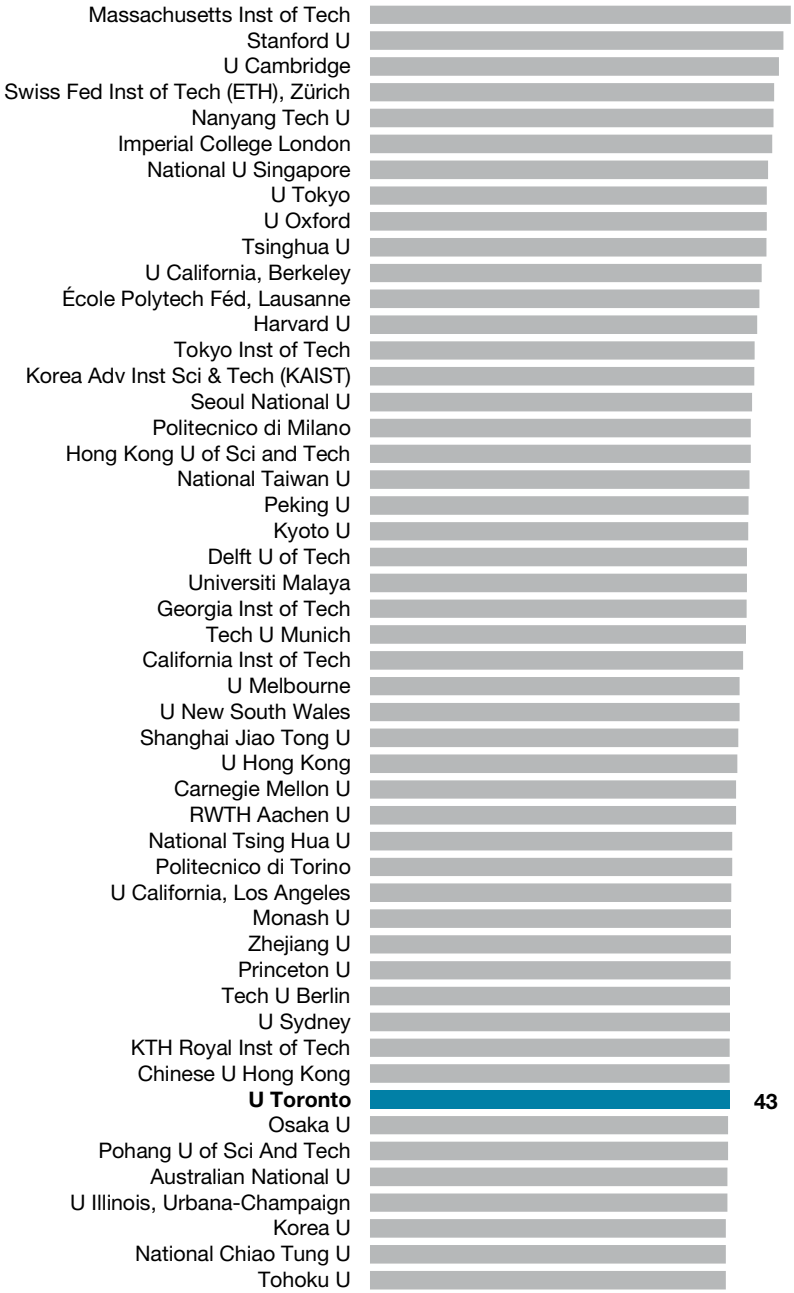
U of T Engineering has consistently ranked as the top engineering school in Canada across four organizations that have been producing world university rankings specific to engineering for 10 years or more: the Quacquarelli Symonds World University Rankings (QS), the Times Higher Education World University Rankings (THE), Academic Ranking of World Universities (ARWU) and the National Taiwan University Performance Ranking of Engineering Papers (NTU; formerly HEEACT). Our Faculty also ranks in the top 10 of North American public universities and is the only Canadian university to appear within the top 50 in the three rankings for which metrics specific to engineering are published.

While each organization's assessments are unique and often distinct from the others, our high standing across all major rankings is one of the factors that enables us to attract top students, faculty and industry collaborators. We are focused on maintaining and enhancing our global reputation in the years to come.

Comprehensive University Rankings

QS World University Rankings for Engineering and Information Technology

Figure 6.1a **QS Top 50 World Universities, 2018**



U of T Engineering ranked 43rd in the most recent QS World University Rankings for Engineering and Information Technology. As in past years, ours was the only Canadian university to make the QS top 50. Shown in Figure 6.1b, our standing among North American public universities, our closest peers, remained in fourth place.

We continue to rank as the top Canadian engineering school in four of the seven engineering and information technology subjects (Chemical Engineering, Civil & Structural Engineering, Computer Science & Information Systems, Electrical & Electronic Engineering) and second in two of the others (Materials Sciences, Mechanical, Aeronautical & Manufacturing Engineering) demonstrating our strength across a range of disciplines.

Data in this chapter include rankings published between August 2017 and July 2018.

Figure 6.1b **QS Top North American Public Universities, 2018**

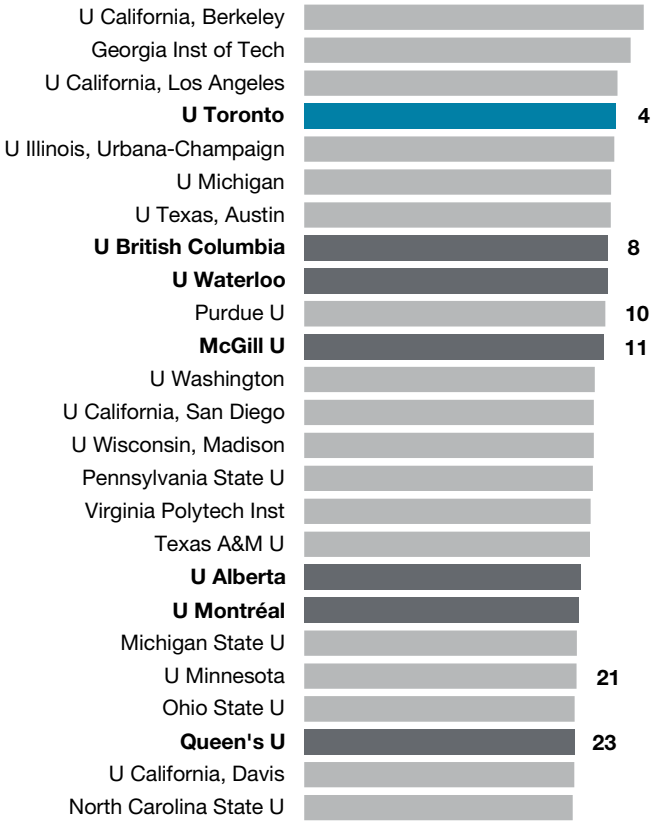


Figure 6.1c **Canadian U15 Universities in QS Top 200, 2018**

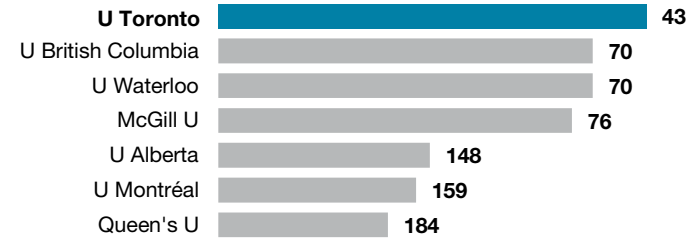
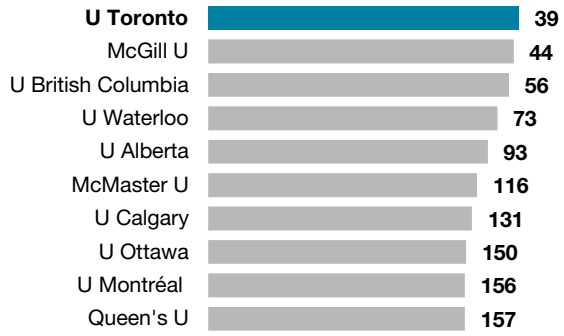
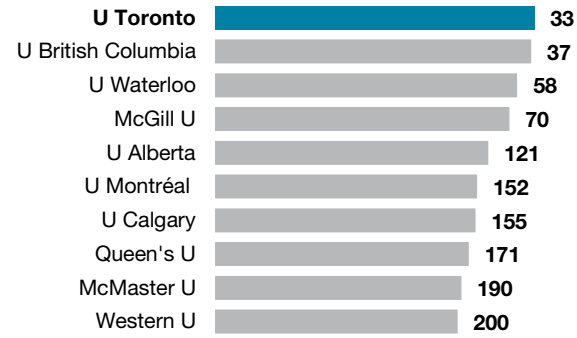


Figure 6.1d **Canadian Universities in QS by Subject, 2018**

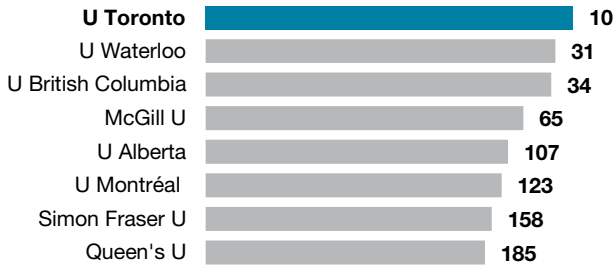
Chemical Engineering



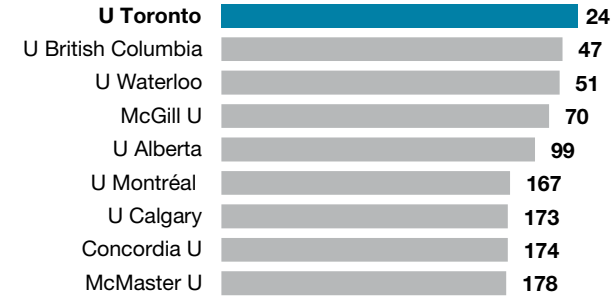
Civil & Structural Engineering



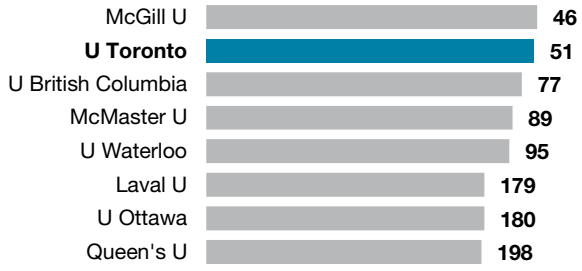
Computer Science & Information Systems



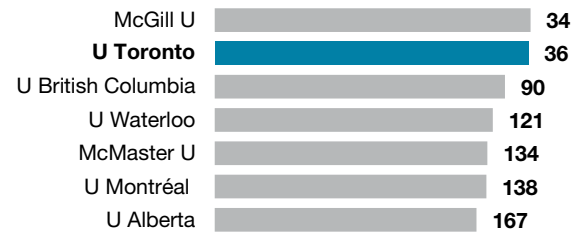
Electrical & Electronic Engineering



Materials Sciences



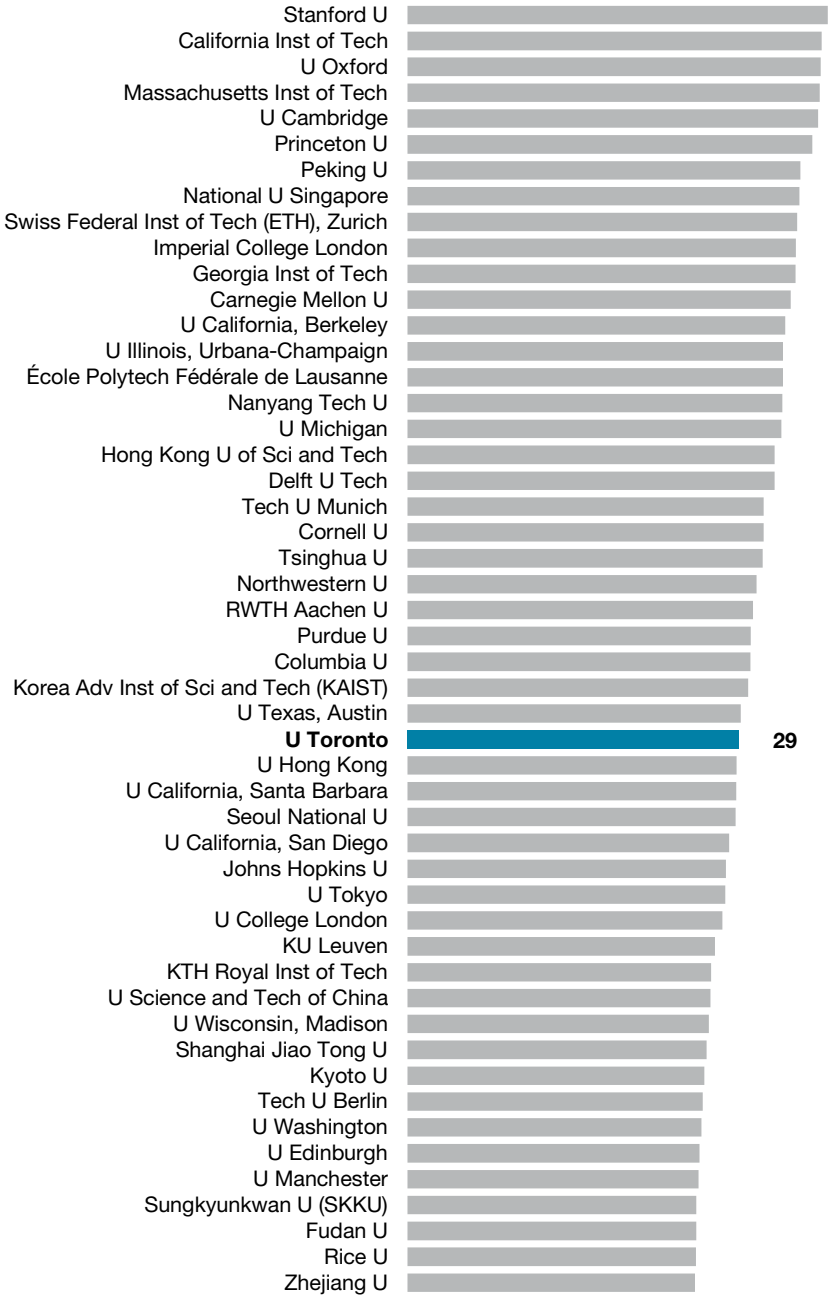
Mechanical, Aeronautical & Manufacturing Engineering



Mineral & Mining Engineering

Times Higher Education (THE)–Elsevier World University Ranking for Engineering and Technology

Figure 6.2a **THE Top 50 World Universities, 2017**



In the 12 years that Times Higher Education (THE) has published rankings in Engineering and Information Technology, our Faculty has consistently been ranked the top Canadian school and among the top 10 North American public universities, this year placing seventh.

THE is the second-longest-running survey of its kind after ARWU. What sets it apart as an influential assessment of global, research-intensive universities is the breadth of its evaluation, which aims to measure institutions across all their core missions: teaching, research, knowledge transfer and international outlook. The THE ranking uses 13 performance indicators in five weighted categories:

- Teaching: the learning environment (30%)
- Research: volume, income and reputation (30%)
- Citations: research influence (30%)
- International outlook: staff, students and research (7.5%)
- Industry income and innovation (2.5%)

Figure 6.2b **THE Top North American Public Universities, 2017**

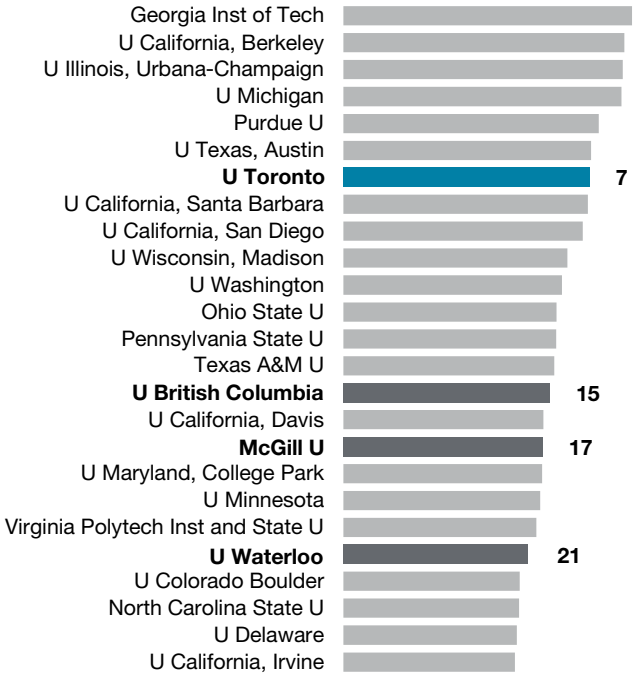
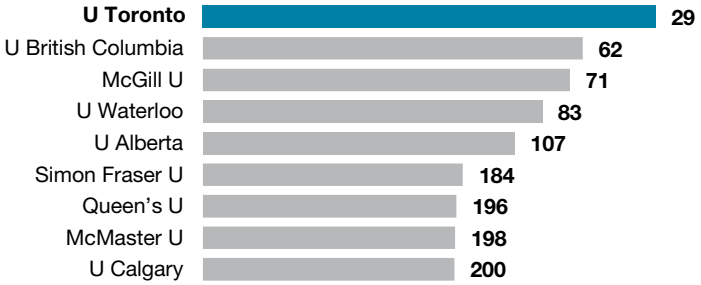


Figure 6.2c **Canadian U15 Universities in THE Top 200, 2017**



Academic Ranking of World Universities (ARWU) for Engineering Subjects

U of T Engineering is Canada's top school across six of the engineering subject-level rankings provided by ARWU, including Aerospace Engineering, Biomedical Engineering, Computer Science & Engineering, Electrical & Electronic Engineering, Materials Science & Engineering and Mining & Mineral Engineering. We rank second in Canada in two more: Mechanical Engineering and Civil & Structural Engineering.

ARWU has provided university-level rankings since 2003 and provided field-level rankings (e.g. Engineering, Science, Medicine) from 2007 to 2016. In 2016, ARWU first introduced subject-level rankings for engineering disciplines (e.g. Mechanical Engineering, Aerospace Engineering). In the most recent data, ARWU discontinued the field-level rankings that have formed the basis of our previous reporting in favour of an expanded set of subject-level rankings. These included 22 engineering-related fields, of which we have chosen to report the nine most relevant to our programs (See list at right). In the final ARWU field-level rankings for engineering (2016) we remained Canada's top school and ranked 50th worldwide.

The ARWU's methodology has changed over the years, and is currently based on five scoring measures:

- **PUB** – The number of papers authored by an institution in an academic subject during 2011-2015, as indexed in Clarivate's InCites report.
- **CNCI** – Category Normalized Citation Impact: The ratio of citation of papers published by an institution in an academic subject during the period of 2011-2015 to the average citation of papers in the same category, of the same year and same type.
- **IC** – The extent of international co-authorship.
- **TOP** – The number of papers published in top journals.
- **AWARD** – The number of faculty members winning a significant award

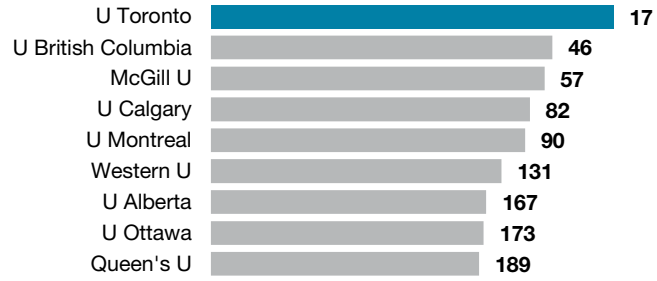
Below is the complete list of ARWU Subject Rankings in Engineering, with those relevant to our programs in bold:

Mechanical Engineering
Electrical & Electronic Engineering
Automation & Control
Telecommunication Engineering
Instruments Science & Technology
Biomedical Engineering
Computer Science & Engineering
Civil Engineering
Chemical Engineering
Materials Science & Engineering
Nanoscience & Nanotechnology
Energy Science & Engineering
Environmental Science & Engineering
Water Resources
Food Science & Technology
Biotechnology
Aerospace Engineering
Marine/Ocean Engineering
Transportation Science & Technology
Remote Sensing
Mining & Mineral Engineering
Metallurgical Engineering

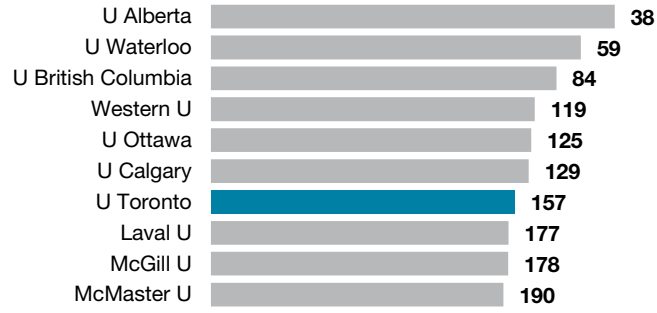
Figure 6.3 Top 200 Canadian Universities in the Academic Ranking of World Universities (ARWU) by Subject, 2017

Aerospace Engineering

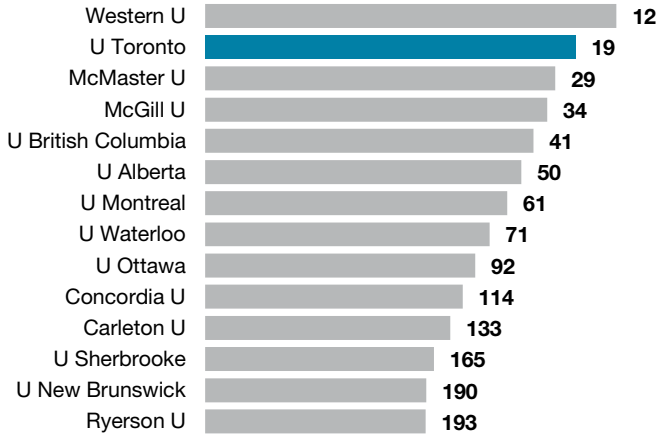
Biomedical Engineering



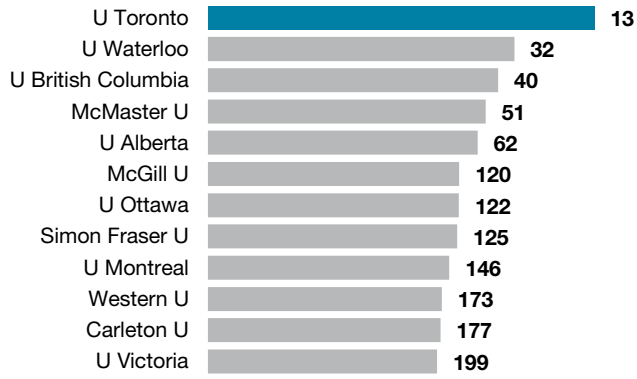
Chemical Engineering



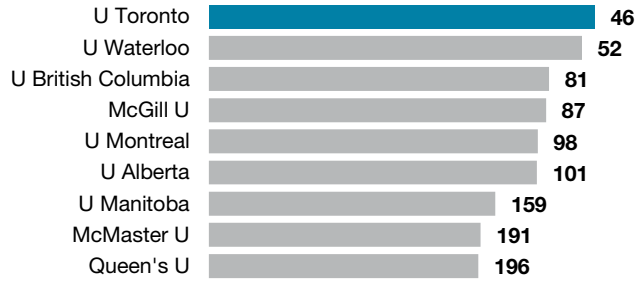
Civil & Structural Engineering



Computer Science & Engineering



Electrical Engineering



Materials Science & Engineering

Mechanical Engineering

Mineral Engineering

National Taiwan University (NTU) Performance Ranking of Engineering Papers

U of T Engineering ranked first in Canada, ninth among top-tier North American public universities, and 50th in the National Taiwan University (NTU) Performance Ranking of Engineering Papers.

The NTU ranking differs from the others in this section in that it is based entirely on bibliometrics. It compares the top 200 universities in the world by subject, using eight weighted criteria grouped into three broad categories:

Research Productivity

- Total number of articles published in the past 11 years (2006–16) [10%]
- Total number of articles published in the most recent year reported (2016) [15%]

Research Impact

- Total number of citations in the past 11 years (2006–16) [15%]
- Total number of citations in the past two years (2015–16) [10%]
- Average annual number of citations over the past 11 years (2006–16) [10%]

Research Excellence

- H-index (measures productivity and impact of published work) of the past two years (2015–16) [10%]
- Number of highly cited papers in the past 11 years (2006–16) [15%]
- Number of papers published in high-impact journals in the current year (2016) [15%]

Figure 6.4a **NTU Top 50 World Universities, 2017**

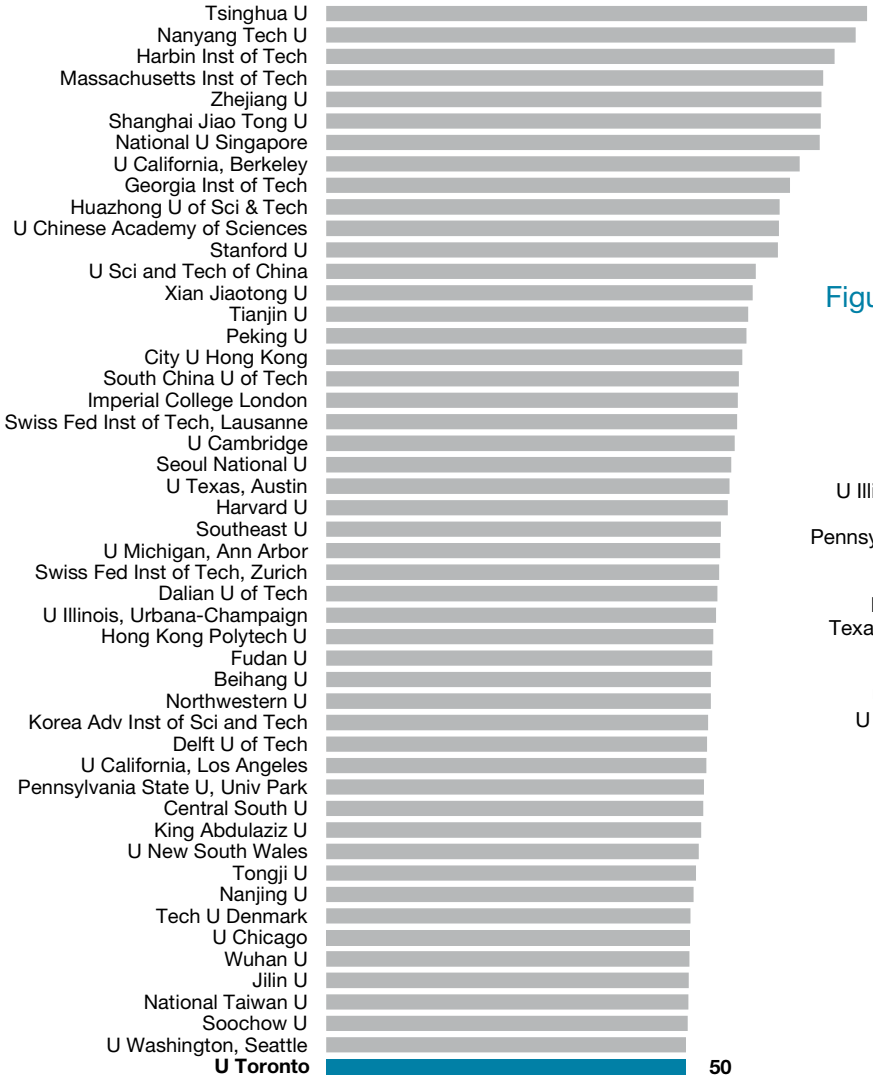
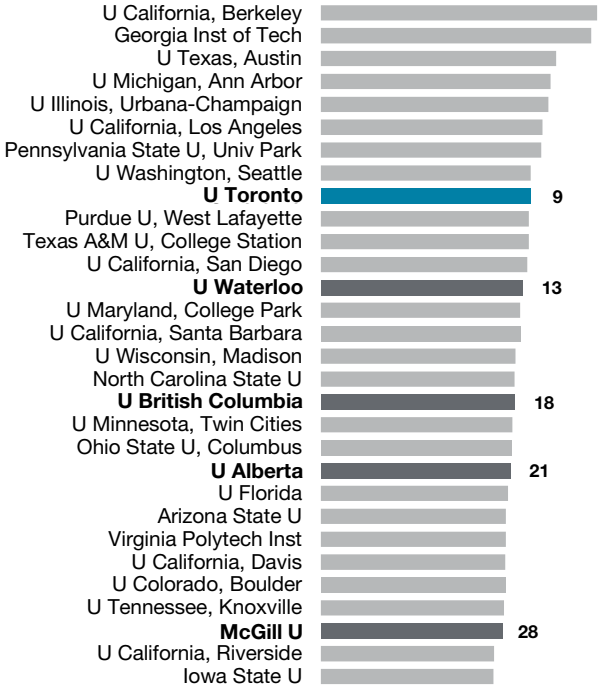


Figure 6.4b **NTU Top North American Public Universities, 2017**



In NTU's rankings of engineering and information technology subject areas, U of T Engineering placed first among Canadian institutions in three out of six subject rankings, as shown in Figure 6.4d. We are among the top 50 globally in Computer Science, Civil Engineering and Electrical Engineering.

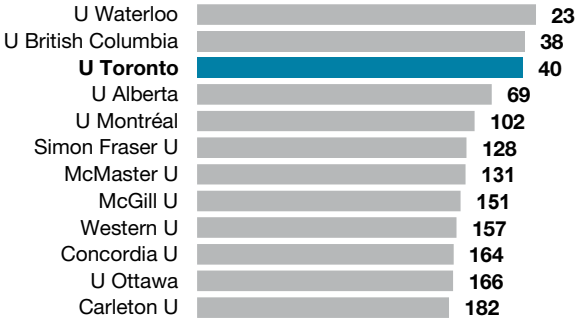
Figure 6.4c **Canadian U15 Universities in NTU Top 200, 2017**

Figure 6.4d **Canadian Universities in NTU by Subject, 2017**

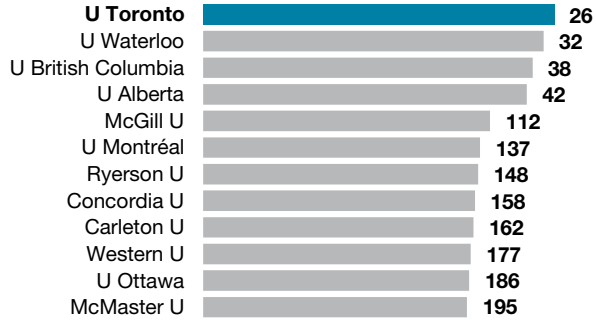
Chemical Engineering

Civil Engineering

Computer Science

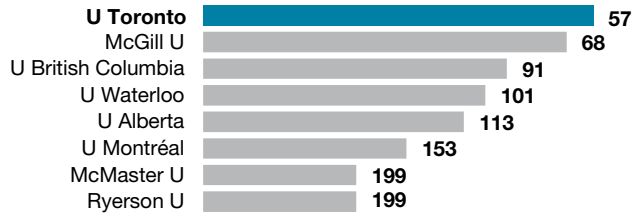


Electrical Engineering



Materials Science

Mechanical Engineering



Rankings Based on Publications and Citations

The Association of American Universities (AAU) index measures research output, productivity and intensity based on publication counts. Once again, U of T Engineering ranked 10th in North America and second in Canada, based on a total publication count of 2,805 papers between 2012 and 2016.

Figure 6.5a **Number of Engineering Publications Indexed by Thomson Reuters for Association of American Universities (AAU) Public and Canadian Peer Institutions, 2012 to 2016**

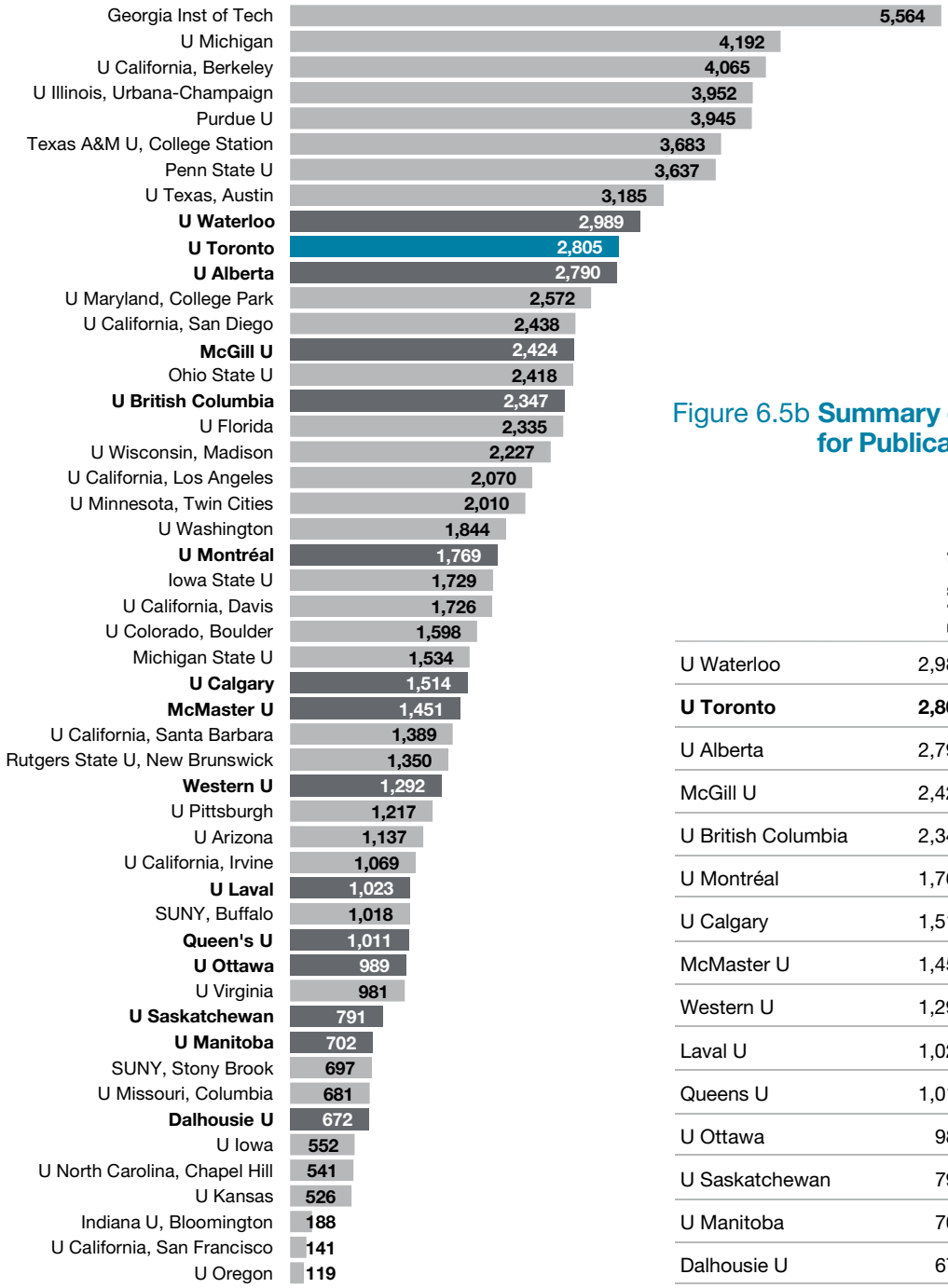


Figure 6.5b **Summary of U15 Bibliometrics for Publications**

	Publications	Faculty Count	Publications per Faculty	Rank on Pub per Faculty
U Waterloo	2,989	292	10.2	6
U Toronto	**2,805**	**256**	**11.0**	**5**
U Alberta	2,790	218	12.8	2
McGill U	2,424	145	16.7	1
U British Columbia	2,347	188	12.5	4
U Montréal	1,769	246	7.2	12
U Calgary	1,514	162	9.3	8
McMaster U	1,451	152	9.5	7
Western U	1,292	102	12.7	3
Laval U	1,023	162	6.3	15
Queens U	1,011	146	6.9	13
U Ottawa	989	125	7.9	11
U Saskatchewan	791	86	9.2	9
U Manitoba	702	87	8.1	10
Dalhousie U	672	103	6.5	14

Note 6.5 and 6.6: Faculty counts are based on data from the Engineers Canada Resources Report (2016) Publication and citation data from Thomson Reuters InCites™, updated April 20, 2018.

The AAU index citation counts are based on the total number of papers cited over a five-year period, as well as the frequency of citations per faculty member and article. U of T Engineering placed first in Canada and ninth among North American public institutions in the total number of citations.

As in the past three years we ranked third in Canada for citations per faculty after McGill University and Western University and retained the lead among Canadian universities in the number of citations per publication, which is the metric representing the relevance of our publications as cited by other researchers.

Figure 6.6a **Number of Engineering Citations Indexed by Thomson Reuters for Association of American Universities (AAU) Public and Canadian Peer Institutions, 2012-2016**

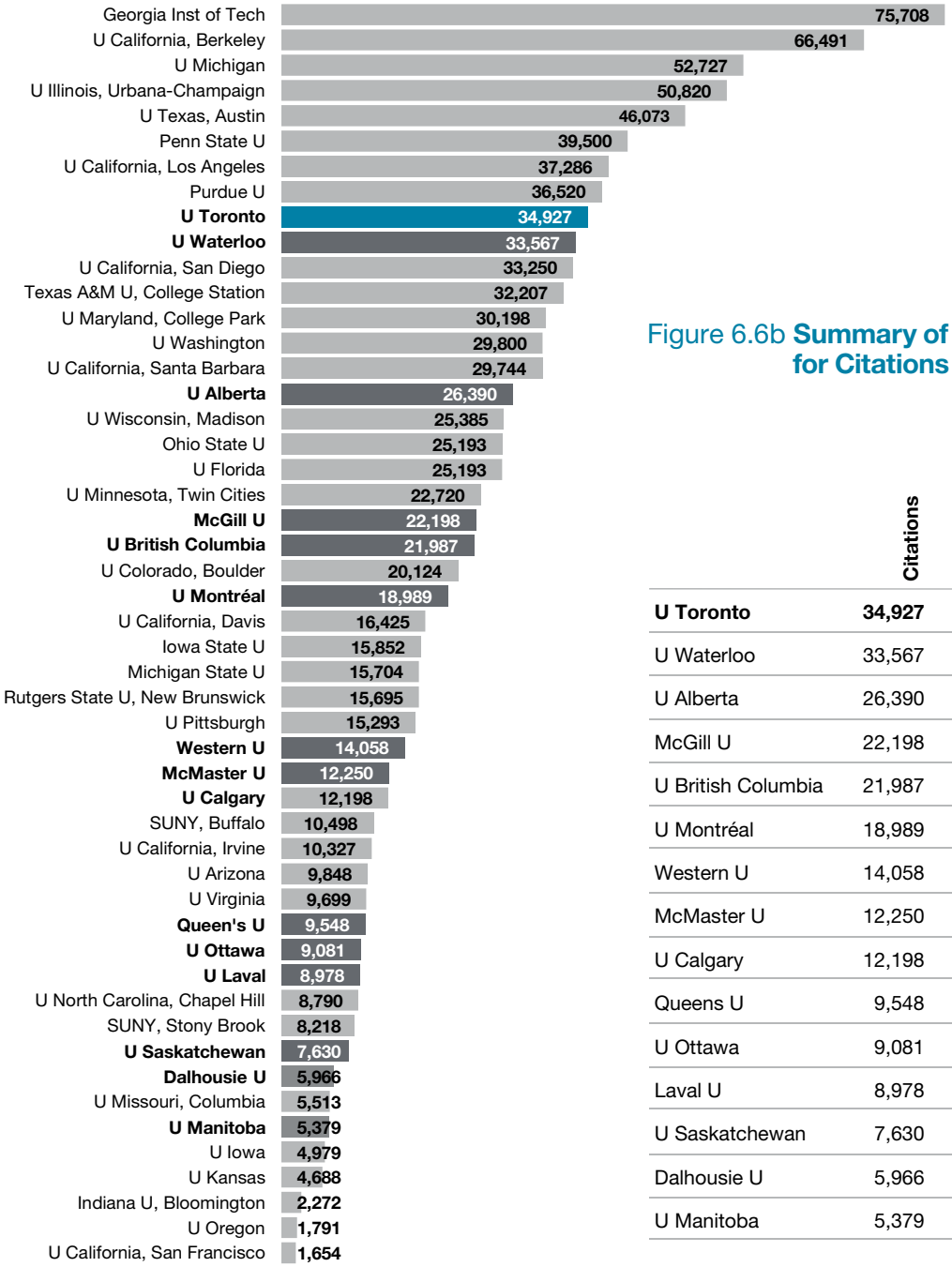


Figure 6.6b **Summary of U15 Bibliometrics for Citations**

	Citations	Faculty Count	Citations per Faculty	Rank on Citations per Faculty	Citations per Publication	Rank on Citations per Publication
U Toronto	**34,927**	**256**	**136.5**	**3**	**12.5**	**1**
U Waterloo	33,567	292	115.0	6	11.2	2
U Alberta	26,390	218	121.3	4	9.5	6
McGill U	22,198	145	153.1	1	9.2	10
U British Columbia	21,987	188	117.2	5	9.4	8
U Montréal	18,989	246	77.2	9	10.7	4
Western U	14,058	102	138.5	2	10.9	3
McMaster U	12,250	152	80.5	8	8.4	13
U Calgary	12,198	162	75.3	10	8.1	14
Queens U	9,548	146	65.4	12	9.4	7
U Ottawa	9,081	125	72.6	11	9.2	9
Laval U	8,978	162	55.4	15	8.8	12
U Saskatchewan	7,630	86	89.1	7	9.6	5
Dalhousie U	5,966	103	58.0	14	8.9	11
U Manitoba	5,379	87	61.8	13	7.7	15

Summary of Ranking Results

In the most recent results available, U of T Engineering remained the top Canadian university across all rankings, and the only Canadian institution within the global top 50. Among North American public universities, we ranked in the top 10 in three of the four ranking systems. Although no ranking can decisively illustrate a school's performance, our high rankings enhance our ability to attract top students, faculty and collaborators from around the world.

Figure 6.7 **Summary of University of Toronto Engineering Performance in World Rankings**

Ranking Organization	Release Date	Canada	North American Public	World
QS World University Rankings for Engineering and Information Technology	**February 2018**	1	4	43
QS World University Rankings by Subject	February 2018			
• Chemical Engineering		1	9	39
• Civil & Structural Engineering		1	7	33
• Electrical & Electronic Engineering		1	5	24
• Materials Science		2	11	51
• Mechanical, Aeronautical & Manufacturing Engineering		2	7	36
• Mineral & Mining Engineering		6	9	25
• Computer Science & Information Systems		1	2	10
Times Higher Education (THE) – Elsevier World University Ranking for Engineering & Technology	**October 2017**	1	7	29
Academic Ranking of World Universities (ARWU) for Engineering Subjects	**August 2017**			
• Aerospace Engineering		1	9	18
• Biomedical Engineering		1	5	17
• Chemical Engineering		7	28	157
• Civil Engineering		2	9	19
• Computer Science and Engineering		1	3	13
• Electrical & Electronic Engineering		1	15	46
• Mechanical Engineering		2	18	64
• Materials Science & Engineering		1	13	70
• Environmental Science & Engineering		1	1	9
National Taiwan University (NTU) Performance Ranking of Scientific Papers for World Universities by Subject	**October 2017**	1	9	50
NTU Performance Ranking by Subject	October 2017			
• Chemical Engineering		4	20	136
• Civil Engineering		2	12	48
• Electrical Engineering		1	6	26
• Materials Science		1	11	74
• Mechanical Engineering		1	12	57
• Computer Science		3	9	40