

# The subject specialists

Asian institutions are learning from the big players that a narrow focus can bring rewards

Over the next four pages, we set out the 50 top performers in each of the main areas of academic achievement, starting here with technology, science and biomedicine.

We capture their merits in two ways. One column gives their score in our academic peer review, while the other shows their citations per paper as measured over five years by Scopus. We have not amalgamated the two columns because every expert we have consulted advised us that the combined result would be meaningless. Instead, we list the institutions in order of academic peer opinion and show the citations per paper alongside. Unlike the main rankings table, we show citations per paper rather than citations per person because we do not have data on staff numbers in each subject area. But because we are looking at the same subjects across the world, the citations data ought to be consistent between them.

To be included in these rankings, institutions must teach in at least two of these five areas. A look at our table for engineering and information technology suggests that this is a field in which focus brings rewards. The great technology hubs of the United States' East and West coasts, the Massachusetts and the California institutes of technology, feature here in first and fourth position, with MIT in a commanding lead over second-placed Berkeley. Other technology specialists in prominent positions include Imperial College London, ETH

Zurich and the Tokyo Institute of Technology.

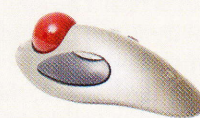
European and US universities dominate this table, in part because of the research budgets of their countries' companies and governments, but a number of emerging Asian nations have made developing their engineering expertise a priority. Both the National University of Singapore and Nanyang, a new technology university, are here from Singapore. From South Korea, the Korea Advanced Institute of Science and Technology appears above Seoul National University. Harvard University appears in our peer review here in 19th place, its lowest showing anywhere in these rankings. But at 5.2 citations per paper, it has the world's most highly cited engineering academics.

Our academic peer reviewers around the world put MIT in top place for science as well as technology. But although some specialist science and technology institutions do well in this table, most of the top places are taken by large general universities that also figure prominently in our overall top 200, such as Berkeley, Harvard, Oxford, Cambridge, Princeton and Tokyo.

Our table of the top players in biomedicine shows that Harvard Medical School, which carries out more research than many entire countries, is regarded as the world's best biomedical institution by informed observers around the world. But Harvard does not have the most highly cited papers in the biomedical field. It is beaten comfortably by both MIT and Caltech. ●

## ENGINEERING AND INFORMATION TECHNOLOGY

Rank	Institution	Country	Final	Citations per
1	Massachusetts Institute of Technology	US	100.0	
2	University of California, Berkeley	US	93.9	
3	Stanford University	US	85.3	
4	California Institute of Technology	US	81.6	
5	University of Cambridge	UK	76.2	
6	Carnegie Mellon University	US	71.6	
7	Imperial College London	UK	70.9	
8	Georgia Institute of Technology	US	68.9	
9	University of Tokyo	Japan	67.4	
10	University of Toronto	Canada	66.0	
11	National University of Singapore	Singapore	64.5	
12	Tsinghua University	China	63.4	
13	ETH Zurich	Switzerland	63.1	
14	University of Oxford	UK	61.6	
15	Princeton University	US	61.5	
16	University of California, Los Angeles	US	61.4	
17	Delft University of Technology	Netherlands	60.4	
18	McGill University	Canada	60.1	
19	Harvard University	US	59.6	
20	University of Illinois	US	58.4	
21	Tokyo Institute of Technology	Japan	57.0	
22=	University of British Columbia	Canada	56.8	
22=	Kyoto University	Japan	56.8	
24=	Cornell University	US	56.4	
24=	Hong Kong University of Science & Technology	Hong Kong	56.4	
26	Nanyang Technological University	Singapore	55.2	
27	University of New South Wales	Australia	54.7	
28	University of Melbourne	Australia	54.4	
29	Technion - Israel Institute of Technology	Israel	54.1	
30	University of Waterloo	Canada	53.9	
31	Ecole Polytechnique	France	52.6	
32	University of Texas at Austin	US	52.0	
33	Purdue University	US	50.9	
34	Korea Advanced Institute of Science & Technology	South Korea	50.5	
35	University of California, San Diego	US	50.3	
36=	Australian National University	Australia	49.9	
36=	Indian Institute of Technology Bombay	India	49.9	
38=	University of Michigan	US	49.2	
38=	Peking University	China	49.2	
40	Technical University of Munich	Germany	48.7	
41	University of Sydney	Australia	48.0	
42	Indian Institute of Technology Delhi	India	47.7	
43	Seoul National University	South Korea	46.0	
44	Ecole Polytechnique Fédérale de Lausanne	Switzerland	45.2	
45	University of Manchester	UK	44.8	
46	University of Alberta	Canada	44.6	
47	Monash University	Australia	44.3	
48	Shanghai Jiao Tong University	China	43.8	
49=	National Taiwan University	Taiwan	42.3	
49=	Osaka University	Japan	42.3	
49=	University of Science and Technology of China	China	42.3	
49=	Eindhoven University of Technology	Netherlands	42.3	



SOURCE: QS QUACQUARELLI



## LIFE SCIENCES AND BIOMEDICINE

Rank	Institution	Country	Final	Citations per paper
1	Harvard University	US	100.0	12.5
2	University of Cambridge	UK	87.1	10.4
3	Johns Hopkins University	US	84.7	10.2
4	University of California, Berkeley	US	83.7	10.4
5	University of Oxford	UK	81.4	10.3
6	Stanford University	US	80.3	11.4
7	Yale University	US	76.4	10.2
8	Massachusetts Institute of Technology	US	75.7	14.3
9	University of California, San Diego	US	69.4	11.2
10	McGill University	Canada	68.0	8.2
11=	Imperial College London	UK	65.4	8.9
11=	University of California, Los Angeles	US	65.4	9.8
13	University of Toronto	Canada	64.1	8.0
14	University of British Columbia	Canada	61.8	7.2
15	University of Tokyo	Japan	60.5	6.9
16	California Institute of Technology	US	59.5	13.7
17	National University of Singapore	Singapore	58.7	5.6
18	Cornell University	US	57.6	8.4
19	Peking University	China	56.9	3.2
20	Columbia University	US	56.3	9.7
21	Duke University	US	55.7	9.9
22	Princeton University	US	54.4	11.0
23	Karolinska Institute	Sweden	54.0	7.9
24	Kyoto University	Japan	53.1	6.9
25	University College London	UK	52.6	8.5
26	University of Melbourne	Australia	52.3	6.3
27	University of Sydney	Australia	51.9	5.9
28=	University of California, Davis	US	51.4	7.0
28=	Washington University in St Louis	US	51.4	10.2
30	Monash University	Australia	50.4	6.0
31	University of Michigan	US	49.6	9.4
32=	University of Edinburgh	UK	48.9	8.5
32=	University of Queensland	Australia	48.9	6.0
34	King's College London	UK	48.7	7.3
35	University of Chicago	US	48.4	9.5
36	Osaka University	Japan	47.5	8.2
37	Australian National University	Australia	46.9	6.4
38	Uppsala University	Sweden	45.6	8.1
39	University of Hong Kong	Hong Kong	45.0	7.3
40	Seoul National University	South Korea	44.9	4.7
41	University of Pennsylvania	US	44.8	9.4
42	University of Auckland	New Zealand	43.9	5.8
43	Boston University	US	43.2	9.7
44	University of Washington	US	43.1	9.9
45	University of Alberta	Canada	41.9	6.3
46	University of Bristol	UK	40.4	7.5
47	University of Wisconsin-Madison	US	40.3	8.0
48	Heidelberg University	Germany	40.0	7.4
49	Fudan University	China	39.0	2.7
50=	University of New South Wales	Australia	38.2	6.4
50=	Brown University	US	38.2	8.1



## NATURAL SCIENCES

Rank	Institution	Country	Final	Citations per paper
1	Massachusetts Institute of Technology	US	100.0	8.2
2	University of California, Berkeley	US	99.5	8.5
3	University of Cambridge	UK	98.3	6.7
4	Harvard University	US	96.1	10.1
5	University of Oxford	UK	92.3	6.5
6	Princeton University	US	91.1	10.1
7	California Institute of Technology	US	90.7	11.7
8	Stanford University	US	88.0	7.8
9	University of Toronto	Canada	79.2	6.3
10	University of Tokyo	Japan	77.2	5.3
11	Cornell University	US	76.8	7.0
12	University of Chicago	US	75.2	12.1
13	Kyoto University	Japan	74.4	5.0
14	Imperial College London	UK	74.3	6.2
15	ETH Zurich	Switzerland	73.7	6.4
16	Peking University	China	73.0	3.8
17	Yale University	US	72.1	8.1
18	University of California, Los Angeles	US	72.0	8.7
19	Ecole Normale Supérieure, Paris	France	68.5	6.2
20	University of British Columbia	Canada	67.8	7.4
21	Australian National University	Australia	66.1	5.8
22	McGill University	Canada	63.1	4.8
23	Columbia University	US	62.5	8.5
24	University of California, Santa Barbara	US	61.9	7.8
25	Université Pierre-et-Marie-Curie, Paris VI	France	60.0	5.2
26	Ecole Polytechnique	France	59.6	5.4
27	University of Melbourne	Australia	58.7	5.7
28	Tsinghua University	China	57.1	2.3
29	Lomonosov Moscow State University	Russia	56.6	2.2
30	University of California, San Diego	US	55.6	6.2
31=	National University of Singapore	Singapore	55.5	4.5
31=	Seoul National University	South Korea	55.5	4.1
31=	Technion - Israel Institute of Technology	Israel	55.5	4.1
34	University of Texas at Austin	US	54.9	6.5
35	University of Michigan	US	54.8	6.6
36	University of Illinois	US	53.4	6.3
37=	Utrecht University	Netherlands	52.4	5.5
37=	University of Rome - La Sapienza	Italy	52.4	3.8
39	University of New South Wales	Australia	50.2	4.8
40=	Osaka University	Japan	49.5	4.2
40=	Technical University of Munich	Germany	49.5	6.1
42	University of Waterloo	Canada	48.9	3.9
43	Heidelberg University	Germany	48.3	6.5
44	University of Sydney	Australia	48.1	4.7
45	Johns Hopkins University	US	48.0	9.1
46	Korea Advanced Institute of Science & Technology	South Korea	47.4	3.6
47	University of Pennsylvania	US	45.9	8.6
48	Ludwig-Maximilians University, Munich	Germany	45.8	6.1
49	University of Science and Technology of China	China	45.5	3.6
50	National Taiwan University	Taiwan	45.1	3.6

