



# Global vision ensures healthy competition

The elite institutions have mostly held their places, but below them is a host of challengers from around the world. **John O'Leary** tracks changes in fortunes and refinements in survey methods

**T**his third edition of *The Times Higher* World University Rankings shows most of the leading institutions maintaining their positions, but considerable change further down the main table. Harvard University remains at the top of the tree — albeit with a much-reduced lead at the end of a turbulent year — and Imperial College London is the only newcomer in the top ten.

Cambridge University has moved up to second place and Yale University has entered the top five for the first time, but there is a settled look about the leading group. US universities still dominate the top ten, with the UK well represented, but the top 30 includes institutions from China, Australia, France, Singapore, Japan, Canada and Switzerland.

After only two years, inevitably the rankings are still settling down. The methodology continues to be refined — in this edition, for example, with a shift from measuring ten years of citations to five — and the prevailing views of universities do alter. As a result, there have been some big shifts this year. Tsing Hua University, which regularly tops China's domestic university league tables, is a prime example, climbing from outside the top 50 to 28th place.

There will be further changes of methodology as new sources of comparison become available. But, for the sake of consistency, the basis of the rankings has remained the same in the current edition. More academics from a wider range of countries have taken part in the peer-review exercise conducted by QS Quacquarelli Symonds, and the company's survey of international employers has been greatly expanded, but the same six measures have been used as in 2005.

Consequently, the calculation of citations

per academic and the ratio of students to academic staff remain the other key indicators, while the proportion of international staff and students is included with a lower weighting. A full explanation of this year's methodology follows on pages 6 and 7.

**'The decision to opt for a stable system at this stage has not been for want of discussion'**

The decision to opt for a stable system at this stage has not been for want of discussion with academics and university administrators in many parts of the globe. Over one weekend in May, the rankings were being discussed in Berlin, Seoul and Tartu, in Estonia. Other meetings have been held in Australia, Japan, Greece and Lithuania, to name but a few. The overriding theme of these debates has been the difficulty of sourcing truly international data and agreeing a framework for comparing the world's great universities.

Ranking universities will remain controversial for the foreseeable future. But there is much less argument than there was two years ago about whether the process should even be attempted.

Universities continue to define themselves internationally, both at subject level and as whole institutions. Different rankings have emerged in the past 12 months, and there is broad acceptance that cross-border comparisons are here to stay in higher education.

David Levin, the president of Yale, gave his account of what makes a global university in the magazine *Newsweek* earlier this year. "In response to the same forces that have propelled the world economy, universities have become more self-consciously global: seeking students from around the world who represent the entire spectrum of cultures and values, sending

their own students abroad to prepare them for global careers, offering courses of study that address the challenges of an interconnected world and collaborative research programmes to advance science for the benefit of all humanity," he wrote.

The World University Rankings will continue to focus on research, teaching and international outlook, attempting to give a picture of current strengths rather than the backward look that is inherent in tallies of Nobel prizes and other accolades from past decades. That requires not only the adoption of proxy measures such as staffing levels, in the absence of international comparisons of teaching standards, but also the sampling of expert opinion. As in previous editions, full-time academics have been asked to identify the leading universities in their own discipline, and their views have been aggregated into a judgment on overall institutions. The results by groups of subjects — the arts and humanities, social sciences, natural sciences, biomedicine and engineering and IT — will appear in *The Times Higher* over the next three weeks.

**'There is broad acceptance that cross-border comparisons are now here to stay'**

But the aim is to produce the most expert view of academic strengths rather than an impressionistic verdict on whole universities that may be swayed by outside factors.

The main ranking, as in previous years, is more diverse than many experts would have predicted.

Thirty countries have universities in the top 200 in the world, and

more will be represented in the 500 that will be listed in a book based on the rankings to be published in the next few weeks.

There remain issues about the advantages enjoyed by English-language universities and those institutions with a base in science and medicine, but there will be continuing efforts to level the playing field as far as is practicable.

## THE WORLD'S TOP 200 UNIVERSITIES

Source: QS

| 2006 RANK | 2005 RANK | NAME                                  | COUNTRY     | PEER REVIEW SCORE (40%) | RECRUITER REVIEW (10%) | INT'L FACULTY SCORE (5%) | INT'L STUDENTS SCORE (5%) | FACULTY/STUDENT SCORE (20%) | CITATIONS/FACULTY SCORE (20%) | OVERALL SCORE |
|-----------|-----------|---------------------------------------|-------------|-------------------------|------------------------|--------------------------|---------------------------|-----------------------------|-------------------------------|---------------|
| 1         | 1         | Harvard University                    | US          | 93                      | 100                    | 15                       | 25                        | 56                          | 55                            | 100.0         |
| 2         | 3         | Cambridge University                  | UK          | 100                     | 79                     | 58                       | 43                        | 64                          | 17                            | 96.8          |
| 3         | 4         | Oxford University                     | UK          | 97                      | 76                     | 54                       | 39                        | 61                          | 15                            | 92.7          |
| 4=        | 2         | Massachusetts Institute of Technology | US          | 81                      | 93                     | 11                       | 39                        | 42                          | 54                            | 89.2          |
| 4=        | 7         | Yale University                       | US          | 72                      | 81                     | 45                       | 26                        | 93                          | 24                            | 89.2          |
| 6         | 5         | Stanford University                   | US          | 82                      | 85                     | 9                        | 34                        | 32                          | 55                            | 85.4          |
| 7         | 8         | California Institute of Technology    | US          | 53                      | 21                     | 24                       | 40                        | 67                          | 100                           | 83.8          |
| 8         | 6         | University of California, Berkeley    | US          | 92                      | 75                     | 6                        | 13                        | 22                          | 39                            | 80.4          |
| 9         | 13        | Imperial College London               | UK          | 65                      | 44                     | 55                       | 56                        | 88                          | 12                            | 78.6          |
| 10        | 9         | Princeton University                  | US          | 68                      | 61                     | 21                       | 29                        | 53                          | 34                            | 74.2          |
| 11        | 17        | University of Chicago                 | US          | 57                      | 67                     | 19                       | 30                        | 73                          | 17                            | 69.8          |
| 12        | 20        | Columbia University                   | US          | 57                      | 64                     | 9                        | 32                        | 74                          | 17                            | 69.0          |
| 13        | 11        | Duke University                       | US          | 39                      | 78                     | 11                       | 21                        | 100                         | 19                            | 68.3          |
| 14        | 15        | Beijing University                    | China       | 70                      | 55                     | 5                        | 11                        | 69                          | 2                             | 67.9          |
| 15        | 14        | Cornell University                    | US          | 60                      | 74                     | 10                       | 25                        | 44                          | 26                            | 65.9          |
| 16        | 23        | Australian National University        | Australia   | 72                      | 30                     | 48                       | 33                        | 38                          | 13                            | 64.8          |
| 17        | 11        | London School of Economics            | UK          | 42                      | 85                     | 89                       | 100                       | 53                          | 1                             | 63.9          |
| 18        | 24        | Ecole Normale Supérieure, Paris       | France      | 46                      | 30                     | 22                       | 28                        | 69                          | 37                            | 63.3          |
| 19=       | 22        | National University of Singapore      | Singapore   | 70                      | 44                     | 82                       | 47                        | 22                          | 8                             | 63.1          |
| 19=       | 16        | Tokyo University                      | Japan       | 72                      | 29                     | 8                        | 10                        | 35                          | 27                            | 63.1          |
| 21        | 24        | McGill University                     | Canada      | 57                      | 61                     | 31                       | 33                        | 52                          | 10                            | 62.3          |
| 22        | 19        | Melbourne University                  | Australia   | 72                      | 44                     | 51                       | 36                        | 25                          | 7                             | 61.6          |
| 23        | 27        | Johns Hopkins University              | US          | 49                      | 37                     | 15                       | 20                        | 65                          | 29                            | 61.3          |
| 24        | 21        | ETH Zurich                            | Switzerland | 51                      | 25                     | 84                       | 45                        | 44                          | 23                            | 59.7          |
| 25        | 28        | University College London             | UK          | 46                      | 28                     | 39                       | 47                        | 70                          | 12                            | 58.7          |
| 26        | 32        | Pennsylvania University               | US          | 45                      | 64                     | 17                       | 26                        | 52                          | 22                            | 57.8          |
| 27        | 29        | University of Toronto                 | Canada      | 63                      | 51                     | 37                       | 17                        | 15                          | 25                            | 57.7          |
| 28        | 62        | Tsing Hua University                  | China       | 45                      | 34                     | 22                       | 9                         | 84                          | 1                             | 56.1          |
| 29=       | 31        | Kyoto University                      | Japan       | 61                      | 20                     | 15                       | 7                         | 44                          | 18                            | 56.0          |
| 29=       | 36        | University of Michigan                | US          | 50                      | 61                     | 15                       | 19                        | 46                          | 15                            | 56.0          |
| 31        | 37        | University of California, Los Angeles | US          | 58                      | 42                     | 2                        | 12                        | 34                          | 25                            | 55.9          |
| 32        | 26        | University of Texas at Austin         | US          | 44                      | 56                     | 24                       | 14                        | 19                          | 53                            | 55.0          |
| 33=       | 30        | Edinburgh University                  | UK          | 54                      | 42                     | 28                       | 29                        | 42                          | 11                            | 54.8          |
| 33=       | 41        | University of Hong Kong               | Hong Kong   | 48                      | 40                     | 84                       | 27                        | 46                          | 6                             | 54.8          |
| 35=       | 44        | Carnegie Mellon University            | US          | 44                      | 64                     | 28                       | 40                        | 48                          | 11                            | 54.6          |
| 35=       | 38        | Sydney University                     | Australia   | 65                      | 26                     | 56                       | 31                        | 23                          | 8                             | 54.6          |
| 37        | 10        | Ecole Polytechnique                   | France      | 37                      | 40                     | 18                       | 40                        | 64                          | 17                            | 53.0          |
| 38        | 33        | Monash University                     | Australia   | 57                      | 40                     | 61                       | 51                        | 21                          | 5                             | 52.6          |
| 39        | 88        | Geneva University                     | Switzerland | 26                      | 13                     | 69                       | 58                        | 81                          | 7                             | 49.9          |
| 40        | 35        | Manchester University                 | UK          | 44                      | 50                     | 42                       | 29                        | 38                          | 6                             | 49.0          |
| 41        | 40        | University of New South Wales         | Australia   | 56                      | 36                     | 23                       | 37                        | 20                          | 7                             | 48.2          |
| 42        | 46        | Northwestern University               | US          | 32                      | 71                     | 12                       | 20                        | 44                          | 19                            | 47.9          |
| 43        | 56        | New York University                   | US          | 39                      | 51                     | 8                        | 16                        | 55                          | 6                             | 47.6          |
| 44        | 42        | University of California, San Diego   | US          | 46                      | 16                     | 3                        | 9                         | 26                          | 42                            | 47.5          |
| 45        | 47        | Queensland University                 | Australia   | 52                      | 26                     | 51                       | 31                        | 18                          | 12                            | 47.2          |
| 46=       | 52        | Auckland University                   | New Zealand | 51                      | 17                     | 44                       | 21                        | 38                          | 2                             | 46.8          |
| 46=       | 73        | King's College London                 | UK          | 42                      | 28                     | 42                       | 30                        | 44                          | 7                             | 46.8          |
| 48=       | 73        | Rochester University                  | US          | 21                      | 26                     | 8                        | 23                        | 91                          | 12                            | 46.7          |
| 48=       | 58        | Washington University, St Louis       | US          | 25                      | 32                     | 5                        | 18                        | 73                          | 22                            | 46.7          |
| 50=       | 38        | University of British Columbia        | Canada      | 51                      | 38                     | 23                       | 15                        | 19                          | 16                            | 46.4          |
| 50=       | 51        | Chinese University of Hong Kong       | Hong Kong   | 39                      | 38                     | 62                       | 24                        | 41                          | 7                             | 46.4          |
| 52        | 69        | Sciences Po                           | France      | 21                      | 29                     | 22                       | 53                        | 86                          | -                             | 45.6          |
| 53        | 114       | Vanderbilt University                 | US          | 22                      | 37                     | 2                        | 14                        | 81                          | 14                            | 45.3          |
| 54=       | 71        | Brown University                      | US          | 32                      | 32                     | 34                       | 20                        | 50                          | 18                            | 45.0          |
| 54=       | 66        | Copenhagen University                 | Denmark     | 44                      | 21                     | 12                       | 13                        | 51                          | 5                             | 45.0          |
| 56        | 141       | Emory University                      | US          | 19                      | 38                     | 1                        | 14                        | 84                          | 15                            | 44.9          |
| 57        | 50        | Indian Institutes of Technology       | India       | 45                      | 34                     | 0                        | 1                         | 27                          | 24                            | 44.5          |
| 58=       | 45        | Heidelberg University                 | Germany     | 43                      | 28                     | 17                       | 28                        | 36                          | 11                            | 44.3          |
| 58=       | 43        | Hong Kong University Sci & Technol    | Hong Kong   | 40                      | 41                     | 74                       | 21                        | 17                          | 16                            | 44.3          |
| 60        | 109       | Case Western Reserve University       | US          | 19                      | 34                     | 3                        | 24                        | 77                          | 19                            | 44.2          |
| 61=       | 117       | Dartmouth College                     | US          | 22                      | 56                     | 13                       | 17                        | 59                          | 16                            | 43.7          |
| 61=       | 48        | Nanyang Technological University      | Singapore   | 40                      | 37                     | 77                       | 56                        | 21                          | 3                             | 43.7          |
| 63        | 93        | Seoul National University             | South Korea | 43                      | 13                     | 2                        | 7                         | 57                          | 4                             | 43.6          |
| 64=       | 49        | Bristol University                    | UK          | 36                      | 44                     | 37                       | 26                        | 34                          | 10                            | 43.2          |
| 64=       | 34        | Ecole Polytech Fédérale de Lausanne   | Switzerland | 28                      | 13                     | 70                       | 66                        | 47                          | 11                            | 43.2          |
| 66        | 54        | Boston University                     | US          | 35                      | 38                     | 9                        | 21                        | 47                          | 10                            | 42.9          |
| 67        | 70        | Eindhoven University of Technology    | Netherlands | 19                      | 18                     | 21                       | 11                        | 92                          | 3                             | 42.1          |

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|-----------|-----------|---|-------------|-------------------------|------------------------|--------------------------|---------------------------|-----------------------------|-------------------------------|---------------|
| 68        | 84        | Indian Institutes of Management         | India       | 31                      | 46                     | 0                        | 10                        | 60                          | 2                             | 41.6          |
| 69        | 58        | Amsterdam University                    | Netherlands | 42                      | 20                     | 30                       | 10                        | 28                          | 15                            | 41.3          |
| 70=       | 103       | School of Oriental and African Studies  | UK          | 23                      | 9                      | 48                       | 74                        | 64                          | 0                             | 40.4          |
| 70=       | 105       | Osaka University                        | Japan       | 39                      | 0                      | 4                        | 9                         | 45                          | 17                            | 40.4          |
| 72        | 92        | Ecole Normale Supérieure, Lyon          | France      | 21                      | 18                     | 15                       | 19                        | 50                          | 34                            | 40.1          |
| 73        | 77        | Warwick University                      | UK          | 39                      | 40                     | 38                       | 41                        | 22                          | 4                             | 40.0          |
| 74        | 95        | National Autonomous Univ of Mexico      | Mexico      | 29                      | 36                     | 3                        | 1                         | 65                          | 0                             | 39.8          |
| 75        | 127       | Basel University                        | Switzerland | 21                      | 0                      | 76                       | 28                        | 63                          | 10                            | 39.7          |
| 76        | 88        | Catholic University of Louvain (French) | Belgium     | 37                      | 25                     | 29                       | 25                        | 29                          | 11                            | 39.4          |
| 77        | 58        | University of Illinois                  | US          | 39                      | 31                     | 10                       | 16                        | 32                          | 9                             | 39.3          |
| 78        | 111       | Trinity College Dublin                  | Ireland     | 37                      | 34                     | 58                       | 29                        | 17                          | 9                             | 39.1          |
| 79=       | 186       | Otago University                        | New Zealand | 26                      | 17                     | 94                       | 20                        | 45                          | 3                             | 38.5          |
| 79=       | 73        | University of Wisconsin                 | US          | 39                      | 11                     | 0                        | 14                        | 35                          | 16                            | 38.5          |
| 81        | 101       | Glasgow University                      | UK          | 35                      | 33                     | 17                       | 16                        | 35                          | 9                             | 38.4          |
| 82=       | 67        | Macquarie University                    | Australia   | 32                      | 40                     | 100                      | 51                        | 10                          | 5                             | 38.3          |
| 82=       | 105       | Technical University Munich             | Germany     | 30                      | 26                     | 22                       | 30                        | 42                          | 10                            | 38.3          |
| 84        | 88        | Washington University                   | US          | 31                      | 23                     | 13                       | 10                        | 38                          | 20                            | 38.2          |
| 85        | 97        | Nottingham University                   | UK          | 34                      | 37                     | 34                       | 29                        | 28                          | 6                             | 38.1          |
| 86        | 53        | Delft University of Technology          | Netherlands | 34                      | 13                     | 52                       | 18                        | 37                          | 7                             | 38.0          |
| 87        | 65        | Vienna University                       | Austria     | 43                      | 22                     | 23                       | 26                        | 10                          | 15                            | 37.8          |
| 88        | 193       | Pittsburgh University                   | US          | 22                      | 19                     | 20                       | 10                        | 62                          | 11                            | 37.6          |
| 89        | 133       | Lausanne University                     | Switzerland | 20                      | 21                     | 54                       | 33                        | 53                          | 9                             | 37.3          |
| 90=       | 143       | Birmingham University                   | UK          | 34                      | 27                     | 34                       | 29                        | 28                          | 9                             | 37.2          |
| 90=       | 138       | Leiden University                       | Netherlands | 33                      | 21                     | 33                       | 11                        | 20                          | 26                            | 37.2          |
| 92        | 57        | Erasmus University Rotterdam            | Netherlands | 22                      | 49                     | 24                       | 31                        | 11                          | 38                            | 37.1          |
| 93=       | 79        | Lomonosov Moscow State University       | Russia      | 42                      | 28                     | 1                        | 7                         | 30                          | 3                             | 37.0          |
| 93=       | 88        | Pierre and Marie Curie University       | France      | 31                      | 0                      | 29                       | 35                        | 49                          | 6                             | 37.0          |
| 95        | 120       | Utrecht University                      | Netherlands | 37                      | 12                     | 24                       | 9                         | 25                          | 18                            | 36.7          |
| 96        | 95        | Catholic University of Leuven (Flemish) | Belgium     | 37                      | 35                     | 11                       | 20                        | 18                          | 13                            | 36.6          |
| 97        | 108       | Wageningen University                   | Netherlands | 16                      | 9                      | 16                       | 45                        | 61                          | 17                            | 36.5          |
| 98        | 55        | Munich University                       | Germany     | 35                      | 23                     | 19                       | 21                        | 29                          | 9                             | 36.4          |
| 99=       | 112       | Queen Mary, University of London        | UK          | 26                      | 9                      | 44                       | 40                        | 47                          | 4                             | 36.3          |
| 99=       | 64        | Pennsylvania State University           | US          | 33                      | 43                     | 7                        | 8                         | 31                          | 6                             | 36.3          |
| 101       | 124       | University of Southern California       | US          | 27                      | 28                     | 7                        | 28                        | 45                          | 9                             | 36.2          |
| 102=      | 159       | Georgetown University                   | US          | 19                      | 65                     | 6                        | 17                        | 41                          | 11                            | 36.1          |
| 102=      | 150       | Rice University                         | US          | 20                      | 31                     | 12                       | 23                        | 50                          | 15                            | 36.1          |
| 102=      | 143       | Sheffield University                    | UK          | 31                      | 22                     | 32                       | 28                        | 33                          | 8                             | 36.1          |
| 105=      | 80        | University of Adelaide                  | Australia   | 38                      | 0                      | 47                       | 44                        | 14                          | 14                            | 35.9          |
| 105=      | 112       | Humboldt University Berlin              | Germany     | 32                      | 15                     | 18                       | 18                        | 43                          | 5                             | 35.9          |
| 105=      | 100       | Sussex University                       | UK          | 27                      | 18                     | 42                       | 27                        | 41                          | 6                             | 35.9          |
| 108       | 114       | National Taiwan University              | Taiwan      | 40                      | 0                      | 1                        | 0                         | 43                          | 4                             | 35.8          |
| 109=      | 136       | St Andrews University                   | UK          | 26                      | 20                     | 40                       | 53                        | 33                          | 9                             | 35.7          |
| 109=      | 85        | Zurich University                       | Switzerland | 26                      | 0                      | 69                       | 23                        | 41                          | 11                            | 35.7          |
| 111=      | 133       | Maryland University                     | US          | 27                      | 33                     | 16                       | 15                        | 35                          | 14                            | 35.6          |
| 111=      | 180       | Uppsala University                      | Sweden      | 36                      | 0                      | 17                       | 8                         | 41                          | 9                             | 35.6          |
| 111=      | 199       | Wake Forest University                  | US          | 10                      | 32                     | 2                        | 6                         | 80                          | 10                            | 35.6          |
| 111=      | 80        | University of Western Australia         | Australia   | 34                      | 11                     | 61                       | 28                        | 19                          | 13                            | 35.6          |
| 115       | 217       | University of Twente                    | Netherlands | 23                      | 15                     | 29                       | 16                        | 59                          | 3                             | 35.5          |
| 116=      | 72        | Fudan University                        | China       | 39                      | 47                     | 11                       | 8                         | 18                          | 2                             | 35.4          |
| 116=      | 62        | Helsinki University                     | Finland     | 38                      | 20                     | 7                        | 5                         | 16                          | 20                            | 35.4          |
| 118       | 99        | Tokyo Institute of Technology           | Japan       | 29                      | 18                     | 3                        | 14                        | 39                          | 16                            | 35.3          |
| 119       | 77        | Hebrew University of Jerusalem          | Israel      | 41                      | 0                      | 14                       | 5                         | 22                          | 16                            | 35.2          |
| 120       | 215       | Keio University                         | Japan       | 28                      | 25                     | 18                       | 4                         | 48                          | 2                             | 35.1          |
| 121       | 103       | Leeds University                        | UK          | 32                      | 33                     | 28                       | 25                        | 25                          | 7                             | 35.0          |
| 122       | 180       | Lund University                         | Sweden      | 35                      | 0                      | 26                       | 9                         | 36                          | 10                            | 34.8          |
| 123       | 143       | University of North Carolina            | US          | 23                      | 38                     | 7                        | 8                         | 36                          | 19                            | 34.6          |
| 124=      | 68        | University of Massachusetts Amherst     | US          | 32                      | 28                     | 1                        | 10                        | 20                          | 23                            | 34.5          |
| 124=      | 109       | York University                         | UK          | 28                      | 22                     | 31                       | 30                        | 33                          | 8                             | 34.5          |
| 126       | 138       | Aarhus University                       | Denmark     | 30                      | 15                     | 38                       | 13                        | 33                          | 9                             | 34.4          |
| 127       | 61        | Purdue University                       | US          | 32                      | 42                     | 20                       | 15                        | 21                          | 6                             | 34.2          |
| 128=      | 222       | Kyushu University                       | Japan       | 21                      | 17                     | 8                        | 8                         | 59                          | 7                             | 34.1          |
| 128=      | 129       | Nagoya University                       | Japan       | 29                      | 11                     | 4                        | 9                         | 41                          | 13                            | 34.1          |
| 130=      | 164       | Tufts University                        | US          | 17                      | 31                     | 12                       | 17                        | 42                          | 22                            | 33.9          |
| 130=      | 105       | Virginia University                     | US          | 20                      | 57                     | 6                        | 11                        | 34                          | 14                            | 33.9          |
| 132       | 83        | Durham University                       | UK          | 25                      | 41                     | 43                       | 25                        | 23                          | 10                            | 33.8          |
| 133=      | 149       | University of Alberta                   | Canada      | 32                      | 11                     | 40                       | 21                        | 17                          | 18                            | 33.6          |
| 133=      | 259       | Brussels Free University (Flemish)      | Belgium     | 16                      | 15                     | 21                       | 17                        | 72                          | -                             | 33.6          |

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|-----------|-----------|---|-------------|-------------------------|------------------------|--------------------------|---------------------------|-----------------------------|-------------------------------|---------------|
| 133=      | 157       | Hokkaido University                     | Japan       | 29                      | 0                      | 8                        | 6                         | 52                          | 8                             | 33.6          |
| 133=      | 168       | Newcastle upon Tyne University          | UK          | 25                      | 24                     | 33                       | 32                        | 36                          | 7                             | 33.6          |
| 137       | 177       | Nijmegen University                     | Netherlands | 21                      | 9                      | 33                       | 10                        | 55                          | 7                             | 33.5          |
| 138       | 86        | Vienna Technical University             | Austria     | 29                      | 17                     | 27                       | 34                        | 36                          | 3                             | 33.3          |
| 139       | 119       | Liverpool University                    | UK          | 26                      | 26                     | 32                       | 21                        | 32                          | 8                             | 33.2          |
| 140       | 234       | Cranfield University                    | UK          | 14                      | 26                     | 31                       | 62                        | 52                          | 2                             | 33.0          |
| 141=      | 159       | University of California, Santa Barbara | US          | 31                      | 11                     | 7                        | 8                         | 22                          | 24                            | 32.9          |
| 141=      | 228       | Cardiff University                      | UK          | 29                      | 13                     | 27                       | 23                        | 36                          | 4                             | 32.9          |
| 141=      | 219       | Ghent University                        | Belgium     | 29                      | 9                      | 20                       | 10                        | 43                          | 4                             | 32.9          |
| 141=      | 206       | Southampton University                  | UK          | 26                      | 16                     | 38                       | 25                        | 34                          | 7                             | 32.9          |
| 145       | 147       | Georgia Institute of Technology         | US          | 30                      | 36                     | 2                        | 27                        | 19                          | 13                            | 32.8          |
| 146       | 82        | RMIT University                         | Australia   | 34                      | 26                     | 31                       | 65                        | 9                           | 1                             | 32.5          |
| 147=      | 166       | Chalmers University of Technology       | Sweden      | 27                      | 9                      | 17                       | 8                         | 46                          | 5                             | 32.4          |
| 147=      | 188       | Tel Aviv University                     | Israel      | 35                      | 22                     | 0                        | 3                         | 13                          | 21                            | 32.4          |
| 148       | 172       | Free University Berlin                  | Germany     | 37                      | 0                      | 27                       | 17                        | 25                          | 6                             | 32.3          |
| 150=      | 184       | Korea University                        | South Korea | 25                      | 8                      | 5                        | 19                        | 55                          | 1                             | 32.2          |
| 150=      | 125       | Texas A&M University                    | US          | 30                      | 39                     | 12                       | 13                        | 16                          | 13                            | 32.2          |
| 152       | 179       | Notre Dame University                   | US          | 19                      | 51                     | 17                       | 14                        | 35                          | 9                             | 32.0          |
| 153       | 130       | Bath University                         | UK          | 21                      | 36                     | 34                       | 35                        | 32                          | 5                             | 31.8          |
| 154       | 178       | City University of Hong Kong            | Hong Kong   | 28                      | 11                     | 75                       | 14                        | 25                          | 5                             | 31.7          |
| 155       | 184       | McMaster University                     | Canada      | 29                      | 24                     | 9                        | 13                        | 18                          | 19                            | 31.6          |
| 156=      | 101       | Curtin University of Technology         | Australia   | 28                      | 18                     | 71                       | 70                        | 12                          | -                             | 31.5          |
| 156=      | 114       | Göttingen University                    | Germany     | 32                      | 0                      | 17                       | 17                        | 31                          | 8                             | 31.5          |
| 158=      | 194       | Technion – Israel Inst of Technology    | Israel      | 31                      | 17                     | 6                        | 6                         | 23                          | 16                            | 31.4          |
| 158=      | 240       | University of Ulm                       | Germany     | 12                      | 0                      | 22                       | 16                        | 70                          | 9                             | 31.4          |
| 158=      | 202       | Waseda University                       | Japan       | 27                      | 24                     | 11                       | 6                         | 42                          | 1                             | 31.4          |
| 161=      | 121       | Chulalongkorn University                | Thailand    | 33                      | 18                     | 9                        | 1                         | 33                          | 0                             | 31.2          |
| 161=      | 131       | University Louis Pasteur Strasbourg     | France      | 25                      | 15                     | 22                       | 34                        | 28                          | 12                            | 31.2          |
| 163       | 121       | Michigan State University               | US          | 28                      | 39                     | 10                       | 12                        | 21                          | 9                             | 31.1          |
| 164       | 219       | Saint Petersburg State University       | Russia      | 26                      | 18                     | 1                        | 9                         | 47                          | 1                             | 30.7          |
| 165=      | 76        | Brussels Free University (French)       | Belgium     | 30                      | 19                     | 15                       | 39                        | 13                          | 12                            | 30.5          |
| 165=      | 93        | China University of Sci & Technol       | China       | 36                      | 14                     | 3                        | 0                         | 24                          | 5                             | 30.5          |
| 165=      | 175       | State Univ of New York, Stony Brook     | US          | 26                      | 16                     | 6                        | 15                        | 30                          | 14                            | 30.5          |
| 168=      | 199       | George Washington University            | US          | 24                      | 46                     | 3                        | 13                        | 30                          | 5                             | 30.4          |
| 168=      | 136       | Tohoku University                       | Japan       | 26                      | 0                      | 8                        | 7                         | 31                          | 21                            | 30.4          |
| 170=      | 206       | University of California, Davis         | US          | 30                      | 0                      | 2                        | 8                         | 30                          | 17                            | 30.3          |
| 170=      | 260       | University of Tübingen                  | Germany     | 21                      | 21                     | 21                       | 19                        | 37                          | 9                             | 30.3          |
| 172=      | 172       | Aachen RWT                              | Germany     | 23                      | 37                     | 24                       | 24                        | 28                          | 4                             | 30.2          |
| 172=      | 157       | Maastricht University                   | Netherlands | 18                      | 28                     | 34                       | 46                        | 24                          | 13                            | 30.2          |
| 172=      | 196       | Royal Institute of Technology           | Sweden      | 24                      | 11                     | 17                       | 12                        | 43                          | 4                             | 30.2          |
| 172=      | 254       | Yeshiva University                      | US          | 7                       | 0                      | 9                        | 6                         | 70                          | 20                            | 30.2          |
| 176       | 261       | Queen's University                      | Canada      | 21                      | 36                     | 38                       | 8                         | 28                          | 7                             | 30.0          |
| 177       | 138       | Oslo University                         | Norway      | 30                      | 0                      | 17                       | 9                         | 34                          | 5                             | 29.9          |
| 178       | 228       | University of Bern                      | Switzerland | 17                      | 9                      | 1                        | 16                        | 54                          | 9                             | 29.8          |
| 179       | 169       | Shanghai Jiao Tong University           | China       | 31                      | 37                     | 13                       | 5                         | 19                          | 1                             | 29.7          |
| 180       | 150       | Nanjing University                      | China       | 35                      | 20                     | 24                       | 2                         | 16                          | 3                             | 29.6          |
| 181=      | 172       | Kobe University                         | Japan       | 25                      | 17                     | 8                        | 7                         | 38                          | 5                             | 29.4          |
| 181=      | 132       | Université de Montréal                  | Canada      | 25                      | 25                     | 48                       | 11                        | 13                          | 14                            | 29.4          |
| 183=      | 192       | Jawaharlal Nehru University             | India       | 32                      | 14                     | 2                        | 6                         | 27                          | 4                             | 29.3          |
| 183=      | 186       | Free University of Amsterdam            | Netherlands | 25                      | 9                      | 19                       | 8                         | 36                          | 8                             | 29.3          |
| 185       | 289       | University of Kebangsaan Malaysia       | Malaysia    | 32                      | 22                     | 9                        | 6                         | 25                          | 0                             | 29.2          |
| 186       | 165       | Innsbruck University                    | Austria     | 23                      | 0                      | 30                       | 48                        | 32                          | 6                             | 29.1          |
| 187=      | 213       | Brandeis University                     | US          | 19                      | 23                     | 7                        | 23                        | 34                          | 13                            | 29.0          |
| 187=      | 142       | Frankfurt University                    | Germany     | 30                      | 17                     | 22                       | 17                        | 19                          | 7                             | 29.0          |
| 187=      | 150       | University of Minnesota                 | US          | 26                      | 20                     | 8                        | 10                        | 20                          | 16                            | 29.0          |
| 190=      | 240       | University of Barcelona                 | Spain       | 31                      | 16                     | 2                        | 11                        | 26                          | 4                             | 28.9          |
| 190=      | 248       | Reading University                      | UK          | 21                      | 19                     | 32                       | 25                        | 30                          | 6                             | 28.9          |
| 192=      | 169       | Malaya University                       | Malaysia    | 33                      | 14                     | 10                       | 7                         | 24                          | 1                             | 28.6          |
| 192=      | 118       | Queensland University of Technology     | Australia   | 33                      | 8                      | 51                       | 19                        | 13                          | 2                             | 28.6          |
| 194       | 154       | Technical University of Denmark         | Denmark     | 25                      | 0                      | 19                       | 19                        | 25                          | 17                            | 28.5          |
| 195       | 267       | Aberdeen University                     | UK          | 20                      | 9                      | 37                       | 25                        | 33                          | 7                             | 28.3          |
| 196       | 308       | University of Wollongong                | Australia   | 23                      | 8                      | 69                       | 64                        | 15                          | 3                             | 28.2          |
| 197       | 125       | La Sapienza University, Rome            | Italy       | 37                      | 15                     | 2                        | 6                         | 11                          | 5                             | 28.1          |
| 198=      | 254       | University of California, Irvine        | US          | 24                      | 16                     | 2                        | 10                        | 19                          | 21                            | 28.0          |
| 198=      | 143       | Korea Advanced Inst Science & Technol   | South Korea | 24                      | 11                     | 14                       | 6                         | 29                          | 12                            | 28.0          |
| 200       | 305       | University of Paris-Sorbonne (Paris IV) | France      | 32                      | 29                     | 6                        | 29                        | 13                          | 0                             | 27.9          |

Compiled from data by QS and Evidence Ltd



# Insiders and outsiders lend a balanced view

**T**he tables on pages 3-5 are the third edition of *The Times Higher/QS World University Rankings*. As in 2004 and 2005, they list the world's top 200 universities according to a range of qualitative and quantitative criteria. Our methodology this year follows that we used in 2005 very closely.

Qualitative and quantitative forms of data each account for half the total score. The qualitative data is based on our belief that the people who know most about university quality are those who work in them or are closely connected to them.

For this reason, 40 per cent of the score allotted to each university is derived from peer review carried out among academics by QS Ltd, partners with *The Times Higher* in compiling the World University Rankings. This has involved gathering data from 3,703 academics around the world. Each was asked which area of academic life — science, medicine, technology, the social sciences or the arts and humanities — they are expert in, and then asked to name up to 30 universities they regard as the top institutions in their area. This is a robust and simple test, and is almost immune to fraud. To achieve this large total of participants, we amalgamated data from our surveys in 2004 and 2005 with this year's responses. However, only the most recent response was used from any individual. In future years, we shall not use data more than three years old.

This peer review shows that, although there are a few dozen universities that are plainly world leaders, there are also well-regarded universities in a surprisingly large variety of countries, in both the rich and developing worlds. Indeed, *Top Universities Guide*, the book that accompanies this supplement, shows that the top 500 universities in the world all have their supporters. The top 200 come from 30 countries, while the top 500 come from 51.

This peer review is enhanced by a further 10 per cent of the score based on the opinion of a vital group of outsiders who observe the world's universities closely. These are graduate recruiters, especially those who

Peer review is once again a key criterion in this year's rankings. But research quality is now gauged on five rather than ten years of citations, making it more topical, says **Martin Ince**

work internationally or on a substantial national scale. The sample includes people from companies in manufacturing, services, finance and transport, as well as from the public sector. They were asked which universities they like to recruit from, a question that we hope reveals something about the quality of the students an institution can attract and the teaching they receive there. We sampled 736 recruiters.

Peer review is the standard way in which the quality of individual pieces of academic work is judged. We believe that applying it to institutions in the controlled way we have done provides an up-to-date measure of the dynamism of whole institutions and of wide groups of subjects in them.

The other half of the rankings scores are made up of quantitative measures. As with the whole of this exercise, the problem is to obtain a measure of university quality that can be calculated on a consistent basis in widely differing environments. This means developing questions that can be answered in a valid and informative way in Norway as well as in Brazil.

Teaching and research are the main activities that occur in universities. Measures designed to capture the quality of these activities account for 40 per cent of the total score in our rankings.

We measure teaching by the classic criterion of staff-to-student ratio. This is captured by asking universities how many staff and students they have, and dividing one by the other. In practice, things are not quite so simple. One complication is to decide exactly who is a student. We ask universities to count people studying towards degrees or other substantial qualifications,

not those taking short courses. Staff numbers, too, can be a matter of opinion. We ask universities to submit a figure based on staff with some regular contractual relationship with the institution. A guest lecturer, however distinguished, should not count. This measure is also prone to subject bias. Teaching people to be surgeons or musicians is inherently more person-intensive than transmitting some other forms of knowledge. But because our analysis deals mainly with large general universities, this variation should even itself out.

The measure of staff-to-student ratio is intended to determine how much attention a student can hope to get at a specific institution, by seeing how well stocked it is with academic brainpower relative to the size of its student body. It accounts for 20 per cent of the possible score.

Our next measure, relating to research, is intended to examine how much intellectual power a university has relative to its size. It is based on citations of academic papers, since these are regarded as the most reliable measure of a paper's impact. The world's accepted authority on citations is Thomson Scientific in Philadelphia, formerly the Institute of Scientific Information. We use data from Thomson's Essential Science Indicators database, processed by Evidence Ltd in Leeds. The ESI concentrates on the world's most highly cited and influential research. Our analysis uses data covering 2001-06. This is a change from the first two editions of the World University Rankings, which used ten years of data. Using five years increases the dynamism and rate of change of this measure, but still provides a statistically valid amount — more than 40,000 papers and more than a million citations each for Texas and Harvard universities, the world's top two generators of scholarship on this measure.

To compile our analysis, we divide the number of citations by staff numbers to correct for institution size and to give a measure of how densely packed each university is with the most highly cited and impactful researchers.



There are well-known problems with citations as a measure of research. One is the underrepresentation of papers in languages other than English in citations data. Thomson is addressing this issue by sampling more journals in Asian and continental European languages. But it is also becoming less of a factor as English becomes the language of choice for academic publishing across the world.

As our introduction on page 2 makes clear, the increasingly international nature of higher education is a key reason for the existence of the World University Rankings. The final 10 per cent of our score is intended to determine how global universities are: 5 per cent is awarded on the basis of the percentage of overseas staff each university has, and a further 5 per cent for its percentage of overseas students. This measure is intended to help mobile staff and students by giving them an impression of how international a university may be. But because this measure counts for only 10 per cent of the total score, it is not possible for an institution to do well in the overall table

on this measure without being excellent in other categories.

There are many measures we do not attempt to capture in these pages. We gather data on universities that teach undergraduates only. This eliminates many high-quality specialist institutions such as Rockefeller University and the University of California, San Francisco, both of which are postgraduate medical institutions.

We have considered a wide range of other criteria, such as graduate employment and entry standards, as possible quality measures. But these have all failed the test of being applicable evenly around the world. For example, a university in a particular country could show poor graduate employment figures because of the state of its national economy, not because it provided a bad education.

Likewise, universities are under pressure to produce spin-off companies and other forms of knowledge transfer. But their success in doing so will depend to a large extent on the economic system in which they are embedded. In the same way, it is

impossible to devise a universal measure for entry standards. However, we are always interested in readers' suggestions for new measures we could consider applying.

**We regret that there are no data on Royal Holloway, University of London. We plan to include the institution in the rankings for 2007.**

**Acknowledgments**

The World University Rankings are co-ordinated by **Martin Ince** (martin@martinince.com), contributing editor of *The Times Higher*. He would like to thank **Nunzio Quacquarelli** and **Ben Sowter** of QS (www.qsnetwork.com), **Jonathan Adams** of Evidence Ltd (www.evidence.co.uk) and their colleagues, as well as the staff of *The Times Higher*, for their participation in this project.

# Best of British close in on Uncle Sam's finest

Focused research funding and broad international appeal are helping Europe's centres of excellence to gain on their US rivals, suggests **Martin Ince**

**T**he World University Rankings leave no doubt that the US contains the top universities. US institutions fill 11 of the top 20 slots, and they are well represented lower down the table.

But the message of our top 200 is that there is more than one road to academic excellence. In 2004 and 2005, Harvard University, the top institution, was more than 10 per cent ahead of its nearest rival, and both years the runners-up were US universities. This year, the gap has narrowed to less than 4 per cent, and the second and third contenders are European. They are among five European universities in the top 20.

Oxford and Cambridge universities, Europe's top two, are of course medieval establishments that have retained a central role in British life, not least because their

graduates — who range from Isaac Newton to Tony Blair — have been in charge of the country most of the time. They produce top research and are the European pioneers of US-style spin-offs and industrial links.



**Erasmus University: most non-Anglophone citations**

CAREL VAN HEES/HOLLANDESE HOOGTE

Our analysis shows that as well as being well liked by academics (Cambridge University is top in the world in our peer review) and employers, these universities have a highly international staff and student body. This is not only an academic plus but also allows them to benefit from the higher fees they can charge students from outside the European Union.

The same applies to the other UK universities with high rankings, Imperial College London and the London School of Economics. Another part of the reason for the excellence of these top UK institutions is that the vast bulk of the country's research funding goes to a small number of universities. This is a message that the European Commission has noticed and that informs its plans for a European Research Council.



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**ECOLE NORMALE SUPERIEURE**

The Ecole Normale Supérieure in Paris is one of the great institutions of revolutionary France, a *grande école* created in 1794 to train university and *lycée* teachers for the *agrégation*, the competitive high-level teaching examination.

Today, the school, also known as ENS, is France's elite training ground not only for academics and researchers but also for those seeking careers in the Civil Service, in business or in politics.

Alumni number winners of Nobel prizes and Fields medals and include scientists, philosophers, writers, social

scientists and politicians, such as Louis Pasteur, Jean-Paul Sartre, Michel Foucault, Jacques Derida, Léon Blum and Georges Pompidou. And Samuel Beckett taught there.

ENS has more than 1,300 *normaliens* (pupils selected on the *concours exam*) and students up to doctorate level, and 224 teachers.

In addition to its 150 researchers, it has 1,004 associated researchers from institutions such as the National Scientific Research Centre and the National Medical Research Institute.

About 60 foreign academics visit the ENS annually for about a month, and some 300 international researchers stay for up to two years.

**Jane Marshall**

But a closer look at our table of top European universities suggests there may be other ways of attaining quality. France's Ecole Normale Supérieure, Paris, is 18th in the world, up from 24 in 2005; it is in fifth place in Europe, making it the Continent's top institution outside the UK. It is less international than its UK rivals and less well regarded by academic peers around the world. Although its graduates occupy many key positions in French business and politics, it has comparatively little prestige with the international recruiters consulted by QS. But it is impressive on staff-to-student ratio and on citations of papers by its staff. On this latter criterion, it is just behind Erasmus University Rotterdam, the leading non-Anglophone university in the world for citations. This is significant because of the known bias of

citations data towards publications in English.

While European universities fill 88 of the top 200 slots, the Continent's top universities are far from evenly distributed. Twenty-nine are in the UK, but the presence of other major EU countries varies widely. Germany and France have ten and seven institutions respectively in the top 200. But both countries have significant public research organisations that employ many of the most cited scientists, reducing the ability of universities to get top slots in our research category.

**'Dutch universities are very international; they are also popular with employers and produce much-cited research'**

German observers are also more critical than most of the rankings process. Some have made the point that German universities are intended to produce qualified professionals and solid incremental research advances, not compete head to head with Harvard.

Smaller and more internationally focused European nations also come out well in our survey. Both Belgium and the Netherlands (six and 11 respectively in the top 200) are prominent, while Austria and Denmark have three representatives each. As well as being very international, Dutch universities are popular with employers and produce much-cited research. Critics point out that it is simple to be international if one is in a country such as the Netherlands, where several other countries are within a day's drive. But it is still tricky to make the most of the international opportunity geography has offered. Switzerland has seven entrants — the two federally funded institutions, plus five cantonal universities.

More alarming among small European nations is the position of Ireland, which has only one entrant, Trinity College Dublin. Its rise from 111th place in 2005 to 78 today will be a relief to a Government that wants Ireland's universities to match the country's increasing emergence on the European stage. But the real issue is not Trinity's position but the fact that no other Irish university has made it to the top 200, not even University College Dublin.

The real gap in Europe's higher education, however, seems to be in southern Europe. Italy's only entrant, La Sapienza University, appears in 197th place, down 72 places since last year's rankings. Spain manages one new entrant, Barcelona, at 190, replacing the relegated Madrid. These results reemphasise the severe challenges higher education faces in both countries.

**EUROPE'S TOP 50 UNIVERSITIES**

| RANK | WORLD RANK | UNIVERSITY NAME                 | COUNTRY     |
|------|------------|---------------------------------|-------------|
| 1    | 2          | Cambridge University            | UK          |
| 2    | 3          | Oxford University               | UK          |
| 3    | 9          | Imperial College London         | UK          |
| 4    | 17         | London School of Economics      | UK          |
| 5    | 18         | Ecole Normale Supérieure, Paris | France      |
| 6    | 24         | ETH Zurich                      | Switzerland |
| 7    | 25         | University College London       | UK          |
| 8    | 33         | Edinburgh University            | UK          |
| 9    | 37         | Ecole Polytechnique             | France      |
| 10   | 39         | Geneva University               | Switzerland |
| 11   | 40         | Manchester University           | UK          |
| 12   | 46         | King's College London           | UK          |
| 13   | 52         | Sciences Po                     | France      |
| 14   | 54         | Copenhagen University           | Denmark     |
| 15   | 58         | Heidelberg University           | Germany     |
| 16=  | 64=        | Bristol University              | UK          |
| 16=  | 64=        | Ecole Polytech Féd Lausanne     | Switzerland |
| 18   | 67         | Eindhoven University of Technol | Netherlands |
| 19   | 69         | Amsterdam University            | Netherlands |
| 20   | 70         | Soas                            | UK          |
| 21   | 72         | Ecole Normale Supérieure, Lyon  | France      |
| 22   | 73         | Warwick University              | UK          |
| 23   | 75         | Basel University                | Switzerland |
| 24   | 76         | Catholic Univ Louvain (French)  | Belgium     |
| 25   | 78         | Trinity College Dublin          | Ireland     |
| 26   | 81         | Glasgow University              | UK          |
| 27   | 82         | Technical University Munich     | Germany     |
| 28   | 85         | Nottingham University           | UK          |
| 29   | 86         | Delft University of Technology  | Netherlands |
| 30   | 87         | Vienna University               | Austria     |
| 31   | 89         | Lausanne University             | Switzerland |
| 32=  | 90=        | Birmingham University           | UK          |
| 32=  | 90=        | Leiden University               | Netherlands |
| 34   | 92         | Erasmus University Rotterdam    | Netherlands |
| 35=  | 93=        | Lomonosov Moscow State Univ     | Russia      |
| 35=  | 93=        | Pierre and Marie Curie Univ     | France      |
| 37   | 95         | Utrecht University              | Netherlands |
| 38   | 96         | Catholic Univ Leuven (Flemish)  | Belgium     |
| 39   | 97         | Wageningen University           | Netherlands |
| 40   | 98         | Munich University               | Germany     |
| 41   | 99         | Queen Mary, Univ of London      | UK          |
| 42   | 102        | Sheffield University            | UK          |
| 43=  | 105=       | Humboldt University Berlin      | Germany     |
| 43=  | 105=       | Sussex University               | UK          |
| 45=  | 109=       | St Andrews University           | UK          |
| 45=  | 109=       | Zurich University               | Switzerland |
| 47   | 111        | Uppsala University              | Sweden      |
| 48   | 115        | University of Twente            | Netherlands |
| 49   | 116        | Helsinki University             | Finland     |
| 50   | 121        | Leeds University                | UK          |

Source: QS

# How the land of the free charged right to the top

Well-resourced private universities continue to be world-beaters in technology and science, says **Martin Ince**, despite concern that the clash between knowledge and belief is undermining scholarship

**T**he US is the world's largest economy and has a bigger propensity than any other major nation to spend its wealth on universities. While European Union countries spend on average about 1.1 per cent of gross domestic product on higher education, as does Japan, the US spends 2.6 per cent, an annual total of about \$250 billion (£133 billion).

But although money is the essential input for universities, simply having a lot of it does not guarantee success. Unlike the UK, the US decided long ago not to have a national university system and nobody drives US higher education from the centre. Instead, the managers of individual universities have taken the major role in shaping the system — along, of course, with their world-beating fundraisers.



## YALE

Yale University, which breaks into our top five for the first time this year, has one of the broadest

curricula in US higher education, requiring its undergraduates to take at least three classes in each of four groups: languages, culture, social sciences, and science and maths. Students are required to speak a foreign

language and to submit a senior essay or project, unusual in US higher education.

The university also seeks to make itself affordable to the broadest possible range of students.

From the 2005-06 academic year,

families with combined incomes below \$45,000 (£24,000) a year were no longer required to pay towards their children's education, a groundbreaking move that is being watched closely by other universities.

The university is

in New Haven, Connecticut, a small city plagued with problems of urban poverty.

Its economic decline appears to be slowly reversing, helped in part by the role of the university in attracting biomedical and pharmaceu-

tical companies.

Alumni include presidents George Bush and George W. Bush, Clinton and Ford, and Senator Hillary Clinton; actors Jodie Foster and Meryl Streep, and telegraph inventor Samuel Morse.

**Jon Marcus**

As the table shows, this freedom of action has yielded results. The US has 11 of the top 20 universities in the world, and Harvard University has been top of our rankings in all three years of their publication.

This table is dominated by heavily resourced private universities, led by Harvard and its neighbours in the North-Eastern US such as Yale, Cornell and Columbia universities. They are joined by the Massachusetts Institute of Technology and the California Institute of Technology, which like Imperial College London in the UK have succeeded by dominating fast-growing and high-prestige areas of science and technology. But despite their similar titles, these institutions have different roles. MIT trains future technologists and scientists in large numbers, while Caltech is mainly a research and postgraduate university.

In recent years, many US commentators have bemoaned the comparative collapse of the US state university system, once seen as only slightly less prestigious than the private research universities. Our analysis shows they are right to be concerned. Berkeley, part of the University of California, is among our top institutions but has always been exceptionally well resourced. It is seventh in our rankings this year, having been second in our first edition in 2004. The University of California, Los Angeles, and the University of Texas at Austin, 31 and 32 in the world, are the next public universities we list.

Part of the reason seems to be money. Between 1990 and 2004, the public four-year universities of the US increased the amount they charged undergraduates from \$10,900 to \$15,100 a year in constant dollars. This is a huge sum to European eyes. But over the same period, private non-profit four-year universities upped their resources per undergraduate from \$21,200 to \$29,500. In addition, the big private universities are home to the most lucrative research centres. Johns Hopkins University, 23rd in the world in these rankings, runs the Hubble Space Telescope for Nasa.

However, bigger questions arise about the strength in depth of the US university system. While the US has 2,500 accredited four-year universities, only the top few produce globally significant research, attract attention from international employers or are visible to the internationally oriented academics in our peer review. Having taken 11 of the top 20 places in our rankings, US

universities fall away drastically lower down and account for just 55 of the top 200 compared with 88 for Europe.

In recent years, questions have been raised about just how serious the US is about its role as the world's leading producer of knowledge. Reluctance to use public money for stem-cell research and the power of creationist teaching in schools are commonly cited evidence for these doubts. But the sceptics may be underestimating the diversity of the US, financial and intellectual. In California, the state has stepped in to fund stem-cell research that it would be illegal to support with federal cash. And across the US research and teaching in science coexist with beliefs that might

seem to oppose our basic knowledge of the universe. This means that the US is likely to remain a magnet for the brightest Asian and European students and researchers.

Canada spends about 2 per cent of GDP on education, less than the US but more than any other developed country except Korea. Its success in the rankings reflects this commitment, with two universities, McGill and Toronto, in the top 30 and seven in the top 200. McGill's breadth and international reach make it the most visible of Canada's institutions. It is popular with academics and recruiters, and has an impressive staff-to-student ratio. Its main rivals in Canada are Toronto and British Columbia universities, which appear here in the same league as the top European and US research institutions.

**'Questions have been raised about just how serious the US is about its role as the world's leading producer of knowledge'**



Nasa's Hubble telescope: run by Johns Hopkins

## NORTH AMERICA'S TOP 50 UNIVERSITIES

| RANK | WORLD RANK | UNIVERSITY NAME                       | COUNTRY |
|------|------------|---------------------------------------|---------|
| 1    | 1          | Harvard University                    | US      |
| 2=   | 4=         | Massachusetts Institute of Technology | US      |
| 2=   | 4=         | Yale University                       | US      |
| 4    | 6          | Stanford University                   | US      |
| 5    | 7          | California Institute of Technology    | US      |
| 6    | 8          | UC, Berkeley                          | US      |
| 7    | 10         | Princeton University                  | US      |
| 8    | 11         | University of Chicago                 | US      |
| 9    | 12         | Columbia University                   | US      |
| 10   | 13         | Duke University                       | US      |
| 11   | 15         | Cornell University                    | US      |
| 12   | 21         | McGill University                     | Canada  |
| 13   | 23         | Johns Hopkins University              | US      |
| 14   | 26         | Pennsylvania University               | US      |
| 15   | 27         | University of Toronto                 | Canada  |
| 16   | 29         | University of Michigan                | US      |
| 17   | 31         | UC, Los Angeles                       | US      |
| 18   | 32         | University of Texas at Austin         | US      |
| 19   | 35         | Carnegie Mellon University            | US      |
| 20   | 42         | Northwestern University               | US      |
| 21   | 43         | New York University                   | US      |
| 22   | 44         | UC, San Diego                         | US      |
| 23=  | 48=        | Rochester University                  | US      |
| 23=  | 48=        | Washington University, St Louis       | US      |
| 25   | 50         | University of British Columbia        | Canada  |
| 26   | 53         | Vanderbilt University                 | US      |
| 27   | 54         | Brown University                      | US      |
| 28   | 56         | Emory University                      | US      |
| 29   | 60         | Case Western Reserve University       | US      |
| 30   | 61         | Dartmouth College                     | US      |
| 31   | 66         | Boston University                     | US      |
| 32   | 77         | University of Illinois                | US      |
| 33   | 79         | University of Wisconsin               | US      |
| 34   | 84         | Washington University                 | US      |
| 35   | 88         | Pittsburgh University                 | US      |
| 36   | 99         | Pennsylvania State University         | US      |
| 37   | 101        | University of Southern California     | US      |
| 38=  | 102=       | Georgetown University                 | US      |
| 38=  | 102=       | Rice University                       | US      |
| 40=  | 111=       | Maryland University                   | US      |
| 40=  | 111=       | Wake Forest University                | US      |
| 42   | 123        | University of North Carolina          | US      |
| 43   | 124        | University of Massachusetts Amherst   | US      |
| 44   | 127        | Purdue University                     | US      |
| 45=  | 130=       | Tufts University                      | US      |
| 45=  | 130=       | Virginia University                   | US      |
| 47   | 133        | University of Alberta                 | Canada  |
| 48   | 141        | UC, Santa Barbara                     | US      |
| 49   | 145        | Georgia Institute of Technology       | US      |
| 50   | 150        | Texas A&M University                  | US      |

Source: QS



# Tiger's growl builds up

Asian, Australian and Latin American institutions are strong regional bastions of quality that are keen to join the global high-flyers, says **Martin Ince**

Is Asia emerging as a rival to the US and Europe as home to the world's top universities? The first three years of the World University Rankings provide a mixed response to this complex question.

In each of the three years, Asian institutions have impressed in the rankings. Australia, which we class with Asia in these tables, has a big university system and has done everything it can to raise its impact across mainland Asia and the Pacific Rim. It has been consistently the most prominent, and this year has 13 of the top 200 universities. This may make it the most heavily represented country in these rankings per head of population, apart from micro-states such as Singapore.

But the picture changes when the upper layers of the rankings are examined. In 2004, our top 20 featured four Asian institutions. They were Tokyo in 12th position, the Australian National University, Peking and the National University of Singapore in 16th, 17th and 18th places respectively. This year the same four remain in the top 20, although Peking has replaced Tokyo as Asia's top university according to our criteria.

This suggests that although there are many capable Asian universities lower down our rankings, few institutions in the region are likely to emerge as full-scale rivals to Harvard, Berkeley or Cambridge. For example, Tokyo is indisputably Japan's top institution. It is well regarded by employers and academics, and it produces citations in respectable numbers, but it is not very international — it seems to be an excellent national institution, not a world leader.

Japan musters 11 universities in the rankings, perhaps not an impressive total for the world's second largest economy and one of the most high-technology countries in the world. Its leading universities hope that a shift of emphasis to quality will strengthen

## SINGAPORE

The National University of Singapore, founded in 1905, has forged a global reputation since independence from Malaysia in 1965 and now ranks in the top quartile of the world's universities.

The university, set on a 1.5 square kilometre campus at Kent Ridge, which in February 1942 was the scene of the last stand by the Malay Regiment, is a beacon for the huge investment in education at all levels made by the Government of Singapore.

Newly privatised on April 1, 2006, the university continues to receive a state subsidy as the country seeks to maintain the highest all-round standards in education.

Student enrolment is around 23,000, with more than 2,100 faculty. Student intake is from a wide range of countries. In the law school, more than two dozen nationalities are represented, while exchange schemes take Singaporean students to countries that include China, Canada, Australia and the US.

Among its leading graduates the NUS lists Goh Chok Tong, former Prime Minister of Singapore, Kishore Mahbubani, dean of the Lee Kuan Yew School of Public Policy at NUS, and Choo San Goh, Washington Ballet choreographer.

Active on an international level, Singapore plays a leading role in the Association of Pacific Rim Universities, while consolidating its position at the forefront of the International Alliance of Research Universities. Singapore has



five overseas colleges: Bio Valley (US); Silicon Valley; Shanghai; Stockholm; and Bangalore. A recent initiative has seen the NUS enter the film-making world through the establishment of the

NUS Hollywood Lab in co-operation with the University of Southern California School of Cinema and Television.

The university's facilities include six libraries and four museums, the latter including the Raffles

their position as the country's supply of young people dwindles in coming years. But the shrinking number of candidates may damage elite as well as modest institutions.

In contrast, Beijing University's status in the top 20 seems stable. This year's 14th place, up one from 2005, may be only the start of the story. Peking has gained this position despite a poor citations score and

having few international students. China is regarded as a market for other countries' universities, not a place to go to study. It would not be surprising if Peking, which on this showing is Asia's top university, became a magnet for mobile students. If it does, and if its staff produce more highly cited papers in key journals, it could enter the top ten in the next few years.



# slowly to a roar



PIC CREDIT

Museum of Biodiversity Research, named in honour of the founder of the British colony, polymath Sir Thomas Stamford Raffles.

The museum holds more than 500,000 specimens

of flora and fauna.

The Government's current reorientation of the republic's economy sets goals in new areas such as biotechnology and biomedicine, where the university also plays a leading role.

**David Jardine**

China has ten entries in the top 200, including four from Hong Kong. By contrast, India, the next most populous nation, manages only three. Of these two, the Indian Institutes of Technology and of Management are both multi-campus institutions. We plan to collect discrete data on their various centres in future years.

Elsewhere in Asia, several ambitious

countries show up only modestly in our rankings. The exception (see box) is Singapore, whose national university comes in at 19. It is accompanied by Nanyang Technological University in position 61. However, Taiwan and Thailand manage only one university each in our rankings and Malaysia two, both modestly placed.

An interesting contrast is Korea, whose flagship institution, Seoul National University, might have been expected to suffer in our rankings from highly visible misdeeds in its stem-cell research programme. In fact, Seoul National rose 30 places, from 93 to 63, between 2005 and 2006, and its main rival, Korea University, is up 34 places to 150. By contrast, the University of Western Australia, which had its biggest ever coup last year with the winning of the Nobel Prize for Medicine, is down 31 places to 111.

There is little doubt that Asian nations want universities that can be ranked alongside top European and North American institutions as an essential driver of economic progress.

The same ambitions can be found elsewhere in the developing world but are being fulfilled more slowly. The National Autonomous University of Mexico is ranked 74th in the world, rising from 195th in our first series of rankings. It is probably the world's largest university by student numbers, but it produces no cited research on the measures we use. It is also the only institution we list from Latin America, Africa or Oceania. São Paulo in Brazil was in our top 200 in 2005 but has now dropped out.

It seems harder than ever for countries such as Brazil or South Africa to assemble the resources needed to sustain a research university. Indonesia, the world's fourth biggest country by population, is also noticeable by its absence from our top 200. However, moves under way in Africa to rank its universities on viable local criteria may allow the continent's top institutions to be identified and to increase their argument for more resources.

**'It would be no surprise if Peking, which on this showing is Asia's top university, became a magnet for mobile students'**

## THE REST OF THE WORLD'S TOP 50 UNIVERSITIES

| RANK | WORLD RANK | UNIVERSITY NAME                 | COUNTRY     |
|------|------------|---------------------------------|-------------|
| 1    | 14         | Beijing University              | China       |
| 2    | 16         | Australian Natl University      | Australia   |
| 3=   | 19=        | Natl Univ Singapore             | Singapore   |
| 3=   | 19=        | Tokyo University                | Japan       |
| 5    | 22         | Melbourne University            | Australia   |
| 6    | 28         | Tsing Hua University            | China       |
| 7    | 29         | Kyoto University                | Japan       |
| 8    | 33         | Hong Kong University            | Hong Kong   |
| 9    | 35         | Sydney University               | Australia   |
| 10   | 38         | Monash University               | Australia   |
| 11   | 41         | Univ of New South Wales         | Australia   |
| 12   | 45         | Queensland University           | Australia   |
| 13   | 46         | Auckland University             | New Zealand |
| 14   | 50         | Chinese Univ Hong Kong          | Hong Kong   |
| 15   | 57         | Indian Institutes of Technology | India       |
| 16   | 58         | Hong Kong Univ Sci & Technol    | Hong Kong   |
| 17   | 61         | Nanyang Technological Univ      | Singapore   |
| 18   | 63         | Seoul National University       | South Korea |
| 19   | 68         | Indian Insts of Management      | India       |
| 20   | 70         | Osaka University                | Japan       |
| 21   | 74         | Natl Auton Univ of Mexico       | Mexico      |
| 22   | 79         | Otago University                | New Zealand |
| 23   | 82         | Macquarie University            | Australia   |
| 24   | 105        | University of Adelaide          | Australia   |
| 25   | 108        | National Taiwan University      | Taiwan      |
| 26   | 111        | Univ of Western Australia       | Australia   |
| 27   | 116        | Fudan University                | China       |
| 28   | 118        | Tokyo Inst Technology           | Japan       |
| 29   | 119        | Hebrew Univ Jerusalem           | Israel      |
| 30   | 120        | Keio University                 | Japan       |
| 31=  | 128=       | Kyushu University               | Japan       |
| 31=  | 128=       | Nagoya University               | Japan       |
| 33   | 133        | Hokkaido University             | Japan       |
| 34   | 146        | RMIT University                 | Australia   |
| 35   | 147        | Tel Aviv University             | Israel      |
| 36   | 150        | Korea University                | South Korea |
| 37   | 154        | City University of Hong Kong    | Hong Kong   |
| 38   | 156        | Curtin University of Technol    | Australia   |
| 39=  | 158=       | Technion — Israel Inst Technol  | Israel      |
| 39=  | 158=       | Waseda University               | Japan       |
| 41   | 161        | Chulalongkorn University        | Thailand    |
| 42   | 165        | China Univ Sci & Technol        | China       |
| 43   | 168        | Tohoku University               | Japan       |
| 44   | 179        | Shanghai Jiao Tong University   | China       |
| 45   | 180        | Nanjing University              | China       |
| 46   | 181        | Kobe University                 | Japan       |
| 47   | 183        | Jawaharlal Nehru University     | India       |
| 48   | 185        | Univ Kebangsaan Malaysia        | Malaysia    |
| 49=  | 192=       | Malaya University               | Malaysia    |
| 49=  | 192=       | Queensland Univ of Technol      | Australia   |

Source: QS

# Big thinkers presented in pleasingly petit packs

Elite institutions in developed economies find it easier to provide tuition on a personal level

**T**his table shows the world's top ten universities measured by staff-to-student ratio. We regard this measure as a key indicator of an institution's commitment to teaching. While there are many national surveys of teaching effectiveness and student fulfilment, it is hard to measure teaching on a world scale, not least because students are bound to vary in the expectations they have of the courses they take and how they prepare for them.

But we know that students around the world are becoming more picky consumers. And one thing they need to know is how many other students will be competing with them for the attention of each staff member.

On this measure all the top universities are in high-wage economies. Institutions in

| RANK | WORLD RANK | NAME                               | COUNTRY     | STAFF/STUDENT SCORE |
|------|------------|------------------------------------|-------------|---------------------|
| 1    | 13         | Duke University                    | US          | 100                 |
| 2    | 4=         | Yale University                    | US          | 93                  |
| 3    | 67         | Eindhoven University of Technology | Netherlands | 92                  |
| 4    | 48=        | Rochester University               | US          | 91                  |
| 5    | 9          | Imperial College London            | UK          | 88                  |
| 6    | 52         | Sciences Po                        | France      | 86                  |
| 7    | 28         | Tsing Hua University               | China       | 84                  |
| 8    | 56         | Emory University                   | US          | 84                  |
| 9    | 53         | Vanderbilt University              | US          | 81                  |
| 10   | 39         | Geneva University                  | Switzerland | 81                  |

Source: QS

countries such as Mexico, India or Thailand, where staff can be hired more cheaply than in Europe or North America, seem not to want to press home this advantage by increasing staff numbers, or perhaps cannot afford to do so. The economics of running a university in the developing world seems to demand high student numbers and small staff head counts.

The top two institutions on this measure, Duke and Yale universities in the US, are significant research universities and are in the top 20 in our overall world rankings. Yale, ranked fourth, is also one of the few US universities to have a substantial percentage of international staff by European or Asian standards.

This is one measure in which no country

is dominant. Two European technology universities, Eindhoven in the Netherlands and Imperial College London, appear in third and fifth positions, while Sciences Po in France, a specialist in the social sciences, is also prominent as a comparatively small, elite school. The other European institution here, Geneva University, is maintained by cantonal rather than federal funding, but it has defeated Switzerland's national institutions on this measure.

This table contains only three of the world's top 20 universities overall. On this measure, Cambridge and Oxford emerge in 27th and 31st places, just ahead of Harvard in 37th. Even further behind are California's big players — Stanford University at 119 and the University of California, Berkeley, at 158.

| RANK | WORLD RANK | NAME                                  | COUNTRY     | CITATIONS SCORE |
|------|------------|---------------------------------------|-------------|-----------------|
| 1    | 7          | California Institute of Technology    | US          | 100             |
| 2    | 1          | Harvard University                    | US          | 55              |
| 3    | 6          | Stanford University                   | US          | 55              |
| 4    | 4=         | Massachusetts Institute of Technology | US          | 54              |
| 5    | 32         | University of Texas at Austin         | US          | 53              |
| 6    | 44         | University of California, San Diego   | US          | 42              |
| 7    | 8          | University of California, Berkeley    | US          | 39              |
| 8    | 92         | Erasmus University Rotterdam          | Netherlands | 38              |
| 9    | 18         | Ecole Normale Supérieure, Paris       | France      | 37              |
| 10   | 10         | Princeton University                  | US          | 34              |

Source: QS and Evidence Ltd

# California hits the top spot on good citations

Centres focusing on hard, high-impact research are runaway winners

# Oxbridge players are in a class of their own

UK academics make a big impression in the global arena, trouncing the US high-flyers

**B**ecause peer review accounts for 40 per cent of a university's possible score in the World University Rankings, the top universities on this criterion tend to be highly placed in our overall table as well as in this one. Here we see the top ten universities in the eyes of academics around the world.

It shows that Harvard University, the top institution overall, is beaten comfortably by Cambridge and Oxford universities on this measure. Its score of 93 out of a possible 100 puts it only just ahead of the University of California, Berkeley, which is often regarded as its biggest rival.

Also conspicuous in this list is the Massachusetts Institute of Technology, which does well on this measure despite its

**W**hich universities have the world's most respected researchers? This table of the top ten institutions for citations gives the answer in the way that the academic community itself measures impact. It shows the top ten universities in terms of the number of citations of their papers, per staff member, recorded over the past five years by Thomson Scientific in its Essential Science Indicators database.

It shows that one institution, the California Institute of Technology, outguns the rest of the world on this score by a almost double. Harvard University, the Massachusetts Institute of Technology and the University of California, Berkeley are left far behind. The reason for Caltech's dominance is clear. It has fewer than 1,000 undergraduates but 1,200 postgraduates and 1,200 academic staff, not including visitors.

## TOP 10 FOR PEER REVIEW

| RANK | WORLD RANK | NAME                                  | COUNTRY   | PEER REVIEW | EMPLOYER REVIEW |
|------|------------|---------------------------------------|-----------|-------------|-----------------|
| 1    | 2          | Cambridge University                  | UK        | 100         | 79              |
| 2    | 3          | Oxford University                     | UK        | 97          | 76              |
| 3    | 1          | Harvard University                    | US        | 93          | 100             |
| 4    | 8          | University of California, Berkeley    | US        | 92          | 75              |
| 5    | 6          | Stanford University                   | US        | 82          | 85              |
| 6    | 4=         | Massachusetts Institute of Technology | US        | 81          | 93              |
| 7    | 16         | Australian National University        | Australia | 72          | 30              |
| 8    | 22         | Melbourne University                  | Australia | 72          | 44              |
| 9    | 19=        | Tokyo University                      | Japan     | 72          | 29              |
| 10   | 4=         | Yale University                       | US        | 72          | 81              |

Source: QS

specialist nature. Its work in fields such as art and languages is on a small scale but it is highly prestigious and visible, allowing MIT to garner votes in disciplines far removed from science and technology.

The overall message is that the world's academics are sceptical about the idea that the US has all the best universities. Cambridge's lead in peer review is convincing. And, on this measure, its ancient rival Oxford is its nearest challenger on the world stage as well as in the UK.

This measure contains only five US institutions. It shows that the big two Australian universities are well regarded around the world, especially the Australian National University, which has been well funded for some decades and is

involved in a full range of research and teaching.

The picture is more complex in Asia. While Peking University shows up well ahead of Tokyo University in our overall rankings, academics still take Tokyo more seriously.

The table also shows how well employers like the universities that most impress academics — and the two measures overlap substantially. Here, Harvard is the world leader, a position it has perhaps achieved by overall excellence supplemented by having the world's most prestigious business school. MIT, Stanford and the London School of Economics (not in this table because it scored only 42 in our peer review) also do well. Tokyo shows poorly on this measure.

And they are concentrated in high-impact areas, mainly science and technology, with a growing emphasis on the life sciences.

Citations analysis is not a process that favours academic diversity. Behind Caltech, this table is dominated by US universities with medical schools because of the ferocious publishing and citation culture of biomedical research. Like Caltech, MIT does not have a medical school, but it brings in substantial income from biomedical research via its life sciences departments. Caltech's life sciences papers had more than 22 citations each in the period under review, ahead of MIT at 20. Princeton University was ranked a distant third, with 15 citations per paper.

Because of the bias of citations in favour of work published in English, the appearance of two continental European institutions here is of special interest. In the

Netherlands, Erasmus University Rotterdam has gained its position by well-cited medical publishing. In France, papers in the natural sciences have allowed Paris's Ecole Normale Supérieure to compete.

Citations are famously unkind to the humanities and social sciences. While the era in which a historian could have a brilliant career by writing three massive books may be ending, the culture of frequent journal articles and citations will probably never catch on there as it has in science and medicine.

There is little valuable citations data for the humanities. But we know that in the social sciences, MIT and Harvard tie as the institutions with the most-cited papers — with an average of just four citations per paper, about a quarter of the figure for the most-cited medical research.

