

**What's Inside...**

**NOAA's Susan Solomon  
 Minds the Air Up There . . . . . 3**

**New Treatment Brightens  
 Outlook in Severe Sepsis . . . . . 5**

**Constant Refinement from  
 Hubble Space Telescope . . . . . 6**

**El TOPO: Controlling Cobalt  
 in Nanocrystal Synthesis. . . . . 7**

**Short Interfering RNAs Help  
 to Identify Gene Function . . . . . 8**

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# Harvard Rides High in Latest "Top Ten" Research Roundup

On two previous occasions—1994 and 1998—this publication has presented “Top Ten” rankings of the top 100 federally funded U.S. universities, based on the citation impact of their published research in major fields of science and the social sciences. *Science Watch* now offers the latest two-part collection of rankings, showing the universities whose research papers attracted citations at a rate notably above the world average in each field over the last five years. In all, 21 fields are represented. Nine rankings in the biological sciences appear on page 2. Additional rankings in the physical and social sciences will appear in the next issue.

As the table at right shows, Harvard University posted the highest number of Top Ten appearances, showing up in 15 of the 21 rankings. Stanford University was second, with 11 appearances. This repeats the results seen in the last set of rankings in 1998, when Harvard and Stanford also finished one-two in overall placements. The remaining schools in the table (that is, those with at least six Top Ten appearances) are also holdovers from the 1998 survey, with the exception of Columbia University and Duke University, both of which debut here among the top finishers.

This time, three schools that appeared among the elite in the 1998 survey narrowly missed the six-or-more-fields threshold for inclusion in the new table: Cornell University and the University of Washington each scored five Top Ten placements, while the University of California, Santa Barbara, made the grade in four fields. (Note: the last survey, from the September/October and November/December 1998 issues, can be viewed online at [www.sciencewatch.com](http://www.sciencewatch.com).)

As in the previous surveys, *Science Watch* drew upon the exclusive publication and citation data in ISI's University Science Indicators database. In 21 fields (each defined by a discrete set of ISI-indexed journals), *Science Watch* calculated the citations-per-paper (impact) score for each university, based on papers published and cited between 1997 and 2001. The resulting figure was compared to a world baseline figure representing the impact for the field during the same period. This produced a “relative impact” score, expressed as a percentage. In clinical medicine, for example, papers from Harvard University were cited, on average, 9.78 times during 1997-2001. The world average for the field was 4.54. Harvard, therefore, scored 115% above the world average to win its first-place ranking in the field, fol-

## Highest Impact U.S. Universities, 1997-2001

(Ranked by frequency of Top Ten appearances in 21 fields)

Rank	University	Top Ten Appearances
1	Harvard University	15
2	Stanford University	11
3	MIT	9
4	Univ. Calif., San Diego	9
5	Yale University	8
6	Univ. Calif., Berkeley	8
7	Columbia University	8
8	Caltech	7
9	University of Michigan	7
10	Duke University	6

SOURCE: ISI University Science Indicators

lowed by the University of California, San Diego, which scored 106% above the world mark. (Tie scores in relative impact were settled in two ways: preference was given to universities that displayed a higher impact score before the “relative” figure was calculated and rounded off—e.g., in neurosciences, the University of Illinois's average of 12.50 cites per paper edged the Johns Hopkins University score of 12.46 citations. When the impact score itself happened to be identical, priority went to the school that produced the greater number of papers.)

In each field, in order to confine the analysis to universities that produced a substantial body of papers during the five-year period, *Science Watch* set a minimum threshold for number of papers produced. This threshold varied, reflecting differences from field to field in the number of journals used to define each field, and in the number of papers published in those journals.

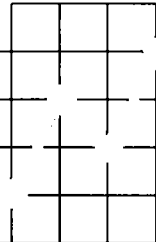
A slightly different ranking for these 10 universities can be obtained by calculating their average showings (that is, by taking the sum of their ranks and dividing by the number of the number of appearances.) By this measure, Caltech scored the highest average placement, with a mark of 3.14, followed by Harvard at 3.40, then Duke and Yale (4.50 each), MIT (4.67), Stanford (5.36), UC Berkeley (5.63), UC San Diego (5.78), Columbia (6.38), and the University of Michigan (6.71). ■

# Top Ten Universities in Biological Science Fields, 1997-2001

Clinical Medicine >1,200 papers				Immunology >300 papers				Molecular Biology & Genetics >500 papers			
Rank	Institution	# of Papers	Relative Impact (%)	Rank	Institution	# of Papers	Relative Impact (%)	Rank	Institution	# of Papers	Relative Impact (%)
1	Harvard University	16,297	+115	1	Rockefeller University	337	+241	1	MIT	776	+179
2	Univ. Calif., San Diego	4,406	+106	2	Yale University	631	+105	2	Univ. Texas Southwestern Med. Ctr., Dallas	786	+147
3	Tufts University	2,833	+103	3	Stanford University	716	+97	3	Rockefeller University	629	+136
4	Johns Hopkins University	9,719	+94	4	Washington University	596	+87	4	Univ. Calif., San Diego	1,149	+129
5	Vanderbilt University	3,298	+87	5	Harvard University	2,133	+79	5	Harvard University	3,494	+125
6	Columbia University	5,664	+86	6	University of Iowa	342	+73	6	Stanford University	1,217	+110
7	University of Chicago	3,029	+85	7	University of Chicago	327	+68	7	Univ. Calif., San Francisco	1,491	+107
8	Univ. Calif., San Francisco	8,203	+84	8	Baylor College of Medicine	434	+67	8	Columbia University	1,088	+83
9	University of Washington	7,950	+84	9	Emory University	452	+55	9	Yale University	1,218	+80
10	Univ Texas Southwestern Med. Ctr., Dallas	3,615	+80	10	Univ. Texas Southwestern Med. Ctr., Dallas	415	+55	10	Yeshiva University	523	+74
Neurosciences >300 papers				Plant & Animal Sciences >300 papers				Pharmacology >200 papers			
Rank	Institution	# of Papers	Relative Impact (%)	Rank	Institution	# of Papers	Relative Impact (%)	Rank	Institution	# of Papers	Relative Impact (%)
1	Caltech	319	+124	1	Harvard University	518	+159	1	Vanderbilt University	298	+126
2	Rockefeller University	537	+111	2	Rutgers University	664	+149	2	Duke University	212	+107
3	MIT	429	+107	3	Univ. Calif., San Diego	654	+146	3	Univ. Calif., San Diego	205	+101
4	Univ. Calif., San Francisco	1,424	+106	4	Indiana University	316	+135	4	University of Pennsylvania	229	+99
5	Washington University	1,258	+105	5	Duke University	499	+123	5	Univ. Calif., San Francisco	385	+88
6	Harvard University	2,997	+95	6	Univ. Calif., Berkeley	1,009	+117	6	Johns Hopkins University	313	+64
7	Yale University	1,738	+76	7	Univ. Calif., Los Angeles	398	+117	7	University of Colorado	281	+63
8	Oregon Health Sci. Univ.	729	+72	8	University of Arizona	748	+106	8	University of Washington	394	+61
9	Univ. Illinois, Urbana	315	+71	9	Woods Hole Ocean. Inst.	535	+104	9	University of Michigan	449	+57
10	Johns Hopkins University	1,897	+71	10	SUNY Stony Brook	318	+100	10	University of Cincinnati	201	+57
Agricultural Sciences >300 papers				Ecology/Environment >300 papers				Biology & Biochemistry >500 papers			
Rank	Institution	# of Papers	Relative Impact (%)	Rank	Institution	# of Papers	Relative Impact (%)	Rank	Institution	# of Papers	Relative Impact (%)
1	Univ. Wisconsin, Madison	675	+86	1	Stanford University	466	+155	1	Rockefeller University	635	+150
2	Cornell University	685	+59	2	University of Minnesota	658	+108	2	Univ. Texas Southwestern Med. Ctr., Dallas	1,381	+116
3	Pennsylvania State Univ.	415	+58	3	Univ. Calif., Berkeley	764	+88	3	Harvard University	4,583	+115
4	Michigan State University	455	+52	4	Oregon State University	583	+80	4	Univ. Calif., San Francisco	1,999	+110
5	University of Minnesota	641	+46	5	Michigan State University	466	+75	5	Duke University	1,352	+105
6	Washington State University	448	+41	6	Duke University	447	+73	6	MIT	921	+94
7	Univ. Calif., Davis	947	+32	7	Harvard University	522	+68	7	Stanford University	1,515	+93
8	Ohio State University	469	+31	8	Utah State University	336	+65	8	Univ. Calif., San Diego	1,774	+92
9	Purdue University	469	+30	9	University of Michigan	419	+63	9	Yale University	1,667	+91
10	Iowa State University	694	+27	10	Cornell University	626	+62	10	University of Michigan	1,710	+79

SOURCE: ISI University Science Indicators

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## What's Inside...

Harvard's Paul M. Ridker  
on C-Reactive Protein . . . . . 3

Stem Cells into Liver Cells:  
Will Promise Pan Out? . . . . . 5

Oscillating Fans Pleased  
By New Neutrino Reports . . . . . 6

Zinc Oxide Nanolasers  
Hit It Right on the Nose . . . . . 7

Hearts and Bones: More  
on Stem-Cell Versatility . . . . . 8

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## Physical Sciences at U.S. Universities: Harvard, Stanford Top the "Top Tens"

### Highest Impact Universities in Physical and Social Science Fields, 1997-2001

Physics >500 papers				Chemistry >500 papers			
Rank	Institution	# of Papers	Relative Impact (%)	Rank	Institution	# of Papers	Relative Impact (%)
1	Rice University	520	+291	1	Yale University	778	+227
2	Univ. Calif., Santa Cruz	2,519	+284	2	Caltech	1,115	+204
3	University of Pennsylvania	1,100	+231	3	Harvard University	1,108	+202
4	Harvard University	1,771	+223	4	MIT	1,723	+159
5	Boston University	1,175	+219	5	Univ. Calif., San Diego	899	+148
6	Stanford University	2,645	+187	6	Northwestern University	1,229	+138
7	Univ. Calif., Santa Barbara	2,519	+187	7	Univ. Calif., Santa Barbara	915	+127
8	University of Washington	1,570	+179	8	Univ. Calif., Berkeley	2,679	+126
9	SUNY Stony Brook	1,424	+178	9	Carnegie Mellon University	649	+125
10	Louisiana State University	607	+170	10	U. North Carolina, Chapel Hill	992	+119

SOURCE: ISI University Science Indicators

This is the second of two installments in the latest "Top Ten" roundup of U.S. university research in 21 fields, as measured by the citation impact of research papers published and cited between 1997 and 2001. The first part of the survey appeared in the previous issue and presented Top Ten rankings in nine biological or biomedical fields (see *Science Watch*, 13[5]:1-2, September/October 2002). This second part features 12 listings in the physical and social sciences (11 tables, along with one ranking presented in the text below). Physics and chemistry appear above, with the other tables on page 2. All the rankings are based on "relative citation impact"—that is, each university's average-citations-per-paper score for the five-year period compared, on a percentage basis, against the world impact average in each field. The rankings are based on exclusive publication and citation data on more than 100 U.S. universities in Thomson ISI's *University Science Indicators*, 1981-2001.

In terms of overall results, as was noted in the first part of the survey, Harvard scored the greatest number of Top Ten placements, appearing in 15 of the 21 fields. Stanford was second, with 11 placements. In all, 10 schools achieved particular distinction in the overall survey, with at least six Top Ten appearances each (Harvard, Stanford, MIT, Uni-

versity of California (UC) at San Diego, Yale, UC Berkeley, Columbia, Caltech, University of Michigan, and Duke). Collectively, these universities accounted for 88 Top Ten placements—more than 40% of the 210 available spots in the 21 fields.

As in the overall standings, Harvard and Stanford are the standout universities in the physical- and social-science rankings presented here: Harvard appears in eight of the listings, Stanford in seven. Four schools—Caltech, Columbia, MIT, and UC Berkeley—made the Top Ten in six of the accompanying fields.

Space limitations prevented a table for one of the social-science fields, Education. Of those universities that published at least 100 papers between 1997 and 2001 in education journals indexed by ISI, the University of Michigan ranked highest in relative impact, scoring 131% above the citations-per-paper average in the field. UCLA was next (92% above the field average), followed by Purdue (+80), the University of North Carolina, Chapel Hill (+76), the University of Wisconsin, Madison (+64), the University of Georgia (+62), the University of Texas, Austin (+62), Michigan State University (+56), University of Maryland, College Park (+52), and the University of Minnesota (+52).

# Top Ten Universities in Physical and Social Science Fields, 1997-2001

Geosciences >300 papers				Space Science >500 papers				Materials Science >300 papers			
Rank	Institution	# of Papers	Relative Impact (%)	Rank	Institution	# of Papers	Relative Impact (%)	Rank	Institution	# of Papers	Relative Impact (%)
1	Harvard University	504	+195	1	Univ. Calif., Santa Cruz	624	+130	1	Univ. Calif., Santa Barbara	379	+302
2	Princeton University	555	+151	2	Univ. Calif., Berkeley	1,328	+123	2	University of Minnesota	353	+167
3	University of Washington	1,215	+137	3	University of Hawaii	574	+123	3	MIT	667	+127
4	Columbia University	794	+123	4	University of Michigan	554	+97	4	Univ. Calif., Berkeley	622	+123
5	MIT	893	+113	5	Princeton University	647	+91	5	North Carolina State Univ.	562	+75
6	Caltech	1,213	+106	6	Caltech	2,390	+72	6	Northwestern University	511	+74
7	Univ. Calif., San Diego	980	+106	7	University of Arizona	1,168	+53	7	Pennsylvania State Univ.	877	+74
8	University of Colorado	1,488	+105	8	University of Colorado	777	+51	8	Univ. Illinois, Urbana	539	+62
9	Woods Hole Ocean. Inst.	953	+102	9	University of Chicago	560	+50	9	University of Florida	405	+54
10	University of Miami	464	+101	10	Johns Hopkins University	1,052	+49	10	University of Michigan	409	+48
Mathematics >200 papers				Engineering >300 papers				Computer Science >100 papers			
Rank	Institution	# of Papers	Relative Impact (%)	Rank	Institution	# of Papers	Relative Impact (%)	Rank	Institution	# of Papers	Relative Impact (%)
1	Caltech	225	+156	1	Yale University	314	+249	1	Princeton University	188	+236
2	New York University	336	+138	2	Univ. Calif., Santa Barbara	698	+154	2	Caltech	195	+181
3	Stanford University	417	+133	3	Stanford University	1,513	+153	3	Univ. Calif., Berkeley	376	+129
4	Harvard University	390	+131	4	Caltech	1,352	+144	4	Univ. Illinois, Urbana	331	+127
5	University of Washington	299	+120	5	Harvard University	475	+128	5	Columbia University	149	+118
6	Cornell University	400	+120	6	Cornell University	957	+121	6	Stanford University	407	+100
7	Columbia University	261	+102	7	Princeton University	840	+120	7	University of Pennsylvania	156	+97
8	Univ. Calif., Los Angeles	441	+92	8	University of Arizona	757	+107	8	MIT	574	+82
9	MIT	471	+84	9	Univ. Calif., Los Angeles	1,191	+105	9	Univ. Massachusetts, Amherst	143	+80
10	Univ. Calif., Berkeley	651	+82	10	Boston University	397	+104	10	Univ. Calif., San Diego	288	+76
Psychology/Psychiatry >300 papers				Economics & Business >300 papers				Law >100 papers			
Rank	Institution	# of Papers	Relative Impact (%)	Rank	Institution	# of Papers	Relative Impact (%)	Rank	Institution	# of Papers	Relative Impact (%)
1	Duke University	704	+107	1	University of Chicago	525	+229	1	Yale University	187	+146
2	Harvard University	1,869	+107	2	Harvard University	1,029	+152	2	Harvard University	282	+111
3	University of Pittsburgh	1,104	+107	3	MIT	647	+129	3	University of Chicago	299	+105
4	Carnegie Mellon University	319	+103	4	Northwestern University	520	+128	4	University of Michigan	141	+104
5	Virginia Commonwealth Univ.	374	+95	5	Stanford University	604	+128	5	Univ. Texas, Austin	151	+100
6	Yale University	1,240	+95	6	University of Pennsylvania	729	+123	6	University of Virginia	193	+95
7	Columbia University	1,197	+93	7	Columbia University	510	+115	7	Columbia University	184	+87
8	Case Western Reserve U.	375	+88	8	Duke University	312	+112	8	New York University	177	+74
9	Stanford University	940	+87	9	Univ. Calif., Berkeley	592	+107	9	Cornell University	121	+54
10	Univ. Calif., San Diego	836	+86	10	Univ. Calif., Los Angeles	410	+102	10	Stanford University	176	+36

SOURCE: ISI University Science Indicators

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