



Research From the Ground Up

by Christopher King

Six years ago, when *Science Watch* last surveyed geosciences research, the listings were dominated by atmospheric science and climatology (12[6]: 1-2, [November/December 2001](#)). On that occasion, *Science Watch* examined publications and citations within the broad selection of journals defining the "Geosciences" category in Thomson Scientific's *Essential Science Indicators*SM.

This time, for a slightly different view, *Science Watch* attempted to narrow the focus more towards geology, with a population of journals drawn from Thomson's *Science Citation Index* categories denoting "Geology," "Geochemistry & Geophysics," "Geosciences-Multidisciplinary," and "Mineralogy." From the resultant sample of 224 journals and more than 150,000 papers published and cited between 1996 and early 2007, *Science Watch* here presents high-impact institutions ([first table](#)) in two separate rankings, featuring, at left, those with the highest total citations, and, on the right, those averaging the highest numbers of citations per paper. Also featured in other tables on this page are highly cited [researchers](#) (below) and [journals](#) (right).

As usual in a total-citations ranking, larger institutions tend to wield an advantage thanks to their abundance of published papers, and this list is no exception—particularly with the



inclusion of several large governmental organizations representing scores of separate research

installations (NASA, the Russian and Chinese academies of sciences, the French Centre

Most-Cited Journals in Geosciences Sciences, 1996-2007

(Ranked by citations to papers published and cited between 1996 and 2007)

Rank	Journal	Citations
1	Geophysical Research Letters	116,069
2	Geology	42,202
3	Journal of Hydrology	22,157
4	American Mineralogist	20,185
5	Palaeogeogr./climat./eol. (Palaeo3)	20,130
6	Quaternary Science Review	17,672
7	Marine Geology	16,060
8	Global Biogeochem. Cycles	15,648
9	Contrib. Mineralogy & Petrology	15,097
10	Geol. Soc. America Bulletin	13,243

National de la Recherche Scientific [CNRS], etc.). Nevertheless, the University of Colorado shows its clout near the top of the list, as do the University of Washington and the University of Cambridge.

The cites-per-paper ranking, meanwhile, displays its usual penchant for allowing smaller-producing institutions to shine through. Atop this list, the University of New Hampshire takes the crown, despite a comparatively modest output of 498 papers within the selected journal set. One of these papers, a 1997 *Geology* report on Holocene climatic instability some 8,000 years ago (also featuring first author Richard B. Alley of Penn State, #15 on the list of researchers), has now been cited more than 400 times and is the third-most-cited paper in this survey.

11	Adv. in Space Research	12,870
12	Precambrian Research	12,242
13	Paleoceanography	11,999
14	J. Structural Geology	11,853
15	J. Volcanol. Geotherm. Res.	11,550
SOURCE: Thomson Scientific <i>Topical Citation Report</i>		

Among the featured authors, none bested the citation total of the University of Manitoba's Frank C. Hawthorne and his tally of more than 2,200. Hawthorne is also the only researcher in the current survey to have been ranked in *Science Watch's* 2001 geosciences report. His most-cited publication here, a 1997 *American Mineralogist* paper on the nomenclature of minerals known as amphiboles, has been cited more than 260 times. (The paper's coauthors, incidentally, include Joel D. Grice, #9 on the current list.)

Of the most-cited journals ([right table](#)), *Geophysical Research Letters* dwarfs all comers in terms of output and citations, with more than 116,000 citations to 13,000 papers published since 1996. This journal also embodies—despite *Science Watch's* attempt to focus on geology and closely related areas—the inescapable, multidisciplinary breadth that characterizes geosciences as a whole. In addition to earthbound geological studies, *Geophysical Research Letters* published numerous reports on climatological and atmospheric research (including a 1998 report on the Arctic Oscillation, the most-cited report in the survey, with a tally topping 800). And the journal reaches even higher, notably in high-impact reports from the Fast Auroral Snapshot (FAST) satellite mission, an effort to examine and record the Earth's magnetic and electric fields from orbit. Hence, the presence among the authors of several space scientists from the University of California, Berkeley, and elsewhere. In geosciences, clearly, the sky's no limit.

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[Table 1]

Geology/Geosciences

Institutions Ranked by Citations and Citation Impact

(among those that published ≥ 400 papers, 1996-2007)

Rank	Institution	Citations 1996-2006	Rank	Institution	Impact 1996-2006
1	U.S. Geological Survey	23,172	1	University of New Hampshire	14.62
2	NASA	20,303	2	Natl. Ctr. Atmospheric Research	14.46
3	University of Colorado	15,365	3	Woods Hole Oceanographic Inst.	13.45
4	Russian Academy of Sciences	15,019	4	Princeton University	13.14
5	Chinese Academy of Sciences	14,937	5	University of Washington	12.57
6	University of Washington	12,934	6	University of Bergen	11.79
7	University of Cambridge	12,573	7	NOAA	11.72
8	Caltech	12,459	8	University of Bern	11.71
9	Univ. Calif., Berkeley	12,139	9	Oregon State University	11.62
10	CNRS (France)	11,993	10	Columbia University	11.37
11	Australian National University	11,554	11	Univ. Calif., Santa Barbara	11.00
12	Geological Survey of Canada	10,579	12	University of Kiel	10.82
13	Stanford University	10,134	13	MIT	10.75
14	NOAA	9,960	14	University of Colorado	10.71
15	CNR (Italy)	9,511	15	Univ. Calif., Los Angeles	10.48
16	University of Arizona	9,375	16	University of Cambridge	10.21
17	MIT	9,120	17	Alfred Wegener Institute	10.20
18	Univ. Calif., Los Angeles	8,552	18	Australian National University	10.16
19	University of Wisconsin	8,440	19	Pennsylvania State University	10.16
20	University of Tokyo	8,388	20	Caltech	10.15
21	Columbia University	8,235	21	Univ. Calif., Santa Cruz	9.96
22	University of Bergen	8,194	22	University of Minnesota	9.90
23	University of Bern	7,986	23	Stanford University	9.76
24	Pennsylvania State University	7,976	24	University of Utrecht	9.72
25	University of Oxford	7,483	25	University of Bayreuth	9.68

[Table 2]

Highly Cited Authors in Geosciences, 1996-2007

(Ranked by total citations)

Rank	Name	Institution	Department/ Specialty	Papers	Citations
1	Frank C. Hawthorne	University of Manitoba	Crystallography/ Mineralogy	194	2,204
2	Roger Powell	University of Melbourne	Metamorphic Geology	53	1,825
3	Charles W. Carlson	Univ. Calif., Berkeley	Space Physics	72	1,822
4	Timothy J.B. Holland	University of Cambridge	Petrology	18	1,592
5	Andre Balogh	Imperial College London	Space Physics	171	1,568
6	H. John B. Birks	University of Bergen	Ecology/ Palaeoecology	52	1,548
7	Peter C. Burns	University of Notre Dame	Mineralogy	120	1,414
8	Henri Reme	CNRS, CESR, Toulouse	Space Science	165	1,335
9	Joel D. Grice	Canadian Museum of Nature	Mineralogy	84	1,330
10	Juhn G. Liou	Stanford University	Geol./ Environmental Sciences	95	1,327
11	James P. McFadden	Univ. Calif., Berkeley	Space Physics	44	1,324
12	Jean Poesen	Katholieke Univ. Leuven	Geomorphology	104	1,290
13	C. Mark Fanning	Australian National University	Earth Sciences	116	1,275
14	Alfred Kroner	Johannes Gutenberg Univ., Mainz	Earth Sciences	82	1,241
15	Richard B. Alley	Pennsylvania State University	Geosciences	57	1,234
16	Zhisheng An	Chinese Academy of Sciences	Geology	69	1,210
17	Robert E. Ergun	University of Colorado	Space Physics	36	1,172
18	Victor A. Drits	Russian Academy of Sciences	Geology	59	1,162

19	Shigenori Maruyama	Tokyo Institute of Technology	Earth Sciences	57	1,138
20	Andre F. Lotter	University of Utrecht	Palaeoecology	35	1,107
21	Samuel A. Bowring	MIT	Geology	62	1,101
22	Simon A. Wilde	Curtin Univ. Technology	Applied Geology	56	1,098
23	Forrest S. Mozer	Univ. Calif., Berkeley	Space Physics	43	1,090
24	Michael A. Temerin	Univ. Calif., Berkeley	Space Physics	30	1,088
25	T. Mark Harrison	Univ. Calif., Los Angeles	Geology	35	1,084
	Robert P. Lin	Univ. Calif., Berkeley	Space Physics	77	1,084
SOURCE: Thomson Scientific <i>Topical Citation Report</i>					

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