

Appendix table 5-60

Citation of S&E articles in USPTO patents, by cited field and cited country/sector: 2003–12

Field and sector	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
All fields, all sectors	164,283	143,718	135,427	191,725	190,996	198,191	221,456	305,873	323,073	332,778
Foreign	72,031	64,037	62,199	87,954	88,463	94,643	105,242	147,096	158,870	165,271
United States	92,252	79,681	73,228	103,771	102,533	103,548	116,214	158,777	164,203	167,507
Federal government	6,584	5,290	4,483	6,533	6,654	6,590	7,416	10,078	9,806	9,767
Industry	18,870	16,660	15,338	21,409	19,800	19,514	22,021	28,822	28,814	28,156
Academic	54,685	47,735	44,509	63,087	63,380	64,379	72,235	99,771	104,748	108,660
FFRDCs	2,146	2,049	1,695	2,480	2,420	2,456	2,662	3,455	3,464	3,533
Nonprofit	9,325	7,396	6,682	9,494	9,566	9,976	11,139	15,576	16,289	16,192
State/local government	351	278	276	421	398	328	409	573	582	628
Joint/unknown sectors	292	274	246	347	315	305	332	502	499	571
Engineering	9,267	10,497	10,539	14,181	13,520	13,342	16,310	21,267	24,309	27,205
Foreign	5,086	5,701	5,769	7,672	7,080	7,203	8,915	11,637	13,541	15,495
United States	4,181	4,796	4,770	6,509	6,440	6,139	7,395	9,630	10,768	11,710
Federal government	174	186	178	236	210	208	249	293	318	370
Industry	1,601	1,850	1,654	2,256	2,126	1,959	2,227	2,655	2,655	2,547
Academic	2,093	2,400	2,524	3,518	3,601	3,522	4,360	5,994	7,023	7,998
FFRDCs	194	246	242	278	277	225	302	370	418	426
Nonprofit	95	95	147	183	204	194	228	281	306	300
State/local government	3	1	1	2	0 *	3	5	9	11	14
Joint/unknown sectors	21	17	25	35	21	28	24	28	37	56
Astronomy	8	11	2	10	8	11	21	19	39	24
Foreign	6	7	1	1	4	3	10	16	21	13
United States	2	5	1	9	4	8	11	3	18	11
Federal government	1	2	0	0 *	1	1	0	1	0	1
Industry	1	1	0	1	0	1	1	0	2	1
Academic	0	2	1	7	3	5	5	1	13	6
FFRDCs	0	1	0	0 *	0 *	0 *	4	0	3	2
Nonprofit	0	0	0	0	0	0	1	1	1	2
State/local government	0	0	0	0	0	0	0	0	0	0
Joint/unknown sectors	0	0	0	0	0	0	0	0	0	0
Chemistry	19,180	17,528	16,734	22,511	20,029	20,330	26,353	37,066	40,643	43,382
Foreign	10,115	9,107	8,880	11,782	10,339	10,873	14,356	20,100	22,692	24,254
United States	9,065	8,421	7,854	10,729	9,690	9,457	11,997	16,966	17,951	19,128
Federal government	259	246	243	335	331	248	343	465	499	581
Industry	2,403	1,991	1,845	2,407	2,148	1,978	2,381	3,377	3,342	3,397
Academic	5,527	5,304	5,022	6,958	6,239	6,364	8,119	11,415	12,382	13,390
FFRDCs	487	516	366	542	475	500	538	778	751	866
Nonprofit	368	333	347	423	454	348	569	873	933	846
State/local government	8	6	12	36	16	6	22	20	19	14
Joint/unknown sectors	14	25	18	29	28	13	25	38	24	33
Physics	13,787	13,931	15,136	19,880	18,041	18,747	20,809	25,222	26,628	25,189
Foreign	7,414	7,587	8,302	10,641	9,519	10,057	11,060	13,311	14,357	13,985

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Field and sector	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
United States	6,373	6,344	6,834	9,239	8,522	8,690	9,749	11,911	12,271	11,204
Federal government	286	256	283	389	361	373	445	540	517	472
Industry	2,255	2,214	2,182	2,718	2,281	2,041	2,169	2,500	2,373	2,089
Academic	3,246	3,329	3,916	5,399	5,134	5,423	6,294	7,792	8,169	7,580
FFRDCs	490	445	382	629	640	703	713	793	865	840
Nonprofit	83	81	55	90	90	138	112	251	319	187
State/local government	0	0	0	0	0 *	1	1	1	1	1
Joint/unknown sectors	13	19	16	13	16	13	15	32	26	35
Geosciences	568	664	473	651	467	722	854	1,096	1,247	1,330
Foreign	227	253	214	274	246	384	385	585	677	787
United States	341	411	259	376	221	338	469	511	570	543
Federal government	39	42	21	45	24	32	43	56	47	51
Industry	59	90	50	57	35	55	77	87	74	78
Academic	217	246	168	249	140	227	311	321	395	361
FFRDCs	8	16	10	11	13	11	25	38	37	37
Nonprofit	10	6	5	7	4	9	7	5	10	8
State/local government	5	10	4	4	4	4	2	2	7	5
Joint/unknown sectors	2	2	1	3	1	0 *	3	3	1	3
Mathematics	77	69	94	116	91	111	178	222	215	274
Foreign	27	35	25	41	30	46	81	105	82	130
United States	50	34	69	75	61	65	97	117	133	144
Federal government	3	2	1	2	0	4	4	1	3	0
Industry	10	2	5	6	7	7	8	13	6	8
Academic	36	29	60	61	51	46	82	92	113	128
FFRDCs	2	1	2	6	2	7	1	6	7	5
Nonprofit	0	0	0 *	1	0	0	2	4	2	3
State/local government	0	0	0	0	0	0	1	0 *	0	0 *
Joint/unknown sectors	0	0	0	0	1	1	0	1	1	0
Computer sciences	1,407	1,711	1,975	3,200	2,782	3,368	4,306	5,212	5,414	6,564
Foreign	407	573	628	1,010	906	1,038	1,335	1,744	1,855	2,377
United States	1,000	1,138	1,347	2,190	1,876	2,330	2,971	3,468	3,559	4,187
Federal government	8	11	12	35	12	21	39	41	42	39
Industry	372	445	516	790	740	965	1,136	1,289	1,318	1,341
Academic	590	653	792	1,307	1,076	1,298	1,710	2,043	2,108	2,687
FFRDCs	16	18	13	19	9	13	30	34	34	50
Nonprofit	10	8	7	23	22	24	42	39	36	52
State/local government	3	0	0	1	2	0	0	0	0 *	0
Joint/unknown sectors	3	3	7	14	16	9	14	22	20	17
Agricultural sciences	1,110	923	784	1,223	1,607	1,276	1,754	3,038	2,880	2,924
Foreign	530	443	399	620	736	591	833	1,435	1,565	1,829
United States	580	480	385	603	871	685	921	1,603	1,315	1,095
Federal government	116	94	81	116	149	133	204	404	312	220

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Citation of S&E articles in USPTO patents, by cited field and cited country/sector: 2003–12

Field and sector	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Industry	65	81	59	120	84	90	113	203	155	168
Academic	390	297	237	353	622	445	589	969	824	691
FFRDCs	0	0	0	2	2	4	1	6	3	2
Nonprofit	6	3	4	9	9	4	5	10	14	12
State/local government	1	2	1	0 *	2	0 *	2	1	2	0
Joint/unknown sectors	2	2	2	3	3	8	8	10	5	3
Biological sciences	88,293	72,506	66,539	96,508	94,558	95,994	106,407	144,718	149,974	149,016
Foreign	34,709	28,812	27,364	40,138	39,819	41,823	46,547	64,795	68,762	68,346
United States	53,584	43,694	39,176	56,370	54,739	54,171	59,860	79,923	81,212	80,670
Federal government	4,291	3,418	2,718	4,095	4,043	4,030	4,514	5,847	5,669	5,569
Industry	10,386	8,592	7,657	11,115	10,309	10,230	11,382	14,980	14,833	13,996
Academic	31,500	26,015	23,735	33,775	33,225	32,741	36,077	48,802	50,121	50,704
FFRDCs	776	671	580	847	850	764	893	1,205	1,107	1,095
Nonprofit	6,305	4,735	4,234	6,168	5,976	6,102	6,637	8,625	8,995	8,813
State/local government	202	150	152	234	209	180	223	284	302	287
Joint/unknown sectors	124	113	101	136	127	124	135	180	186	205
Medical sciences	30,379	25,685	22,921	33,142	39,640	43,948	44,044	67,417	71,025	76,054
Foreign	13,448	11,438	10,544	15,660	19,664	22,493	21,571	33,152	35,069	37,773
United States	16,932	14,247	12,377	17,482	19,976	21,455	22,473	34,265	35,956	38,281
Federal government	1,404	1,030	943	1,274	1,519	1,528	1,563	2,414	2,367	2,425
Industry	1,685	1,372	1,331	1,916	2,056	2,164	2,510	3,689	4,013	4,498
Academic	10,987	9,382	7,951	11,328	13,190	14,150	14,480	22,040	23,262	24,702
FFRDCs	173	135	100	145	152	229	153	223	238	200
Nonprofit	2,441	2,131	1,874	2,570	2,794	3,144	3,512	5,456	5,644	5,937
State/local government	131	108	105	138	163	134	151	255	236	303
Joint/unknown sectors	111	90	74	111	102	106	105	187	197	214
Other life sciences	56	44	60	81	57	81	100	127	158	185
Foreign	18	26	25	47	33	40	43	56	56	59
United States	38	18	35	34	24	41	57	71	102	126
Federal government	1	0	1	1	1	4	5	8	8	10
Industry	6	10	18	6	6	10	7	8	10	14
Academic	28	4	12	16	10	24	35	41	71	81
FFRDCs	1	1	0	1	0	0	2	1	1	9
Nonprofit	1	3	3	8	6	3	5	12	11	9
State/local government	0	0	0	1	0	1	0	0 *	0 *	0 *
Joint/unknown sectors	1	0	0	2	1	0 *	2	1	2	3
Psychology	134	137	142	167	156	196	236	318	416	501
Foreign	41	50	43	54	68	79	91	133	163	182
United States	93	87	99	113	88	117	145	185	253	319
Federal government	2	4	2	4	3	3	3	5	14	14
Industry	22	12	15	13	6	13	10	16	28	16
Academic	62	67	73	80	72	89	116	151	190	265

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Field and sector	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
FFRDCs	0	0	0	0	0	0	0	0	0	0
Nonprofit	6	2	6	13	6	10	11	11	17	21
State/local government	0	0	1	3	1	1	3	0	4	2
Joint/unknown sectors	1	1	1	1	1	2	1	1	1	0 *
Social sciences	17	12	28	55	40	65	84	151	125	130
Foreign	4	5	5	13	18	13	15	26	31	42
United States	12	7	22	42	21	52	69	124	94	88
Federal government	0	0	0	1	1	5	4	2	11	15
Industry	3	0	5	5	1	0 *	0	5	4	2
Academic	9	6	17	36	17	45	58	110	76	67
FFRDCs	0	0	1	0	0	0	0	0	0	0
Nonprofit	1	0	0	1	2	1	7	7	2	4
State/local government	0	0	0	0 *	1	0	0	0 *	1	0 *
Joint/unknown sectors	0	1	0	0	0	0	0	0 *	0	0

* = rounds to zero.

FFRDC = federally funded R&D center; USPTO = U.S. Patent and Trademark Office.

NOTES: Citations are references to country/sector of S&E articles in journals covered by the Science Citation Index (SCI) and Social Sciences Citation Index (SSCI). Citations are credited on a fractional-count basis (i.e., for cited articles with collaborating institutions from more than one country/sector, each receives fractional credit on the basis of the proportion of its participating institutions). Citation counts are based on an 11-year window with a 5-year lag (e.g., citations for 2012 are references in USPTO patents issued in 2012 to articles published in 1997–2007). Detail may not add to total because of rounding. Data in the table are not comparable to previous versions due to changes in the cited-year window.

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics, and The Patent Board™, special tabulations (2013) from USPTO, Patent Grant Bibliographic Data, and Thomson Reuters, SCI and SSCI, http://www.thomsonreuters.com/products_services/science/.

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