

Appendix table 5-45

S&E articles in physics, by coauthorship attribute and selected country/economy: 1997–2012

Country/economy and coauthorship attribute	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
World																
Total articles	82,831	84,980	87,269	84,340	86,724	88,378	96,918	91,228	104,273	102,608	100,965	115,461	109,558	102,239	106,754	110,814
with multiple institutions	42,106	43,701	46,641	46,078	48,686	50,355	55,623	53,361	61,146	60,584	60,917	71,009	68,222	64,745	68,386	71,553
with domestic institutions only	63,526	64,756	65,722	62,327	63,749	64,530	71,006	67,030	76,612	76,250	74,519	84,545	80,272	74,109	77,123	79,515
with international institutions	19,305	20,224	21,547	22,013	22,975	23,848	25,912	24,198	27,661	26,358	26,446	30,916	29,286	28,130	29,631	31,299
Canada																
Total articles	2,474	2,318	2,200	2,273	2,253	2,470	2,715	2,621	3,212	3,180	3,058	3,660	3,474	3,098	3,299	3,501
with multiple institutions	1,558	1,551	1,462	1,549	1,521	1,671	1,825	1,831	2,174	2,227	2,149	2,629	2,567	2,284	2,428	2,626
with domestic institutions only	1,279	1,107	1,059	1,037	1,004	1,133	1,244	1,149	1,447	1,470	1,368	1,593	1,480	1,322	1,389	1,388
with international institutions	1,195	1,211	1,141	1,236	1,249	1,337	1,471	1,472	1,765	1,710	1,690	2,067	1,994	1,776	1,910	2,113
Mexico																
Total articles	654	808	942	921	970	967	1,067	951	1,142	1,080	1,068	1,168	1,073	1,006	1,117	1,128
with multiple institutions	411	559	650	682	693	698	718	692	837	816	770	886	817	788	863	895
with domestic institutions only	383	396	507	442	477	485	593	512	614	571	593	595	540	491	519	466
with international institutions	271	412	435	479	493	482	474	439	528	509	475	573	533	515	598	662
United States																
Total articles	21,696	21,787	22,131	21,072	21,791	21,888	23,566	22,300	25,931	24,803	23,177	26,622	24,193	23,049	23,780	25,100
with multiple institutions	13,269	13,314	13,882	13,638	14,225	14,418	15,501	14,799	17,084	16,507	15,834	18,548	17,192	16,493	17,266	18,542
with domestic institutions only	14,690	14,528	14,502	13,247	13,497	13,305	14,454	13,724	15,967	15,485	14,050	15,749	13,795	13,157	13,263	13,597
with international institutions	7,006	7,259	7,629	7,825	8,294	8,583	9,112	8,576	9,964	9,318	9,127	10,873	10,398	9,892	10,517	11,503
Argentina																
Total articles	584	588	658	616	680	695	616	608	734	640	681	740	743	638	707	766
with multiple institutions	432	434	501	478	530	545	465	498	605	515	557	610	628	547	623	691
with domestic institutions only	308	308	327	292	300	337	299	239	301	287	315	319	331	267	281	264
with international institutions	276	280	331	324	380	358	317	369	433	353	366	421	412	371	426	502
Brazil																
Total articles	1,383	1,547	1,749	1,568	2,080	1,967	1,950	2,296	2,270	2,255	2,195	2,495	2,075	2,019	2,177	2,442
with multiple institutions	908	1,041	1,163	1,068	1,438	1,361	1,377	1,568	1,621	1,569	1,623	1,863	1,561	1,537	1,729	1,948
with domestic institutions only	737	846	993	860	1,179	1,082	1,144	1,387	1,337	1,363	1,261	1,395	1,126	1,078	1,069	1,148
with international institutions	646	701	756	708	901	885	806	909	933	892	934	1,100	949	941	1,108	1,294
Chile																
Total articles	116	140	131	151	142	152	222	187	242	287	261	311	300	301	373	537
with multiple institutions	86	97	100	120	109	110	150	140	195	227	214	246	246	252	335	458
with domestic institutions only	50	66	49	52	59	61	108	74	82	101	76	98	104	106	102	157
with international institutions	66	74	82	99	83	91	114	113	160	186	185	213	196	195	271	380
Austria																
Total articles	789	841	897	915	892	899	1,037	924	1,139	971	1,025	1,194	1,035	1,076	1,271	1,282
with multiple institutions	569	625	709	694	691	695	767	745	937	793	822	965	853	910	1,084	1,110
with domestic institutions only	272	275	252	297	276	263	353	265	298	272	298	350	301	287	290	281
with international institutions	517	566	645	618	616	636	684	659	841	699	727	844	734	789	981	1,001

Appendix table 5-45

S&E articles in physics, by coauthorship attribute and selected country/economy: 1997–2012

Country/economy and coauthorship attribute	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Belgium																
Total articles	1,066	1,112	1,251	1,174	1,251	1,350	1,482	1,397	1,529	1,422	1,442	1,583	1,483	1,398	1,500	1,551
with multiple institutions	765	787	949	899	939	1,027	1,108	1,082	1,165	1,113	1,151	1,311	1,236	1,219	1,248	1,330
with domestic institutions only	387	409	417	359	419	442	514	453	527	457	431	469	457	353	418	416
with international institutions	679	703	834	815	832	908	968	944	1,002	965	1,011	1,114	1,026	1,045	1,082	1,135
Czech Republic																
Total articles	595	701	788	735	790	905	840	870	1,051	958	979	1,040	1,036	1,048	1,188	1,320
with multiple institutions	470	556	630	590	639	690	687	682	830	747	813	850	856	882	1,003	1,130
with domestic institutions only	196	211	242	214	218	308	250	277	335	321	311	304	304	290	323	319
with international institutions	399	490	546	521	572	597	590	593	716	637	668	736	732	758	865	1,001
Denmark																
Total articles	906	879	872	913	818	789	826	734	789	700	764	890	828	823	953	1,075
with multiple institutions	699	693	691	711	638	609	636	564	607	526	589	707	648	641	767	886
with domestic institutions only	270	260	249	273	254	253	279	236	258	263	246	283	269	267	291	290
with international institutions	636	619	623	640	564	536	547	498	531	437	518	607	559	556	662	785
Finland																
Total articles	632	666	700	740	720	686	798	749	812	830	830	976	937	852	1,026	1,014
with multiple institutions	457	508	567	595	531	505	590	566	620	626	639	763	758	701	876	864
with domestic institutions only	251	221	214	224	269	262	304	284	304	316	308	351	306	266	282	260
with international institutions	381	445	486	516	451	424	494	465	508	514	522	625	631	586	744	754
France																
Total articles	7,262	7,052	7,608	7,553	7,512	7,442	8,171	7,274	8,408	7,982	7,962	8,939	8,271	7,822	8,085	8,451
with multiple institutions	5,134	4,974	5,574	5,581	5,704	5,739	6,210	5,693	6,616	6,294	6,395	7,209	6,758	6,544	6,866	7,178
with domestic institutions only	3,580	3,361	3,574	3,319	3,226	3,166	3,424	2,888	3,325	3,178	3,072	3,448	3,181	2,770	2,833	2,939
with international institutions	3,682	3,691	4,034	4,234	4,286	4,276	4,747	4,386	5,083	4,804	4,890	5,491	5,090	5,052	5,252	5,512
Germany																
Total articles	10,203	11,196	10,846	10,788	10,653	10,815	11,482	10,267	11,965	11,136	10,573	12,170	11,342	11,037	11,636	12,043
with multiple institutions	6,403	7,127	7,068	7,286	7,325	7,612	8,193	7,444	8,704	8,171	7,924	9,208	8,682	8,680	9,251	9,551
with domestic institutions only	5,112	5,568	5,127	4,750	4,606	4,522	4,606	4,109	4,761	4,535	4,135	4,709	4,397	4,041	4,299	4,471
with international institutions	5,091	5,628	5,719	6,038	6,047	6,293	6,876	6,158	7,204	6,601	6,438	7,461	6,945	6,996	7,337	7,572
Greece																
Total articles	562	588	666	635	742	705	751	696	795	804	947	962	966	830	943	1,076
with multiple institutions	403	445	495	491	551	527	570	527	594	618	728	728	739	653	781	925
with domestic institutions only	220	224	257	225	296	297	289	247	318	321	394	391	363	282	261	275
with international institutions	342	364	409	410	446	408	462	449	477	483	553	571	603	548	682	801
Hungary																
Total articles	532	589	626	705	681	659	747	676	755	664	647	760	630	590	712	825
with multiple institutions	432	481	519	575	556	529	605	557	616	530	544	618	532	493	614	727
with domestic institutions only	150	167	168	191	187	184	196	219	226	217	177	228	162	166	172	180
with international institutions	382	422	458	514	494	475	551	457	529	447	470	532	468	424	540	645

Appendix table 5-45

S&E articles in physics, by coauthorship attribute and selected country/economy: 1997–2012

Country/economy and coauthorship attribute	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Ireland																
Total articles	181	213	246	242	246	268	302	356	457	458	457	555	538	538	607	598
with multiple institutions	121	140	169	179	169	203	221	244	322	353	338	431	430	433	495	528
with domestic institutions only	72	86	98	87	111	96	99	147	176	151	169	194	189	203	229	173
with international institutions	109	127	148	155	135	172	203	209	281	307	288	361	349	335	378	425
Italy																
Total articles	4,541	4,613	4,717	4,655	4,984	5,158	5,668	5,600	5,832	5,561	5,396	6,150	5,352	5,201	5,089	5,522
with multiple institutions	3,707	3,794	3,933	3,926	4,243	4,414	4,824	4,821	5,042	4,758	4,580	5,316	4,643	4,490	4,469	4,915
with domestic institutions only	2,153	2,157	2,181	2,167	2,315	2,353	2,668	2,550	2,534	2,484	2,354	2,582	2,196	2,119	1,849	1,943
with international institutions	2,388	2,456	2,536	2,488	2,669	2,805	3,000	3,050	3,298	3,077	3,042	3,568	3,156	3,082	3,240	3,579
Netherlands																
Total articles	1,722	1,775	1,713	1,773	1,756	1,872	1,933	1,943	2,061	1,898	1,753	1,993	1,849	1,793	1,972	2,057
with multiple institutions	1,135	1,161	1,148	1,245	1,270	1,369	1,423	1,411	1,553	1,404	1,323	1,555	1,441	1,450	1,566	1,672
with domestic institutions only	794	821	802	733	718	773	758	753	759	729	648	696	650	564	690	636
with international institutions	928	954	911	1,040	1,038	1,099	1,175	1,190	1,302	1,169	1,105	1,297	1,199	1,229	1,282	1,421
Poland																
Total articles	2,075	2,039	2,293	2,350	2,417	2,513	2,872	2,523	2,943	2,740	2,575	2,939	2,546	2,554	2,571	2,867
with multiple institutions	1,457	1,443	1,650	1,702	1,752	1,785	2,024	1,858	2,136	1,967	1,855	2,100	1,870	1,861	1,864	2,081
with domestic institutions only	825	779	879	908	942	991	1,157	955	1,187	1,140	1,077	1,348	1,055	1,099	1,126	1,243
with international institutions	1,250	1,260	1,414	1,442	1,475	1,522	1,715	1,568	1,756	1,600	1,498	1,591	1,491	1,455	1,445	1,624
Portugal																
Total articles	329	359	529	492	569	583	696	646	716	839	756	903	885	842	942	1,122
with multiple institutions	267	278	421	404	453	468	571	546	603	732	625	777	787	758	869	1,021
with domestic institutions only	120	133	215	170	215	217	244	211	248	249	288	306	265	242	217	267
with international institutions	209	226	314	322	354	366	452	435	468	590	468	597	620	600	725	855
Spain																
Total articles	2,362	2,505	2,720	2,662	2,689	2,758	2,997	3,055	3,571	3,449	3,597	4,076	3,968	3,770	4,056	4,376
with multiple institutions	1,653	1,756	1,961	1,925	1,986	2,038	2,249	2,312	2,709	2,683	2,781	3,315	3,252	3,114	3,398	3,745
with domestic institutions only	1,159	1,182	1,234	1,166	1,180	1,196	1,292	1,284	1,454	1,355	1,463	1,523	1,434	1,292	1,313	1,320
with international institutions	1,203	1,323	1,486	1,496	1,509	1,562	1,705	1,771	2,117	2,094	2,134	2,553	2,534	2,478	2,743	3,056
Sweden																
Total articles	1,524	1,527	1,568	1,668	1,757	1,784	1,694	1,676	1,779	1,686	1,666	1,737	1,661	1,596	1,753	1,910
with multiple institutions	1,113	1,102	1,149	1,250	1,366	1,367	1,307	1,288	1,348	1,292	1,288	1,372	1,322	1,278	1,425	1,542
with domestic institutions only	594	617	602	640	629	648	581	591	613	580	535	533	486	455	481	513
with international institutions	930	910	966	1,028	1,128	1,136	1,113	1,085	1,166	1,106	1,131	1,204	1,175	1,141	1,272	1,397
United Kingdom																
Total articles	6,049	6,368	6,623	6,645	6,148	6,376	6,683	6,395	7,314	6,813	6,708	7,868	7,275	6,802	7,052	7,281
with multiple institutions	3,690	3,896	4,117	4,175	4,005	4,256	4,455	4,367	5,062	4,751	4,785	5,766	5,367	5,086	5,274	5,588
with domestic institutions only	3,209	3,401	3,409	3,337	2,969	2,964	3,059	2,860	3,199	2,952	2,818	3,026	2,815	2,586	2,624	2,533
with international institutions	2,840	2,967	3,214	3,308	3,179	3,412	3,624	3,535	4,115	3,861	3,890	4,842	4,460	4,216	4,428	4,748

Appendix table 5-45

S&E articles in physics, by coauthorship attribute and selected country/economy: 1997–2012

Country/economy and coauthorship attribute	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Norway																
Total articles	349	287	317	307	308	289	317	367	427	438	463	505	415	450	556	624
with multiple institutions	267	218	249	234	244	221	267	316	354	351	380	404	339	370	456	546
with domestic institutions only	122	95	92	103	92	91	71	85	111	122	140	132	118	117	177	132
with international institutions	227	192	225	204	216	198	246	282	316	316	323	373	297	333	379	492
Russia																
Total articles	8,198	8,549	8,644	8,188	7,815	7,869	7,983	7,208	7,573	7,086	6,796	7,424	7,462	6,805	7,182	7,159
with multiple institutions	4,013	4,270	4,525	4,477	4,467	4,747	4,900	4,423	4,840	4,393	4,260	4,613	4,566	4,208	4,563	4,687
with domestic institutions only	4,994	5,195	5,038	4,594	4,200	4,015	4,047	3,684	3,658	3,608	3,444	3,862	4,140	3,788	3,987	3,860
with international institutions	3,204	3,354	3,606	3,594	3,615	3,854	3,936	3,524	3,915	3,478	3,352	3,562	3,322	3,017	3,195	3,299
Switzerland																
Total articles	2,263	2,309	2,281	2,251	1,963	2,097	2,321	2,201	2,386	2,355	2,370	2,519	2,355	2,340	2,609	2,777
with multiple institutions	1,619	1,653	1,678	1,676	1,424	1,613	1,780	1,706	1,808	1,775	1,863	2,037	1,924	1,922	2,158	2,348
with domestic institutions only	776	822	737	714	637	589	665	650	736	738	654	634	557	559	620	576
with international institutions	1,487	1,487	1,544	1,537	1,326	1,508	1,656	1,551	1,650	1,617	1,716	1,885	1,798	1,781	1,989	2,201
Iran																
Total articles	76	107	113	157	159	232	294	349	480	582	641	1,026	1,204	1,200	1,534	1,809
with multiple institutions	57	86	87	104	113	145	190	230	286	354	391	595	665	715	906	1,074
with domestic institutions only	54	75	81	104	112	157	202	239	346	435	473	793	970	971	1,169	1,384
with international institutions	22	32	32	53	47	75	92	110	134	147	168	233	234	229	365	425
Israel																
Total articles	1,404	1,488	1,401	1,393	1,350	1,441	1,525	1,322	1,459	1,383	1,440	1,617	1,384	1,367	1,420	1,574
with multiple institutions	898	934	895	931	942	956	1,017	899	997	924	973	1,100	957	970	1,022	1,168
with domestic institutions only	680	734	699	658	563	655	711	600	683	622	658	729	613	559	565	630
with international institutions	724	754	702	735	787	786	814	722	776	761	782	888	771	808	855	944
Saudi Arabia																
Total articles	69	65	57	53	75	84	91	91	94	110	112	135	183	246	421	539
with multiple institutions	30	26	32	26	34	41	52	51	53	69	71	77	126	196	334	440
with domestic institutions only	50	44	32	32	48	51	49	53	49	49	53	69	74	65	106	129
with international institutions	19	21	25	21	27	33	42	38	45	61	59	66	109	181	315	410
Turkey																
Total articles	289	332	369	355	461	534	680	714	815	820	889	1,065	1,028	915	1,105	1,403
with multiple institutions	159	186	187	197	233	293	386	400	459	448	517	650	671	631	786	1,026
with domestic institutions only	184	218	245	211	300	336	452	495	567	579	639	716	679	571	641	760
with international institutions	105	114	124	144	161	198	228	219	248	241	250	349	349	344	464	643
Egypt																
Total articles	197	197	268	262	321	302	357	337	347	390	389	414	448	416	502	540
with multiple institutions	89	97	124	119	138	138	195	172	177	196	210	230	268	271	379	433
with domestic institutions only	144	134	199	182	235	225	244	231	242	293	270	294	266	256	209	188
with international institutions	53	63	69	80	86	77	113	106	105	97	119	120	182	160	293	352

Appendix table 5-45

S&E articles in physics, by coauthorship attribute and selected country/economy: 1997–2012

Country/economy and coauthorship attribute	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
South Africa																
Total articles	202	254	276	203	204	233	184	221	228	257	255	317	333	299	437	612
with multiple institutions	154	179	207	136	146	163	132	162	183	187	192	260	266	255	377	537
with domestic institutions only	77	109	109	86	86	104	66	81	66	111	94	105	123	96	119	184
with international institutions	125	145	167	117	118	129	118	140	162	146	161	212	210	203	318	428
China																
Total articles	4,475	4,405	4,610	5,069	5,733	6,388	8,357	9,160	12,047	13,238	14,556	17,936	18,880	17,885	19,574	21,595
with multiple institutions	2,827	2,913	3,014	3,308	3,764	4,220	5,371	5,770	7,546	8,141	8,957	11,204	12,077	11,476	12,934	14,257
with domestic institutions only	3,477	3,242	3,398	3,704	4,206	4,706	6,347	7,091	9,488	10,457	11,533	14,217	14,786	13,889	14,891	16,382
with international institutions	998	1,163	1,212	1,365	1,527	1,682	2,010	2,069	2,559	2,781	3,023	3,719	4,094	3,996	4,683	5,213
India																
Total articles	2,157	2,332	2,312	2,209	2,501	2,534	2,807	2,686	3,276	3,622	3,591	4,671	4,659	4,531	4,847	5,170
with multiple institutions	1,031	1,132	1,206	1,161	1,317	1,407	1,532	1,487	1,874	2,104	2,087	2,916	2,867	2,836	3,040	3,279
with domestic institutions only	1,647	1,738	1,695	1,540	1,739	1,752	1,937	1,857	2,194	2,544	2,535	3,244	3,293	3,121	3,354	3,495
with international institutions	510	594	617	669	762	782	870	829	1,082	1,078	1,056	1,427	1,366	1,410	1,493	1,675
Japan																
Total articles	10,978	11,319	12,173	11,906	12,545	12,452	14,429	12,357	13,083	12,517	11,881	12,508	11,334	10,319	10,521	10,428
with multiple institutions	5,847	6,308	7,050	7,088	7,677	7,626	9,126	8,125	8,748	8,324	8,202	8,775	7,941	7,381	7,665	7,580
with domestic institutions only	8,769	8,967	9,581	9,169	9,645	9,503	10,838	9,092	9,527	9,180	8,552	8,805	7,992	7,106	7,141	6,967
with international institutions	2,209	2,352	2,592	2,737	2,900	2,949	3,591	3,265	3,556	3,337	3,329	3,703	3,342	3,213	3,380	3,461
Singapore																
Total articles	273	335	474	548	666	689	706	838	960	1,082	1,074	1,253	1,373	1,172	1,306	1,353
with multiple institutions	147	185	272	320	392	390	457	561	658	761	778	978	1,041	917	1,014	1,098
with domestic institutions only	172	216	314	366	446	464	438	533	559	672	586	615	685	534	559	546
with international institutions	101	119	160	182	220	225	268	305	401	410	488	638	688	638	747	807
South Korea																
Total articles	1,937	2,183	2,584	2,533	2,981	3,400	3,796	3,764	4,243	4,215	4,514	5,305	5,494	4,917	5,407	5,483
with multiple institutions	1,297	1,437	1,730	1,742	2,090	2,418	2,710	2,640	2,987	3,003	3,242	3,839	3,959	3,583	4,061	4,143
with domestic institutions only	1,373	1,590	1,903	1,839	2,095	2,416	2,575	2,628	2,866	2,889	3,134	3,626	3,836	3,410	3,567	3,519
with international institutions	564	593	681	694	886	984	1,221	1,136	1,377	1,326	1,380	1,679	1,658	1,507	1,840	1,964
Taiwan																
Total articles	1,168	1,297	1,309	1,374	1,573	1,635	1,822	1,955	2,447	2,502	2,690	3,101	2,986	2,778	3,057	2,858
with multiple institutions	672	731	817	905	1,057	1,108	1,235	1,379	1,721	1,790	1,964	2,280	2,297	2,171	2,382	2,258
with domestic institutions only	905	1,012	960	964	1,103	1,132	1,293	1,394	1,782	1,885	1,983	2,249	2,140	1,994	2,106	1,856
with international institutions	263	285	349	410	470	503	529	561	665	617	707	852	846	784	951	1,002
Australia																
Total articles	1,474	1,547	1,456	1,299	1,423	1,412	1,562	1,466	1,731	1,714	1,841	2,112	2,121	1,954	2,066	2,423
with multiple institutions	791	912	869	799	910	927	1,028	969	1,155	1,164	1,275	1,521	1,538	1,416	1,544	1,901
with domestic institutions only	870	869	798	695	717	678	743	706	801	766	853	858	888	794	788	833
with international institutions	604	678	658	604	706	734	819	760	930	948	988	1,254	1,233	1,160	1,278	1,590

Appendix table 5-45

S&E articles in physics, by coauthorship attribute and selected country/economy: 1997–2012

Country/economy and coauthorship attribute	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
New Zealand																
Total articles	178	184	192	187	194	170	184	182	245	226	213	289	263	252	330	325
with multiple institutions	99	112	98	118	135	108	118	115	164	147	157	201	171	187	269	265
with domestic institutions only	88	88	106	80	73	73	84	82	109	112	89	122	112	91	92	87
with international institutions	90	96	86	107	121	97	100	100	136	114	124	167	151	161	238	238

NOTES: Article counts are from the set of journals covered by the Science Citation Index (SCI) and Social Sciences Citation Index (SSCI). Articles are classified by the year they entered the database, rather than the year of publication, and are assigned to a country/economy on the basis of the institutional address(es) listed in the article. Articles are credited on a whole-count basis (i.e., each collaborating country/economy is credited with one count). Countries/economies with less than 1% of internationally coauthored articles in 2012 are omitted. Articles with multiple institutions are counts of articles with two or more institutional addresses. Articles with domestic institutions only are counts of articles with one or more institutional addresses all within the country/economy. Articles with international institutions are counts of articles with one or more institutional addresses outside the country/economy.

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

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