

Table 65. Companies that collaborated with universities, by industry and type of collaboration: 2023

(Percent)

Industry	NAICS code	All companies (number)	All companies with any kind of collaborative research (number)	All companies with any kind of collaborative research	Performed collaborative research with university researchers	Funded university research	Funded PhD students and postdoctoral researchers at universities	Licensed or purchased IP from a university	Signed nondisclosure agreements, material transfer agreements, or other agreements with universities governing usage of IP	Hired science and engineering graduates	Engaged in formal or informal personnel exchanges with universities
All industries	11, 21–23, 31–33, 42–81	5,033,879	128,746	2.6	30.4	8.7	5.9	4.7	14.8	42.2	51.2
Manufacturing industries	31–33	207,352	11,476	5.5	34.9	13.6	6.9	7.1	19.9	59.7	41.6
Food	311	18,929	880	4.6	54.2	27.3	15.3	r 6.0	11.0	31.9	54.2
Beverage and tobacco products	312	9,236	658	7.1	49.8	3.8	r 2.1	r 1.8	r 11.1	24.6	69.3
Textile, apparel, and leather products	313–16	9,223	197	2.1	31.0	0.5	r 1.5	r 16.8	r 17.8	r 29.4	61.4
Wood products	321	9,572	70	0.7	41.4	r 17.1	0.0	4.3	r 15.7	48.6	37.1
Paper	322	2,042	91	4.5	50.5	r 25.3	r 3.3	0.0	r 16.5	r 70.3	35.2
Printing and related support activities	323	18,767	277	1.5	2.2	r 1.8	r 1.4	r 19.9	r 28.9	r 23.8	35.7
Petroleum and coal products	324	222	25	11.3	60.0	32.0	28.0	12.0	48.0	80.0	12.0
Chemicals	325	7,878	1,263	16.0	51.9	27.5	16.5	17.3	34.0	61.4	41.9
Pesticide, fertilizer, and other agricultural chemicals	3253	499	69	13.8	r 82.6	r 34.8	r 7.2	r 4.3	r 24.6	r 49.3	49.3
Pharmaceuticals and medicines	3254	1,702	441	25.9	61.9	39.5	9.3	19.0	40.1	48.5	31.3
Soap, cleaning compound, and toilet preparation	3256	1,817	190	10.5	52.1	r 6.3	4.2	r 2.6	r 8.9	r 46.8	56.3
Other chemicals	other 325	3,860	563	14.6	40.1	24.3	27.4	r 22.6	r 38.9	78.2	44.2
Plastics and rubber products	326	6,787	333	4.9	20.7	r 6.9	r 3.0	r 2.7	r 12.0	r 86.5	39.9
Nonmetallic mineral products	327	7,659	295	3.9	42.7	r 5.8	r 4.7	r 19.3	r 27.5	r 23.4	37.3
Primary metals	331	1,933	115	5.9	30.4	r 24.3	13.0	r 6.1	20.0	72.2	31.3
Fabricated metal products	332	47,168	1,556	3.3	21.3	r 13.5	r 5.1	r 4.6	r 17.2	56.9	44.7
Machinery	333	17,417	2,032	11.7	25.2	r 6.4	2.0	1.2	15.1	86.3	26.7
Computer and electronic products	334	8,108	1,553	19.2	42.2	17.1	11.3	11.1	25.5	68.9	35.9
Communications equipment	3342	973	114	11.7	17.5	r 22.8	r 8.8	r 6.1	r 14.9	72.8	22.8
Semiconductor and other electronic components	3344	2,583	345	13.4	47.8	15.7	12.2	r 17.1	r 31.3	80.0	38.3
Navigational, measuring, electromedical, and control instruments	3345	3,674	1,004	27.3	45.3	16.8	12.0	9.8	26.5	64.4	38.6
Other computer and electronic products	other 334	878	89	10.1	16.9	r 18.0	r 3.4	9.0	6.7	71.9	12.4
Electrical equipment, appliances, and components	335	4,012	493	12.3	41.8	15.4	4.9	2.4	22.9	r 65.3	30.4
Transportation equipment	336	7,200	546	7.6	28.6	r 11.5	6.0	4.4	14.8	80.2	41.9
Automobiles, bodies, trailers, and parts	3361–63	4,517	270	6.0	31.1	r 10.7	6.3	4.8	15.2	74.1	33.0
Aerospace products and parts	3364	907	167	18.4	37.1	15.0	7.8	r 6.6	r 18.6	83.8	38.3
Other transportation	other 336	1,776	109	r 6.1	r 10.1	r 9.2	r 2.8	0.0	r 7.3	r 89.9	69.7
Furniture and related products	337	11,432	148	1.3	57.4	13.5	0.0	0.0	10.1	r 45.3	16.2
Miscellaneous	339	19,766	943	4.8	22.5	7.0	3.1	7.1	r 22.1	44.0	59.0
Medical equipment and supplies	3391	7,071	501	7.1	32.5	12.0	4.2	12.2	r 27.5	52.7	47.1

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Other miscellaneous manufacturing	3399	12,695	441	3.5	11.1	1.4	1.6	1.4	16.1	34.2	72.6
Nonmanufacturing industries	11, 21–23, 42–81	4,826,527	117,270	2.4	30.0	8.2	5.8	4.5	14.3	40.5	52.1
Agriculture, forestry, fishing, and hunting	11	18,408	490	2.7	65.9	20.2	0.0	17.1	16.9	19.4	61.6
Mining, extraction, and support activities	21	14,212	383	2.7	34.2	12.3	5.5	0.8	9.7	52.2	52.5
Utilities	22	3,367	153	4.5	56.9	18.3	4.6	3.3	34.0	54.9	19.6
Construction	23	697,532	6,483	0.9	11.5	3.1	2.3	3.1	7.2	62.6	36.3
Wholesale trade	42	236,689	6,071	2.6	34.8	14.4	7.3	5.0	18.2	41.8	44.4
Retail trade	44–45	542,047	6,707	1.2	33.5	11.6	8.1	7.3	14.2	28.1	65.1
Transportation and warehousing	48–49	184,207	1,209	0.7	37.3	8.0	10.8	8.2	15.6	37.9	55.8
Information	51	67,109	4,994	7.4	24.4	6.8	5.2	6.0	19.4	54.1	44.2
Publishing	511	19,008	2,367	12.5	27.5	7.6	5.8	5.9	18.3	64.3	40.6
Newspaper, periodical, book, and directory publishers	5111	8,557	338	4.0	13.3	3.8	2.1	3.6	7.7	11.5	74.6
Software publishers	5112	10,451	2,029	19.4	29.9	8.2	6.5	6.3	20.0	73.1	34.9
Telecommunications	517	6,886	251	3.6	26.7	26.7	21.5	21.9	24.3	67.7	52.2
Data processing, hosting, and related services	518	8,312	1,058	12.7	22.2	7.4	1.2	8.0	21.6	67.4	40.1
Other information	other 51	32,903	1,318	4.0	20.3	1.3	4.2	1.4	18.7	22.6	52.7
Finance and insurance	52	195,489	2,436	1.2	17.0	15.3	2.4	6.7	11.7	32.9	64.3
Real estate and rental and leasing	53	282,087	1,793	0.6	20.4	13.9	7.8	5.6	15.2	21.3	63.7
Lessors of nonfinancial intangible assets (except copyrighted works)	533	1,783	4	0.2	50.0	0.0	50.0	0.0	50.0	50.0	0.0
Other real estate and rental and leasing	other 53	280,304	1,789	0.6	20.3	13.9	7.7	5.6	15.0	21.2	63.9
Professional, scientific, and technical services	54	730,285	45,919	6.3	32.5	8.3	5.7	4.6	18.8	53.3	43.3
Legal services	5411	153,500	2,260	1.5	18.6	10.9	6.4	3.3	3.6	18.1	67.6
Accounting, tax preparation, bookkeeping, and payroll services	5412	108,031	709	0.7	20.9	6.2	0.3	0.0	16.1	30.7	61.9
Architectural, engineering, and related services	5413	88,454	12,604	14.2	16.9	3.8	3.2	0.8	9.0	82.3	30.5
Specialized design services	5414	28,137	1,014	3.6	24.2	0.2	3.4	0.1	17.6	19.6	68.0
Computer systems design and related services	5415	99,385	8,000	8.0	29.6	5.4	5.7	5.4	22.5	68.0	29.3
Management, scientific, and technical consulting services	5416	156,771	11,432	7.3	41.3	7.6	4.5	2.1	19.7	28.0	54.3
Scientific research and development services	5417	11,544	5,376	46.6	71.9	29.9	18.0	22.8	48.9	53.6	41.2
Advertising, public relations, and related services	5418	27,216	702	2.6	20.7	4.3	0.0	0.9	37.0	10.0	53.0
Other professional, scientific, and technical services	5419	57,246	3,822	6.7	22.7	2.3	3.1	1.2	4.2	44.5	58.5
Management of companies and enterprises	55	2,682	137	5.1	23.4	1.5	0.0	0.0	0.0	98.5	0.7
Administrative and support and waste management and remediation services	56	305,400	4,229	1.4	29.1	12.5	10.7	7.7	18.2	40.9	54.3

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Educational services	61	61,684		3,783	6.1		28.1		3.1		3.1	r	1.0	r	19.0		20.5		63.7	
Health care and social assistance	62	549,826		23,151	4.2		28.8		4.8		4.4		1.0		4.6		23.2		65.6	
Health care services	621–23	482,098		21,078	4.4		28.0		4.6		4.2		1.0		4.4		24.3		66.2	
Social assistance	624	67,728		2,073	3.1		37.0		6.4		6.6		1.4	r	6.0		11.5		59.6	
Arts, entertainment, and recreation	71	97,837		2,891	3.0		22.0		6.3		3.9	r	5.8	r	10.1		18.0		68.8	
Accommodation and food services	72	492,801		4,090	0.8		40.7		16.7		9.9		14.0		14.3		21.5		58.4	
Other services	81	344,866		2,350	0.7		36.9		6.6	r	10.0	r	2.0	r	13.8		17.2		62.3	

r = relative standard error > 50%.

IP = intellectual property; NAICS = 2022 North American Industry Classification System.

Note(s):
Detail may not add to total because of rounding or unavailable NAICS detail for select records beyond the 4-digit industry classification. Industry classification is based on dominant establishment payroll. Statistics are representative of companies located in the United States.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, 2024 Annual Business Survey: Data Year 2023.