

Foreign nationals receive a plurality of U.S. graduate STEM degrees. They are mostly federally funded

Across the eight core STEM fields, non-resident students on temporary visas received **40.2%** of master's degrees and **38.8%** of research doctorates awarded between 2021 and 2025.

In 1979, temporary-visa holders took **11.59%** of all U.S. research doctorates. By 2024 that had reached **33.32%** — close to a threefold increase in the share.

40.2%

of core-STEM master's degrees went to temporary-visa holders, 2021–2025 (475,551 of 1,182,438)

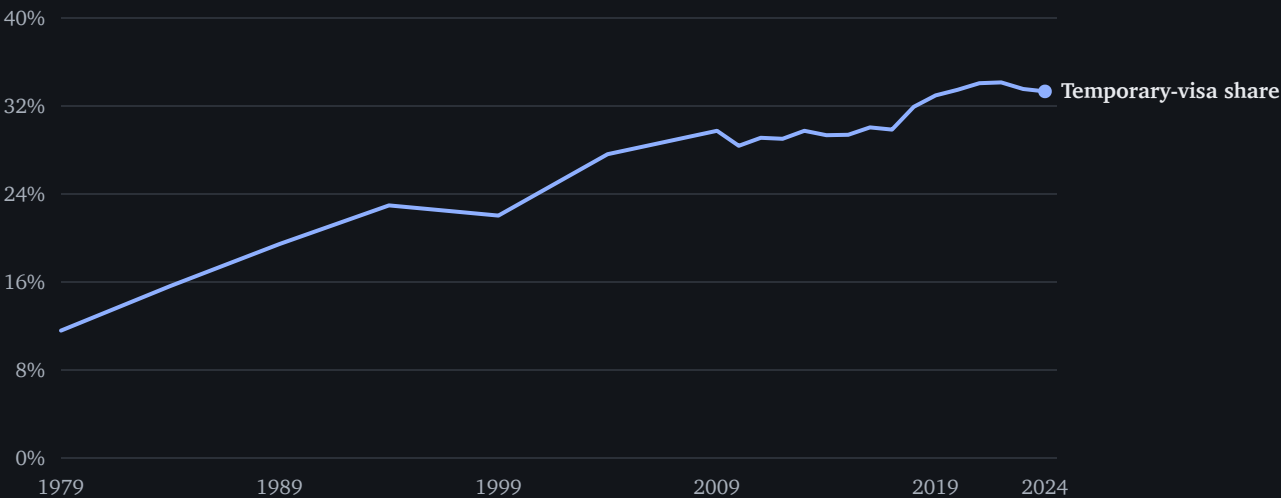
76.0%

of visa-holding S&E doctorate recipients were funded by assistantships, against 53.1% of citizens

\$874,630

median federal research obligations per research doctorate awarded, across 99 institutions

THE LONG VIEW



Temporary-visa share of all U.S. research doctorates, 1979–2024. Five-yearly to 2004, annual from 2009. Peak 34.15% in 2022. Source: NSF NCSSES Survey of Earned Doctorates, a census of every research doctorate awarded by a U.S. institution.

Full data, per-institution detail and source code: phd-demographics.andy-barr.com

Every figure in this document comes from federal statistical sources — the National Center for Education Statistics, the National Science Foundation, the Department of Homeland Security, the State Department and the Department of Labor. No estimates, models or projections are used. Page 38 states plainly what these data do not establish.

Five findings, each from a federal source

1 · THE SHIFT IS AT MASTER'S LEVEL, AND IT HAS NOT TURNED

Non-residents took **24.4%** of core-STEM master's degrees in 1995 and **45.9%** in 2025. The doctorate moved +4.8 points over the same thirty years, peaked in 2021 and has fallen since. American output rose at both levels — master's +189% — so this is a change in *share*, not an American retreat. IPEDS Completions. Page 6.

2 · THE FEDERALLY FUNDED ROUTE IS THE ONE AMERICANS TAKE LEAST

Research assistantships are how federal money reaches doctoral students: 52,428 federally supported research assistantships against 1,041 teaching ones. They fund **48.9%** of visa holders against **29.3%** of citizens — a gap of 19.6 points that has not fallen below 19.3 in any of the seven years on record. NSF SED and GSS. Pages 9, 10.

3 · THE MONEY AND THE ENROLMENT ARE IN THE SAME INSTITUTIONS

Across the 99 institutions awarding at least a hundred core-STEM research doctorates, federal obligations run to a median of **\$874,630** for every research doctorate awarded — the scale of public research money moving through them. And at **108** institutions a majority of graduate students hold a temporary visa: those hold **\$19.4bn** of federal research expenditure, 32.9% of the matched total, and 210,870 graduate students. A second model sits beside it: at the highest-share master's programmes there is almost no federal research money and **\$3.36bn** a year in published tuition billed to non-resident master's graduates. NSF Federal Support Survey, HERD and GSS; IPEDS. An intensity ratio, not a price — those obligations fund research, not only degrees. Pages 9, 11, 15.

4 · THE WORK VISA IS CHEAPER TWICE OVER

First on the wage: **84.0%** of the 517,103 H-1B filings that can be placed promise *less than the median wage for their occupation in the metropolitan area where the work is*. For software developers the four legal wage levels run 63%, 74%, 91% and 105% of that median — three of the four sit below it. Then on the tax: wages earned on Optional Practical Training carry no Social Security or Medicare, saving the employer **7.65%** of payroll across 289,938 authorisations. DOL OFLC and BLS OEWS state file; IRC 3121(b)(19); DHS SEVR Pages 19, 18.

5 · THE STUDENT VISA IS THE FRONT OF A ROUTE TO PERMANENT RESIDENCE

58.3% of those who earned a U.S. doctorate on a temporary visa now hold citizenship or a green card; only 9.8% remain on a temporary visa. Nationally, **74.6%** of employment-based green cards go to people already in the country, against 5.4% on the family route. NSF SDR; DHS Yearbook. Pages 33, 34.

What follows from it, and what the data will not support

THE MECHANISM, IN ONE LINE

Graduate study is the entry point; the work visa is cheaper to the employer than an American at the same salary; and the green card that ends it is filed by that employer, for a named job. An Indian national reaching the front of the EB-2 queue has waited **12.7 years** — a category that was *current* before 2005 — against 1.2 for everyone else. Through all of it, leaving the employer means starting again. State Department Visa Bulletin. Page 22.

WHERE ENFORCEMENT IS

The Labor Department has found H-1B violations in **2,887** investigations since 2000, agreeing **\$123m** in back wages for 13,640 employees. Measured against the size of the programme, it looks less often than it used to: **2.4** investigations per 10,000 H-1B visas issued in 2024, against 26.2 at the peak. DOL WHISARD. Page 23.

WHAT THIS DOCUMENT DOES NOT CLAIM

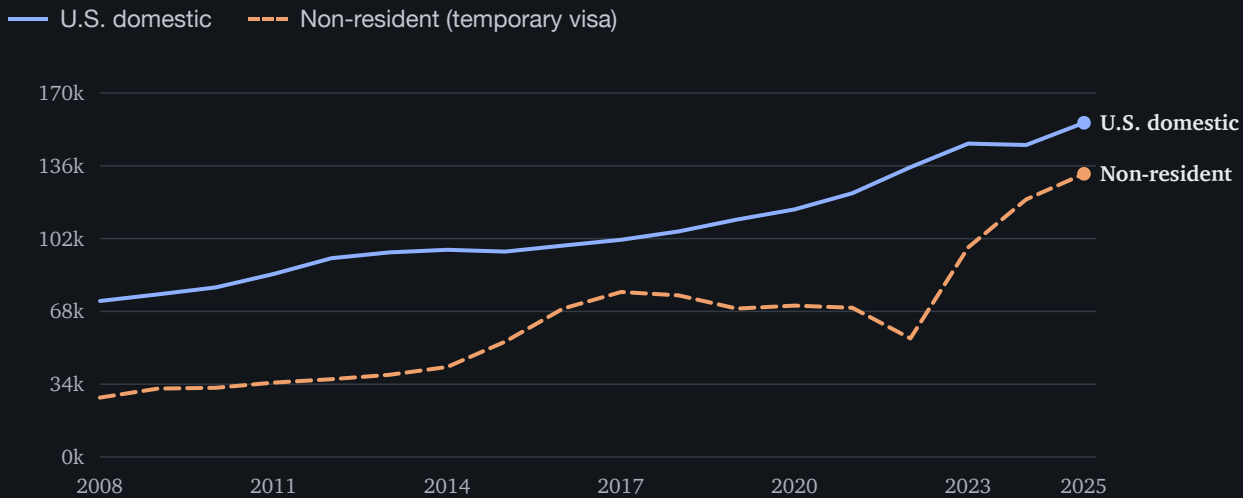
- **Not that foreign graduates are paid less.** Compared within a graduation cohort, pay is level. That comparison was run, and the first version of it — a \$30,000 gap — was withdrawn once cohort was controlled.
- **Not that federal grants paid named foreign students.** Research expenditure is recorded at the institution and never at a person. The claim is about institutions and their graduate operations in bulk.
- **Not that violations rose or fell.** Enforcement counts what was *found*, which needs a complaint. A falling line is equally consistent with fewer complaints from workers who depend on the employer they would report.
- **Not that Americans left STEM.** Domestic output rose at every level measured. What fell is the domestic share, and the rate at which American bachelor's graduates go on to a doctorate.

THE THREE THINGS NO FEDERAL SOURCE WILL ANSWER

Cap-exempt status per employer, which USCIS records and does not publish. Graduate applications and admissions, which no agency collects — so falling domestic conversion cannot be attributed to choice, rejection or funding. And citizens separated from permanent residents at conferral, collected in three categories and published in two. Each is set out on page 40.

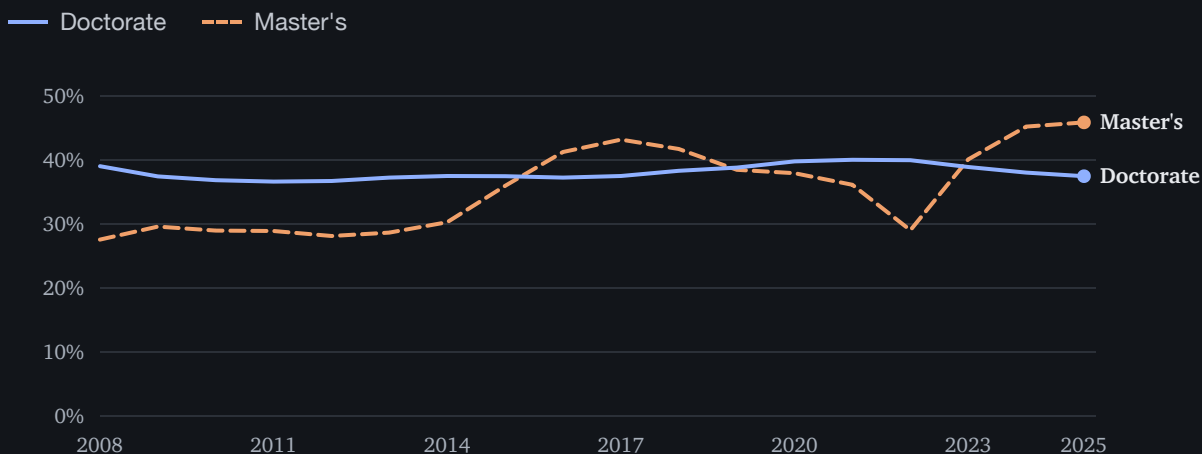
The master's degree is where the change happened

Between 2008 and 2025, core-STEM master's degrees awarded to U.S. domestic students rose **114%**. Awards to non-residents rose **377%** — more than three times as fast. Domestic production did not fall; it was outpaced.



Core-STEM master's degrees conferred, 2008–2025. Non-resident awards grew from 27,718 to 132,149; domestic awards from 72,802 to 155,921. Source: IPEDS Completions, CIP families 11, 14, 15, 26, 27, 30, 40, 42.

THE TWO LEVELS BEHAVE DIFFERENTLY



Non-resident share of core-STEM degrees conferred, by level, 2008–2025. The master's share rose from 27.6% to 45.9%. The doctorate share was 39.0% in 2008 and 37.5% in 2025.

An important qualification. At the doctorate level the share is not rising. It has moved within a narrow band for nearly two decades and sits below its 2021–22 peak of 40.1%. Since 2008, domestic doctorate output grew 43% against 34% for non-residents. The doctorate concern is the sustained *level* — roughly two in five — not a worsening trend.

Americans are not leaving STEM. They are stopping before the doctorate

Domestic core-STEM completions rose at every level between 2011 and 2025. The shortfall is not in how many Americans earn STEM degrees.

+56%

domestic bachelor's degrees, 2011–2025 (399,752 to 624,699)

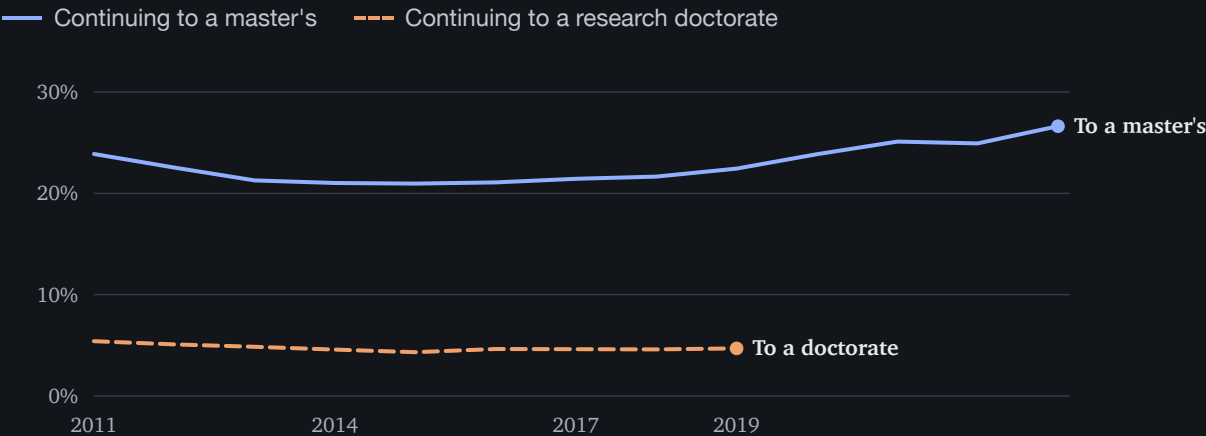
+82%

domestic master's degrees (85,451 to 155,921)

+35%

domestic research doctorates (19,059 to 25,794)

What changed is where they stop. Of a domestic bachelor's cohort, the share going on to a master's **rose** from 23.88% to 26.63%. The share going on to a research doctorate **fell** from 5.41% to 4.7% — a decline of about an eighth.



Domestic bachelor's cohort continuing to a graduate degree. Plotted by the year of the bachelor's cohort, against master's two years later and doctorates six. The lag is a modelling choice; IPEDS counts degrees, not people, so this is a ratio between two populations rather than a tracked cohort. Source: IPEDS Completions.

DOCTORATES BY FIELD, 2011–2025

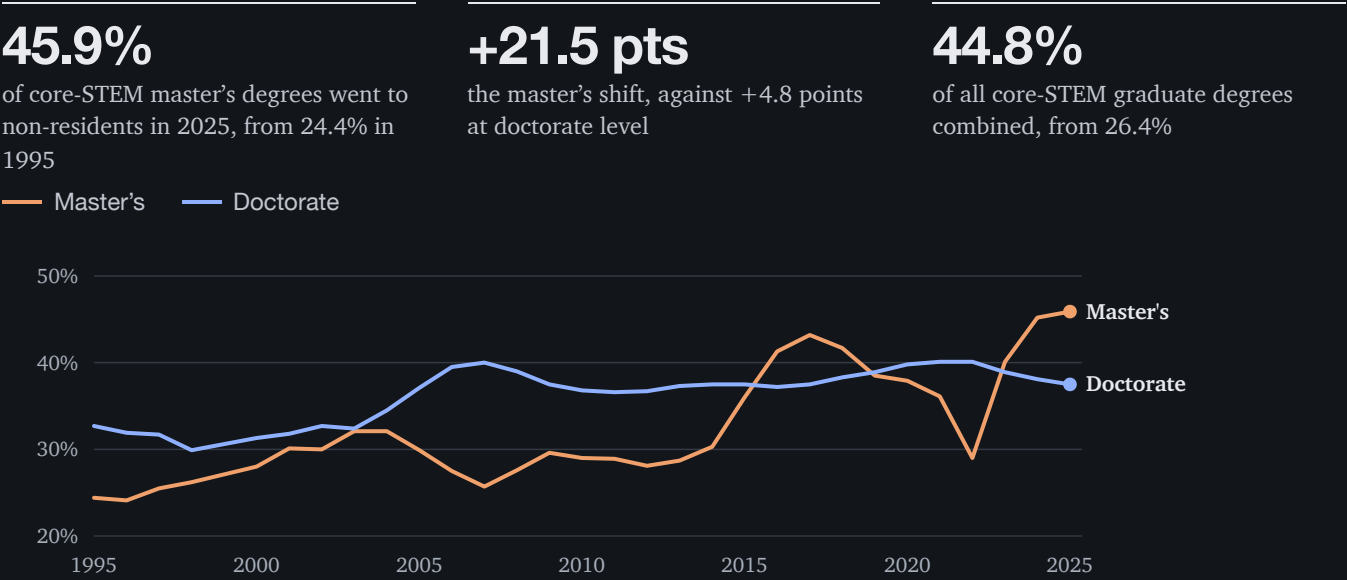
FIELD	DOMESTIC 2011	DOMESTIC 2025	DOMESTIC	NON-RESIDENT
Statistics	155	142	-8%	+97%
Electrical engineering	693	695	+0%	+9%
Physics	853	1,070	+25%	+25%
Civil engineering	271	372	+37%	+78%
Mechanical engineering	484	811	+68%	+58%
Computer science	361	699	+94%	+209%

Research doctorates conferred. Source: IPEDS Completions.

Fields differ, and two here run against the pattern: mechanical engineering's domestic output grew faster than its non-resident output, and physics moved in step. The exception that matters is electrical engineering, where American doctorate production has not moved in fourteen years while non-resident production rose.

Across thirty years the shift is at master’s level, and it is now approaching half of all core-STEM master’s degrees

The doctorate is the smaller end of graduate education and the one most often measured. Taken across every year IPEDS supports, the master’s degree moved more than four times as far.



Non-resident share of core-STEM degrees conferred, 1995–2025. First majors only. The doctorate peaked at 40.1% in 2021 and has fallen since; the master’s has not turned. Source: NCES IPEDS Completions.

LEVEL	1995	2025	CHANGE (PTS)	NON-RESIDENT	DOMESTIC
Master’s	24.4%	45.9%	+21.5	+658%	+189%
Doctorate	32.7%	37.5%	+4.8	+115%	+74%
Graduate, combined	26.4%	44.8%	+18.4	+499%	+164%

A separate collection reaches further back and is restricted to science, engineering and health. On it, the temporary-visa share of graduate *enrolment* went from **13.7%** in 1980 to **38.5%**, and among postdoctoral researchers from 35.4% to **58.3%** — a majority of the people doing the country’s postdoctoral science.

Domestic output rose at both levels over the period — master’s +189%, doctorate +74% — so this is a change in share, not an American retreat. Non-resident is a *visa* category: a permanent resident is counted under their race and appears here as domestic, so these lines understate the foreign-born share and say nothing about where the visa holders end up. Page 33 follows that.

The categories are one field, not two: non-resident sits beside the race groups

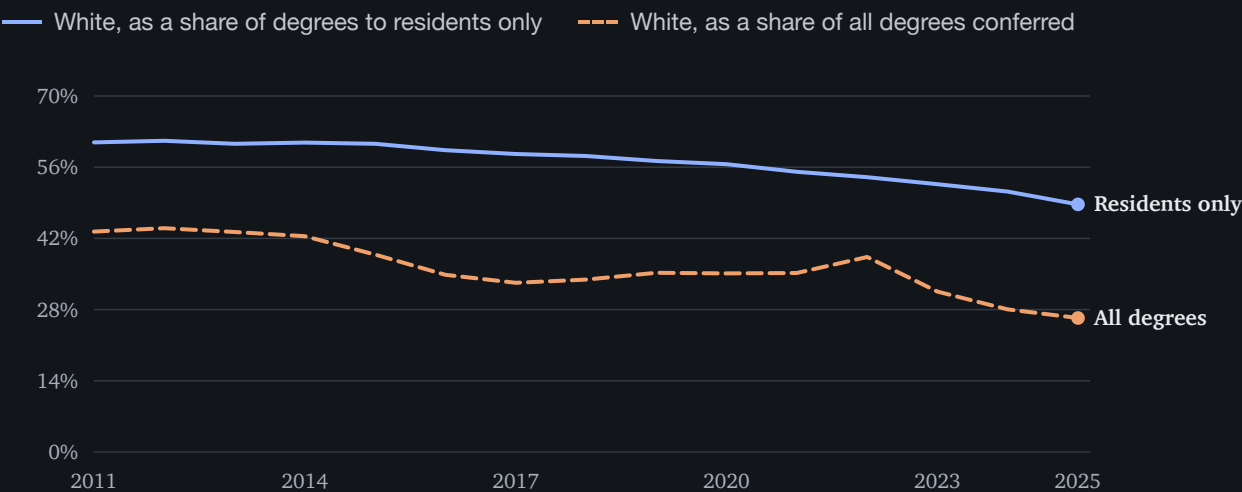
IPEDS records every completion in a single field with nine mutually exclusive values. “Non-resident” is one of them, alongside the race categories — not a separate citizenship axis above them. A permanent resident is counted under their race; a foreign national on a student visa is counted as non-resident whatever their race. The data contains no citizen-versus-foreign split, and cannot separate citizens from permanent residents.

CORE-STEM MASTER'S DEGREES CONFERRED, 2025

CATEGORY	DEGREES	OF ALL	OF RESIDENTS ONLY
Non-resident (temporary visa)	132,149	45.87%	—
White	75,941	26.36%	48.7%
Asian	23,900	8.3%	15.3%
Hispanic or Latino	22,347	7.76%	14.3%
Black or African American	15,924	5.53%	10.2%
Race/ethnicity unknown	10,491	3.64%	6.7%
Two or more races	6,531	2.27%	4.2%
American Indian or Alaska Native	516	0.18%	0.3%
Native Hawaiian or Other Pacific Islander	271	0.09%	0.2%

Total 288,070; residents only 155,921. Source: IPEDS Completions, first majors.

THE WHITE SHARE, ON BOTH DENOMINATORS



White recipients as a share of core-STEM master's degrees, 2011–2025. Of all degrees: 43.35% to 26.36%. Of degrees to residents only: 60.87% to 48.7%. The two differ because non-residents are in the denominator of the first and not the second.

Which denominator to use depends on the question. A group's share of *all* degrees falls when non-resident numbers rise even if that group's own count is unchanged. Comparisons against national population shares use the resident-only figure.

The doctorate pays, but it takes six years to start collecting

Domestic doctorate conversion is falling. The most obvious explanation is price: a graduate with a STEM bachelor's can take an industry job now, or spend six years on a stipend first.

+99%

median earnings premium of a doctorate over a bachelor's in the same field, one year after each finishes

3 of 27

fields where the doctorate pays *less* than the master's in that field

208

doctoral programmes with earnings published, against 7,121 at bachelor's level

MEDIAN EARNINGS ONE YEAR AFTER COMPLETION

FIELD	BACHELOR'S MASTER'S DOCTORATE			DOCTORATE VS BACHELOR'S
Systems Engineering	\$67,120	\$100,114	\$160,692	+139%
Electrical, Electronics, and Communica	\$69,655	\$94,709	\$139,530	+100%
Engineering-Related Fields	\$62,085	\$90,994	\$135,821	+119%
Information Science/Studies	\$53,731	\$72,151	\$117,731	+119%
Computer and Information Sciences, Gen	\$55,408	\$81,855	\$114,251	+106%
Chemical Engineering	\$66,094	\$71,421	\$112,828	+71%
Computer Science	\$63,355	\$98,509	\$112,216	+77%
Mechanical Engineering	\$65,319	\$81,943	\$112,202	+72%
Computer/Information Technology Admini	\$51,665	\$86,262	\$106,301	+106%

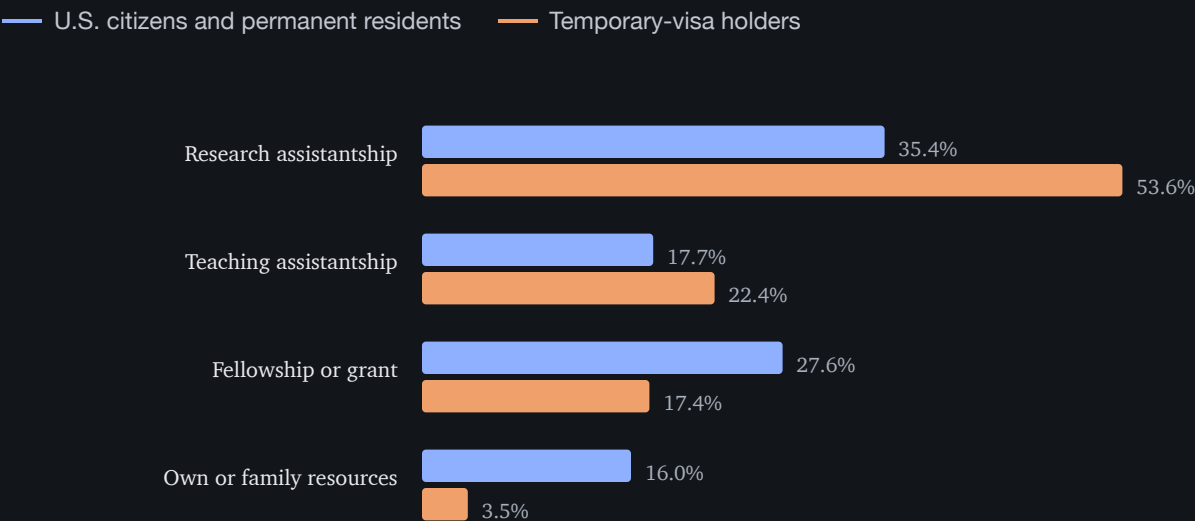
Source: U.S. Department of Education, College Scorecard, field of study file. Highest-paying doctoral fields shown.

This is not the return to a doctorate. Each figure is measured one year after that credential finishes, so the bachelor's cohort is around 23 and the doctoral cohort around 29 — and the bachelor's holder has six years of earnings the comparison does not count. Read alongside page 9: the doctorate is the funded route, and it is the one Americans take least.

The taxpayer-funded route through a doctorate is used disproportionately by visa holders

The Survey of Earned Doctorates asks every recipient how their doctoral study was primarily funded. Among science and engineering doctorate recipients in 2024, **76.0%** of temporary-visa holders were supported principally by a research or teaching assistantship, against **53.1%** of U.S. citizens and permanent residents.

The mirror of that gap is self-funding. U.S. citizens and permanent residents were **4.6 times** more likely to pay their own way: 16.0% funded themselves from personal or family resources, against 3.5% of visa holders.



Primary source of financial support, science and engineering doctorate recipients, 2024. Based on 25,660 citizens and permanent residents and 15,497 temporary-visa holders reporting a primary source; employer or other accounts for the remaining 3.4% and 3.1%. Source: NSF Survey of Earned Doctorates, Table 4-1.

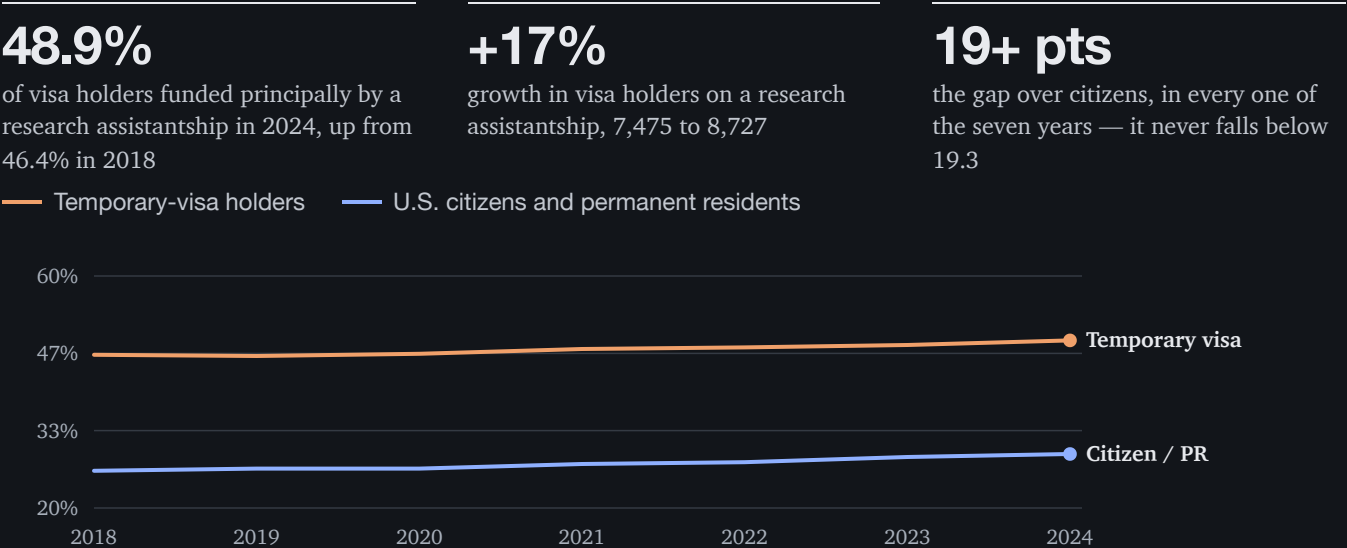
WHAT THAT FUNDING AMOUNTS TO

Research assistantships are the single largest channel, and they are overwhelmingly financed by federal research awards. Across the **99** institutions awarding at least a hundred core-STEM research doctorates, federal obligations from all agencies came to a median of **\$874,630** for every research doctorate awarded.

That figure is an intensity ratio, not a price. Federal obligations fund research whose outputs include papers, instruments, facilities and staff, not only degrees, so it does not establish that the public paid \$874,630 for any particular doctorate. What it does establish is the scale of public research money flowing through the institutions that produce them. The federal link behind the assistantship figures is likewise an inference, well supported rather than measured: the SED records that a student was funded by a research assistantship and never which award paid, while the graduate-student survey supplies the connection — 52,428 federally supported research assistantships against 1,041 teaching ones. No published field crosses funding agency with citizenship.

This is not a snapshot. The federally funded route through a doctorate has tilted toward visa holders in every year on record

The gap on page 9 is a single year. The Survey of Earned Doctorates asks the same question with every release, so the series below is built from seven of them, 2018 through 2024: the pattern holds in all seven, and the visa share rises across them.



Share of doctorate recipients funded principally by a research assistantship, by citizenship at graduation, 2018–2024. All fields. Research assistantships are the channel federal research money travels through. Source: NSF Survey of Earned Doctorates, primary-source-of-support table, seven releases.

YEAR	CITIZENS & PR	VISA HOLDERS	GAP (PTS)	VISA HOLDERS ON AN RA
2018	26.4%	46.4%	20.0	7,475
2019	26.8%	46.2%	19.4	7,738
2020	26.8%	46.6%	19.8	7,921
2021	27.6%	47.4%	19.8	7,773
2022	27.9%	47.7%	19.8	8,686
2023	28.8%	48.1%	19.3	8,599
2024	29.3%	48.9%	19.6	8,727

Visa holders are now 47.2% of everyone funded principally by a research assistantship, against 46.4% in 2018 — approaching half of the federally funded doctoral workforce.

The SED records that a student was funded by a research assistantship, not which award paid. The federal link comes from the Survey of Graduate Students and Postdoctorates: 52,428 federally supported research assistantships against 1,041 federally supported teaching assistantships. The series runs on all fields because NCSES revised the field taxonomy in 2023, which would split a science-and-engineering series across two definitions; on the S&E rollup the 2024 gap is wider still, 35.4% against 53.6%.

Federal research money and foreign graduate enrolment are concentrated in the same institutions

Page 14 shows where the visa share is highest. This asks whether those are also the institutions the taxpayer funds. Sorted into quartiles by federal research and development expenditure, the answer holds at both levels.

FEDERAL R&D QUARTILE	MEDIAN FEDERAL R&D	DOCTORAL VISA SHARE	MASTER'S VISA SHARE
Q1 (least funded)	\$3m	20.5%	32.9%
Q2	\$19m	44.2%	35.8%
Q3	\$90m	49.0%	50.9%
Q4 (most funded)	\$454m	43.6%	50.3%

477 institutions matched between the enrolment survey and the R&D survey; shares pooled within each quartile. Sources: NSF GSS 2024; NSF HERD FY2024 table 14.

INSTITUTIONS WHERE A MAJORITY OF GRADUATE STUDENTS HOLD A VISA

COUNTED AT	INSTITUTIONS	FEDERAL R&D	SHARE OF MATCHED	STUDENTS
Doctoral	106	\$12.5bn	21.5%	70,197
Master's	109	\$24.1bn	41.1%	128,885
Both combined	108	\$19.4bn	32.9%	210,870

Taking graduate study as a whole, **108** institutions enrol a majority of foreign graduate students. They hold **\$19.4bn** of federal research expenditure — **32.9%** of the matched total — and 210,870 graduate students.

LARGEST BY FEDERAL R&D	FEDERAL R&D	DOCTORAL	MASTER'S	GRADUATE STUDENTS
Johns Hopkins University	\$3,618m	39.9%	63.3%	6,488
Georgia Institute of Technology-Main C	\$1,213m	55.1%	51.0%	6,943
University of California-San Diego	\$1,152m	45.5%	59.7%	5,779
Columbia University in the City of New	\$1,077m	46.1%	72.5%	8,366
Duke University	\$1,040m	41.7%	72.2%	3,198
Pennsylvania State University-Main Cam	\$859m	57.2%	41.7%	5,237
Washington University in St Louis	\$822m	50.0%	69.9%	3,367

HERD reports R&D **expenditure** at the institution: it is not all federal money an institution receives, and it is not student support. The claim here is about institutions and their graduate operations in bulk, which is what the data measures — not that any particular grant paid any particular student. 172 institutions could not be matched by name, and unmatched does not mean unfunded.

The same measures for every institution, on one identifier

The findings on pages 11 and 14 each rest on a different survey with a different population. This puts them on one row for each of **2,290** institutions, joined on the federal unit identifier rather than the name, so any two can be compared and any group added to a state.

LARGEST NON-RESIDENT CORE-STEM MASTER'S COHORTS

INSTITUTION	NON-RESIDENT	MASTER'S	DOCTORATE	FEDERAL
Northeastern University	14,670	78.4%	57.2%	\$171m
Columbia University in the City of	14,175	69.4%	38.9%	\$882m
New York University	13,656	64.0%	53.1%	\$589m
University of Southern California	11,111	64.8%	53.9%	\$518m
Carnegie Mellon University	10,393	73.0%	55.8%	\$145m
Georgia Institute of Technology-Ma	9,605	42.0%	52.5%	\$503m
University of North Texas	8,701	80.8%	44.0%	\$111m
Arizona State University Campus Im	8,626	70.2%	49.0%	\$270m

Degrees pooled 2021–2025; obligations FY2023. A dash is missing data, not a zero. The full table, with graduate enrolment 2023 and tuition, is at phd-demographics.andy-barr.com/institutions.html.

ADDED UP TO STATES

STATE	MASTER'S	SHARE	DOCTORATES	SHARE	FEDERAL
CA	133,258	35.0%	25,091	33.1%	\$5.87bn
NY	113,189	53.6%	14,105	40.3%	\$3.84bn
TX	89,769	49.3%	14,263	49.8%	\$2.87bn
MA	72,840	52.0%	10,627	41.7%	\$2.24bn
IL	58,177	50.3%	8,333	44.2%	\$1.87bn
PA	56,690	43.3%	8,720	43.5%	\$2.62bn
FL	48,442	29.5%	7,756	42.3%	\$1.44bn
AZ	38,949	28.1%	4,343	29.5%	\$669m

The join is exact or it is nothing. The two NCSES research surveys publish names and no identifier, and resolving those by similarity puts Florida A&M's money in the University of Florida's row. Names are matched exactly after normalisation or referred to a hand-checked list; 1.7% of R&D dollars and 3.1% of obligations stay unresolved and are excluded rather than guessed at — nearly all of them research institutes with no teaching unit, such as Scripps and Woods Hole. Across the 262 institutions nationally awarding enough core-STEM research doctorates to carry it, federal obligations run to a median of **\$821,054** for each awarded per year: a wider population than page 9, and the same kind of number — an intensity ratio, not a price.

The master's is the level that pays. Almost none of it is funded, and the billings have quadrupled

Page 6 shows where the balance moved. This is why the level it moved at is the master's. A doctoral student is normally paid to be there — page 9. A master's student normally is not: the Survey of Graduate Students puts master's assistantship rates at 7.0% on a research assistantship and 6.9% on a teaching one, so roughly 86% hold neither and pay their own way.

\$3.36bn

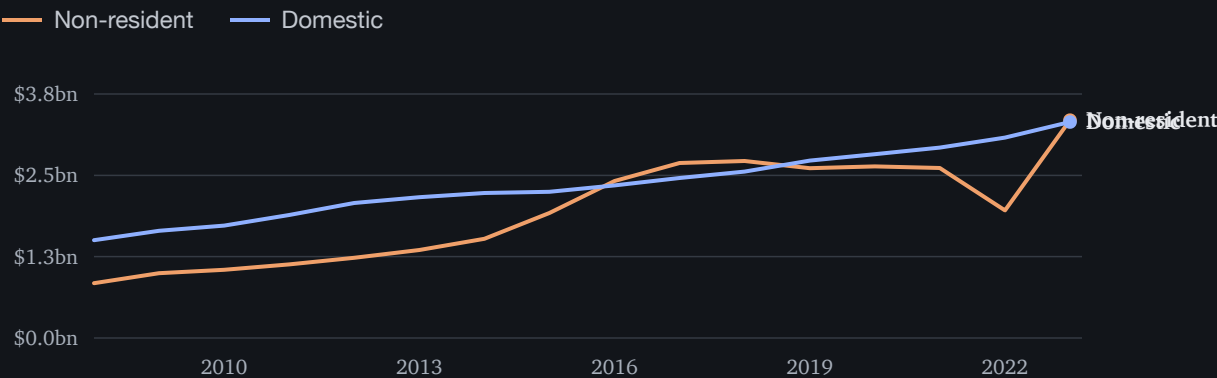
a year in published tuition billed to non-resident core-STEM master's graduates, from \$0.85bn in 2008

+297%

real growth over the period, after inflation

86%

of master's students hold neither a research nor a teaching assistantship



Published tuition and required fees billed to core-STEM master's graduates, constant 2024 dollars. Non-resident billings passed domestic in 2023, on 97,850 degrees against 145,957. Sources: IPEDS Institutional Characteristics and Completions, 1,108 institutions matched.

This is **sticker price, not receipts**: one year of published out-of-state graduate tuition multiplied by the degrees conferred, not net of discounts, waivers or aid, and not what any institution banked. A master's normally runs 1.5 to 2 years, so the figure for a whole programme is larger than the annual one shown. What the series establishes is the direction and the scale of the difference between the two levels, not an institution's revenue.

At some institutions the science and engineering master’s is almost entirely a foreign-student programme

The national figures on page 6 are averages, and averages hide the institutions that have built a programme around this. Of full-time science, engineering and health graduate enrolment, **46.8%** at master’s level and **44.5%** at doctoral level is held by temporary-visa holders. At the institutions below the master’s figure is above ninety.

HIGHEST TEMPORARY-VISA SHARE, FULL-TIME MASTER’S

INSTITUTION	VISA HOLDERS	ENROLLED	SHARE
Harrisburg University of Science and Technol	1,591	1,651	96.4%
Southern Arkansas University	216	225	96.0%
Gannon University	285	299	95.3%
Illinois Institute of Technology	1,995	2,120	94.1%
University of Central Missouri	2,652	2,862	92.7%
Clark University	668	724	92.3%
University of Bridgeport	617	674	91.5%
University of Arkansas at Little Rock	241	265	90.9%
Saint Louis University	2,343	2,637	88.9%
Governors State University	341	384	88.8%

Institutions with at least 200 full-time master’s students; 331 qualify.

LARGEST BY NUMBER OF VISA HOLDERS

INSTITUTION	VISA HOLDERS	ENROLLED	SHARE
Northeastern University	7,300	9,286	78.6%
New York University	4,732	6,567	72.1%
Columbia University in the City of New York	4,169	5,754	72.5%
University of Southern California	3,778	5,722	66.0%
Arizona State University	3,579	6,119	58.5%

Source: NSF Survey of Graduate Students and Postdoctorates, 2024. Enrolments in science, engineering and health units.

These are **enrolments, not degrees**, on a science, engineering and health basis — not comparable with the core-STEM degree counts elsewhere. Permanent residents are counted under their race and appear as domestic, so these shares are a floor on the foreign-born proportion. Single year, 2024.

Where the students fund the institution rather than the taxpayer funding the research

Page 11 follows the federal money. The institutions with the very highest master’s visa shares are somewhere else entirely: they receive little federal research money, and what they bill their foreign master’s students dwarfs it.

INSTITUTION	VISA SHARE	ENROLLED	TUITION BILLED	FEDERAL R&D	PER \$1 R&D
Illinois Institute of Technology	94.1%	2,120	\$67m	\$32m	2.1×
Clark University	92.3%	724	\$32m	\$3m	10.1×
University of Arkansas at Little Rock	90.9%	265	\$4m	\$10m	0.4×
Saint Louis University	88.9%	2,637	\$57m	\$44m	1.3×
Central Michigan University	88.7%	933	\$13m	\$12m	1.2×
Purdue University Northwest	88.3%	206	\$2m	\$4m	0.5×
University of North Texas	87.0%	4,062	\$59m	\$43m	1.4×
Pace University	86.6%	1,376	\$35m	\$2m	16.9×
Auburn University at Montgomery	86.5%	304	\$5m	\$446k	11.2×

Tuition is one year of published out-of-state graduate tuition and required fees multiplied by the foreign master’s head count. Institutions with at least 200 full-time master’s students. Sources: IPEDS ic2023_ay.csv; NSF GSS 2024; NSF HERD FY2024.

Harrisburg University of Science and Technology and the University of Central Missouri rank higher on share than anything listed above — 96.4% and 92.7% — and do not appear in the federal research survey at all.

Two different machines running on one visa. On page 11 the taxpayer funds the research and the students work on it; here the students pay to be there. The tuition figure is **sticker price, not receipts**: gross of every waiver, remission and scholarship, and one year where a master’s normally runs one and a half to two. It measures the scale of the difference between the two models, not any institution’s income. The table is ordered by visa share rather than by the ratio, so institutions where tuition does *not* dominate appear too.

Foreign-born workers are a fifth of employment and nearly a third of the computing occupations

Every other page in this document counts the foreign side: degrees awarded, visas issued, petitions approved. This one counts the workforce as a whole, so the rest can be read against it.

19.2%

of all employed people are foreign born

29.0%

of computer and mathematical occupations — half again the national rate

\$1,236

median weekly earnings, native born, against \$1,059 foreign born

EMPLOYMENT BY OCCUPATION GROUP, 2025

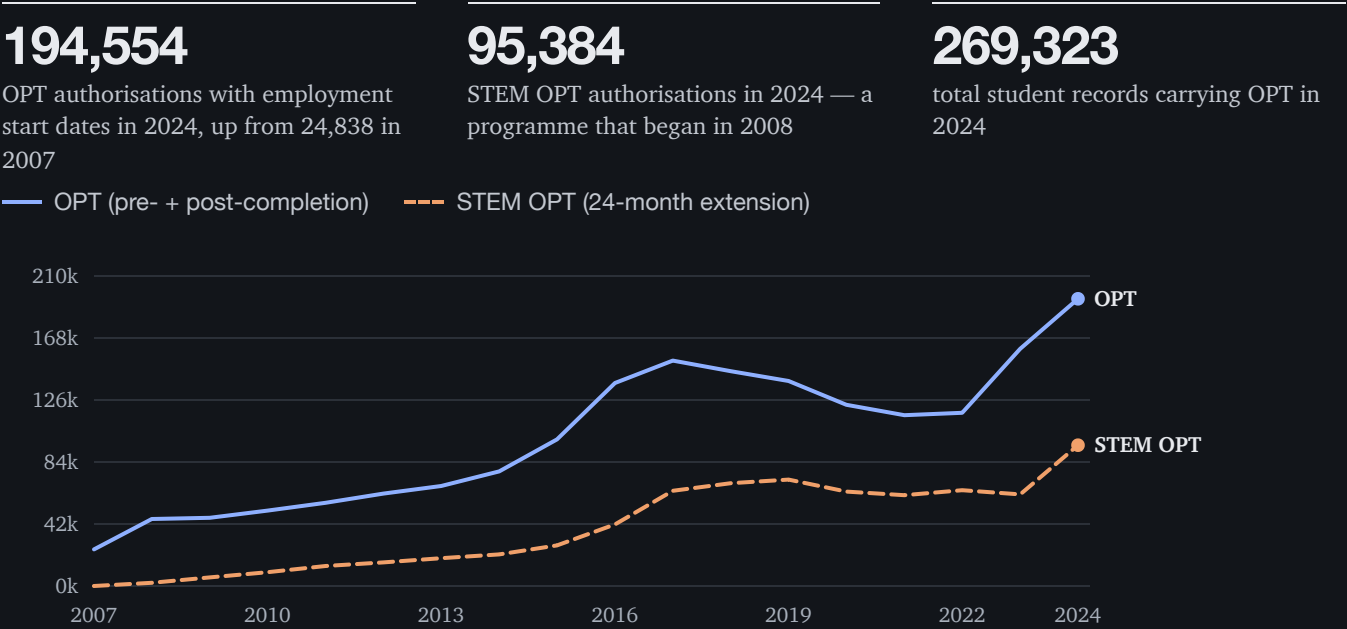
OCCUPATION GROUP	FOREIGN BORN	NATIVE BORN	FOREIGN-BORN SHARE
Computer and mathematical	1,942k	4,758k	29.0%
Architecture and engineering	783k	2,908k	21.2%
Life, physical, and social science	407k	1,454k	21.9%
Professional and related	6,891k	33,440k	17.1%
Management, professional, and related	11,526k	59,742k	16.2%

Current Population Survey annual averages, 2025. Occupation counts are rebuilt from each group's published distribution. Source: BLS foreign-born workers release.

Nativity is not visa status. “Foreign born” here pools naturalised citizens, permanent residents and temporary-visa holders together, and “native born” means born in the United States whatever the parentage. It is a far broader cut than the visa categories used elsewhere in this document and the two are not the same population. The earnings figures are equally **not a like-for-like comparison**: the groups differ in age, education, occupation, region and language, none of which is controlled here, so the gap describes two populations rather than what an employer pays for the same work.

The pipeline does not end at graduation: work authorisation has grown faster than the degrees

Optional Practical Training lets a graduate work in the United States on a student visa — twelve months for any field, and a further twenty-four for STEM graduates. The STEM extension dates from 2008: it accounted for 2 authorisations in 2007 and 95,384 in 2024.



Annual OPT and STEM OPT authorisations with employment start dates, 2007–2024. A complete national count, not a sample. Source: DHS Student and Exchange Visitor Program.

WHERE THESE GRADUATES WORK — 2024

EMPLOYER	STUDENTS	ON OPT	ON STEM OPT
1. Amazon	10,167	5,379	6,679
2. University of California	2,916	2,112	1,278
3. Google	2,454	1,110	1,778
4. Microsoft	2,143	1,066	1,496
5. Meta	2,032	1,081	1,302
6. Arizona State University	1,962	1,895	136

Top employers of OPT and STEM OPT students, 2024. A student holding both authorisations at one employer is counted once under Students and in both columns. Source: DHS SEVP Top 200 Employers.

OPT is the bridge between the degree and the H-1B. It rests on DHS regulation rather than statute, and is not subject to the H-1B numerical cap. It also carries a payroll-tax exemption that an American graduate competing for the same job does not — page 18.

Equal pay is not equal cost: an American graduate is the more expensive hire at the same salary

Compared within a graduation cohort, doctorate holders trained on a temporary visa earn about what their American classmates earn: among those who finished in 2015 or later, a median of **\$103,000** against **\$100,000** for citizens trained here. That is a statement about salary, and salary is not what an employer pays. Wages earned on Optional Practical Training are exempt from Social Security and Medicare tax under IRC 3121(b)(19). The graduate is cheaper to employ at the same salary.

7.65%

of payroll the employer does not pay on an OPT hire — \$7,650 on every \$100,000 of wages

15.3%

counting the employee side, which is also exempt

289,938

OPT and STEM OPT authorisations in 2024 to which the exemption can apply

This is the mechanism behind the disadvantage. An American graduate competing for the same job carries 7.65% in employer payroll tax that the OPT graduate does not, on identical work at an identical wage. The exemption is statutory and applies automatically — nobody has to seek it — which is what makes the cost comparison an employer faces different from the wage comparison the salary data shows.

PAYROLL TAX NOT COLLECTED, 2024 AUTHORISATIONS

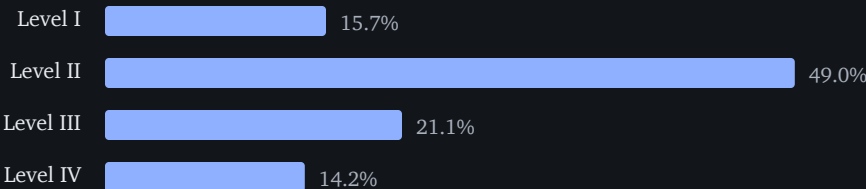
IF WAGES AVERAGE	OPT, EMPLOYER SIDE	STEM OPT, EMPLOYER SIDE	BOTH, EMPLOYER + EMPLOYEE
\$60,000 a year	\$0.89bn	\$0.44bn	\$2.66bn
\$80,000 a year	\$1.19bn	\$0.58bn	\$3.55bn
\$100,000 a year	\$1.49bn	\$0.73bn	\$4.44bn

The rates are statutory and the authorisation counts are published. **The wage is an assumption** — wages on OPT are not reported anywhere, which is why three levels are priced rather than one. Sources: IRC 3121(b)(19); IRS guidance lists practical training as exempt. Authorisation counts: DHS SEVP.

An authorisation is not a full-time year of employment, so applying an annual wage to a count overstates any single year. The exemption ends when the holder becomes a resident alien for tax purposes, generally after five calendar years in F or J status — so it is a discount on early-career employment, which is exactly the stage at which a new American graduate is competing.

Two in three H-1B filings name the bottom of the legal wage range

Every H-1B filing states a prevailing-wage level for the occupation, from I to IV. Level I is the entry rate, Level IV the experienced one. Across **1,150,107** certified filings in 2019 and 2023, **64.6%** named Level I or Level II.



Certified H-1B filings by prevailing-wage level. Source: DOL Office of Foreign Labor Certification disclosure data. Tata Consultancy files 86.2% of its certified applications at Level I or II and Wipro 90.0%, across 2,973 employers filing at least 50 times. For software developers the four levels pay 63%, 74%, 91% and 105% of the national median.

WHAT THOSE LEVELS PAY, AGAINST THE OCCUPATION

The levels are positions in a distribution. Setting the wage promised beside what the occupation actually pays gives the size of the difference — and the yardstick decides the answer. The more precisely the comparison is localised, the worse the filings look, which is what happens when they concentrate in expensive places.

WAGE COMPARED WITH THE MEDIAN FOR THE OCCUPATION	FILINGS	PROMISING LESS
Nationally	565,966	70.8%
In the worksite state	565,966	78.7%
In the worksite metropolitan area	517,103	84.0%

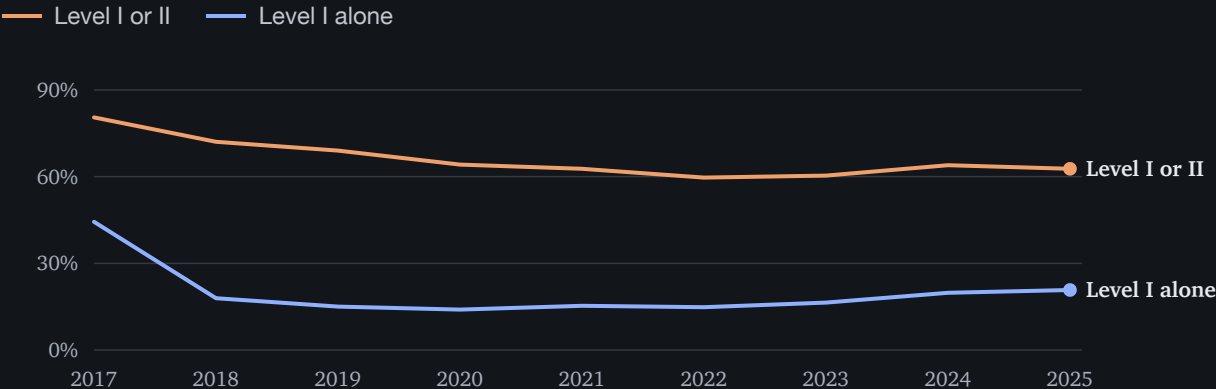
On the same 517,103 filings that resolve to a metropolitan area, 70.0% fall below the national median and **84.0%** below the local one. California shows why: 38% of its filings are under the national median for their occupation, 70% under the Californian one.

Prevailing wages annualised. Metropolitan areas are reached through the worksite county and the Census delineation file, so no city name or postcode is guessed; 48,863 filings whose county resolves to no metropolitan area keep the state comparison. Sources: DOL OFLC; BLS OEWS 2024; Census CBSA delineation.

Filing at Level I or II is **entirely lawful**. It is the cheapest legal way to fill a role, and this page reports what employers *promised*, not what they paid. Of the filings, 64% carried both a usable occupation code and wage and could be priced. The obvious next question — whether low wage levels predict later violations — **cannot be answered here**: only six of these employers appear in the published enforcement extract, which carries just its largest cases, and enforcement is not random to begin with, since large employers and staffing firms are investigated more and both skew toward low levels. Six matches cannot support a correlation, and none is claimed.

On the wage level, employers file higher than they did — the one measure in this document moving the other way

Two years cannot say whether a pattern is worsening, so the whole disclosure archive was read. The share of filings at the bottom two wage levels has **fallen**, from 80.5% in 2017 to 62.7% in 2025. Level I alone has fallen from 44.4% to 20.8%.



Certified H-1B filings by prevailing-wage level, 2017–2025. Source: DOL Office of Foreign Labor Certification disclosure archive.

FISCAL YEAR	CERTIFIED FILINGS	LEVEL I	LEVEL I OR II
2017	470,084	44.4%	80.5%
2018	576,359	17.9%	72.1%
2019	567,880	15.0%	69.0%
2020	523,135	14.0%	64.2%
2021	703,998	15.3%	62.7%
2022	570,524	14.8%	59.7%
2023	582,227	16.4%	60.4%
2024	493,324	19.8%	64.0%
2025	524,350	20.8%	62.7%

The break is a single year. Level I fell from 44.4% to 17.9% between 2017 and 2018 — the year after an executive order directed the agencies to scrutinise H-1B wage levels. Both files use the same column and the same visa-class field, so it is a real reading of the data and not a change in how it was recorded.

This is the **level mix**, and it is a different question from whether the wage clears the local market. Employers have moved up the legal scale while, on page 19, the wage promised still sits below the median for the occupation in the local area in 84.0% of filings. Both are true: the scale itself sits low against local pay. The coincidence with the 2017 order is a coincidence in time, not a demonstrated cause, and the archive carries no wage level at all before 2017.

The largest H-1B users request the bottom of the wage range, and are refused more often

Three agencies hold three pieces of this and never publish them together. The Labor Department certifies what an employer asked for and at which wage level; USCIS approves or denies the petition; the Wage and Hour Division records what it found on inspection. Joined by employer:

EMPLOYER	APPROVED	CERTIFIED REQUESTS	LEVEL I OR II	DENIAL RATE
Cognizant Tech Solns Us Corp	50,940	43,264	51%	18%
Tata Consultancy Svcs Ltd	43,756	21,903	86%	7%
Wipro Limited	28,460	7,280	90%	9%
Infosys Ltd	23,917	30,496	71%	12%
Accenture Llp	21,489	9,575	44%	7%
Microsoft Corporation	17,416	15,120	56%	1%
Amazon Com Services Llc	17,035	22,123	75%	2%
Google Inc	14,591	18,943	61%	1%
Hcl America Inc	14,052	8,920	49%	8%
Intel Corporation	11,111	5,162	41%	1%

Initial approvals FY2009–2023; certifications FY2019 and FY2023. Sources: USCIS Employer Data Hub; DOL OFLC.

The split runs along one line. The outsourcing and staffing firms file most of their applications at the bottom two wage levels and are refused at seven to eighteen percent; the product companies file lower shares at the bottom and are refused at one or two.

Totals are **floors**. The three agencies share no identifier and each company files under several spellings — one appears eighteen times in the USCIS file alone — so names are normalised for case, punctuation and legal form and matched exactly, with nothing fuzzy-matched. Where a firm is missing from one source that means it is absent from that published extract, *not* that its count is zero. And **no equivalent data exists for I-1 or O-1**: neither requires a labour condition application and USCIS publishes no employer hub for either — page 41.

The employer holds the visa. Losing the job means losing the right to remain in the country, and the worker knows it

The payroll-tax gap on page 18 is a price difference. This is a bargaining difference, and it is larger. H-1B status is tied to one employer: the employer files the petition, and on termination the worker has **60 days** to find another sponsor or leave the country (8 CFR 214.1(l)(2)). Permanent residence is filed by the employer too, for a named job. An American in the next chair can resign on two weeks' notice and lose nothing but the job.

57.6%

of labour certifications are filed for someone already working for that employer on an H-1B

13 years

already served by an Indian national reaching the front of the EB-2 queue, against 1.2 for everyone else; 45.8% of certifications are theirs

74.6%

of employment-based green cards go to people already here on a temporary status — this is the normal condition of the route, not an edge case

The queue is what turns a rule into a decade. India's EB-2 category was *current* — no wait at all — through 2004. It passed three years by 2007, five by 2013 and ten by 2016, and stood at **12.7 years** in 2026. Every year of that is a year in which leaving the employer means starting again.

DISSATISFACTION, DOCTORATE HOLDERS WORKING IN THE U.S.



Share reporting dissatisfaction, by citizenship status now. Workers on a temporary visa are **1.6 times** as likely to be dissatisfied with their job security as citizens doing comparable work, and markedly more dissatisfied with pay. 63,090 employed respondents. Source: NSF Survey of Doctorate Recipients.

Two boundaries. This measures the *structure* of dependence and what workers report about it; no dataset records whether a visa holder accepted worse terms or declined to complain, and none is claimed here. And these respondents are **doctorate holders**, many of them academic postdocs — not the larger H-1B population, most of whom hold a bachelor's or master's and are not surveyed this way. On hours, this survey cannot settle the question either way: its top category is simply "more than 40", so a forty-one-hour week and an eighty-hour week are the same answer, and both figures are self-reported to a federal survey by people whose right to remain depends on an employer.

The Labor Department has recovered \$123 million in unpaid H-1B wages — and it looks less often than it used to

Every survey in this document reaches doctorate holders. The H-1B workforce mostly holds a bachelor’s or master’s and works in industry, and no survey here reaches it. Enforcement records do: one row per investigation, with the employer named.

\$123m

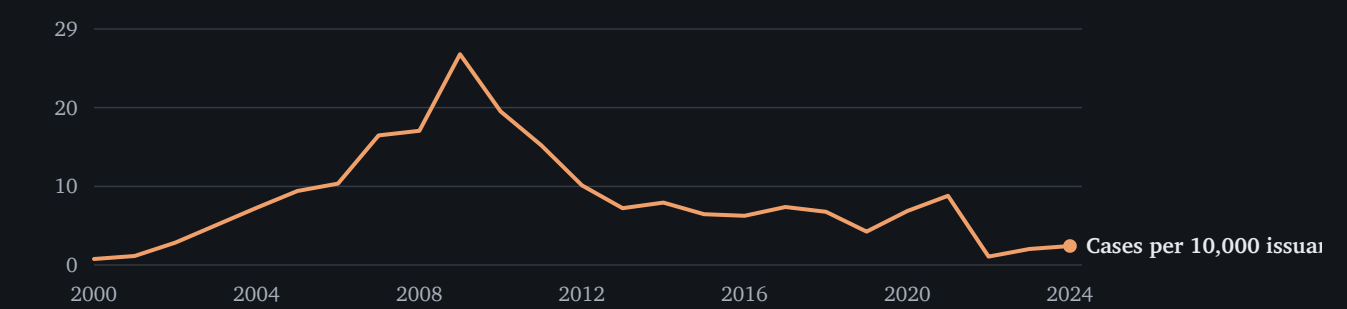
back wages agreed across 2,887 investigations finding H-1B violations, 2000–2026

13,640

employees covered, an average of \$9,049 each

2.4

investigations per 10,000 H-1B visas issued in 2024, against 26.2 in 2009



Investigations finding H-1B violations, per 10,000 H-1B visas issued. Sources: DOL Wage and Hour Division enforcement database; State Department issuance tables.

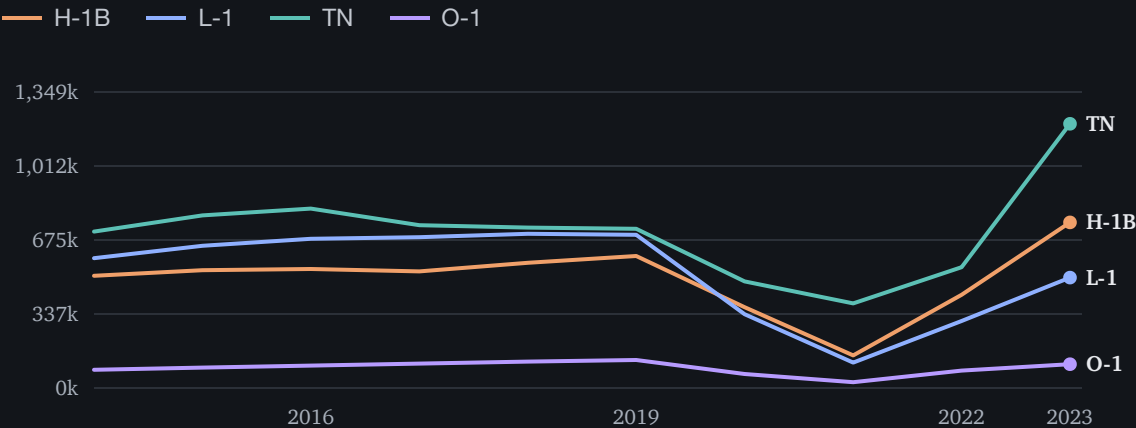
LARGEST FINDINGS BY BACK WAGES AGREED

EMPLOYER	BACK WAGES AGREED	EMPLOYEES
Prince George'S County Public Schools	\$4,222,146	1,046
Advanced Prfessional Marketing, Inc.	\$2,865,216	156
Patni Computer Systems Inc.	\$2,402,757	607
Computech Corporation	\$2,250,000	36
Byton North America Corporation	\$1,749,185	76
Globalcynex, Inc.	\$1,683,584	343
Populus Group, Llc	\$1,159,056	596

Read this as a **floor, never a rate**. These are violations that were *found*, which requires a complaint or an investigation. Nothing here counts violations that occurred, and a falling line is **not** evidence of improving compliance — it is equally consistent with fewer investigations, or with fewer complaints from workers whose right to remain depends on the employer they would be complaining about. This data cannot say which, and the distinction should not be blurred in either direction. Back wages are “agreed to pay”, a finding rather than money proven collected.

The intracompany route did not grow. The specialty-worker and professional routes did

The visa counts elsewhere in this document are documents issued at a consulate. These are *arrivals*: admissions recorded at a port of entry, which is the measure that shows whether a route is actually being used.



Nonimmigrant admissions by class of admission, thousands, 2014–2023. The collapse in 2020 and 2021 is the consular and border closure, not a change in policy toward any class. Source: DHS Yearbook of Immigration Statistics.

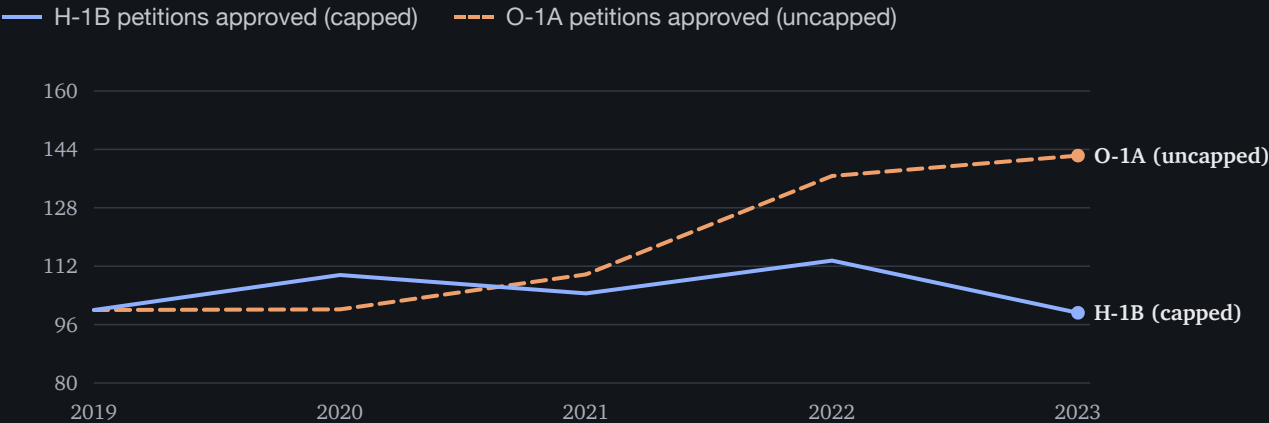
CLASS	2014	2023	CHANGE
H-1B specialty occupation	511,770	755,020	+48%
L-1 intracompany transferee	591,730	503,490	-15%
TN professional	712,740	1,204,910	+69%
O-1 extraordinary ability	83,000	108,180	+30%

Where they arrive is the closest thing to an employer signal these classes have. L-1 admissions concentrate in Texas 73,350, California 62,580, New York 62,070, Michigan 42,080 — Michigan alongside the usual three is the automotive pattern. O-1 concentrates in New York 31,260, California 30,200, Florida 11,200.

An admission is an **entry at a port, not a person and not a visa**. One worker travelling four times in a year is four admissions, which is why 2023 shows 755,020 H-1B admissions against 265,777 H-1B issuances. The two series must never be mixed, and neither counts workers. There is **no employer-level data at all** for L-1 or O-1 — page 41 sets out what would be needed.

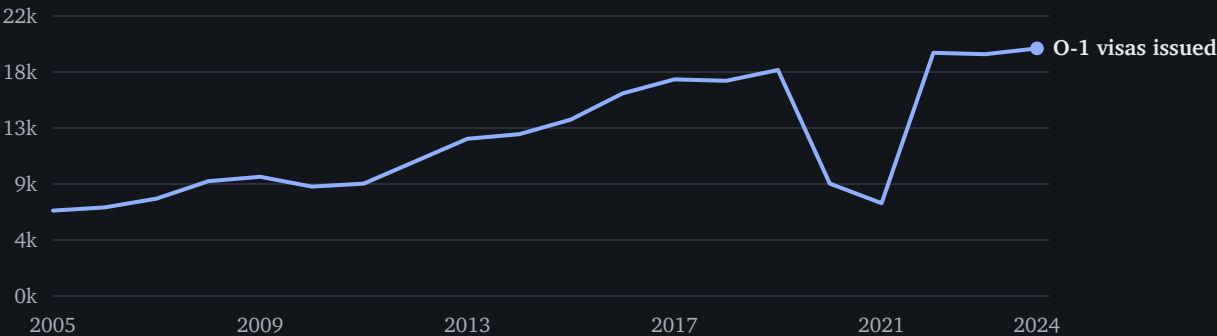
The capped route has stopped growing; the uncapped one has not

The H-1B is limited by statute to 85,000 new petitions a year. The O-1, for workers of “extraordinary ability”, has no numerical limit at all. Over the five years where both agencies count the same way, approvals moved in opposite directions: H-1B petitions -1%, O-1A petitions +42%.



Petitions approved, indexed to 2019 = 100. H-1B 389,378 to 386,340; O-1A 6,670 to 9,490. Indexed because the two differ by a factor of forty. O-1A is the sciences, education, business and athletics category, excluding the arts. Source: USCIS.

O-1 VISAS ISSUED, 2005–2024



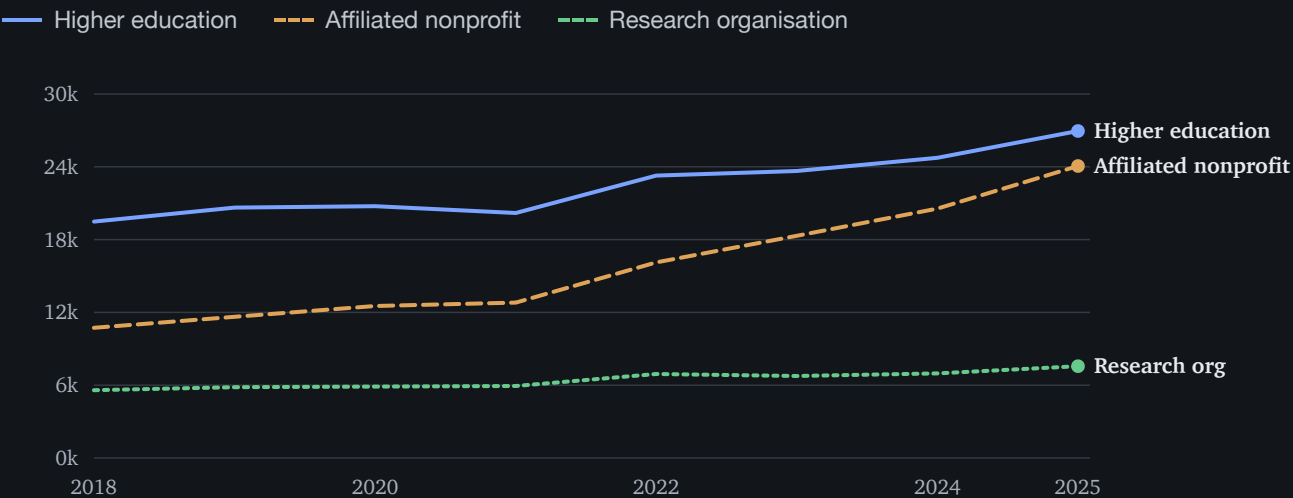
O-1 visas issued at U.S. consulates (O-1A and O-1B combined). 6,712 in 2005 to 19,457 in 2024, an increase of 190%. Source: U.S. State Department, Nonimmigrant Visas Issued by Classification.

The intracompany-transfer route moved the other way: L-1 visas issued fell from 84,532 in 2007 to 71,799 in 2024, -15%. The growth is specific to the uncapped extraordinary-ability category, not to employment visas generally.

The cap does not apply to universities — or to nonprofits affiliated with them

Three employer types are exempt from the H-1B numerical cap by statute: institutions of higher education, nonprofits related to or affiliated with one, and nonprofit or government research organisations. They file without entering the lottery.

Petitions from the affiliated-nonprofit category rose **124%** between 2018 and 2025, from 10,734 to **24,073**. Universities themselves rose 38%.



H-1B petitions filed by cap-exempt employer type, FY2018–FY2025. Source: USCIS annual Report on H-1B Petitions to Congress, Section 2.2.

CAP-EXEMPT EMPLOYER TYPE	FY2018	FY2025	CHANGE
Institution of higher education	19,484	26,949	+38%
Nonprofit related to or affiliated with an institution of higher education	10,734	24,073	+124%
Nonprofit research organisation or government research organisation	5,595	7,560	+35%

The affiliated-nonprofit route does not require the university to employ anyone. A nonprofit’s affiliation with an institution of higher education is what confers the exemption, and the worker may hold that petition alongside other employment.

The largest filers among employers treated as cap-exempt

No government source records cap status against a named employer, so the employers below come from public directories that infer it. Every figure beside them is USCIS’s own: **1,470** of 2,395 candidates appear in the Employer Data Hub, accounting for **84,867** approvals over FY2021–FY2025.

EMPLOYER	STATE	PETITIONS APPROVED
The Leland Stanford Jr University	CA	2,136
University Of Michigan	MI	1,638
Mayo Clinic	MN	1,528
University Of Maryland	MD	1,147
Columbia University	NY	1,122
Johns Hopkins University	MD	1,109
Cleveland Clinic	OH	1,107
University Of Pennsylvania	PA	1,056
Washington University In St Louis	MO	1,056

Candidate list from public cap-exempt directories; approvals from the USCIS H-1B Employer Data Hub.

WHY THE INDUSTRY CODE CANNOT BE USED INSTEAD

Counting employers filing under Educational Services fails: the codes are self-reported and often describe something other than the institution, so major research employers are absent from that category entirely.

EMPLOYER	APPROVALSFILES UNDER
Washington University In St Louis	51831-33 - Manufacturing
National Institutes Of Health Hhs	36854 - Professional, Scientific,
University Of Colorado Denver	34351 - Information
University Of Oklahoma	22756 - Administrative and Suppor
Battelle Memorial Institute	22054 - Professional, Scientific,

Employers the directories identify and an industry-code filter misses. FY2024–FY2025.

The two approaches disagree in both directions: the directories name 130 employers the industry code misses, and the code captures 3,075 the directories exclude — largely school districts and for-profit colleges, which are not cap-exempt. That two independent proxies disagree this sharply is why the exemption cannot be measured from published data.

The affiliated nonprofits, sized by their own tax filings

USCIS counts petitions from nonprofits affiliated with universities but names none of them. The Employer Data Hub names employers but records no cap status. Form 990 is the one public record that sizes a named filer.

ORGANISATION	FROM	REVENUE THEN	FY2023	CHANGE
Battelle Memorial Institute	FY2011	\$5,517.4M	\$12,464.3M	+126%
Dana-farber Cancer Institute	FY2011	\$1,002.5M	\$3,387.6M	+238%
Broad Institute Inc	FY2011	\$351.4M	\$860.4M	+145%
Howard Hughes Medical Institute	FY2011	\$1,046.7M	\$749.0M	-28%
Open Avenues Foundation	FY2018	\$0.3M	\$4.2M	+1418%

IRS Form 990 total revenue. Source: ProPublica Nonprofit Explorer.

OPEN AVENUES FOUNDATION

The organisation behind the Build Fellowship, and the clearest public example of the affiliated-nonprofit route. Revenue rose from **\$279,566** in FY2018 to **\$4,244,093** in FY2023. Its H-1B approvals over a comparable period: FY2019 2, FY2020 9, FY2021 39, FY2022 53, FY2023 27, FY2024 118, FY2025 79.

Revenue is not a count of sponsorships, and a 990 records no cap status. The organisations above file H-1B petitions at volume and fall within the statutory cap-exempt employer types; no published source confirms cap status for any named employer.

Where the Build Fellowship says it operates

The organisation publishes 54 university partners across 20 states. Joined to IPEDS, those institutions conferred **109,643** non-resident graduate STEM degrees between 2021 and 2025.

PARTNERS WITH THE HIGHEST NON-RESIDENT MASTER'S SHARE

INSTITUTION	STATE	NON-RESIDENT MASTER'S	GRAD NON-RES DEGREES
Hult International Business School	MA	95.5%	715
Northeastern University	MA	78.4%	15,236
Illinois Institute of Technology	IL	76.2%	4,327
Lewis University	IL	73.5%	1,067
Cornell University	NY	55.1%	5,483
University of California-San Diego	CA	54.7%	5,586
University of Houston	TX	54.7%	3,079
San Jose State University	CA	52.5%	3,191
Georgia State University	GA	51.2%	1,658
University of Maryland-College Park	MD	50.0%	3,631

Partner list from buildfellowship.com/impact; degree figures from IPEDS Completions, 2021–2025.

A partnership is the organisation's own claim that it trains students at that institution. It does not mean the university sponsors anyone, employs a fellow, or is party to any petition — the affiliation that confers cap exemption is the nonprofit's. By reported participants the list is led by Suffolk, Boston University and City College of San Francisco; Harvard and Northeastern are each shown at fewer than ten students.

The employers hosting fellows file concurrent petitions at 33 times the rate

The arrangement requires a worker to hold two H-1B petitions simultaneously: a cap-exempt one through the nonprofit, and one at the company where the work is done. USCIS reports concurrent petitions as their own category.

69%

of the 72 fellowship employers filed a concurrent petition

2.12%

of all 85,018 employers of comparable size did

33×

the difference, FY2024–FY2026

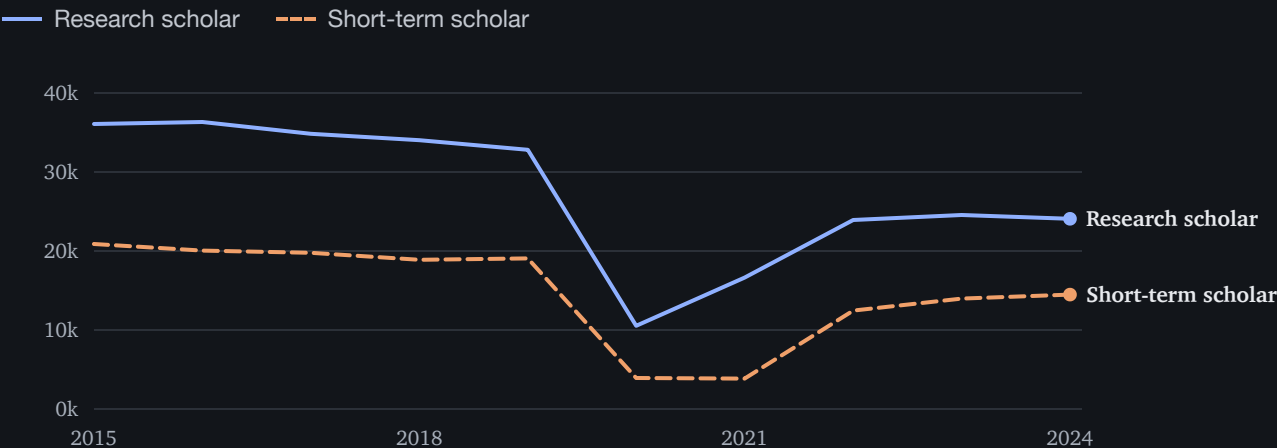
EMPLOYER	FELLOWSHIP PROJECTS	APPROVALS	CONCURRENT
Nomura Securities International	1	66	1
Virtu Financial	3	43	2
Skydio	1	24	2
ES Foundry	1	16	2
Everlaw	5	15	1
Covetrus	1	15	2
Lightbeam Health Solutions	1	14	1
CRISPR Therapeutics	2	10	3
Cypress Creek Renewables	1	9	1
ASARCO	1	8	1

Employer names taken from fellows’ published biographies and matched to the USCIS H-1B Employer Data Hub. Approvals are all petition types.

This is an association, not a demonstration. These firms were identified *because* they host fellows, so some difference is expected — though not one of this size. No source links a named worker to a petition, and a concurrent approval at one of these employers is not evidence that a fellow holds it. Establishing that would need the cap status USCIS declines to publish.

One uncapped academic route is going the other way

The J-1 research scholar category needs no numerical cap, no labour condition application and no wage floor. It is the cheapest lawful way to place a foreign researcher in a university laboratory — and it has been falling for a decade.



J-1 academic participants by calendar year of program begin date, 2015–2024. The 2020 and 2021 troughs are the pandemic closure. Source: BridgeUSA.

CATEGORY	2015	2024	CHANGE
Research scholar	36,083	24,067	-33%
Professor	1,331	704	-47%
Short-term scholar	20,896	14,488	-31%
All J-1 participants	319,145	301,694	-6%

The academic categories fell several times harder than the exchange programme as a whole. CY2025 is excluded: the source publishes it as data through approximately March, and measuring into a partial year turns a 33% fall into a 51% one.

Nearly six in ten permanent-residence filings begin on an H-1B

PERM is where an employer certifies to the Department of Labor that no U.S. worker was available for a job it intends to fill permanently. The disclosure file records the status the beneficiary already held.

57.6%

of 92,258 FY2024 filings were made for someone already on an H-1B

45.8%

were for citizens of India, the largest single origin

50,814

certifications lapsed unused, against 35,505 live

STATUS HELD WHEN THE APPLICATION WAS FILED

CLASS OF ADMISSION	APPLICATIONS	SHARE
H-1B	53,137	57.6%
NOT IN USA	9,198	10.0%
F-1	7,289	7.9%
L-1	4,064	4.4%
B-2	1,513	1.6%
TN	1,425	1.5%
E-2	1,270	1.4%

COUNTRY OF CITIZENSHIP

COUNTRY	APPLICATIONS	SHARE
India	42,220	45.8%
China	8,492	9.2%
Mexico	4,549	4.9%
Vietnam	3,782	4.1%
Philippines	3,458	3.7%
Canada	2,509	2.7%

Source: US DOL Office of Foreign Labor Certification, PERM disclosure data, FY2024.

A certification is not a green card. USCIS must still approve an I-140 and a visa number must be available, which for the largest origin countries takes years. Counts are applications, not people.

The student visa is not a temporary category. For most who finish a doctorate on one, it is the first step to permanent residence

Every count on page 6 is a *visa* count, which invites the assumption that these are visitors. The Survey of Doctorate Recipients follows the same people afterwards. Of those who earned a U.S. doctorate while on a temporary visa, 58.3% now hold citizenship or permanent residence — and only 9.8% are still on a temporary visa.

58.3%

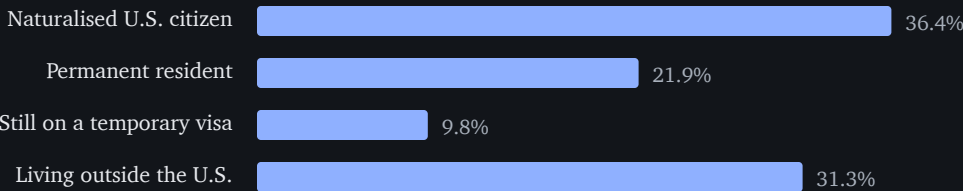
are now U.S. citizens or permanent residents

36.4%

have naturalised — the single largest outcome

86%

of those who stayed in the country reached citizenship or permanent residence



Where doctorate recipients trained on a temporary visa are now. 79,885 respondents with a U.S.-earned doctorate, weighted to the population. Source: NSF Survey of Doctorate Recipients.

Read the two pages together. A non-resident share of 44.8% of graduate STEM degrees does not measure temporary visitors passing through. It measures the entry point of a route to settlement, and 86% of those who stay complete it.

The survey covers every cohort from the 1970s on, so the balance between staying and leaving describes the whole period rather than any single year. Recent graduates have had less time to naturalise, which if anything understates the eventual rate. Status is recorded at the doctorate and again at survey; nothing here identifies which visa or which route was used, and the SED does not follow master's recipients at all — so the transition is measured at doctorate level and applied to the larger population only by inference.

The employment green card is not a way to bring someone in. It is overwhelmingly a way to convert someone already here

Page 33 follows one population, doctorate recipients. DHS reports the same question for every permanent resident, splitting each class into people who arrived from abroad and people who were already in the United States on another status and adjusted without leaving.

74.6% of employment-based green cards in 2023 went to people already in the country	146,880 people, against 49,890 who arrived from abroad	57.6% of labour certifications are filed for someone already on an H-1B, plus 7.9% on a student visa
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ADJUSTED FROM INSIDE THE U.S., OR ARRIVED FROM ABROAD — 2023

CLASS OF ADMISSION	TOTAL	ADJUSTED STATUS	NEW ARRIVAL
Employment-based	196,760	74.6%	25.4%
Immediate relatives	551,590	57.3%	42.7%
Refugees	59,030	100.0%	0.0%
Family-sponsored	204,240	5.4%	94.6%
Diversity lottery	67,350	1.4%	98.6%

Source: DHS Yearbook of Immigration Statistics, table 6. Counts rounded by DHS to the nearest ten.

The contrast is the finding. Family-sponsored admission and the diversity lottery bring people in from outside; employment-based admission mostly changes the status of people already living and working here. It has run between 74.6% and 91.6% for the decade.

An adjustment shows the person was already in the country. It does *not* record which status they held before, so this table cannot say they studied here. The labour-certification figures beside it do carry that field, and they point the same way. Counts are persons, not degrees.

In several fields, U.S. citizens are a minority of doctorates awarded

The national doctorate figure of 38.8% is an average across very different fields. The tables below pool **every institution that reports to IPEDS** — not a sample, and not the institutions this project tracks individually. Totals are for 2021–2025.

DOCTORAL PROGRAMMES WITH THE HIGHEST NON-RESIDENT SHARE

PROGRAMME (CIP)	NON-RESIDENT	TOTAL AWARDED	SHARE
Petroleum Engineering	410	516	79.5%
Statistics, General	1,746	2,409	72.5%
Electrical and Electronics Engineering	7,552	10,611	71.2%
Computer Engineering, General	1,358	1,912	71.0%
Industrial Engineering	1,323	1,904	69.5%
Operations Research	320	462	69.3%

All U.S. institutions reporting to IPEDS. Programmes awarding at least 150 doctorates over 2021–2025; 132 of them qualify. A floor is applied because a share computed on a handful of degrees is noise. Source: IPEDS Completions.

LARGEST DOCTORATE PRODUCERS, BY NON-RESIDENT SHARE

INSTITUTION	NON-RESIDENT	TOTAL AWARDED	SHARE
Purdue University-Main Campus	1,889	3,060	61.7%
Texas A&M University-College Station	1,652	2,916	56.7%
University of Illinois Urbana-Champaign	1,548	2,735	56.6%
Georgia Institute of Technology-Main Campus	1,429	2,720	52.5%
Massachusetts Institute of Technology	1,288	2,915	44.2%
University of Michigan-Ann Arbor	1,233	3,307	37.3%

The largest producers of non-resident core-STEM doctorates in the country, ranked among the 317 institutions clearing a 60-doctorate floor. Source: IPEDS Completions. Their field composition is on page 36.

Concentration matters for policy because it determines where any change in visa, funding or admissions policy would actually land. A measure aimed at the national average would fall very unevenly across these institutions and fields.

Which fields the non-resident doctorates are in

The national ranking on the previous page pools every institution. This is the composition inside the six largest producers of non-resident core-STEM doctorates: the five fields supplying most of each one's non-resident doctorates, 2021–2025.

PURDUE UNIVERSITY-MAIN CAMPUS — 61.7% NON-RESIDENT OVERALL

FIELD (4-DIGIT CIP)	NON-RESIDENT	TOTAL	SHARE
Electrical and Electronics Engineering	300	385	77.9%
Mechanical Engineering	260	391	66.5%
Computer Science	142	171	83.0%
Civil Engineering, General	132	168	78.6%
Chemistry, General	120	284	42.3%

1,889 non-resident doctorates across 34 fields; these five account for 50.5% of them.

TEXAS A&M UNIVERSITY-COLLEGE STATION — 56.7% NON-RESIDENT OVERALL

FIELD (4-DIGIT CIP)	NON-RESIDENT	TOTAL	SHARE
Mechanical Engineering	150	222	67.6%
Civil Engineering, General	139	167	83.2%
Electrical and Electronics Engineering	137	168	81.5%
Chemistry, General	113	234	48.3%
Chemical Engineering	103	133	77.4%

1,652 non-resident doctorates across 51 fields; these five account for 38.9% of them.

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN — 56.6% NON-RESIDENT OVERALL

FIELD (4-DIGIT CIP)	NON-RESIDENT	TOTAL	SHARE
Electrical and Electronics Engineering	235	306	76.8%
Computer Science	204	307	66.4%
Mechanical Engineering	154	214	72.0%
Civil Engineering, General	124	161	77.0%
Physics, General	93	190	48.9%

1,548 non-resident doctorates across 40 fields; these five account for 52.3% of them.

Shares at four-digit CIP level rest on small denominators: a programme awarding a dozen doctorates can read 100% or 0% on one or two students, so the ordering between adjacent fields carries less weight than the pattern across them. Counts are degrees conferred, not people, and a permanent resident is counted under their race rather than as non-resident, so every share here is a floor.

GEORGIA INSTITUTE OF TECHNOLOGY-MAIN CAMPUS — 52.5% NON-RESIDENT OVERALL

FIELD (4-DIGIT CIP)	NON-RESIDENT TOTAL SHARE		
Electrical and Electronics Engineering	331	458	72.3%
Computer and Information Sciences, General	189	269	70.3%
Mechanical Engineering	110	255	43.1%
Aerospace, Aeronautical, and Astronautical/Space Engineering, General	91	186	48.9%
Chemical Engineering	77	155	49.7%

1,429 non-resident doctorates across 32 fields; these five account for 55.8% of them.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY — 44.2% NON-RESIDENT OVERALL

FIELD (4-DIGIT CIP)	NON-RESIDENT	TOTAL	SHARE
Computer Science	204	368	55.4%
Electrical and Electronics Engineering	150	258	58.1%
Mechanical Engineering	126	251	50.2%
Physics, General	100	215	46.5%
Chemistry, General	87	235	37.0%

1,288 non-resident doctorates across 29 fields; these five account for 51.8% of them.

UNIVERSITY OF MICHIGAN-ANN ARBOR — 37.3% NON-RESIDENT OVERALL

FIELD (4-DIGIT CIP)	NON-RESIDENT	TOTAL	SHARE
Electrical and Computer Engineering	146	209	69.9%
Mechanical Engineering	116	225	51.6%
Computer Engineering, General	106	187	56.7%
Biostatistics	55	92	59.8%
Chemistry, General	55	238	23.1%

1,233 non-resident doctorates across 55 fields; these five account for 38.8% of them.

Electrical engineering, mechanical engineering and computer science appear in nearly every list. The concentration is by field more than by institution: the same handful of disciplines runs high wherever doctorates are produced at scale.

What these data do and do not establish

WHAT THE DATA SUPPORTS

- Non-resident students receive a plurality of U.S. core-STEM master's degrees (40.2%) and close to two in five research doctorates (38.8%); the temporary-visa share of all U.S. research doctorates rose from 11.59% in 1979 to 33.32% in 2024.
- Visa-holding doctorate recipients are substantially more likely to be funded through assistantships, and far less likely to self-fund, than citizens.
- Petitions from nonprofits affiliated with universities, which are exempt from the H-1B cap, rose 124% between FY2018 and FY2025.
- An uncapped visa category grew while the capped one did not: O-1A petitions +42% against H-1B -1%, 2019 to 2023.
- Post-graduation work authorisation has grown sharply: STEM OPT went from 2 authorisations in 2007 to 95,384 in 2024.

WHAT THE DATA DOES NOT SUPPORT

- **It does not establish causation.** Nothing here shows that any U.S. citizen was denied a place or a funded position because it went to a non-resident. The data records who received degrees and how they were funded, not who applied or was refused.
- **The doctorate share is not rising.** It has been broadly flat since 2008 and is below its 2021–22 peak. Presenting the doctorate as a worsening trend would misstate the record.
- **Assistantship funding is not broken out by ultimate source.** The SED records that a recipient was supported by a research assistantship; it does not attribute that support to a specific federal award. The per-doctorate federal figure on page 9 is an intensity ratio, not a cost of production.
- **The visa data on page 25 identifies no employer or industry.** It counts petitions and visas nationally by classification. It shows an uncapped category growing while a capped one did not; it cannot show which firms used it, nor that any employer turned to the O-1 because it lost an H-1B. That substitution is an inference from the pattern, not a measurement. Note also that O-1 and L-1 figures are consular visa issuances while O-1A and H-1B are USCIS petition approvals, so each is compared only with its own kind; the window starts at 2019 because USCIS changed its counting basis then and publishes nothing for FY2018.
- **The employer table on page 17 is a Top 200 ranking, not a census.** The OPT series beside it is a complete count, but an employer outside the list is absent rather than at zero, so that table cannot be summed to a total.
- **"Non-resident" is a visa status recorded at graduation.** It is not ethnicity, not country of origin, and not a statement about any individual's intentions or contribution.

How these figures were produced

METHOD

Degree counts are from IPEDS Completions, restricted to eight core-STEM CIP families (11, 14, 15, 26, 27, 30, 40, 42), using award levels 7 for master's and 17 for research doctorates. Domestic counts are derived as total minus non-resident. Doctorate citizenship figures for all fields come from the NSF Survey of Earned Doctorates, a census rather than a sample. Citizenship detail is unavailable in IPEDS before 1995; 1990 and 1999 are not published by NCES.

SOURCES

NCES IPEDS Completions, 1995–2025 · nces.ed.gov/ipeds

NSF NCSES Survey of Earned Doctorates, 1979–2024, Tables 1-7 and 4-1 · nces.nsf.gov

NSF NCSES Federal Support Survey, NSF 25-339 Table 17, FY2023 · nces.nsf.gov

DHS Student and Exchange Visitor Program, OPT/STEM OPT/CPT authorisations 2007–2024 and the 2024 Top 200 employers · [ice.gov/sevis](https://ice.dhs.gov/sevis)

U.S. State Department, Nonimmigrant Visas Issued by Classification, FY2005–FY2024 · travel.state.gov

USCIS, I-129 petition approvals, the STEM-Related Petition Trends factsheet, and the annual Report on H-1B Petitions to Congress FY2018–FY2025 · uscis.gov

U.S. Department of Labor, Office of Foreign Labor Certification, LCA disclosure files, FY2008–FY2026 · dol.gov/agencies/eta/foreign-labor/performance

The underlying figures, the code that produces them, and the per-institution detail behind every table are published at phd-demographics.andy-barr.com. Every chart here can be reproduced from the sources above.

Per-institution pages, the national series behind each chart, a SQL query interface over the underlying records, and a machine-readable catalogue are all published there.

Seven things that would settle questions this document cannot

Each item was searched for before being listed. In every case the agency collects the information; none of it is published in a usable form. The four below concern how the pipeline is measured; the three on the next page concern who is using it.

1 • CAP STATUS ON THE PETITION RECORD — USCIS

Form I-129 records whether a petition is cap-exempt and on what ground. The Report to Congress publishes national totals by category; the Employer Data Hub names every employer but carries no cap field. So the 24,073 affiliated-nonprofit petitions on page 26 cannot be attributed to any organisation. **Would settle:** which employers use the exemption, at what scale, and whether use is concentrated.

2 • FEDERAL FUNDING CROSSED WITH CITIZENSHIP — NSF

The mechanism half is answered: federal money reaches doctoral students overwhelmingly through research assistantships, 52,428 against 1,041 teaching ones, which is what licenses pages 9 and 10. The crossing is not. GSS reports support by agency and enrolment by citizenship, never together; the SED records the assistantship but not which award paid. No published field says which agency funded a foreign national. **Would settle:** what federal research funding spends per doctoral student, by citizenship — turning a seven-year proxy into a measurement.

3 • CITIZENS SEPARATED FROM PERMANENT RESIDENTS AT CONFERRAL

Available after graduation — the Survey of Doctorate Recipients records four categories, native citizen, naturalised, permanent resident, temporary visa — but not at conferral. Every published SED table collapses the first two, and IPEDS does not collect the distinction at all: a permanent resident is counted under their race. “Domestic” in the degree counts throughout this document therefore means citizens and permanent residents together. **Would settle:** the citizen share of U.S. graduate STEM degrees, which no published source reports.

4 • OPT BY INSTITUTION, FOR EVERY INSTITUTION — DHS

SEVP publishes a Top 100 ranking. An institution outside it is absent rather than zero, so school totals are a floor and movement between years may only reflect the cutoff. Complete school-level data exists but is released to school officials for their own institution, or by FOIA. **Would settle:** OPT and STEM OPT participation for every institution.

Who is using the pipeline — and one ask that needs no new collection at all

5 · GRADUATE APPLICATIONS AND ADMISSIONS — NCES

IPEDS counts degrees conferred. Its Admissions component covers first-time undergraduates only, and no federal collection records who applied to graduate programmes, who was admitted, or who was offered funding. **Would settle:** whether domestic applicants are declining, being declined, or not applying — the question behind this document, and the one it cannot answer.

6 · L-1 AND O-1 PETITIONS BY EMPLOYER — USCIS

For H-1B this document can name the employer three times over: what it requested, what USCIS granted, what the Labor Department found. For L-1 and O-1 it cannot name the employer once. Neither classification requires a labour condition application, so the Labor Department never sees them, and USCIS publishes an employer data hub for H-1B, H-2A and H-2B but not for these. The closest substitute is the destination state declared on arrival — L-1 concentrates in Texas, California, New York and Michigan — which is a location, not an employer.

The specific ask. USCIS already holds this: the petitioner name and address on Form I-129 for classifications L-1A, L-1B, O-1A and O-1B, aggregated by petitioner and fiscal year with approvals and denials. That is the same field, from the same form and the same system, that produces the published H-1B Employer Data Hub — the extract exists for one classification and not the others. No new collection is required. **Would settle:** which companies transfer the most staff into the United States without a wage test, and whether O-1 growth sits in the industries most constrained by the H-1B cap.

7 · STUDENT VISAS BY INSTITUTION — STATE AND DHS

The State Department reports visa issuance by consulate and nationality and never by school; SEVP publishes school-level figures for OPT alone. So the institutions that bring in the most foreign students cannot be identified directly. What can be shown is who *enrols* them, from IPEDS, and who places the most into STEM OPT afterwards — two different populations, neither of which is an F-1 count. **Would settle:** where the student pipeline actually enters, which is the first stage of everything else in this document.