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THE INTERNATIONAL SOCIETY
FOR OPTICS AND PHOTONICS

OPTICS & PHOTONICS
**GLOBAL SALARY
REPORT** 2021



Introduction

The Optics and Photonics Global Salary Report provides a reference for employees, students, and managers interested in understanding compensation across the career landscape: How does my pay compare with that of my colleagues? How has the COVID-19 pandemic affected salaries in our community? What can I expect to earn in industry versus academia? The report addresses these questions and a variety of other issues across fourteen topical sections, drawing on original research conducted by SPIE.

SPIE delivers the report each year, free of charge, as part of its mission as a not-for-profit educational society supporting the science and application of light. The report builds on data from over 4,400 individuals in 98 countries¹ who shared career information in a short online survey. This is the eleventh annual survey and report, the largest such study in the optics and photonics community.

Unless otherwise noted, all results are based on full-time workers. For a complete list of participant countries and other details on survey methodology, please see Methodology and Endnotes on page 23.



Key findings:

- The median salary for full-time employees grew 6%, from \$75,000 last year to \$79,380 this year.² This rise likely reflects tight labor markets for the highly-skilled engineers and scientists prevalent in our community.
- The COVID-19 pandemic has strongly impacted workers, with 74% reporting a moderate or greater effect on their personal, academic, and professional lives, though two-thirds report no COVID-19-related reductions in pay.
- Salaries paid in Chinese yuan are up 3% versus last year, but have increased 129% since 2011. Earnings in U. S. dollars were up 6%, while pay in Japanese yen rose 3%. Euro salaries declined 4% and pay in British pounds fell by 10%.
- The highest-paid discipline is aerospace, with a median income of \$118,825. Aerospace has held the top spot for all eleven years that the survey has been conducted.
- Median salaries are 28% higher overall for men than for women, up from 21% in last year's survey. Differences in pay are lowest during early career stages.
- Most full-time workers surveyed (64%) identify as engineers. Within this group, 57% have engineering degrees and are working as engineers, 24% have engineering degrees but are not working as engineers, and 19% work as engineers without having engineering degrees.
- The most popular engineering degrees are electrical (25%) and optical (20%), with engineering physics (13%) falling in third place.
- The largest proportion of engineers focus their work on optical engineering (40%), followed by electrical (11%).
- Startups account for just over 14% of workers at for-profit organizations. These workers earn median salaries of \$91,450, versus \$105,651 for those at traditional companies.
- Almost two-thirds of student respondents (64%) are working towards a PhD, followed by 19% pursuing master's degrees, and 14% seeking a bachelor's degree.

**“ I AM THE HAPPIEST I HAVE EVER BEEN
WHEN IT COMES TO EMPLOYMENT.
THE OPTICS COMMUNITY
IS A FANTASTIC COMMUNITY! ”**

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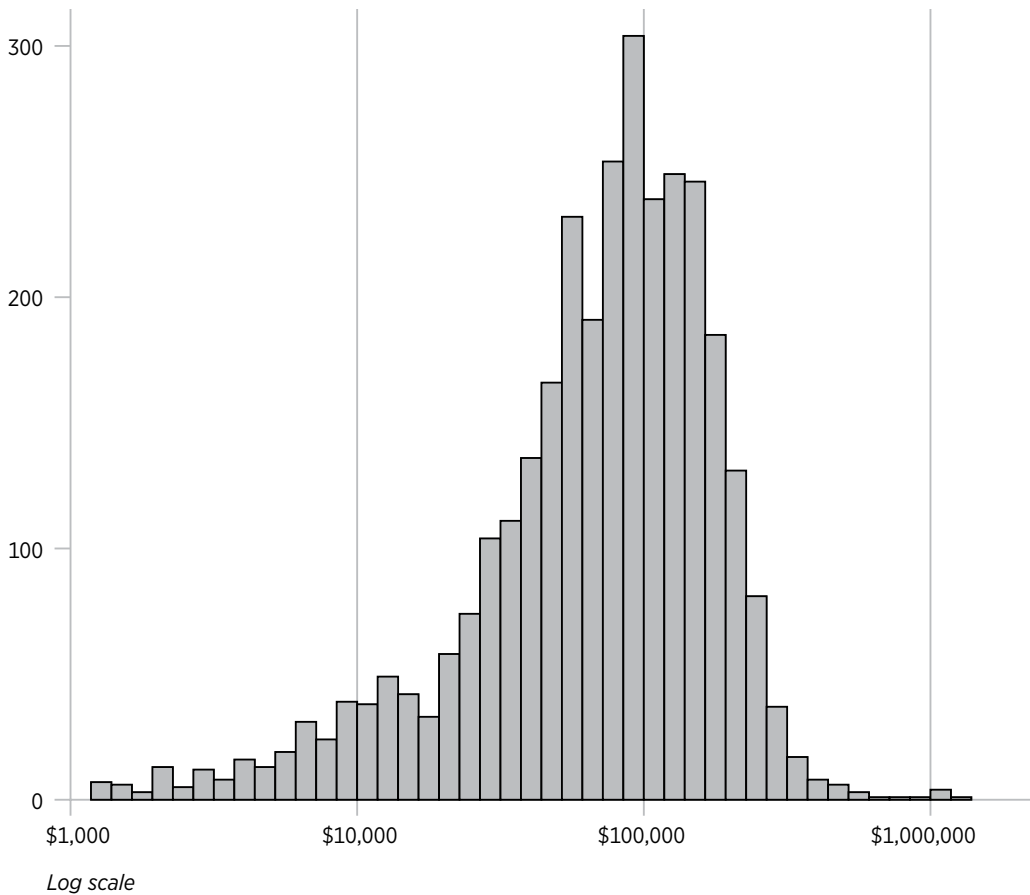


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optics.org covers the global optics and photonics industry for SPIE

Distribution of Full-time Salaries



Data Overview

Full-time Salary Summary Statistics

Mean = \$96,499
Median = \$79,380

- 5th percentile = \$8,624
- 25th percentile = \$42,504
- 75th percentile = \$130,000
- 95th percentile = \$228,000
- 99th percentile = \$350,000

n = 3,199

Response Demographics

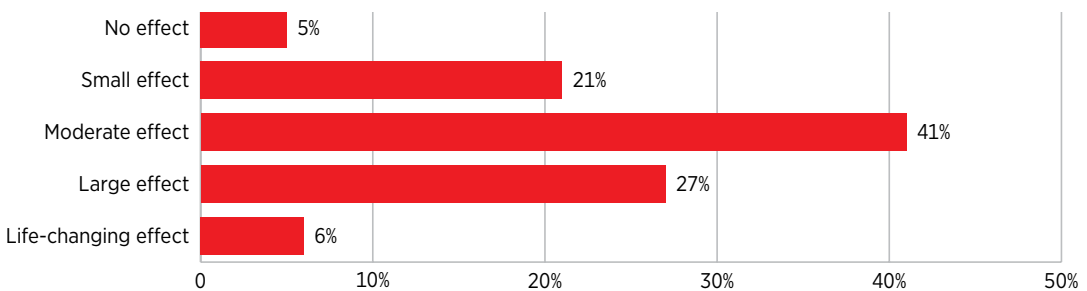
4,447 Valid responses
3,199 Full-time employees
234 Part-time employees
105 Unemployed
75 Retired
3,319 Men
944 Women
834 Students

COVID-19 Impacts on Workers and Students

COVID-19 has had a strong impact on many aspects of our community’s personal and professional lives, but it has not had a discernible effect on salaries. Almost three-quarters of workers (74%) report that the COVID-19 pandemic has had a moderate, large, or life-changing effect on their lives. Most commenters mention negative impacts, including the burden of shifting courses online, lack of access to labs, drastic reductions in travel, stressful home situations, and a variety of other effects. A smaller proportion of survey respondents have discovered silver linings during the pandemic, ranging from more time with family to reduced commuting burdens.

Two-thirds of workers say they have not had a COVID-19-related pay reduction, though the remaining one-third of employees have experienced pay freezes, cancellations of bonuses, or other pay reduction measures. Overall median salaries are up 6% this year, suggesting that our community remains well-paid and strongly employed even though many respondents feel that their productivity has suffered. Almost half of full- and part-time employees (46%) say their personal productivity has declined during the pandemic, while 57% feel that the output of their organizations has also dropped.

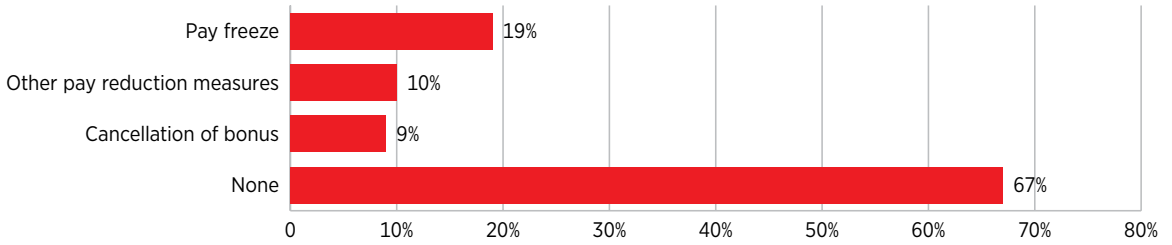
To what degree has the COVID-19 pandemic affected your personal, academic, or professional life?



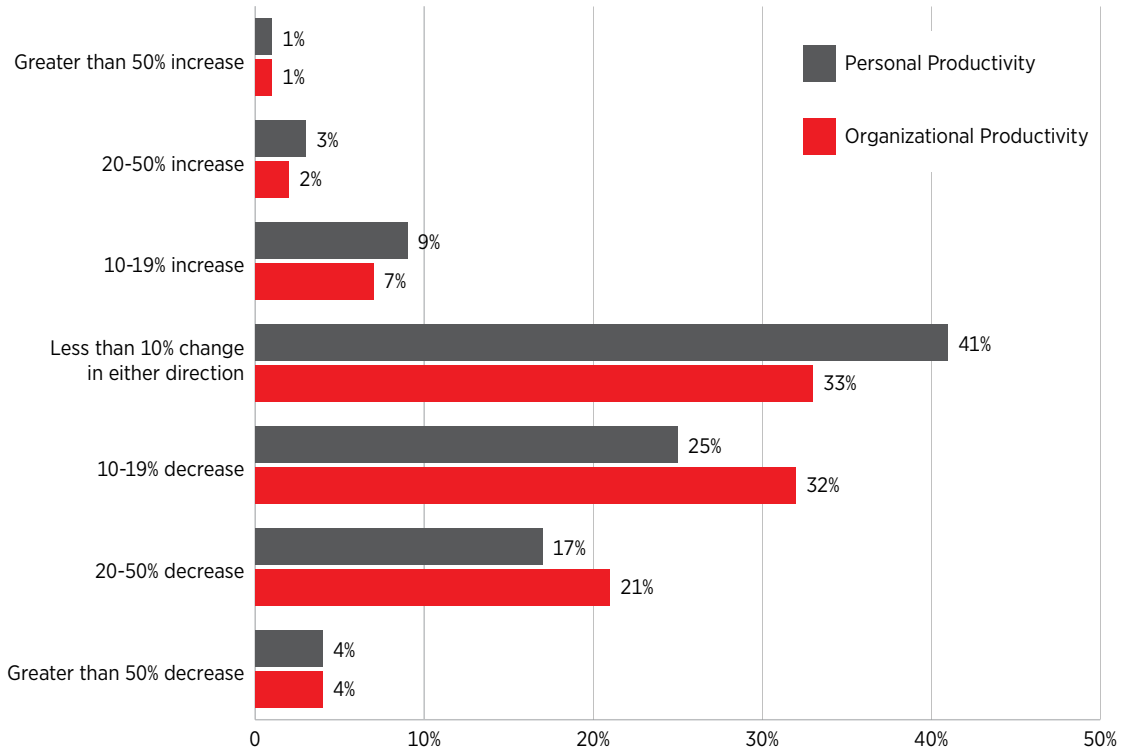
**“ WITH THE LOCKDOWN
I CONVERTED NOT ONLY INTO A
REMOTE WORKER,
BUT ALSO INTO THE
MAIN CHEF OF THE FAMILY
AND INTO AN
AMATEUR PRIMARY TEACHER
FOR MY CHILDREN.”**



COVID-19-related pay reduction measures



COVID-19 impact on personal and organizational productivity



Most students report that their lab activities have been limited due to the pandemic, and that they have shifted to online courses. Nearly half of students indicate that their social lives or academic motivation have suffered. Employers may take note that 22% of students say that their graduations have been delayed, suggesting at least a partial disruption in the pipeline of job candidates.

In what ways has the COVID-19 pandemic affected your life as a student?

My lab or research activities have been significantly limited or reduced	60%
I have shifted from on-campus courses to remote learning (partially or completely)	54%
My social life has suffered negative effects	48%
I have felt a lower level of motivation for my academic work	45%
My graduation has been delayed	22%
I have taken time off from my studies	10%
I lost a job, internship, or offer	10%
None of the above—my life as a student has been unaffected by the COVID-19 pandemic	5%

**“THE ISOLATION,
BOTH PROFESSIONALLY
AND PERSONALLY
IS DIFFICULT TO HANDLE.”**

**“THE ABILITY TO WORK FROM HOME
HAS PROVIDED ME
FLEXIBILITY AND TOTAL CONTROL
OVER MY TIME AND BALANCE
BETWEEN WORK AND PERSONAL LIFE.”**

“ LOWER YOUR PROFILE,
LEARN MORE FROM OTHERS,
AND CARE FOR OTHERS.”

$d=25'$
Light = “red”
 σ/\sqrt{n}

$d=9' 6''$
 $\sigma=.5''$
 σ/\sqrt{n}

$d=9' 10''$
 $\sigma=.6''$
 σ/\sqrt{n}

Country Overview

The countries in the survey represent a broad range of incomes, work/life balance, and workload. Workers in the United States, Switzerland, and Israel enjoy the highest median salaries. Within these high-earning countries, workers at for-profit organizations earn more than their colleagues in academia.

Median salary for full-time workers, overall and at for-profit and academic employers

Country	All	For-profit	Academic
United States (n=1289)	\$130,000	\$135,000	\$100,000
Switzerland (n=36)	\$124,003	\$135,276	\$101,457
Israel (n=38)	\$122,879	\$132,759	
Australia (n=29)	\$108,125	\$115,848*	\$99,243
Germany (n=161)	\$91,079	\$109,295	\$72,863
Netherlands (n=52)	\$89,257	\$92,879	\$73,774
Japan (n=125)	\$87,599	\$95,541	\$77,010
South Korea (n=69)	\$87,092	\$88,906	\$90,721
Austria (n=15)	\$80,149	\$95,936*	\$65,577*
Sweden (n=23)	\$77,697	\$82,989	\$71,322*
Singapore (n=21)	\$75,311	\$90,373	\$48,952*
Belgium (n=18)	\$74,685	\$85,007*	\$78,935*
Finland (n=19)	\$72,863	\$100,794*	\$59,505
Canada (n=100)	\$72,314	\$84,857	\$63,643
France (n=67)	\$63,148	\$76,506	\$49,790
United Kingdom (n=150)	\$55,080	\$63,671	\$51,754
Taiwan (n=50)	\$52,479	\$53,550	\$56,228
Italy (n=115)	\$48,575	\$54,647	\$42,504
Spain (n=77)	\$48,575	\$54,647	\$44,325
Portugal (n=19)	\$43,718	\$68,006*	\$37,039
Czechia (n=25)	\$39,196	\$35,949*	\$35,253
Brazil (n=35)	\$32,064		\$33,055
Peoples Republic of China (n=88)	\$31,788	\$45,521	\$30,862
Greece (n=18)	\$30,360		\$24,895*
Malaysia (n=18)	\$27,187	\$51,903*	\$24,222
Mexico (n=37)	\$25,480		\$22,932
Poland (n=19)	\$21,422	\$8,555*	\$26,777
Turkey (n=34)	\$16,665	\$26,878	\$12,660
India (n=74)	\$14,211	\$12,298	\$14,211
Russia (n=115)	\$11,679	\$12,709	\$10,161
Ukraine (n=16)	\$6,778		\$6,741

Blank cells result from sample size below 5 respondents. An asterisk indicates sample size of 5-9.

Survey responses by region

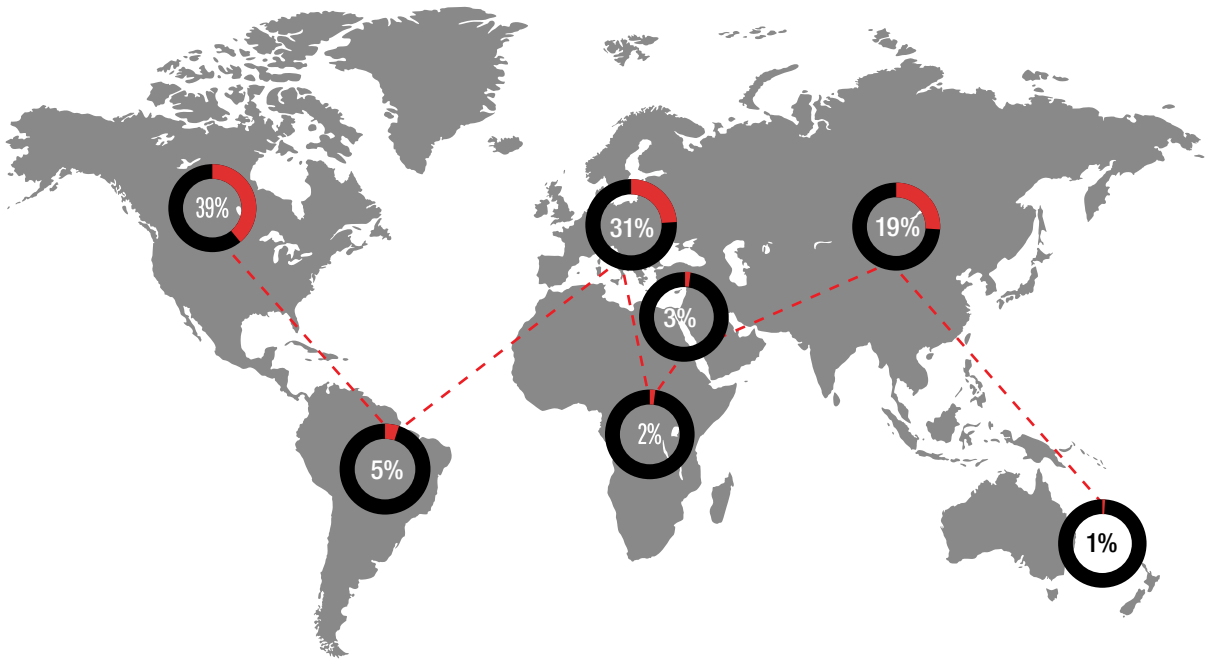
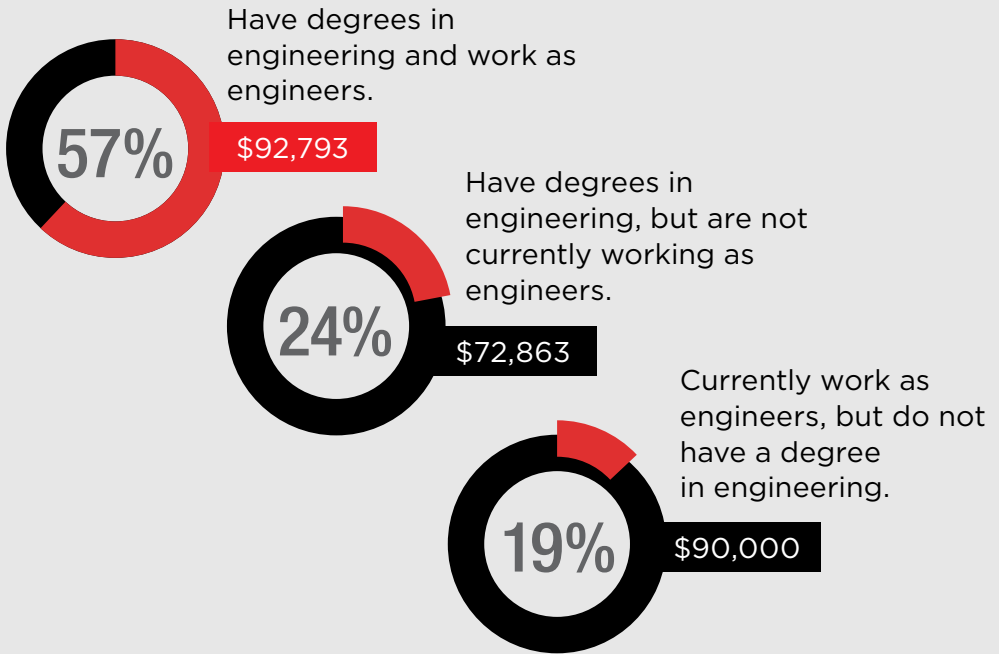


Photo credit: Getty Images, Monty Rakusen

Engineers in Optics and Photonics

64% of full-time workers identify themselves as engineers

Within this group:

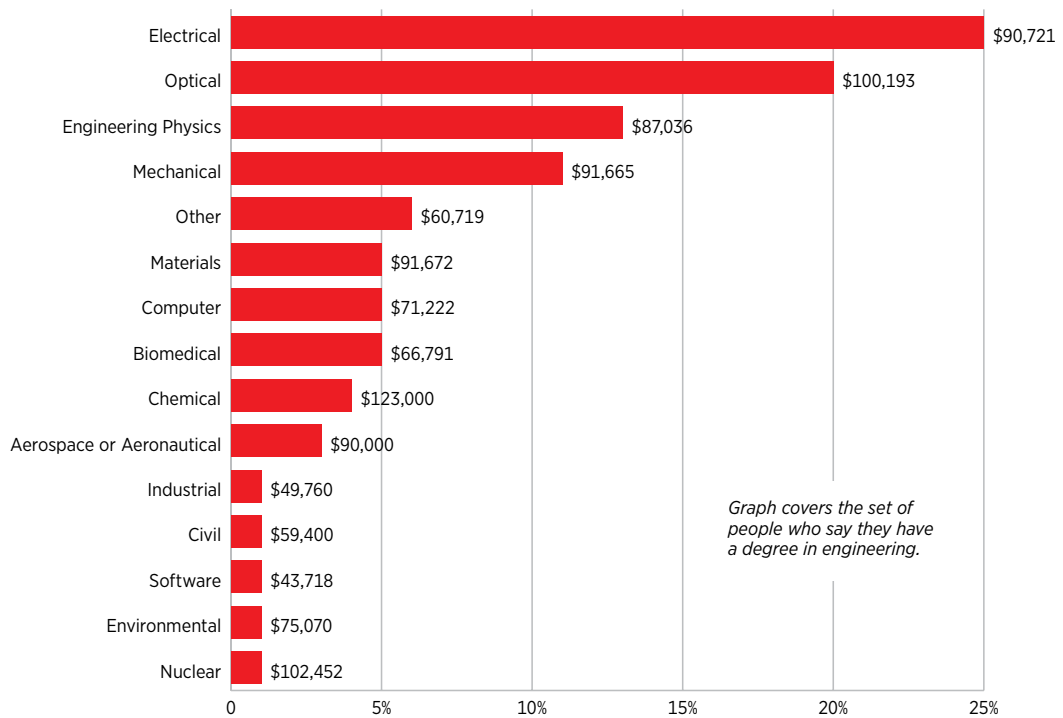


—Median salaries shown.

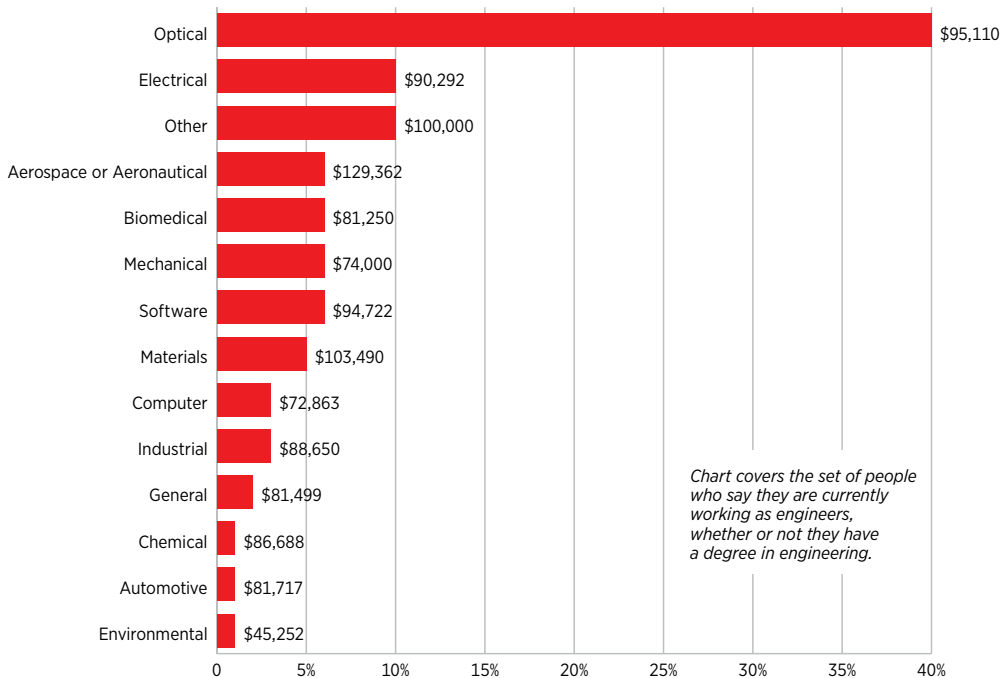
“ I FIRST GOT INTO OPTICS THROUGH A LOVE OF ASTRONOMY. I HAVE THOROUGHLY ENJOYED BEING AN OPTICAL ENGINEER FOR OVER 35 YEARS! ”

Photo credit: Shutterstock, AstroStar

“What type of engineering degree do you have?”



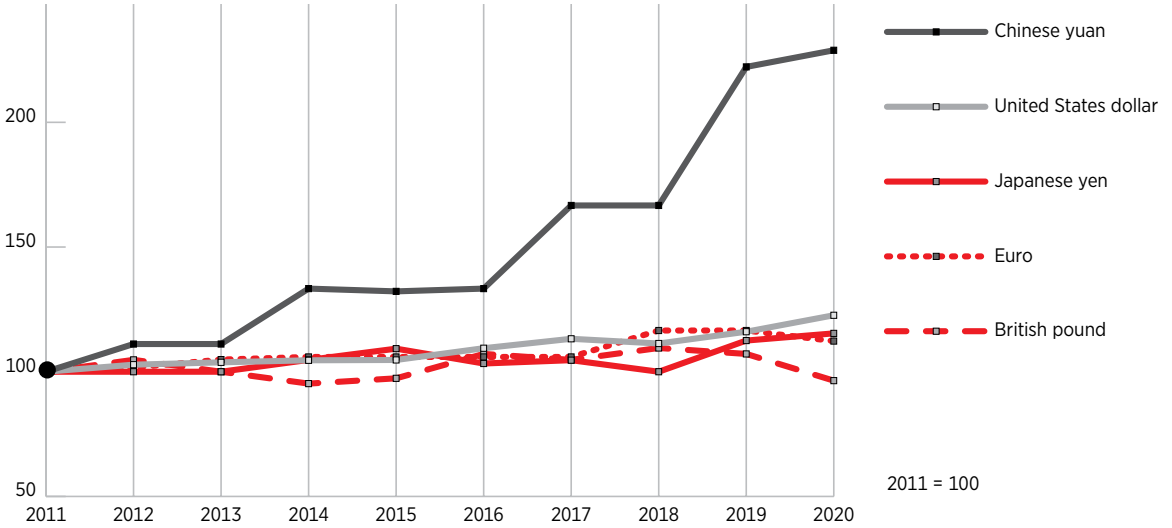
“What type of engineering is your main focus?”



Wage Growth

Pay in U. S. dollars was up 6% over last year, while both Chinese yuan and Japanese yen salaries increased 3%. Salaries paid in euro declined by 4% and pay in British pounds declined by 10%. Over the last decade, median salaries have increased in four out of five currency groups, with pay in Chinese yuan increasing most, rising 129% since 2011.³

Change in median salaries, 2011-20, main currency groups



Growth in median salaries, 2011-2020, main currency groups

	2011 Median Salary	2019 Median Salary	2020 Median Salary	Growth 2019-2020	Growth 2011-2020
Chinese yuan	¥90,000	¥200,000	¥206,000	3%	129%
United States dollar	\$106,000	\$123,000	\$130,000	6%	23%
Japanese yen	¥8,000,000	¥9,000,000	¥9,230,000	3%	15%
Euro	€47,200	€55,000	€53,000	-4%	12%
British pound	£42,000	£45,000	£40,050	-10%	-4%

“It is very competitive these days.

CONTINUOUS LEARNING

is always needed.”

“MY CURRENT
CAREER AND
CURRENT SALARY
SATISFY ME COMPLETELY.”



Career Stage

Pay for full-time workers is highest in the United States and North America at almost every career stage, while employees at for-profit organizations earn more than their counterparts in academia.

Median salary by years employed for selected countries

	Italy	Japan	Germany	Canada	United Kingdom	United States
Less than one year	\$27,627*			\$41,603*	\$49,030*	\$75,000
1-2 years	\$31,574*		\$64,362*	\$64,428*	\$44,694	\$75,000
3-5 years	\$32,181	\$49,094*	\$70,191	\$63,250	\$52,435	\$93,550
6-10 years	\$42,197	\$68,791	\$79,542	\$66,786	\$54,478	\$111,282
11-15 years	\$48,575	\$77,010	\$97,151		\$68,013	\$128,000
16-20 years	\$60,719	\$101,076	\$110,509	\$84,857*	\$71,843	\$138,000
21-25 years	\$66,791	\$87,599	\$133,582	\$122,080	\$84,441	\$160,000
26-30 years	\$85,007*	\$105,889	\$114,152	\$92,321*	\$84,441*	\$164,000
More than 30 years	\$66,791	\$103,482	\$142,690	\$123,921	\$81,717	\$167,000

Blank cells result from sample size below 5 respondents. An asterisk indicates sample size of 5-9.

Median salary by years employed and organization type category

	Academic	Government/military	For-profit
Less than one year	\$38,643	\$47,361	\$54,702
1-2 years	\$45,801	\$40,348	\$60,000
3-5 years	\$46,306	\$61,646	\$75,000
6-10 years	\$48,109	\$61,427	\$90,500
11-15 years	\$45,360	\$51,055	\$94,819
16-20 years	\$60,000	\$70,714	\$105,218
21-25 years	\$87,118	\$95,337	\$137,448
26-30 years	\$100,000	\$85,007	\$142,000
More than 30 years	\$105,444	\$112,250	\$145,726

Median salary by years employed and region

	Europe, lower income	Asia, lower income	Latin America & Caribbean	Middle East	Europe, higher income	Asia, higher-income	North America
Less than one year		\$5,606*	\$8,186*		\$36,432	\$27,216*	\$68,000
1-2 years	\$9,376*	\$9,308	\$9,647*	\$12,095*	\$40,859	\$43,123*	\$72,000
3-5 years	\$10,839	\$16,398	\$28,407	\$14,192	\$54,647	\$51,408	\$90,000
6-10 years	\$8,617	\$15,818	\$23,006	\$32,788	\$59,646	\$59,405	\$109,292
11-15 years	\$10,884	\$23,235	\$30,966	\$32,254	\$65,577	\$75,980	\$125,000
16-20 years	\$19,869	\$30,862	\$35,831	\$48,381*	\$63,755	\$90,721	\$133,000
21-25 years	\$23,710	\$28,696	\$38,221	\$91,542*	\$89,248	\$91,450	\$151,800
26-30 years	\$11,611*	\$40,994		\$73,254	\$94,256	\$96,263	\$156,000
More than 30 years	\$10,001	\$51,926	\$40,217	\$169,808	\$92,293	\$105,889	\$163,000

Blank cells result from sample size below 5 respondents. An asterisk indicates sample size of 5-9.

**“AS A YOUNG,
VERY COMPETENT PERSON
I’ve been called on
TO DO A LOT OF WORK
ABOVE MY STATION.”**

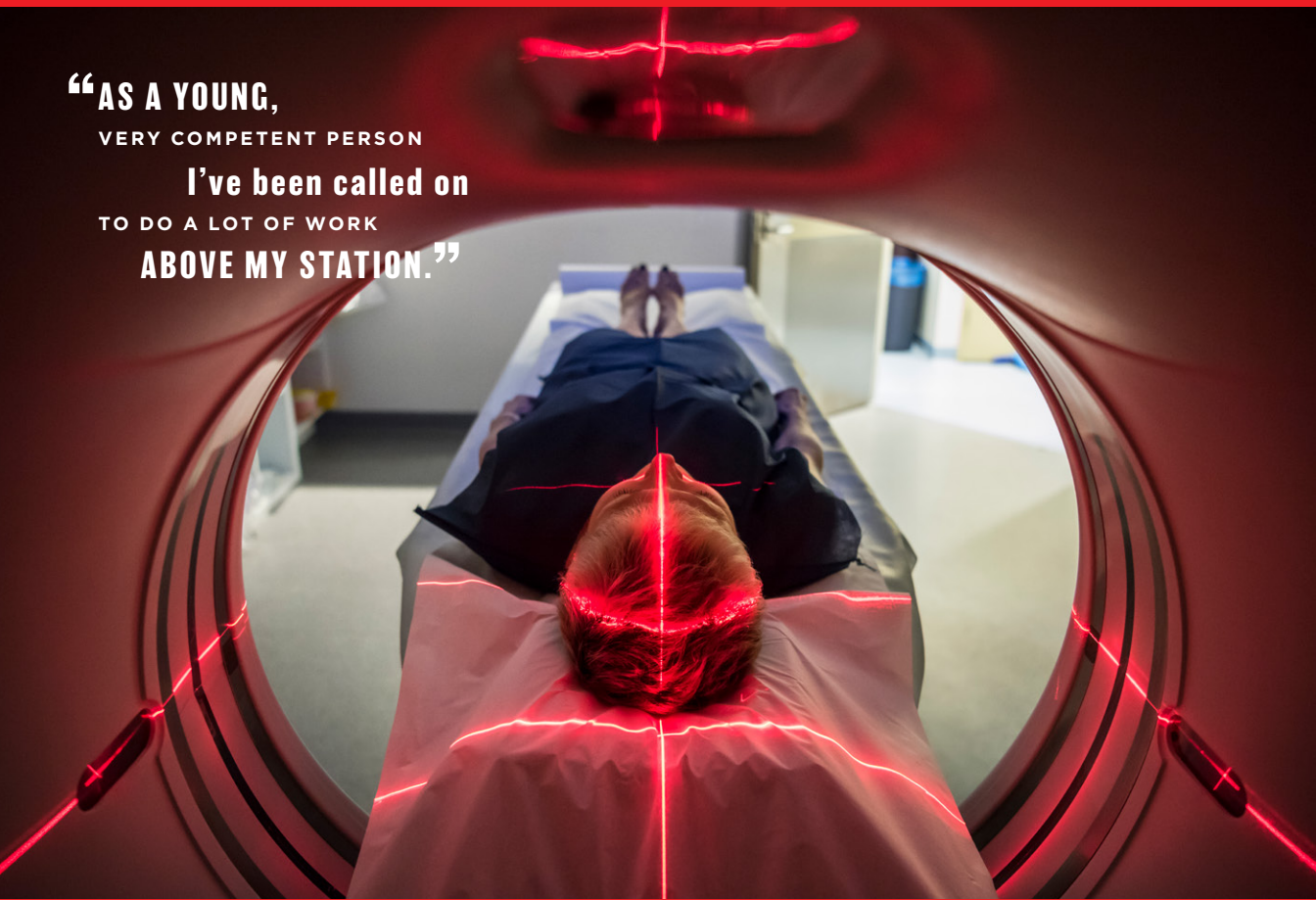
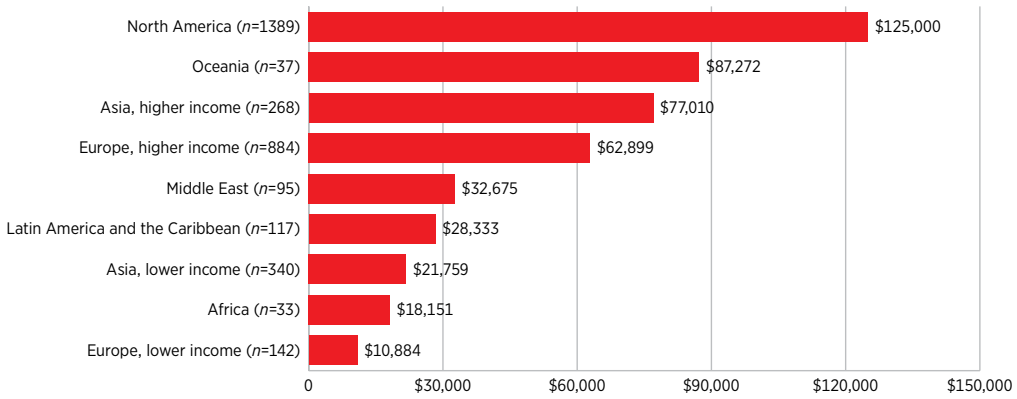


Photo credit: Getty Images, Johnny Greig

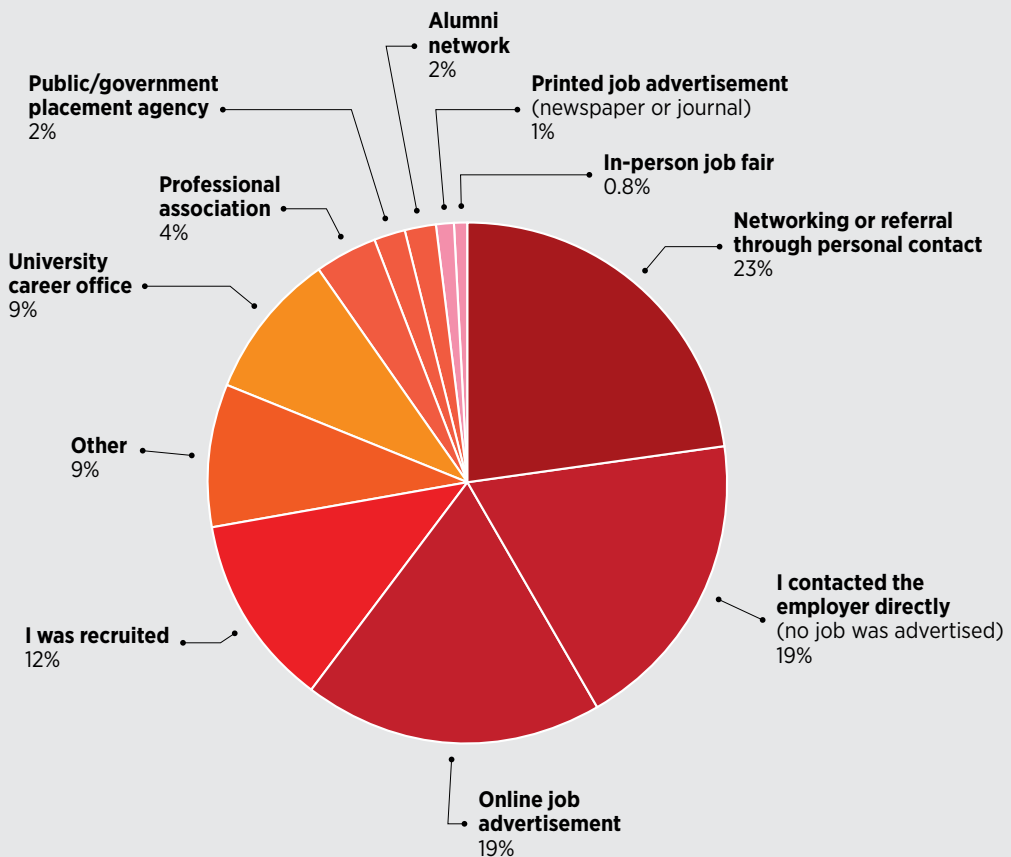
Region

North America, Oceania, and higher-income Asia stand out as the regions with the highest salaries.⁴ A large portion of regional income gaps is explained by the level of economic development of countries within each area.⁵

Median salary by region



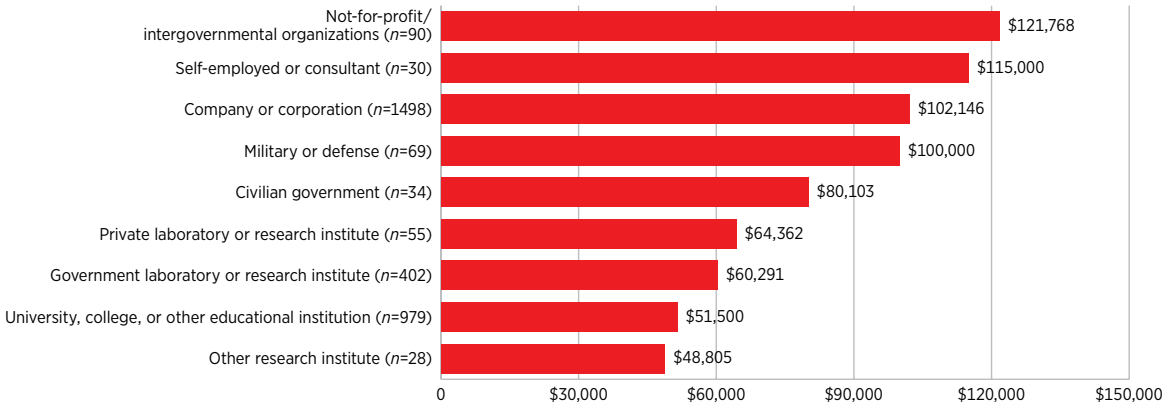
“How did you find your original position at your present employer?”



Employer Type

Median salaries are greatest in not-for-profit/intergovernmental organizations, followed by self-employed/consultants, and for-profit companies. Universities, colleges, and other educational institutions and “other research institute(s)” pay the least.⁶

Median salary by employer type



Median salary by region: for-profit, government/military, and academic employers

Region	For-profit	Government/Military	Academic
North America	\$132,250	\$133,500	\$100,000
Oceania	\$100,402	\$84,179	\$87,272
Asia, higher income	\$89,250	\$73,763	\$71,400
Middle East	\$82,680	\$32,926	\$13,224
Europe, higher income	\$78,935	\$54,647	\$54,478
Asia, lower income	\$31,170	\$21,180	\$19,711
Africa	\$22,332	\$9,035	\$18,150
Latin America & Caribbean	\$16,424	\$26,037	\$31,355
Europe, lower income	\$12,952	\$11,801	\$9,755

Startups account for just over 14% of workers at for-profit organizations. These entrepreneurs earn median salaries of \$91,450 versus \$105,651 for their colleagues at traditional companies.

Median salaries at startup versus traditional companies

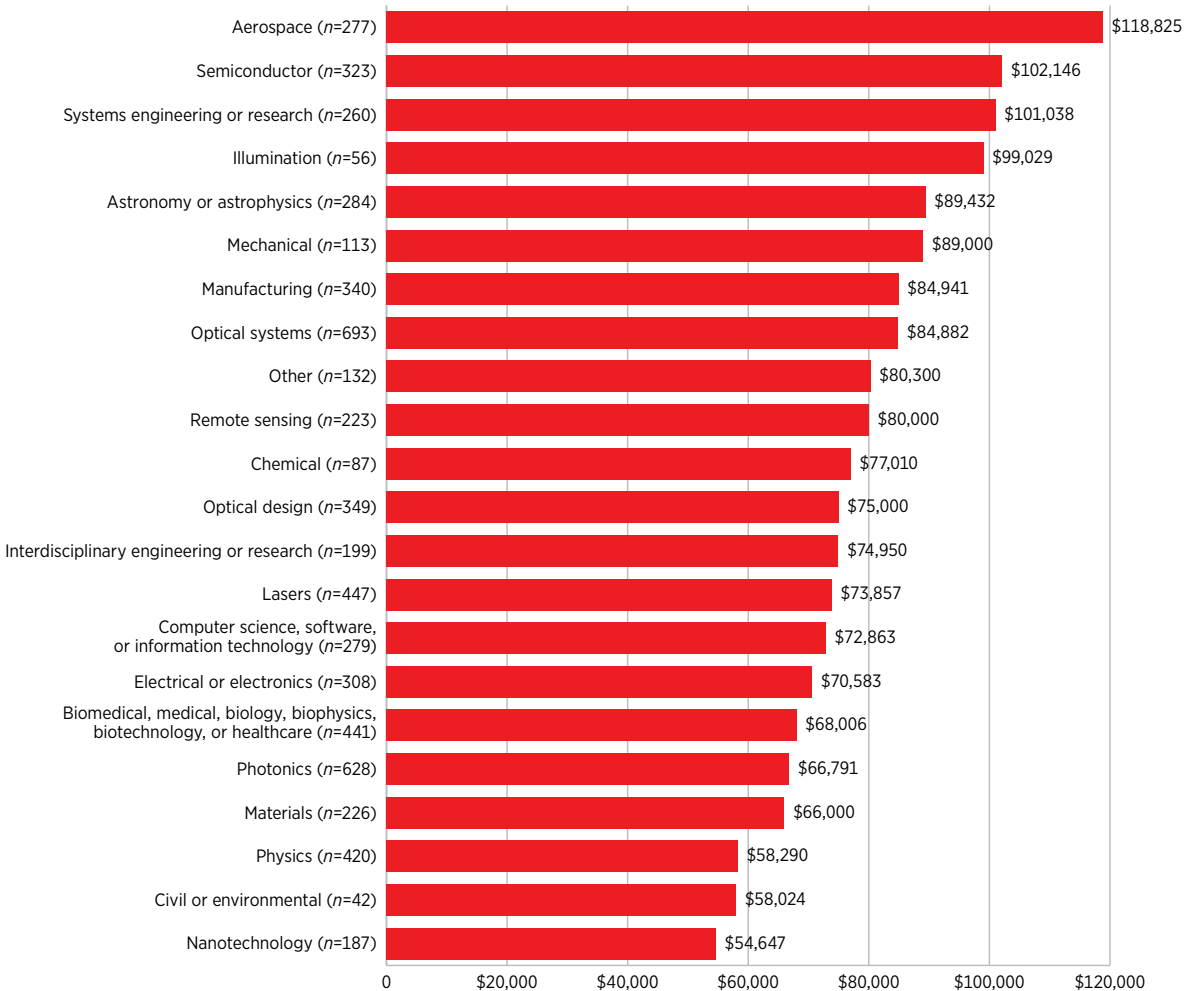
	Percentage of Respondents	Median Salary
Traditional companies	86%	\$105,651
Startup companies	14%	\$91,450

The question was seen only by respondents indicating “Company or corporation” or “Private laboratory or research institute” for organization type.

Discipline

Aerospace and semiconductor disciplines enjoy the highest median earnings, at \$118,825 and \$102,146, respectively. Nanotechnology salaries are the smallest, with a median salary of \$54,647.

Median salary by primary discipline



The two most important factors driving salary gaps across disciplines are employment sector and country income level. The highest-paying disciplines have much higher representation at for-profit companies: 71% of semiconductor and 65% of aerospace workers are at for-profits.

Country income level has a similar impact on median salaries of optics and photonics disciplines. In aerospace, for example, 85% of workers are located in North America or higher-income European countries.

Median salary by discipline: for-profit, government/military, and academic employers

Discipline	For-profit	Government/ Military	Academic
Semiconductor	\$125,268	\$104,972	\$60,394
Aerospace	\$121,500	\$68,135	\$122,475
Interdisciplinary engineering or research	\$118,288	\$74,975	\$59,400
Remote sensing	\$117,937	\$100,903	\$40,173
Systems engineering or research	\$114,198		\$61,978
Illumination	\$105,889	\$73,000	\$38,833
Optical systems	\$105,218	\$63,000	\$60,000
Other	\$105,000	\$49,790	\$39,286
Biomedical, medical, biology, biophysics, biotechnology, or healthcare	\$104,046	\$93,000	\$52,552
Chemical	\$100,729	\$64,362	\$53,946
Astronomy or astrophysics	\$98,575	\$59,000	\$94,208
Electrical or electronics	\$97,151	\$49,980	\$39,984
Mechanical	\$97,151	\$64,257	\$81,900
Computer science, software, or information technology	\$96,219	\$46,850	\$40,159
Materials	\$95,131	\$60,936	\$50,924
Lasers	\$95,000	\$59,517	\$46,293
Physics	\$94,500	\$55,155	\$51,848
Photonics	\$91,832	\$68,714	\$49,337
Manufacturing	\$89,369	\$35,217	\$57,800
Nanotechnology	\$89,263	\$57,758	\$45,000
Optical design	\$87,487	\$59,140	\$59,505
Civil or environmental	\$75,135	\$54,762	\$27,330

Minimum cell sample size is 10 respondents.

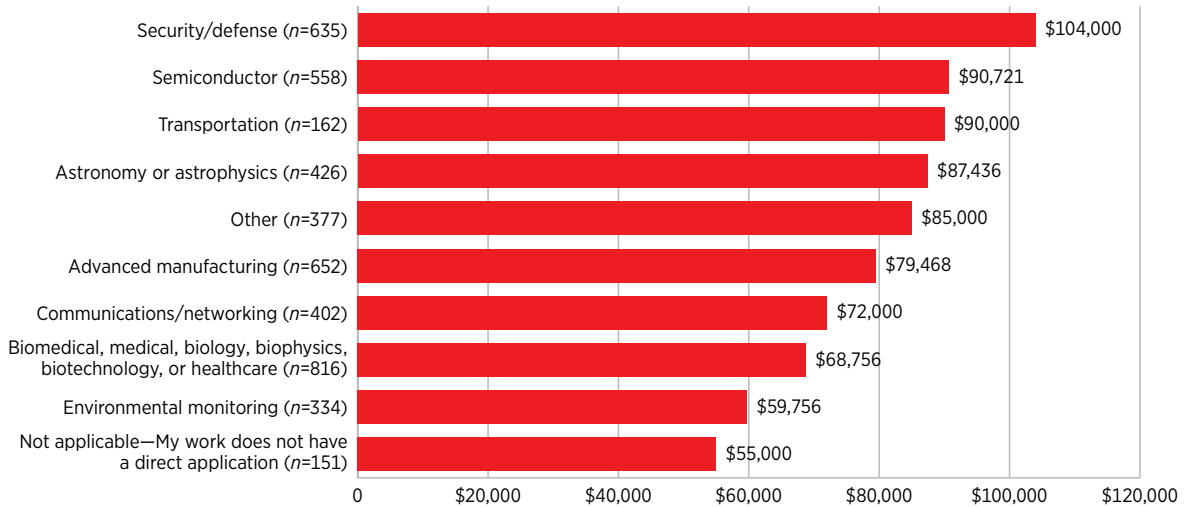
“I’VE FOUND MY SWEET SPOT
in a position that is at the
intersection of
ENGINEERING AND SALES.”

**“BEING AN ENGINEER IS AWESOME,
BUT IT’S NOT FOR EVERYONE.”**

Application Area

Security/defense is the highest-paid application area, which is unsurprising given that 58% of these workers are in aerospace, the highest-paying discipline.

Median salary by application area



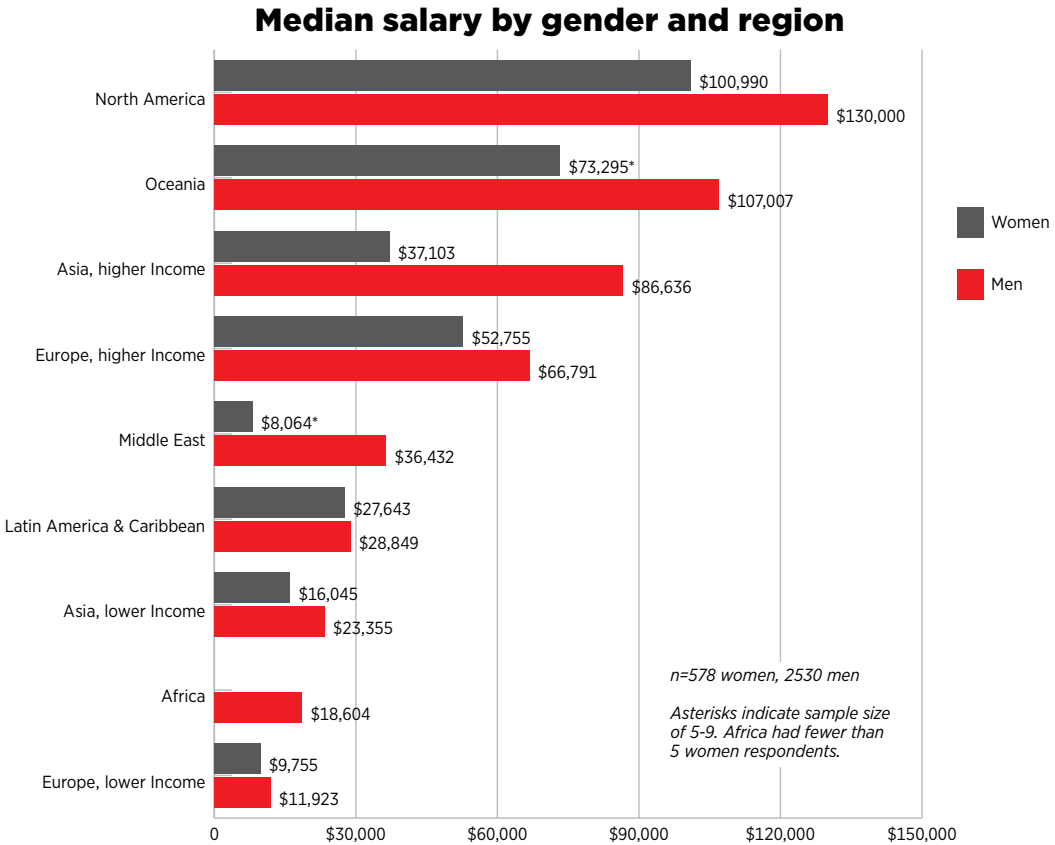
“PHOTONICS
IS A FAST-DEVELOPING FIELD
AND I LOVE BEING A PART OF IT.”



Photo credit: Shutterstock, Georgy Shafeev

Gender

Women make up 22% of the respondents to the survey, 33% of students, 18% of full-time workers, and 30% of part-time workers. Women earn less than men overall, with respective median salaries of \$63,175 and \$83,776.



The largest wage differences are associated with higher-income Asian countries, the Middle East, not-for-profit/intergovernmental organizations, and employment of more than 30 years. Wage gaps for women persist in most demographic subsets of the data, though women earn more than men in a variety of subgroups including military/defense, civilian government, and those with 3-5 years of employment.

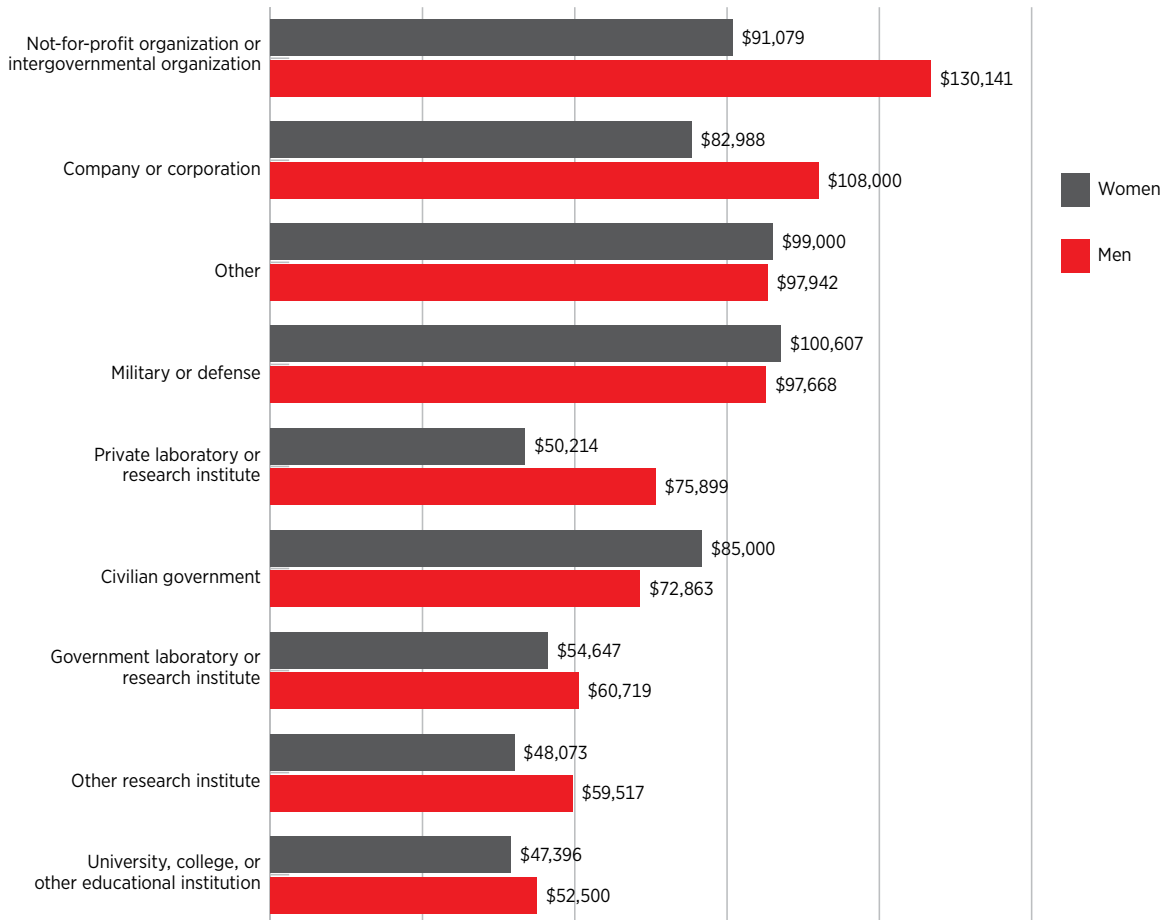
**“ I AM PAID WELL
 FOR A WOMAN
 IN A MAN’S WORLD,
 but not paid well compared to coworkers.”**

Median salary by gender and years employed

	Women	Men
Less than one year	\$44,490	\$45,646
1-2 years	\$50,750	\$51,071
3-5 years	\$60,719	\$60,000
5-10 years	\$61,002	\$68,443
11-15 years	\$54,478	\$74,907
16-20 years	\$60,719	\$89,864
21-25 years	\$93,000	\$120,000
26-30 years	\$102,000	\$124,500
More than 30 years	\$90,373	\$133,582

n=549 women, 2468 men

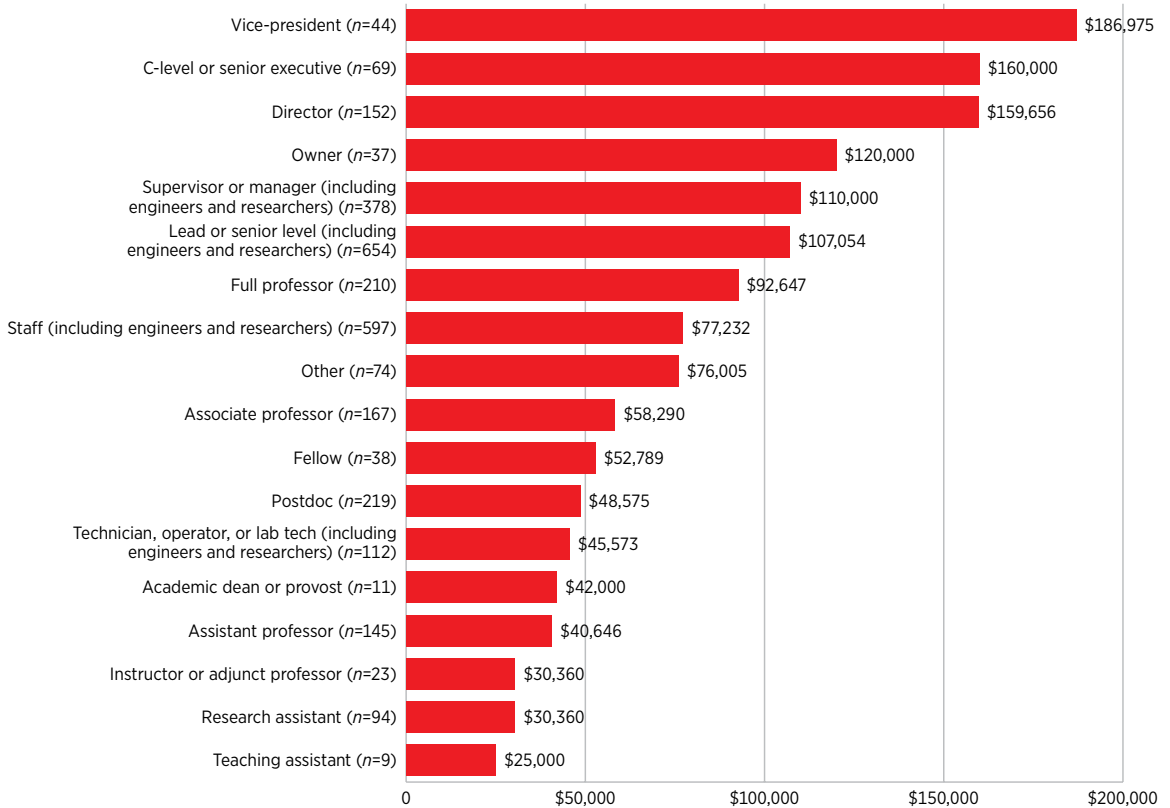
Median salary by gender and employer type



Other Factors

Other factors that influence salary include job level and job role. Top organizational leaders enjoy the highest salaries, while research and teaching assistants anchor the bottom of the range.

Median salary by job level

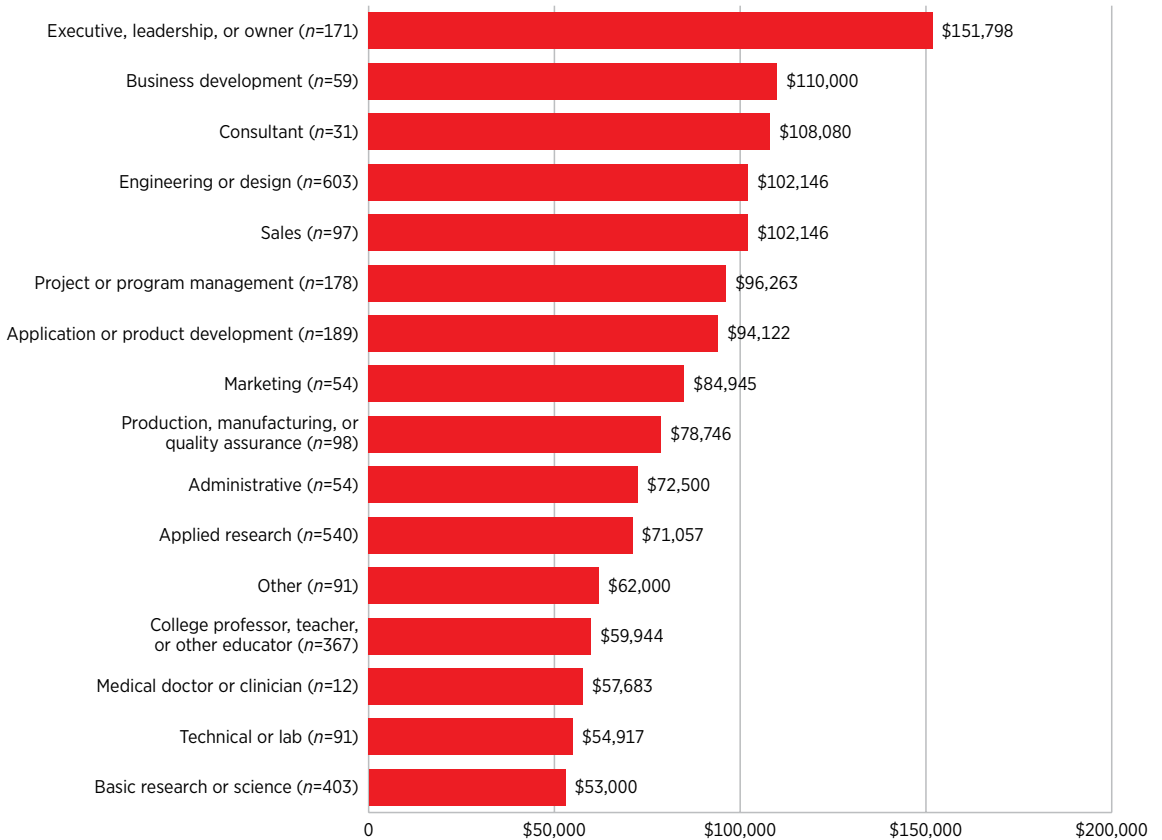


Median salary by job level, selected countries

	Staff	Lead or senior level	Supervisor or manager	Assistant professor	Associate professor	Full professor
United States	\$107,000	\$146,000	\$145,000	\$100,000	\$103,000	\$172,500
Netherlands	\$93,508	\$97,151				
Germany	\$80,757	\$103,223	\$121,438			
South Korea	\$66,226*	\$72,577	\$116,123		\$136,081*	\$90,721*
Canada	\$64,428	\$102,143	\$101,986			\$135,757*
France	\$58,290	\$65,577	\$72,863			
Japan	\$56,795	\$89,043	\$105,889	\$61,319	\$86,636*	\$105,889
United Kingdom	\$51,754	\$68,098	\$87,505			
Italy	\$46,147	\$60,719	\$60,719	\$42,504	\$61,934	\$97,151*
Spain	\$38,860	\$61,341*			\$61,326	\$85,007
Peoples Republic of China	\$30,862*		\$54,008*	\$38,577*	\$30,862	\$23,146*
Russia	\$9,484	\$12,194	\$35,904*		\$7,373	\$13,548
India	\$6,748*	\$16,398	\$21,249*	\$10,932	\$21,522*	\$30,062

Blank cells result from sample size below 5 respondents. An asterisk indicates sample size of 5-9.

Median salary by job role



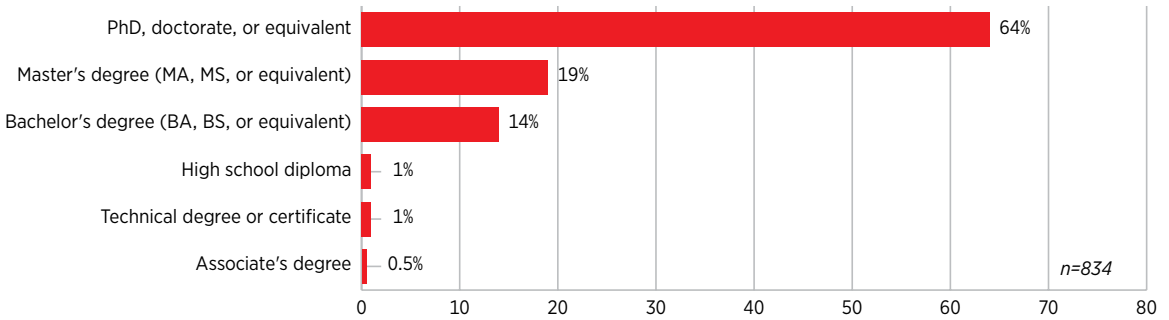
**“STARTING MY OWN TEST LAB
30 YEARS AGO
WAS A FANTASTIC DECISION.”**

“BE PERSISTENT.”

Students

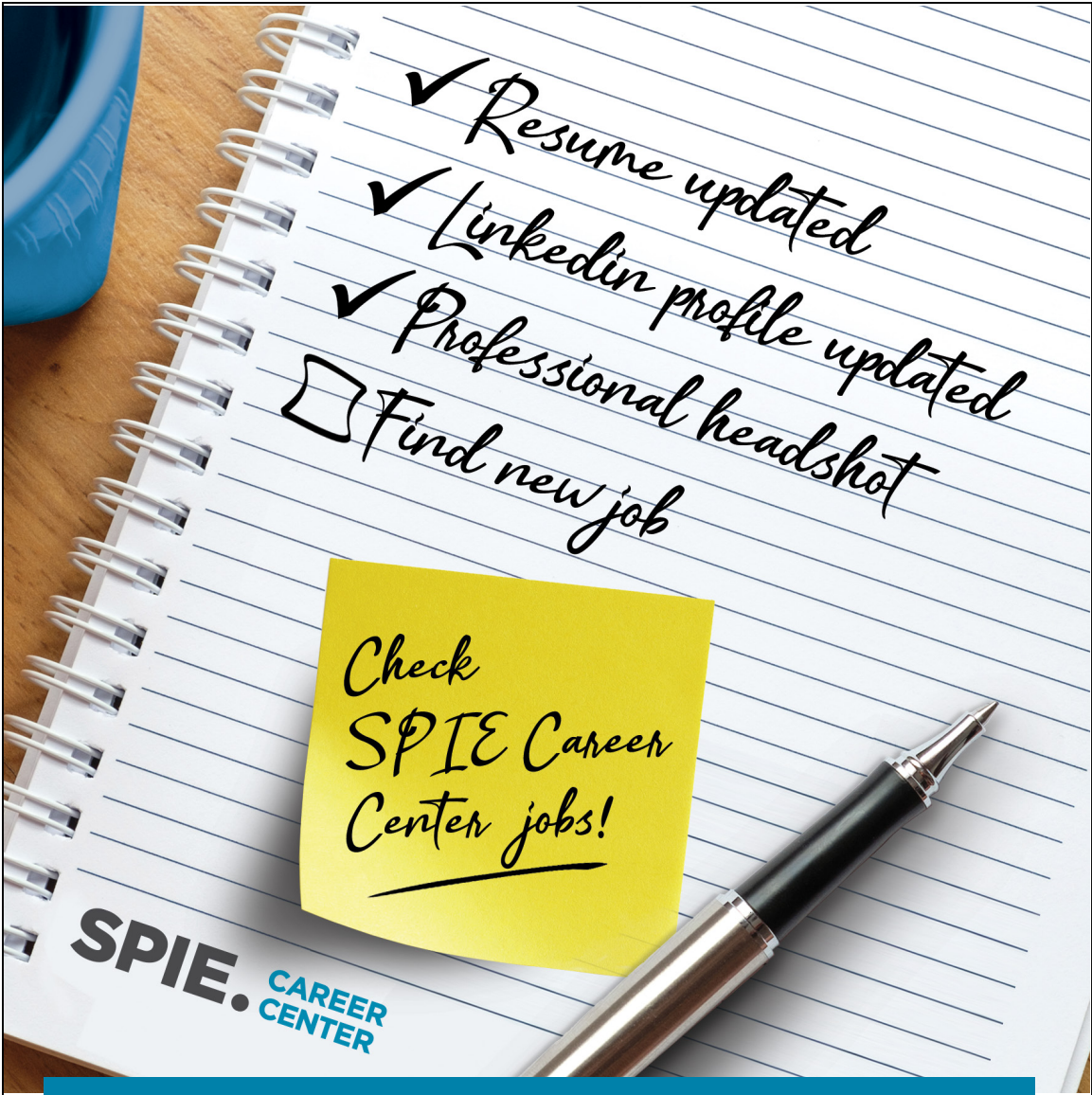
The majority of student respondents are pursuing PhDs.

Degree being pursued



“THIS IS A GREAT FIELD AND THE YOUNG PEOPLE in the field WILL FIND THAT THERE ARE many opportunities TO EXCEL AND GROW.”

Photo credit: Getty Images, sinology

- 
- A spiral-bound notebook with a blue pen and a yellow sticky note. The notebook is open to a page with lined paper. The pen is black and silver. The sticky note is yellow and has handwritten text. The notebook is on a wooden surface.
- ✓ Resume updated
 - ✓ LinkedIn profile updated
 - ✓ Professional headshot
 - Find new job

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Methodology and Endnotes

In January of 2021, SPIE sent email survey invitations to a large subset of its global customer database. Response was voluntary and open. An iPad raffle and early access to this report were offered as incentives to encourage participation. Surveys were completed online using Alchemer's enterprise survey tool. Results were filtered for duplicates and invalid data to yield 4,447 valid responses. Microsoft Excel and SPSS were utilized for summary statistics and related analyses.

Notes:

1. This list includes valid responses from full-time, part-time, unemployed, student, and retiree respondents. United States (1578), India (231), Germany (222), United Kingdom (190), Peoples Republic of China (157), Russia (155), Japan (147), Canada (144), Italy (143), Spain (95), France (92), South Korea (86), Mexico (72), Netherlands (66), Taiwan (62), Brazil (54), Turkey (48), Australia and Switzerland (46), Israel (42), Pakistan (39), Czechia (36), Poland (35), Belgium (29), Colombia and Sweden (28), Malaysia (24), Finland, Ireland, and Singapore (23), Austria, Greece, Portugal, and Ukraine (21), Egypt (20), South Africa (19), Thailand (18), New Zealand (17), Chile (16), Lithuania (15), Denmark and Romania (14), Algeria, Argentina, Indonesia, and Nigeria (12), Latvia and Philippines (8), Bulgaria, Norway, United Arab Emirates, and Vietnam (7), Hong Kong SAR, Peru, and Tunisia (6), Hungary (5), Kazakhstan, Kenya, Moldova, and Slovenia (4), Ecuador, Morocco, Saudi Arabia, and Slovak Republic (3), Bangladesh, Cameroon, Ethiopia, Georgia, Ghana, Iran, Iraq, Liechtenstein, Qatar, Serbia, Sri Lanka, State of Palestine, Tanzania, and Uruguay (2), Armenia, Belarus, Botswana, Chad, Republic of the Congo, Croatia, Cyprus, Kuwait, Kyrgyz Republic, Lebanon, Libya, Mongolia, Nepal, Nicaragua, Oman, Panama, Paraguay, Senegal, Tajikistan, and Zambia (1).
2. U.S. dollars are used throughout. Local currencies were converted using January 2021 market exchange rates. Salary figures include total yearly compensation, both base pay and bonuses. Full-time employees are those who indicated working 35 or more hours per week. Unless otherwise noted, all data on pay is drawn from full-time employees.
3. Yearly growth was computed by comparing same-currency results for each year.
4. Oceania is comprised of Australia and New Zealand. North America is comprised of the United States and Canada. Mexico is included in the Latin America and Caribbean category.
5. Europe and Asia are composed of countries spanning a wide range of income levels, even when subdivided into higher- and lower-income groups. For example, the European higher-income category includes Lithuania and Norway, at \$19,080 and \$82,500 per capita Gross National Income (GNI), respectively, for 2019. European lower-income countries include Russia at \$11,260 and Ukraine at \$3,370.

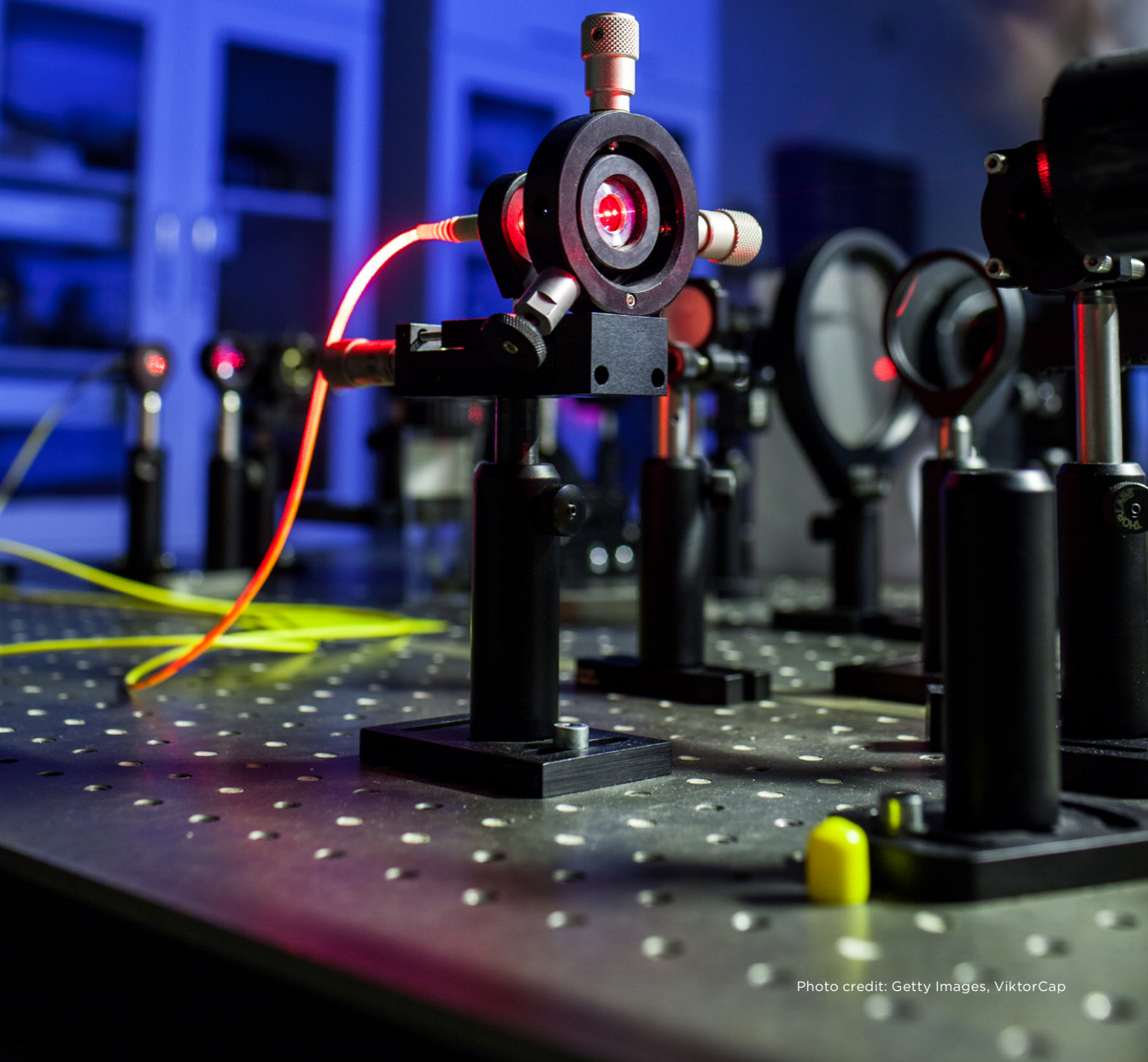
Higher- and lower-income subcategories are based on the World Bank's threshold for high-income countries, \$12,536 per capita GNI in 2019. This threshold is used throughout this report when referring to "higher-income" and "lower-income" countries.

For data on per capita GNI, see <http://data.worldbank.org/indicator/NY.GNP.PCAP.CD/countries>. For World Bank country income categories, see <http://data.worldbank.org/about/country-classifications>
6. The category "for-profit" is composed of company/corporation, self-employed/consultant, and fill-in "other" entries that indicate for-profit affiliation. "Academic" is composed of university/college, private lab or research institute, not-for-profit, intergovernmental, other research institute, and open-text "other" entries that indicate academic organizations. "Government/military" is composed of government lab or research institute, civilian government, and military/defense.

**“ENJOY VISIBLE,
SEARCH FOR
INVISIBLE,
AND ENJOY THE
POSITIVE RESULTS.”**

Notes

**“ WE NEED TO BE MORE KIND,
HELP EACH OTHER,
AND MAKE DECISIONS WITH INTEGRITY
BEYOND SELFISH MEASURES. ”**



“I can't wait to go to **PHOTONICS WEST** again.
HOPE TO SEE YOU IN THE FUTURE :)”

SPIE is the international society for optics and photonics

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SPIE is the international society for optics and photonics, an educational not-for-profit organization founded in 1955 to advance light-based science and technology. The Society serves nearly 255,000 constituents from 183 countries, offering conferences and their published proceedings, continuing education, books, journals, and the SPIE Digital Library in support of interdisciplinary information exchange, professional networking, and patent precedent. In 2020, SPIE provided over \$5 million in community support, including scholarships and awards, outreach and advocacy programs, travel grants, public policy, and educational resources.

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