

# How International Students and Researchers Benefit the United States: Their Experiences, Their Stories



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For more than half a century, the United States has been a premier destination for top global talent. Our nation's ability to recruit the best and brightest minds from around the world to study and work here serves as a competitive advantage and helps the United States maintain its global leadership in cutting-edge scientific research and state-of-the-art technology development.

But now, the United States is losing its pull. During the last few years, for example, as documented in recent reports and data, the United States has seen a significant decline in its ability to attract talented international students. With that decline comes substantial economic risk for the United States, as top international students and scientists are now choosing to go to competitor countries to study, to seed innovation and to build businesses.

Missing from the data and reports, however, have been the views and experiences of not only the international scientists and students who chose to come to the United States, but also their American counterparts. The following pages contain stories about what motivates talented international students and scholars to come here, the programs they use to come here, and the near- and long-term benefits to the United States from them studying and working here. Their stories make clear that international students and scholars are essential to the US scientific enterprise and deliver essential context for policy discussions on the steps that must be taken to restore our nation as a destination of choice for the best and brightest in the world.

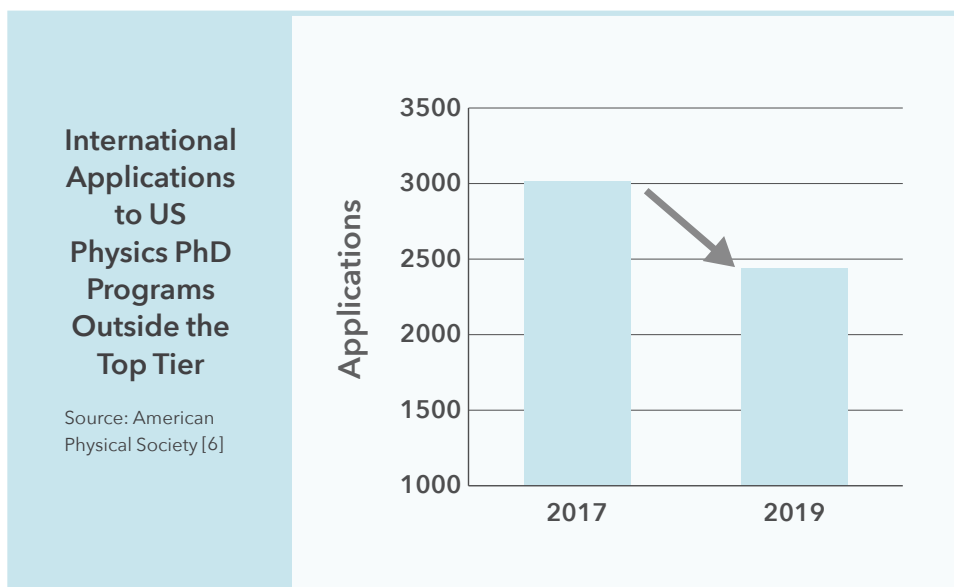
The conclusion of all these stories is inescapable: Optional Practical Training (OPT) and the J-1 visa program are essential to future US economic competitiveness.

## Overview

Foreign-born students, scientists and entrepreneurs bring fresh perspectives, diverse experiences, expertise, new ideas and creativity to our country. Today, more than one-third of the US science and technology (S&T) workforce is foreign-born, including more than 50% of the doctorate holders in engineering, computer science, and mathematics occupations.[1]

The benefit these international students and researchers provide to the United States is clear and measurable. As of 2018, immigrants had founded more than half (50 of 91) of the privately-held billion-dollar startup companies in the United States, and 21 of these 91 companies had a founder who first came to the United States as an international student.[2] As a result, they have promoted job growth,[3] generated higher average salaries for US workers,[4] and become an indispensable part of US high-tech competitiveness.[5]

Despite the considerable contributions international students and scientists have made to the United States, recent federal policies have limited their opportunity to come to the United States. Those policies have contributed to a decline in the ability of the United States to attract talented international students and scholars, as documented in recent data and reports.[6]



Missing from the data and reports, however, have been the views and experiences of international students and scholars and their American counterparts. By collecting these stories – about why and how they come to the United States and the measurable benefits our country receives from their studying and working here – we provide crucial context for the policy discussions about the value of immigration and inform the steps that must be taken to restore our nation as a destination of choice for the best and brightest in the world.

The following pages contain a summary of the more than 100 stories that international students and scientists and their American colleagues have provided the American Physical Society (APS) to help inform visa and immigration policy discussions.

## **In Their Words: Why They Come, How They Come, and What They Provide to the United States**

Historically, international students and scholars have come to the United States to study and pursue their careers. A small but critical number of programs attract them to the United States, including optional practical training (OPT) and the J-1 visa program. These programs bring top international talent for a set timeframe to US universities, national labs and companies. In doing so, these programs are often the launching pad of remarkable careers of talented individuals who stay connected to the US research and development (R&D) ecosystem, contributing to our economy, society, and global leadership.

But recent surveys and reports indicate three emerging problems: increasing challenges to acquiring a visa; the growing perception among international students and researchers that the United States is becoming increasingly unwelcome; and, increasing uncertainties about their ability to stay in the country. Together, these three problems are leading to a decline in the ability of the United States to attract global STEM talent.

APS recently asked its members to share the impacts that the J-1 visa and OPT programs have had on their or their peers' careers. APS then assembled more than 100 of those stories featuring personal narratives that highlight the importance of foreign-born scholars to the US R&D ecosystem, as well as our society more broadly.

The personal events and details vary dramatically—the stories APS collected provide details of the lives of scientists from all parts of the world. Nevertheless, despite all their differences, their stories remarkably all share some common themes:

- OPT and J-1 visas have the ability to attract the world's top international students and researchers;
- OPT and J-1 visas produce strong and positive outcomes for the United States, even in those cases where international scholars return to their home country;
- foreign-born scholars provide benefit well beyond academia, making critical contributions that advance US national security and US industrial competitiveness; and
- foreign-born scholars bring diverse perspectives that greatly benefit the US R&D communities.

Each theme is described below, accompanied by example profiles taken from the more than 100 stories that APS collected.

## OPT and J-1 visas can attract the world's top talent

Historically, the United States has been a premier destination for the world's best and brightest students and scholars. In 2016, for example, the United States attracted more than 19% of the world's students who travel internationally for their education. [7] Additionally, since 2000, more than 38% of all US Nobel Prize laureates have been foreign-born, including more than 42% of those in physics.[8]

*"I owe my success to the J-1 visa ... the USA owes the J-1 visa program for yet another Nobel Prize to an American citizen."*

*Michael Kosterlitz,  
2016 Nobel Prize  
Winner in Physics*



In 1973, Michael Kosterlitz came to the United States from the United Kingdom for a postdoctoral position at Cornell University on a J-1 visa. This experience started a long career in the United States, as he became a physics professor at Brown University and a US citizen. He was awarded the Nobel Prize in Physics in 2016 and one year later was elected to the US National Academy of Sciences. As he puts it, "This would not have happened without my getting a J-1 visa in 1973, so I owe my success to the J-1 visa and (the) USA owes the J-1 visa program for yet another Nobel Prize to an American citizen."

Pavel Pokhilko came to the United States to pursue his PhD at the University of Southern California in a topic related to quantum information science, one of the White House's "industries of the future." He emerged as a leading researcher in the field, far outdistancing typical scientists by publishing more than 10 peer-reviewed papers during his graduate school career. According to Pavel, OPT allowed him to stay in the US post-graduation and continue to contribute to this critical area of research. He stated, "I continue this research as a postdoctoral researcher on the OPT program. I am very grateful for this opportunity to complete the studies, expand my expertise, and contribute to the society." If the United States did not have programs to keep the world's top young scientists here, Pokhilko would have had no choice but to take his skills and future discoveries – in a field the United States has deemed to be of essential importance – to a US competitor.

## OPT and J-1 visas produce strong and positive outcomes for the United States

OPT and the J-1 visa program yield positive outcomes for the United States, even in instances when foreign-born scholars decide to return to their home countries. In both cases, international researchers become part of the US R&D network, often creating long-standing collaborations. Today, more than 70% of foreign-born students who obtain doctorate degrees in S&T fields from US institutions are still working in the United States ten years after completing their degrees.[9]

### Foreign-born scholars who pursue a career in the United States make lasting contributions:

Forty-three years ago, James Myra came to the United States from Canada to pursue a PhD in plasma and fusion physics. After completing his doctorate, Myra was able to transition to a career in the United States through OPT and eventually became a US citizen. "It has been a career in which I could apply my research skills to the benefit of the American people and indeed the world." His contribution to US economic and scientific competitiveness includes: starting a business in Colorado; hiring US citizens; and publishing research publications that have been cited by other scientists around the world an astonishing 6,800+ times.

### Talented scientists who come to the United States attract more talent:

Thirty years ago, Glenn Starkman came to the United States as a PhD student at Stanford on a J-1 visa. Today, Starkman is the chair of the Physics Department at Case Western Reserve University where he supervises dozens of PhD and postdoctoral scholars. He experiences first-hand the benefit of international students and postdocs who work under him: "Several have gone on to become professors at elite US institutions, including at MIT, University of Pennsylvania, and University of Michigan. Others work productively in industry." By extending a J-1 visa to Starkman, the US established a magnet that attracted international talent that helps sustain US global scientific leadership.



### **International scientists who return to their country provide lasting benefit to United States:**

Alejandro Garcia is a US citizen and a professor at the University of Washington, supervising many students and postdoctoral scholars. While reflecting about the impact of the J-1 program, he highlighted the story of one of his postdoctoral scholars on a J-1 visa: "He is one of the brightest and most efficient postdocs I have ever worked with... He was an excellent guidance for all in my group, particularly graduate and undergraduate students." This postdoc published 11 peer-reviewed papers in just three years before joining the Paul Scherrer Institute in Switzerland. Garcia and his former postdoc continue to collaborate on research. Additionally, Garcia boasts seven other similar stories from scholars who came to the United States from India, China and Canada on J-1 visas. The value is evident: even if the scholar returns to their country, they have contributed ideas, techniques and guidance that provide lasting benefit within the US scientific enterprise.

### **OPT and J-1 visas generate critical contributions far beyond academia**

Foreign-born scholars who pursue careers in the United States make critical contributions to the nation's R&D efforts at national laboratories and in industry – indeed, foreign-born inventors are responsible for approximately 23% of all patents filed in the United States since 1976.<sup>[10]</sup> They also provide lasting benefits to the United States far beyond the scientific enterprise.

Robert Cordery came to the United States from Canada as a postdoctoral researcher on a J-1 visa. Based on that experience, he pursued a career in US industrial research at Pitney Bowes, Inc. and was named as an inventor on more than 150 US patents. But he brought more than just his scientific expertise when he came to the US. He brought his personal dreams, too. Cordery got married and started a family that he is extremely proud of: "My three children all have professional careers as a teacher, a therapist and a university school dean."

Aidan Thompson graduated at the top of his class in chemical engineering in Ireland, and he was excited to start his career in America after completing that milestone. "After a few years working in industry, I decided I wanted to be a scientist, and America was the place to do it." In 1989, Aidan joined the PhD program at the University of Pennsylvania; he is now a US citizen working at Sandia National Laboratory in New Mexico. At Sandia, Thompson develops scientific capabilities that help maintain the US nuclear deterrent. "My work is personally fulfilling and also of great value to the United States and the world."

Jennifer Ross is chair of the Physics Department at Syracuse University, and her high-impact work focuses on the physics of cells. She highlighted the contributions that foreign-born scholars have made in her lab, especially one of her former postdoctoral researchers who came to the United States on a J-1 visa from Mexico: “He taught everyone in the lab about molecular biology, protein purification (and) microscopy. He wrote our first paper that came exclusively from my lab. I probably wouldn’t have tenure without his work.” This same postdoctoral fellow, after leaving her lab, contributed to the private sector: “He worked on a start-up company focused on using local RNA delivery to boost wound healing. It has major ramifications for basic science and applications for medical research. In particular, it should be of interest to the military – to help our wounded soldiers to heal faster without scar tissue.”

### **Diverse perspectives greatly benefit the US R&D community**

Foreign-born scholars not only bring their scientific expertise, but also their diverse perspectives, techniques, and passion that are crucial to US students’ experiences and education.

Laurel Anderson is currently a physics PhD student at Harvard University advancing our understanding of nanomaterials. “Although I am a US citizen, I have benefited immensely from the knowledge, expertise and mentorship of J-1 visa recipients. My research lab has postdoctoral researchers from Israel, Finland, Turkey, Brazil, South Korea and other countries. They bring a wealth of specialized skills and scientific insight about our field to help our lab perform cutting-edge experiments. There are very few people in the world with these skills, and losing these postdocs due to visa difficulties would set our research back years... Their advice and support have been truly invaluable to me. They bring so much to our country beyond just their expertise.”

***“Bringing an excellent scientist from around the world doesn’t just mean we gain one scientist, it means all of science in the US is stronger.”***

*Steven Albright*

Stephen Albright is a Yale PhD student who shared with us the positive influence that a Chinese postdoctoral researcher on a J-1 visa had on his career: “I’m about to complete my PhD in physics, and I could not have gotten here without the help of a postdoc in my group, from whom I learned basically every experimental skill I used in my dissertation... That’s the ripple effect of J-1 visas and OPT: bringing an excellent scientist from around the world doesn’t just mean we gain one scientist, it means all of science in the US is stronger.” That postdoc wanted to continue a career in the United States, but couldn’t due to visa-related challenges and is now a faculty member in Canada.



## Conclusions

For more than half a century, the United States has been a premier destination for top global talent. But now, the United States is losing its pull. During the few years, for example, data show a significant decline in the ability to attract talented international students. That creates substantial economic risk for the United States, as top international students and scientists now go to competitor countries to study, to seed innovation and to build businesses.

Missing from the recent data and reports, however, has been the views and experiences that are shaping the decisions of international scientists and students. And while data can clarify the problems, stories can offer insights into solutions.

This report provided clips of some of the more than 100 stories that APS collected. They provide insights into three key issues. In summary:

- Q.** What are the key programs available to international students and researchers to launch their careers in the United States?
  - A.** A small but critical number of programs attract top international talent to the United States, including OPT and the J-1 visa program.
  
- Q.** What challenges/barriers in the United States are driving international students and researchers elsewhere?
  - A.** International students and scholars want to come to the United States to study and pursue their careers, but to do that, they must overcome challenges to acquiring a visa, the growing perception that the United States is becoming increasingly unwelcome to international talent, and uncertainties with being able to stay and have a long-term career in the United States.
  
- Q.** What benefits do international students and researchers provide the United States?
  - A.** The aforementioned stories illustrate a broad range of measurable benefits: from Nobel Prizes to patents, from attracting more international talent to guiding domestic talent, from starting companies and hiring US citizens to establishing research dominance in areas of critical US need. In short, they enable US economic competitiveness, national security, and global scientific leadership.

Optional Practical Training (OPT) and the J-1 visa program are essential contributors to US economic competitiveness and scientific leadership.

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