

The 2021 Nobelists: Lessons for Higher Education, Science, and Society

Philip G. Altbach and Tessa DeLaquil

The Nobel prizes in the sciences (chemistry, economics, physics, and physiology/medicine,) were recently awarded for 2021, and as usual they not only recognize top scientists and their discoveries, but they also have lessons for contemporary universities and science. It is worth reflecting on some general trends in this year's selection of Nobelists. It is, of course, necessary to understand that Nobel awards, with few exceptions, recognize impressive scientific achievements of recent decades, and "reward the discoveries that have conferred the greatest benefit to humankind."

Who and Where?

Here is a brief overview of who received this year's prizes and where they are located. All of the 10 winners this year were men, as is unfortunately the norm for these awards—only 25 women have previously been awarded Nobel prizes in the sciences. (In 2020, exceptionally, three out of 10 were women). This year's winners are currently affiliated with universities in only three countries—seven in the United States, two in Germany, and one in Italy. Three are located at research institutes (two at Germany's Max-Planck-Institutes, and one at the US Howard Hughes Medical Institute) and seven at universities. As is typical, the affiliated universities are top-ranked, highly funded, and well-recognized research universities, for instance Stanford University and Princeton University.

The Origin, Education, and Careers of the 2021 Nobelists

Interestingly, only two of this year's Nobel laureates were born in the United States (others were born in Canada, Germany, Italy, Japan, Lebanon, the Netherlands, and the United Kingdom), although six out of 10 work in the United States at present. Six out of 10 earned their PhDs from US universities, with two from Germany and one each from Japan and Italy. Their undergraduate origins, on the other hand, reflect the diversity of the laureates' countries of birth—only two out of 10 earned their bachelor's degrees from US institutions. The others studied in Canada, Germany, Italy, Japan, Lebanon, the Netherlands, and Scotland—all at top universities and colleges. For graduate study, they moved from the peripheries to centers, if they were not already at the centers.

The career patterns of Nobel laureates are also significant. Only four of the 2021 cohort have remained within a single country (the United States), sometimes with several career moves between top universities, while the other six have had at least one international career experience—ranging from visiting professorships to full-time positions. These experiences often include the laureates' own countries of birth, but also other national contexts that boast top institutions, such as Germany and the United Kingdom.

Science is International—But Limited and Stratified

The education and careers of this year's Nobel laureates show that top scientists are indeed internationally mobile. Some have held appointments in several countries—all at top institutions, and they tend to gravitate to the countries with the most advanced scientific institutions—especially the United States.

The careers of this year's Nobelists are international, but within an elite circle, indicating the extent of global science and the importance of cross-fertilization of ideas. The educational and career journeys of this year's and recent Nobel laureates, especially in terms of graduate student mobility, scholar exchange, and some instances of joint

Abstract

The 2021 Nobel prizes in science reveal much about trends in higher education and science. They show that only top global universities produce Nobelists and that the winners are educated at top universities. The United States and United Kingdom currently have an advantage. Nobel laureates are born in a diversity of countries but often migrate to the United States. The 2021 Nobelists in the sciences include no women—and women are in general dramatically underrepresented.

All of the 10 winners this year were men, as is unfortunately the norm for these awards—only 25 women have previously been awarded Nobel prizes in the sciences.

international collaborative work, may signal a shift in the make-up of the elite scholars of the academic world to include more characteristics of research internationalization.

In keeping with previous years, the 2021 Nobel laureates are largely confined to a few countries in terms of their currently affiliated universities, with no representation this year from anywhere other than Europe and the United States. It is worth noting that, in some cases, the research that led to the Nobel prize took place at a different institution or country from the laureates' current affiliation or location. There is little sign yet of a "rise of Asia," despite the massive research investments made especially by China, and the existence of highly ranked universities in Hong Kong, Japan, Singapore, and South Korea. It is the case that Nobel laureates are a somewhat "lagging indicator" of scientific achievement, but one might expect that the near monopoly of North America and Western Europe might have been somewhat weakened by now. Academe, perhaps especially at the top levels of research universities, changes slowly.

What the 2021 Nobel Prizes Teach Us about Universities and Science

It is clear that the United States dominates the Nobel prizes in the sciences. In 2021, scientists working in US universities snared seven out of 10 prizes. Of course, all of the winners were not born or educated at the undergraduate level in the United States. For this year, only two were US-born and undergraduate educated—although six received their doctorates from American universities, as mentioned above. This is not unusual and shows the attraction of American research universities.

The Nobel prizes show that basic science is both concentrated and stratified. For the past two decades, 103 out of a total of 230 Nobel prizes in the four scientific fields were won by scientists born in the United States. An additional 38 were born in other English-speaking countries. This was not always the case. Prior to World War II, German-speaking countries ranked high—but the Nazi regime destroyed German scientific domination. Indeed, until 1948, Germany often led in terms of the number of prizes by citizenship, at which point the United Kingdom led for a number of years until the United States overtook the count in 1960, due in part to the immigration of Jewish and other scientists fleeing Nazi oppression.

Might the United States and other Anglophone countries lose their dominant positions in the coming years? Despite the much heralded "rise of China" and some evidence of the geographic spread of basic research, it is unlikely that the balance will fundamentally alter in the foreseeable future. The ecosystem of the top American universities is stable—good infrastructure, a culture of research excellence, high (by global academic standards) salaries, competitively available research funding, academic freedom and reasonable autonomy, and, of great importance, the ability and willingness to attract and retain top global talent.

Some change is possible, perhaps likely, and highly desirable. Expanding path-breaking basic research globally would diversify themes and people. And the wave of academic excellence initiatives that are taking place in 15 countries, including China, France, Germany, Russia, and others may, in the medium-term, strengthen the best research universities. The use of English as the global scientific language levels the playing field a bit by giving the global scientific community a common language, while at the same time undeniably giving an advantage to those countries using English as their native medium.

Philip G. Altbach is research professor and distinguished fellow, and Tessa DeLaquil is PhD student and research assistant, Center for International Higher Education, Boston College, US. Emails: altbach@bc.edu and tessa.delaquil@bc.edu.

This article has been previously published in University World News.

Conclusion

Nobel prize-level research clearly operates in a rarified stratosphere of global science. And in today's "results-oriented" academic atmosphere, long-term thinking and orientation toward basic research is considered to be an unaffordable luxury by most governments and universities. Yet, as the Nobel prize committees recognize each year, it is precisely such fundamental research that yields the most brilliant practical results in the long run—such as the work by David Julius and Ardem Patapoutian on the discovery of receptors for temperature and touch, which Francis Collins, director of the US National Institutes of Health, suggests may support the [development of pain treatment](#). It is worth considering, then, whether in our efforts to support research internationalization through funding, mobility, and collaboration schemes, we should also reevaluate our approach to supporting basic research at a global scale. ▲