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focus on

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Physics Doctorates One Year After Degree

Data from the follow-up survey of degree recipients from the classes of 2011 and 2012

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REPORTS ON PHYSICS DOCTORATES

Physics Doctorates, One Year Later (November 2014)

Physics Doctorates, Initial Employment (*forthcoming*)

The last few years have demonstrated a relatively stable job market for physics PhDs. Although the proportion of new PhDs accepting postdocs and potentially permanent positions have experienced some recent annual fluctuations, the overall trend in types of positions new PhDs accepted has changed very little in the last seven years.

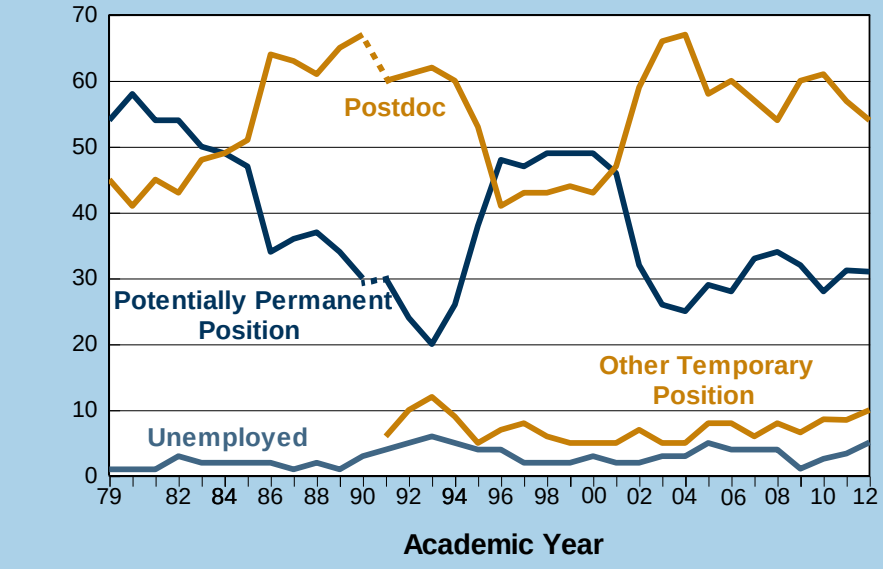
The proportion of new physics PhDs accepting a postdoc declined modestly in the last two years, but was balanced somewhat by a slight increase in acceptance of "other temporary" positions.

THE 2011 AND 2012 FOLLOW-UP SURVEYS OF PHYSICS DOCTORATES

Physics doctorate recipients are contacted in the winter following the academic year in which they receive their degree. They are asked to share both objective and subjective information concerning their employment. This ***focus on*** series describes our findings.

Figure 1

Initial Employment of Physics PhDs, 1979 through 2012.



In 1991, the survey questionnaire was changed to measure "other temporary" employment as a separate category. Data are limited to PhDs who earned their degrees from a U.S. university and remained in the U.S.

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The percent of physics PhDs accepting potentially permanent positions has stayed stable for the last eight years, despite the recession of 2008 and 2009. However, the number of physics PhDs conferred since 2004 has been rising steadily, indicating that the market for those with the knowledge and skills associated with a physics PhD continues to grow. Not all the potentially permanent jobs accepted are in physics, but an overwhelming majority are in STEM fields. This will be discussed in greater detail in the forthcoming 'Initial Employment' report.

The tables and figures in this *focus on* only pertain to physics PhDs from the classes of 2011 and 2012 from US institutions and who remained in the country for their initial employment. Among the survey respondents, 26% of non-US citizens and 11% of citizens left the US after receiving their doctorates. Regardless of citizenship, the majority of PhDs who left the country were in postdoctoral positions.

Half of the US citizens and nearly two thirds of non-US citizens who remained in the US took a postdoc.

Table 1

Initial Employment of Physics PhDs by Citizenship, Classes of 2011 & 2012 Combined.

	U.S. Citizens %	Foreign Citizens %	Overall %
Postdoc	51	63	56
Potentially permanent	35	24	31
Other temporary	9	9	9
Unemployed	5	4	4
N=	913	580	1,493

Data are limited to PhDs who earned their degrees from a U.S. university and remained in the U.S.

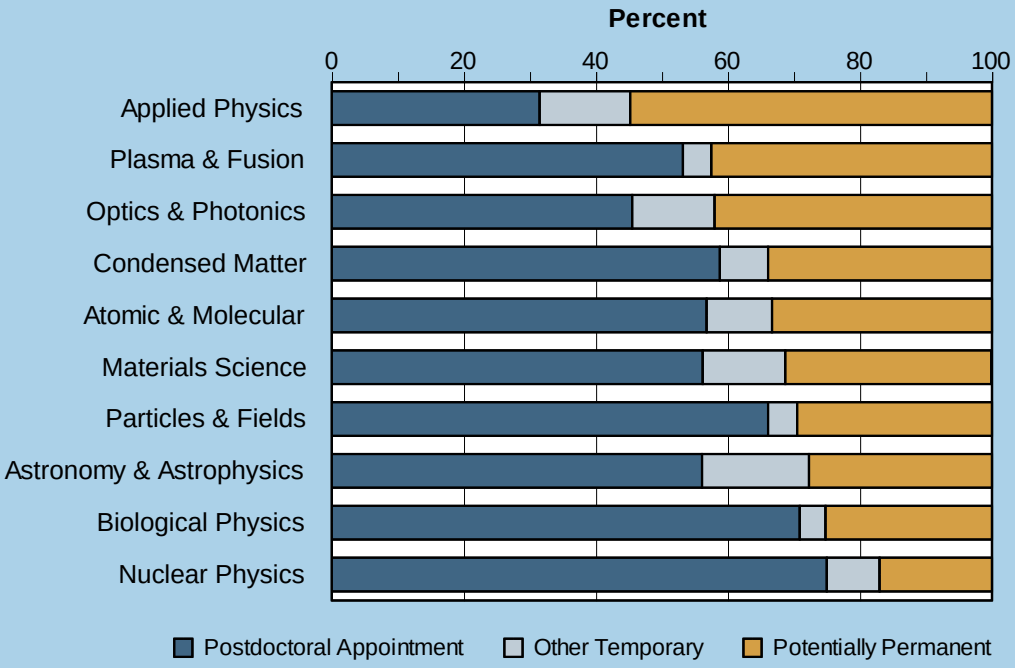
As has been historically true, non-US citizens were more likely to take postdocs than were US citizens. Of the non-US citizens who accepted postdoctoral positions, 14% were non-US citizens with permanent resident status.

Nine percent of new physics PhD recipients accepted temporary positions that were not classified as postdocs. Of these, around 60% were either visiting professors or lecturers in either two- or four-year institutions.

The subfield of dissertation influences the type of initial employment secured by physics PhDs. Individuals who studied nuclear or biological physics were the most likely to accept a postdoctoral appointment after receiving his or her degrees. In contrast, new PhDs with subfields in applied physics, plasma and fusion, and optics and photonics were the most likely to accept potentially permanent positions.

Figure 2

Initial Employment of Physics and Astronomy PhDs by Subfield of Dissertation, Classes of 2011 & 2012 Combined.



Data are limited to PhDs who earned their degrees from a U.S. university and remained in the U.S.

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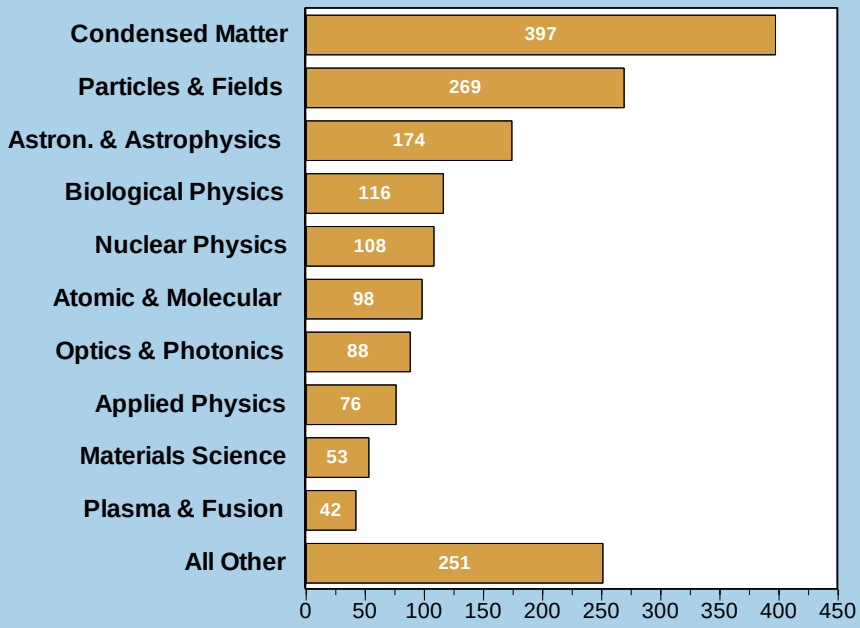
Initial employment outcomes of new physics PhDs are affected by their subfield of research.

Figure 2 shows the initial employment status for the 10 most prevalent subfields for physics PhDs from the classes of 2011 and 2012. Figure 3 illustrates the number of PhDs conferred in each of these subfields. The number of individuals receiving PhDs in a specific subfield has no bearing on the type of initial employment they typically accept. Physics PhDs with the most prevalent dissertation subfield, condensed matter, had a similar proportion accepting potentially permanent positions as PhDs with atomic and molecular dissertations, which had one fourth as many PhDs.

Physics PhDs pursue a variety of dissertation subfields, with the number of PhDs conferred in the different subfield categories varying greatly.

Figure 3

Number of Physics PhDs Granted by Subfield From Physics Departments, Classes of 2011 & 2012 Combined.



Two-Year Averages

Note: These data are based on a 2 year average of 1,726 PhDs conferred at U.S. physics departments in the classes of 2011 and 2012. Additionally, there was an average of 156 PhD astronomers from departments that offer astronomy degrees.

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Table 2

Postdocs From the Classes of 2011 & 2012: "What Was the Most Important Reason for Taking This Temporary Position?"

	Percent
Necessary step to get desired future position	32
To obtain research experience in my field	26
To work with a particular scientist or research group	17
Could not obtain a suitable permanent position	12
To switch to a different field	5
Personal or family-related reasons	5
Visa restrictions limited my options	2
Other	1
N = 552	

Data are limited to PhDs who earned their degrees from a U.S. university and remained in the U.S.

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Many of the new physics PhDs who accepted a postdoc indicated they felt that it was a necessary step on their career paths.

There is probably no single reason why new physics PhDs would accept a postdoc or other temporary position upon receiving their degree. In an effort to better understand why new PhDs would choose to accept a temporary position, we asked them what the most important reason for taking their position was. About three quarters of postdoc holders took their positions for strategic reasons, indicating that they felt it was a necessary step in attaining a desired future position, an opportunity to obtain research experience, or to work with a specific group.

New PhDs holding other temporary positions were just as likely as postdoc holders to indicate they felt their position was a necessary step to get a desired future position. In contrast to the postdoc holders represented in Table 2, a significantly larger proportion of new physics PhDs who accepted other temporary positions indicated that they took their current position because they could not obtain a suitable permanent one. While 12% of postdocs indicated that they took a temporary position because they could not obtain suitable permanent positions, over 45% of physics PhDs in other temporary positions cited the same reason.

Survey Methodology

Each fall the Statistical Research Center conducts its Survey of Enrollments and Degrees, which asks all degree-granting physics and astronomy departments in the U.S. to provide information concerning the number of students they have enrolled and the counts of recent degree recipients. In connection with this survey, we ask for the names and contact information for their recent degree recipients. This degree recipient information is used to conduct our follow-up survey in the winter following the academic year in which they received their degrees. The data in the *focus on* comes from that follow-up survey.

Recent degree recipients can be very difficult to reach because they tend to move after receiving their degrees. Additionally, many departments do not provide or don't have accurate contact information for their alumni. To assist us in determining outcome information and to help obtain updated contact information, we contact the advisors of non-responding degree recipients when possible.

The follow-up surveys for the classes of 2011 and 2012 were administered in a web-based format. Non-responding doctorates were contacted up to four times with invitations to participate in the survey. The physics PhD classes of 2011 and 2012 consisted of 1,688 and 1,762 respectively. We received post-degree information on about 57% of these degree recipients. About 60% of these responses came from PhD recipients themselves, while the other 40% came from advisors. The information obtained from advisors is limited to subfield of dissertation, US citizenship, sex, employment status, sector of employment, and location (in or out of the US). PhDs who left the US after receiving their degrees were not included in the analysis.

In this report, the notation "N" on figures represents the number of individuals for whom we had data on a particular item.

We thank the many physics and astronomy departments, degree recipients, and faculty advisors who made this publication possible.

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