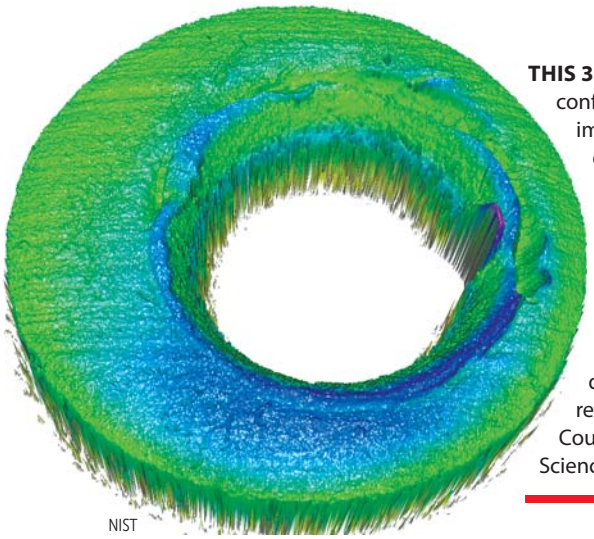


NIST

THIS 3D SCAN, obtained using a confocal microscope, shows the impressions that the breechface of a gun left on the soft metal of the primer at the base of a fired cartridge case. The false color represents depth of deformation, in microns. This type of firearms identification is one of several feature-comparison methods discussed in a recent report by the President's Council of Advisors on Science and Technology.

idence from, say, many handprints on a steering wheel can be difficult or impossible, explains Butler, whereas identifying someone from a blood sample or two people from evidence in a rape case is relatively easy.

The PCAST report also recommends that the FBI undertake a vigorous research program in forensic science and its practice, that the Office of Science and Technology Policy coordinate a national strategy for forensic science R&D, and that judges at all levels take scientific criteria into account in decisions about accepting expert testimony.

A lack of systematics

"Most physicists would be shocked by the lack of systematics for quantifying errors," says University of Maryland theoretical physicist S. James Gates Jr, a member of the PCAST working group. "Justice means you convict the guilty but exonerate the innocent. Science ought to have something to say in this." Unfortunately, he continues, "what is presented in the courtroom as science often falls short of what a scientist would call science. We need to do better."

The scientific measurements can be made, says Butler. They involve materials science, chemistry, computer simulations, machine learning, statistics, genomics, and the handling of large data sets. The challenge, he says, is to translate the measurements into methods that can be reliably implemented. Gates adds that it can be tough to convince forensic investigators, police officers, judges, and attorneys to switch to new approaches. "People are resistant to change. We have to engage them in the process."

In a statement to the *Wall Street Journal* on 20 September, Attorney General Loretta Lynch wrote that the DOJ "believes that the current legal standards regarding the admissibility of forensic evidence are based on sound science and sound legal reasoning. We understand that PCAST also considered the issue of certain legal standards, alongside its scientific review. While we appreciate their contribution to the field of scientific inquiry, the Department will not be adopting the recommendations related to the admissibility of forensic science evidence."

Gates, emphasizing that he can't speak for PCAST, says he is disappointed in the DOJ response but is hopeful that "continued dialog will help resolve any misunderstandings." He adds that his interactions with most of the forensic science community have been encouraging.

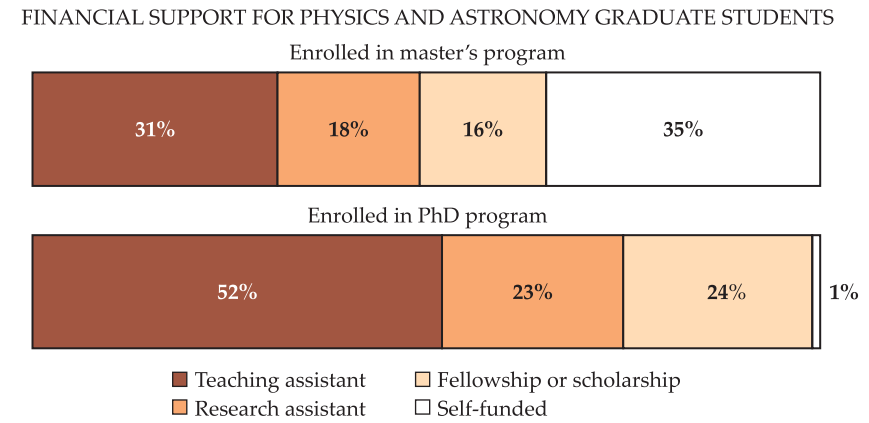
Common forensic analysis on drugs, the growing area of digital forensics, and provenance of documents are examples of forensic science not included in the PCAST report, whose scope was limited to methods based on feature comparisons.

Toni Feder

NEWS NOTES

Physics bachelors. A recent study by the Statistical Research Center of the American Institute of Physics (which publishes PHYSICS TODAY) looks at the combined bachelor's classes of 2013 and 2014 a year after graduation. The study considers students who continued to graduate studies; an upcoming report will look at those who entered the workforce.

Some 53% of the 14 855 degree recipients from those two years were in graduate programs, compared with 61% from the class of 2009. Among those who did continue to a higher degree in 2013 and 2014, nearly three-fifths went into physics or astronomy, with a quarter of those enrolling in master's programs and three-quarters entering PhD programs. The two-fifths who pursued their educations outside of physics were roughly evenly split between engineering and other fields, including math, medicine, and business.



The figure shows how 2013 and 2014 physics bachelors supported themselves in their first year of pursuing advanced degrees. Here, self-funded includes family assistance, loans, and wages. In other fields, the proportion of master's students with teaching or research assistantships was lower, and the proportion who were self-funded was higher. Not surprisingly, students enrolled in PhD programs in all fields had far better institutional support; only 1–2% were self-funded.

More details are available in *Physics Bachelors: One Year After Degree*, available at www.aip.org/statistics/employment/bachelors. TF PT