The Mathematics of Strings, Spaghetti and Splashes

Andrew Belmonte
Penn State University

If, as Galileo said, the book of the universe is written in the language of mathematics, it is also true that many new chapters in the book of mathematics have been inspired by nature. I will explore this connection through several puzzles from the ordinary experiences of everyday life: Why is it difficult to break dry spaghetti in half? Why do things like extension cords, shoe laces and earbuds always get tangled up in knots? How does a falling droplet splash onto the floor? In each case, careful experimentation leads to mathematical answers, generating interesting new questions in the process.

Andrew Belmonte has long worked at the intersection of mathematics and the world to which it can be applied. He received his Ph.D. in physics at Princeton University (1994), and was awarded a Chateaubriand Fellowship and an NSF International Fellowship to study at the Institut Non-Linear de Nice in France for two years, after which he was a postdoc at the University of Pittsburgh. In 1998, he became a faculty member at Penn State University, where he currently works in the W. G. Pritchard Laboratories. He was the recipient of an Alfred P Sloan Fellowship (2000), an NSF CAREER Award (2001), and has been a visiting professor at the ESPCI in Paris, France (2004) and at Harvard University (SEAS, 2007).

For more information, contact Francis Su, su@math.hmc.edu.

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