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Images of Research Competition

University of Alberta

Probability

Honourable Mention (2019)

Here, we have experimentally measured the wavefunction of a single buried arsenic atom peeking through a silicon surface. Its complex form perfectly captures one of the most fundamental properties of quantum mechanics: the location of an electron is based on probability and is never fixed. While we tend to think of electrons as being perfect little spheres existing in a single position, they really can be found everywhere around the atom. Bright spots in the wavefunction show areas with a higher probability of finding one. Arsenic atoms in silicon are used as the building blocks of quantum computers, so understanding its elusive electrons helps with more advanced designs.