

What is a Demon Particle?

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About Demon Particle

- The demon particle was first **predicted by theoretical physicist David Pines in 1956.**
- Pines **theorized that electrons passing through a solid would exhibit unique behaviors**, and that these behaviors could **lead to the formation of a new type of particle** that he **called a “demon particle.”**
- They are **massless, chargeless, and transparent to light.**
- They are also **able to form plasmons**, which are **collective units of electrons that behave like waves.**
- Plasmons are **important in superconductivity**, and the discovery of demon particles **could lead to the development of new superconducting materials that operate at room temperature.**

What is Superconductivity?

- It is a **phenomenon whereby a charge moves through a material without resistance.**

- In theory, this **allows electrical energy to be transferred** between two points **with perfect efficiency, losing nothing to heat.**
 - It was **first discovered in 1911 by Dutch physicist Heike Kamerlingh Onnes** when he observed the sudden drop in electrical resistance of mercury at extremely low temperatures.
 - Superconductivity is **generally observed at very low temperatures**, often close to absolute zero (0 Kelvin or -273.15°C).
 - **Meissner-Ochsenfeld Effect:**
 - **Superconductors expel magnetic fields from their interior** when they enter the superconducting state.
 - This effect, known as the Meissner-Ochsenfeld effect, **causes the superconductor to repel magnetic fields, leading to the phenomenon of magnetic levitation.**
 - **When a magnet is brought near** a superconductor in its superconducting state, it **will float above the superconductor due to this repulsion.**
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Q1)What is an Electron?

An electron is a subatomic particle that carries a negative electric charge. It is one of the fundamental particles that make up atoms, along with protons and neutrons. Electrons carry a fundamental electric charge, denoted as “e,” which is approximately equal to -1.602×10^{-19} coulombs (C). Electrons have a very small mass compared to protons and neutrons. The mass of an electron is approximately 9.109×10^{-31} kilograms (kg), making it about 1/1836 times the mass of a proton.

Source: [Researchers unveil ‘demon particle’ that can lead to making superconductors](#)

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