Scientists now recognize that the universe is teeming with an unidentified form of matter. This invisible matter—now called *dark matter*—is thought to consist of particles which are distributed throughout the universe. In fact, these dark matter particles constitute most of the mass of the universe.

**DARK MATTER: One of the greatest mysteries in the history of cosmology!**

You are here, in the Milky Way Galaxy, and you are surrounded by dark matter. Scientists now recognize that the universe is teeming with an unidentified form of matter. This invisible matter is thought to consist of particles which are distributed throughout the universe. In fact, these dark matter particles constitute most of the mass of the universe.

**Galaxies are mostly dark matter clouds:** Over the evolution of the Universe, dark matter particles formed clusters, the large super structures. These massive agglomerations of dark matter particles become the galaxies. In fact, the gravitational force of dark matter helps hold galaxies together. The mass and motion of the dark matter are just one of the clues to understanding the universe.

**WIMPs, I Want You Dark Matter:** We know dark matter particles possess gravity, but they interact very weakly, making them very hard to see. The sensors on the crystal surface give two sets of signals for each incoming particle. A tiny vibration in a crystal is called a *vibration* (unit: Hz). A metal grid on the other side collects electronic charge which was produced by an incoming particle. A tiny vibration in a crystal is called a *puck*. A red dot on the other side reflects electronic charge which was displaced within the crystal by the incoming particle.

**The detector signals:** We know dark matter particles contain gravity, but they interact very weakly, making them very hard to see. The sensors on the crystal surface give two sets of signals for each incoming particle. A tiny vibration in a crystal is called a *vibration* (unit: Hz). A metal grid on the other side collects electronic charge which was produced by an incoming particle. A tiny vibration in a crystal is called a *puck*. A red dot on the other side reflects electronic charge which was displaced within the crystal by the incoming particle.

**Understanding the detector signals:** Two sets of signals will be seen when a WIMP (weakly interacting massive particle) interacts with the crystal. Like a team, the sensor in the crystal gives two sets of signals (a *hockey puck* and a *vibration*) for each incoming particle. A tiny vibration in a crystal is called a *puck*. A metal grid on the other side collects electronic charge which was displaced within the crystal by the incoming particle. One tower has 6 detectors. The towers are set up *underground* to keep the detectors shielded from cosmic rays, but the data won’t be muddied with cosmic ray interactions or other types of particles which interact with our detectors.

**How to identify a WIMP:** The dots are separated by the red and green lines. Dots in the red column look like WIMPs, while the green column does not. The red column looks like a WIMP.

**WIMPs and neutrinos:** Dark matter particles interact most with neutrinos. Our detectors generate a signal for each incoming particle. A tiny vibration in a crystal is called a *puck*. A metal grid on the other side collects electronic charge which was displaced within the crystal by the incoming particle. These detectors have 5 sets of sensors, which track the WIMPs as they enter the detector.

**CDMS: Cryogenic Dark Matter Search—detecting WIMPs in the CDMS experiment:** The Cryogenic Dark Matter Search (CDMS) experiment is a collaboration of several institutions, including the University of California at Berkeley, University of California at Santa Barbara, University of Colorado at Denver, and University of Minnesota.

**The CDMS experiment:** The CDMS experiment (CDMS—Cryogenic Dark Matter Search) is a collaboration of several institutions, including the University of California at Berkeley, University of California at Santa Barbara, University of Colorado at Denver, and University of Minnesota. The experiment hopes to change that...