Scientist soon to shed light on dark matter

Getty Images: NASA, file. NASA's Alpha Magnetic Spectrometer: The space shuttle Endeavour delivered the Alpha Magnetic Spectrometer to the International Space Station in May, 2011. Results of the AMS research to be revealed in early March, 2013. IMAGE

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Astrophysicists sorting through data garnered by the Alpha Magnetic Spectrometer on the International Space Station will soon announce their deep space discoveries.

In May 2011, a $2 billion machine called the Alpha Magnetic Spectrometer was installed on the International Space Station.

Now, scientists are on the verge of making a very important announcement from their research with the AMS. Samuel Ting, an MIT physicist and the lead investigator on the AMS project, reveals that in the next two weeks his team will release their paper detailing what they have discovered with the machine.

For those who enjoy geeking out on high-level particle physics, the significance of this announcement is not minor: The AMS is being used to detect dark matter in space.

The concept of dark matter was illustrated along pop culture lines by Philip Pullman's fantasy book trilogy, "His Dark Materials," in the late '90s, but scientists have been on the hunt for it much longer than that. Astrophysicists Jan Hendrik Oort and Fritz Zwicky found evidence of dark matter's existence in anomalies of orbital velocities in various heavenly bodies back in the 1930s.

The thing is, dark matter is invisible — telescopes cannot detect it, nor does it shed or absorb light. In fact, dark matter is simply theoretical, based on detectable impact on visible matter, electromagnetic radiation and other parts of the universe.

That said, scientists hypothesize that dark matter particles outnumber regular matter in the universe by about six to one.

There is a theory that dark matter is comprised of "weakly interacting massive particles," also known as WIMPs. WIMPs seem to interact through gravity and the weak force, two of the four fundamental forces of nature. (The other two are the strong nuclear force and electromagnetic radiation.)

It is thought that when WIMPs come in contact with each other, they implode, producing two partner particles in the energetic output. These partners are electrons and positrons.

The AMS has detected 25 billion particle events, according to Space.com, along with 8 billion electrons and positrons, the yin and yang of elementary subatomic particles. Electrons hold a negative electric charge, while their antiparticle partners, positrons, hold the same mass but an opposite electric charge.

Ting says that his team's paper, which they have rewritten 30 times to perfect it, will discuss how many electrons and positrons were captured in the study, and what their energies are made of, according to Space.com.

And what does this mean to those of us wandering the planet? Scientists have figured that only about 5 percent of the universe is matter that can be explained — what we would call "normal matter." The rest, they believe is about 25 percent dark matter, and about 70 percent dark energy, according to NASA.

Understanding the properties of dark matter (and subsequently, dark energy) brings humans closer to understanding how the universe began, how it is expanding, and what star stuff we are made of.

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