

Cosmic Breakthrough: the first direct detection of gravitational waves and its significance

Dr. Maria Babiuc Hamilton grew up in Romania, where she pursued her degree in physics at the University of Iasi, in between classes in Communism and summers spent forced to work in the collective farms. Luckily, the revolution came before her senior year, and things lightened up a bit. In grad school, she started out in solid state physics before switching to general relativity. Her advisor handed her something pamphlet-sized to get her up to speed on the field. That didn't do it, so she tried Kip Thorne's 1,200-page book instead. After running two professorships in Romania, she took a post-doc at the University of Pittsburgh, working on simulations of gravitational waves. She is currently teaching physics at Marshall University, and does research on black holes and gravitational waves.

ABSTRACT:

We have gazed at the night sky since the dawn of time, marveling at the beauty of the cosmos and trying to understand its inner workings. Now we can “hear” it: tiny ripples in the very fabric of space time, that tell stories of great cosmic cataclysms. The first gravitational waves were detected on September 14, 2015 and was revealed to the public on February 11, 2016. Their prediction though was made 100 years ago, by Albert Einstein, as part of his famous general theory of relativity. What are gravitational waves? Why did it take so long to find them? Where do they come from? How does their discovery change our understanding of the cosmos?

Those, are the questions I will answer. Finally, I will talk about my own contributions to this field.