

Abstract Submitted  
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**VIGOR: Virtual Interaction with Gravitational Waves to Observe Relativity** MONISHA ELUMALAI, Graduate Student, MIDORI KITAGAWA, MICHAEL KESDEN, Faculty, NGOC TRAN, THULASI SWAMIPILLAI, None, MARY URQUHART, ROGER MALINA, Faculty — In 2017 a century after Albert Einstein published his theory of general relativity, the Laser Interferometer Gravitational-wave Observatory (LIGO) detected gravitational waves from binary black holes fully consistent with this theory. Our goal for VIGOR (Virtual-reality Interaction with Gravitational waves to Observe Relativity) is to communicate this revolutionary discovery to the public by visualizing the gravitational waves emitted by binary black holes. VIGOR has been developed using the Unity game engine, handheld devices and VR headsets (Oculus Rift DK2 and Samsung Gear VR). Using an iPad or a VR device, VIGOR users control the earth to fly around binary black holes, experiment on the black holes by manipulating their total mass, mass ratio, and orbital separation, and witness how gravitational waves emitted by the black holes stretch and squeeze the earth. We evaluated our prototype of VIGOR with high school students in 2016 and 2017 and are further improving VIGOR based on our findings.

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