FROM COLLIDING BLACK HOLES TO KILONOVAE:  
THE INCEPTION OF GRAVITATIONAL WAVE ASTRONOMY

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Dr. Landry, received his Ph.D under Dr. Willem van Oers in 2000. He joined the LIGO collaboration, whose original leaders just received the 2017 Nobel Prize in Physics for the discovery of gravitational waves.

Abstract
On 14 Sep 2015, after roughly 50 years of searching by groups around the world, gravitational waves were directly detected by LIGO interferometers, distortions in spacetime from the collision of two black holes. This event, and a handful of additional ones revealed a family of heavy stellar-mass binary black holes that were hidden from all other forms of telescope. On 17 Aug 2017, the LIGO and Virgo detectors witnessed a new form of collision, that of two neutron stars, an event that was also seen in gamma rays, UV/optical/IR light, x-ray and radio waves. The resultant fireball has been identified as a kilonova, objects quite possibly responsible for the production of heavy elements in the universe. Gravitational wave astronomy is here, now. Furthermore, these detections have tested and validated Einstein’s Relativity, served to measure the speed of gravity, and made a completely independent measurement of the expansion of the universe from that made with light. In this talk aimed at a general science audience, we will review some history of the field, including expectations for sources of gravitational waves as predicted from Relativity, and the complex instruments that detected them. We will describe the LIGO and Virgo detections to date, and conclude with a look at the future of the field and of the detectors that will be state of the art in the upcoming decades.

Wednesday, January 31, 2018  
3:30 PM - 6:00 PM  
Robert B. Schultz Lecture Theatre,  
St. John’s College, Fort Garry Campus  
University of Manitoba  
Reception to follow lecture