In 2007, astronomers discovered a new mysterious cosmic phenomenon: Fast Radio Bursts. These events consist of short, intense blasts of radio waves arriving from far outside our Milky Way galaxy. Their origin is unknown, however Fast Radio Bursts appear ubiquitous in our Universe, with roughly 1000 arriving every day over the full sky. I will describe the Fast Radio Burst mystery and what is presently known about it, and present a revolutionary new radio telescope being built in Canada that will soon enable astronomers worldwide to make major progress in our understanding of the FRB puzzle.