



Western University
Department of Physics and Astronomy

PHYSICS & ASTRONOMY COLLOQUIUM

Date: Thursday, 3 December 2020

Time: 1:30 p.m.

via Zoom:

Dr. Dan Lizotte

Departments of Computer Science and Epidemiology & Biostatistics
Western University

Dr. Robin Arnason

Interface Fluidics

“Principles and physical/astronomical applications of machine learning and artificial intelligence”

ABSTRACT

Machine learning techniques are finding ever-widening application in many different fields. In the first half of the talk, we will discuss a bit of the history of what is now called machine learning, discuss the three main classes of problems that it aims to solve, and have a quick tour of the methods used to solve them.

X-ray binaries (XRBs) are rare systems containing a compact object in close orbit with a main-sequence star. The non-nuclear X-ray emission of galaxies is dominated by XRBs, and they can be useful tracers of galaxy properties, such as star formation history and stellar mass. Tracing these properties using XRBs requires that the XRB population in a galaxy can be accurately determined—a task that is complicated by the fact that other phenomena can mimic their X-ray properties. Multiwavelength observations of these sources is usually the best solution, but these are not always available or simultaneous. In the second half of this talk, we will present the results of applying several commonly used machine learning classification algorithms to identify new XRB candidates in a Chandra catalog of 943 sources in the Andromeda Galaxy.

Host: Prof. W. K. Hocking