Western University
DEPARTMENT OF PHYSICS AND ASTRONOMY

PHYSICS & ASTRONOMY COLLOQUIUM

Date: **Thursday, 20th October 2016**
Time: **1:30 p.m.**
Location: **Physics & Astronomy Seminar Room 100**

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"From the Horizontal Branch to HgMn stars: atomic diffusion in stars"

ABSTRACT

Horizontal branch stars are old stars that are approaching their final evolutionary stage while HgMn stars are young stars more than 2.5 times more massive than the Sun. Both show exotic chemical composition. Compared to the Sun (and most other stars) they sometimes have gold, lead or platinum overabundant by some 4 orders of magnitude. How is this possible? Does this point to a bizarre set of nuclear reactions? How can stars in very different evolutionary states have similar abundance anomalies?

Put aside around 1930 as ineffectual in stars, atomic diffusion driven by the stars' outwards flux of photons (that is by differential radiation pressure) reentered the scene around 1970 when it was realized that it could lead to most of those anomalies.

In this talk I briefly present the calculations of atomic diffusion in stars. I apply them first to Horizontal Branch stars in clusters and in the field (also called sdB, sdO) and show the simple hydrodynamical model that explains the observations. This simple model is then used to model the HgMn stars. There the quality of the observational data shows that the hydrodynamics are probably not so simple as assumed. Both the hydrodynamical calculations and the atomic physics data need refining. There is work for future generations.

Coffee will be available in the Atrium, 2nd floor, at 1:15 p.m.

We look forward to seeing you at the Colloquium! As a courtesy to the speaker and audience, please set your cellphones to "silent" mode. Thanks!