Contribution ID: **189** Type: **Poster (Non-Student) / affiche (non-étudiant)**

Oscillator Strength Measurements in Lanthanides and Transition Metals Using Laser-Induced Breakdown Spectroscopy

Models for stellar nucleosynthesis, age determinations for stars in the Milky Way's galactic halo, and stellar chemical abundance determinations are dependent upon accurate atomic spectroscopic data to allow the correct interpretation of stellar absorption and emission spectra. It is well known that calculations of many astrophysically important atomic parameters are limited due to line blending, insufficient spectral resolution of some key spectral lines, and also the complicated electronic structure of the important heavy elements. Astrophysicists have therefore looked to laboratory astrophysics experiments to provide accurate atomic data to help resolve these limiting issues.

In this set of experiments, laser-induced breakdown spectroscopy (LIBS) has been employed for the rapid and convenient production of a high-temperature plasma to act as a source of excited atoms and ions. Emission from the LIBS plasma, when dispersed in a high-resolution Echelle spectrometer, is used to measure all the emission lines from numerous excited energy levels simultaneously. Branching ratios from over 1,000 highly-excited energy levels in astrophysically relevant lanthanides (gadolinium, neodymium, praseodymium and samarium) and transition metals (copper and iron) were measured in order to calculate emission oscillator strengths (gA values or log gf values). In this poster we will present our most recent results and compare them to previous experimental measurements and calculations.

Author: Mr PUTNAM, Russell (Department of Physics, University of Windsor)

Co-authors: Dr RYDER, Caleb (National Superconducting Laboratory, Michigan State University); Prof. REHSE, Steven (Department of Physics, University of Windsor)

Presenter: Prof. REHSE, Steven (Department of Physics, University of Windsor)

Track Classification: Plasma Physics / Physique des plasmas (DPP)