Abstract Submitted
for the OSS15 Meeting of
The American Physical Society

Using Metastable Energy States of Lanthanide Metals as Sensors for Radical Oxygen BRENDAN GRAZIANO, Ohio Northern University — Singlet molecular oxygen, the lowest excited state denoted $O_2(^1\Delta_g)$, presents a potential hazard as a byproduct of various biochemical reactions. Currently, the best method for detection of singlet oxygen is to monitor its 1240 nm emission, which is not sensitive. Our research examines indirect sensing of this low-lying state through laser-based spectroscopy of lanthanide-ion complexes whose energy levels closely correlate to that of the singlet oxygen. Specifically, tris(tetramethyl heptanedianato) dysprosium(III) has been explored as a potential sensor because of its matching low-energy states and its highly emissive $^4F_{9/2}$ level at 574 nm. Through two-color, time-resolved transient fluorescence, we hope to measure the rate constant for quenching by non-singlet oxygen, effectively making a metastable detector.

Mellita Caragiu
Ohio Northern University

Date submitted: 07 Mar 2015 Electronic form version 1.4