

## MDPH480/PHYS480/ASTR480/MAPH480 Research Projects 2009

Project Title: Pulsed Laser Deposition of  $KY_3F_{10}$  Thin Films Doped With Praseodymium

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### **Abstract of the Proposed Research** (use this page only)

Complex fluorides have many desirable properties for the development of compact solid state lasers. In particular, they are durable, have excellent thermal conductivity and a wide optical bandgap. The cubic material,  $KY_3F_{10}$  has received much attention over the last five years but all studies have been of bulk crystals.

In this project we will use pulsed laser deposition to prepare thin films of  $KY_3F_{10}$  containing both trivalent praseodymium. Praseodymium is relevant for laser operation both in the infrared and optical regions and is therefore extremely versatile. Optical spectroscopy will be performed to assay the films utilising the departments extensively equipped spectroscopy laboratories on the 6<sup>th</sup> floor and 2<sup>nd</sup> floor.

Assuming good progress, this work is expected to yield a manuscript for submission to a peer reviewed academic journal.