Physics 585 **Instructions for the independent study project**

Below are some suggested topics, but you can choose most any modern AMO or research-in-spectroscopy-related topic. Please let me know what topic you chose in the Problem Set #3 or 4. For basic info on these topics, look in B&J, Fox and books on laser spectroscopy. These books will also have suggestions on original papers related to the topic.

Example topics
(but not limited to; look at Ch. 15-16 in B&J, Chapter 5-14 in Fox:

Atomic beam spectroscopy
Doppler-free two-photon spectroscopy
Saturation spectroscopy
Quantum beat spectroscopy
Laser cooling and trapping of atoms
Atom optics
Atom interferometry
Atomic clocks
Spectroscopy in astrophysics
Level-crossing spectroscopy
Coherent anti-Stokes Raman spectroscopy
Coherent THz spectroscopy
Quantum Information and Entanglement
Photon echo
Optical nutation
Electromagnetically induced transparency
Photon anti-bunching and sub-Poissonian light
Fluorescence correlation spectroscopy

Independent Study Project: Please select ONE comprehensive REVIEW ARTICLE published in the last decade in a high-impact journal. Complete the following

(1) 2-5 page notes summary of the review article.

Convince me that you read & understood most of the review article. This can be your hand-written point-form notes Focus on equations and how they relate to explaining 3-6 figures copied/pasted into your notes. Keep words to a minimum.

(2) 5 min 'elevator-pitch' class talk.

Briefly explain what your chosen topic is, and why it is important?
Do not lecture on the physics. Your job is to convince us that your topic is the most exciting.

(3) 1-page class handout. *In your own words*, write a new 1 paragraph abstract for the review paper. Fill the remainder of the page with anything that you think will help the class appreciate your topic. This could be a figure, some equations; the most important part of #1.

Where to find review articles (typically labeled as such and >10 pages)

Examples of places to find review articles of AMO physics.

-Nature or Science Publishing Group Review Articles

-Annual Reviews, http://www.annualreviews.org/journal/c

-Rev of Mod Phys, https://journals.aps.org/rmp/