

Reading and Analysis Assignment – Due April 30, 2019 by 4:30 pm in office mailbox
75 points

Synopsis:

Choose a modern optical device from among those listed below (or suggest another one for approval by the **outline due date** listed below). Write a paper discussing the assembly/manufacture/design, operation and utility of the device. *Include figures, equations, schematics, pictures, image plane results, or anything else that you think would make it useful to understand the operation of the device. Write it in such a way that a general public person would be interested in the device, even if they didn't understand all the jargon, optics or physics. **The paper is worth 75 points.***

Paper Guidelines:

1) The paper **must be** from 7 - 9 double-spaced (11 or 12 point font) pages of text in length, with 1 inch margins. (This is approximately 1500-2000 words.) Include your name and a title on a separate title page, *page numbers on each page* and *references at the end of the paper* (not part of the page totals). Footnotes are generally not included in papers in scientific disciplines. The paper must include **at least 7 relevant equations** in its description. You may include up to 3 additional pages of figures, etc, all of which should be *labeled with numbers and figure captions* and placed within the paper or appended at the end. (If you take any of these from copywritten material, be sure to cite the source.) Figure captions must be *descriptive* of the figure and, in the best case, will draw the reader's attention to what you'd like them to notice. Please note that longer papers don't get more points – please make your paper succinct and relevant within the guidelines of these directions.

2) Pay careful attention to making a **grammatically correct presentation** – spelling, sentence structure, quotations taken from books, and style/appropriateness of references all count. Consult a book like the “Chicago Style Manual” by Kate Turabian or speak with some of the writing professors on campus or folks in the Writing Center if you are unaware of the correct way to do any of this.

3) The **references should be to refereed material** (i.e. web pages taken from unpublished material are **not** acceptable), operations manuals, safety manuals, textbooks or interviews of experts in the field. You are encouraged to use internet resources and the library to search for material related to whatever device you wish to investigate – but make sure the material is supported *by science*. “Published” internet resources are okay, for instance things taken from: NIST, NASA or DoE, etc. websites. Your paper should include **at least 7 references** that support your description and analysis.

4) Some of the devices/processes you might choose to describe are: LCD/CRT/plasma screen design and operation, optical-laser tweezers, atomic force microscope, image stabilizing binoculars, catadioptric telescope, laser surgery and the eye, Pockel's cell, fiber optic communications equipment, Golay cell, holograms on credit cards, Kerr cell, process and uses of laser cooling, design and uses of any *one* of several types of interferometers, “Transitions” eyeglasses, non-destructive testing methods, CCD or pyroelectric detectors, etc. I have had students who are working on projects with another professor write up one of the project instruments as well. The list is practically endless....so come talk to me or email me if you have an idea and are not sure if it will work.

5) **Outline Due Date:** A *one paragraph abstract and accompanying brief outline* of your intended topic and approach is due **March 14, 2018** in class.