

Homework Assignment #4, Using Analogies in Science

This assignment consists of two parts. Be sure to submit both!

Part 1: Find the analogy in *one* of the following articles and then evaluate the analogy critically. Is it appropriate? Is it helpful in understanding the concept? Is it interesting? Will a reader remember it? Does it oversimplify or introduce misconceptions? Write a 200-word essay describing the analogy and your analysis of it.

[“Jellyfish blooms transfer food energy from fish to bacteria”](#)

[“Weird, rare clouds and the physics behind them”](#)

[“Physicists localize 3-D matter waves for the first time”](#)

[“Electrons take turns like pedestrians”](#)

[“The coolest antiprotons”](#) (plus special commendation for spotting the misplaced “only”)

[“Elusive sun waves come into focus”](#)

[“Catching sight of the elusive wavefunction”](#) (note that “wavefunction” is incorrectly written in the title as one word*)

[“A new shape for optical fiber lasers”](#)

[“Crossing computational frontiers”](#)

[“Cubic neutrons might find it hip to be square”](#)

[“Quantum dots of many colors”](#)

[“New structures self-assemble in synchronized dance”](#)

Part 2: Create an analogy that explains some aspect of physics. Write it down in one concise paragraph.

Here’s an example:

“Optical tweezers,” instruments that trap microscopic objects using beams of photons, allow researchers to manipulate single biomolecules on the nanometer scale and measure piconewton forces exerted on them. However, optical tweezers still have one shortcoming, which Yann Chemla at the University of Illinois has compared with fishing. When a protein is tethered between the two attachment points in an optical trap, a researcher can infer the activity of the protein by its forces on the tether, much as an angler knows he may have caught a fish by the tugs on the line. But an optical trap cannot discriminate what it has “caught,” i.e., how many proteins or the types of proteins that are trapped, just as a fishing line tells the angler only that he has caught *something*, but not whether it’s a big bass, a snapping turtle, or an old tire.

N.B. Do **not** just write a description of something; create an analogy to explain it.

Due: **Friday, February 28, 6:00 PM**. Email your assignment to both Professor Beck and Celia. Late submissions will be downgraded and will be ineligible for rewrite points.

Total—50 points

*Whether to write a word as one word or two, or a hyphenated combination thereof, is something of a moving target and subject to the inscrutable logic of copy editors and lexicographers. Refer to the [AIP Style Manual](#) for the correct or preferred spellings of frequently occurring words in physics. (I have to look up the *wave* words every single time.—*cme*)