



Teaching relativity and quantum mechanics with creative writing

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We will present the results of an effort to teach modern concepts of time, involving relativity as well as quantum mechanics, to a creative writing class centering on Virginia Woolf's "To the Lighthouse"[1]. It was published in 1927, when relativity and quantum mechanics were the rage among the European intelligentsia. Many scholars have pointed out that, through her friendship with Bertrand Russel and Sir Author Eddington, Woolf was familiar enough and fascinated enough with the basic concepts of the new physics that it was only natural that it would influence her work. [2] The lighthouse itself, whose rays separate the clearly defined from the obscure, is an embodiment of a Minkowski diagram. The waves on the ocean and the lack of contact when some of the characters finally travel to the lighthouse emphasize the locality of shore and ship-board interactions. Time itself travels at slowly in the seaside house, where the lighthouse light sets the pace. There, one day takes up most of the book (and entanglement between the women is hinted). But time moves rapidly in continental Europe, where WWI takes its toll.

The format of the class will be two 2.5 hour on-line sessions, with the prerequisite that the book be read in advance. The science viewgraphs will also be distributed in advance. The attendees will not necessarily be students, as the class will be advertised as an offering from a popular local bookstore, with a registration fee of \$120. The first hour will be an equationless description of the "new physics", and the remaining time will devoted to individuals writing fiction based on the book, and discussing the work among themselves in small groups.

The development of relativity will be historical, starting with Newton then moving onto Maxwell and the Michelson-Morley experiment, followed by special and general relativity. The quantum mechanical approach will also be historical, starting from efforts to understand the nature of atoms and leading to entanglement and quantum field theory.

Following the feedback methodology of modern educational theory, there will be quizzes at the end of each natural stopping point in the science presentation.

We will report on the success of the techniques applied. One qualitative metric will be how well the science was worked into the creative writing.

References

- [1] V. Woolf, "To the Lighthouse", published by Harcourt, Brace, and World, 1927
- [2] P.T. Brown, "Relativity, Quantum Physics, and Consciousness in Virginia Woolf's *To the Lighthouse*", *Journal of Modern Literature*, Vol 32, No. 3, 2009