

Cinema as Physics Lesson

I enjoyed the article "Teaching Physics with Superheroes" (PHYSICS TODAY, November 2002, page 29) and Jim Kakalios's idea of using a medium familiar to many students (comic books) to teach principles of physics.

At the University of Central Florida, a similar project has been under development for some time by two of our faculty members, Ralph Llewellyn and Costas Efthimiou. They developed a new course, "Physical Science: Physics in Films," so that students would be motivated to learn physical science, would understand the scientific method, and would learn to distinguish between science and pseudoscience. The course focuses on Hollywood films' use of physics concepts, including electricity and magnetism, mechanics, relativity, and time travel.

Each instructor has so far taught the course twice, to a total of more than 750 students. The results are very encouraging. The instructors found that the traditional "fear of physics" common in general education students seems to be greatly reduced. The instructors can cover more difficult topics that are typical of algebra-based college physics courses and students do not object because they are familiar with the medium that the materials arose from. Furthermore, the students' overall performance is greatly enhanced, as measured by test scores from this and the traditional course given by the same instructors.

During the regular end-of-course evaluation, many students have written comments encouraging further development of the new approach. The university's student newspaper has published two articles dealing with the course.

We believe that this course, like those of Kakalios and undoubtedly others, can make a difference in educating non-science majors about scientific principles and public issues that include scientific components.

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Julian Schwinger's Paradoxical Legacy

We were pleased to see that PHYSICS TODAY has published a review (April 2002, page 77) of our book, *Climbing the Mountain: The Scientific Biography of Julian Schwinger* (Oxford U. Press, 2000), but not so

pleased with the content of Tian Yu Cao's review nor with the fact that PHYSICS TODAY chose to headline it as "Julian Schwinger, But Not the Definitive Julian Schwinger."

The review seems to us, first, to be unrepresentative. The first two-thirds of the book, which deals with Schwinger's early remarkable career in nuclear physics, his profound work on waveguides and synchrotron radiation during World War II, his conquest of quantum electrodynamics, and his groundwork on what became the standard model, is hardly mentioned. Instead, the reviewer

concentrates on Schwinger's disillusionment with operator field theory in the late 1960s, his resulting development of source theory, and his increasing isolation from the mainstream. It is, of course, of great interest to explore that late part of his career. Indeed, the points illuminating Schwinger's rejection of his own creation, renormalized quantum field theory, mentioned by Cao, appear verbatim in our book.

The penultimate paragraph of the review seems particularly unfair. Our book is not intended as a definitive review of quantum chromodynamics,

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