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The Art of the Motorcycle and the History of Art (and Condensed Matter Physics)

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Many topics in physics are such that they are difficult to present in ways that the general public finds engaging. In this talk I will discuss two topics I have worked on, directly related to my research in optical and condensed matter physics, that continue to have widespread appeal. In 1871 Louis Guillaume Perreaux installed a compact steam engine in a commercial bicycle and thus produced the world's first motorcycle. The 145 years since the Michaux-Perreaux have resulted in standard production motorcycles incorporating such materials as carbon-fiber composites, maraging steels, and "exotic" alloys of magnesium, titanium and aluminum that can exceed 190 mph straight from the show room floor. As a result of 'The Art of the Motorcycle' exhibition I co-curated at the Solomon R. Guggenheim Museum the public has learned the evolution of motorcycles is interwoven with developments in materials physics. In a second topic, discoveries I made with the renowned artist David Hockney convincingly demonstrated optical instruments were in use – by artists, not scientists – nearly 200 years earlier than commonly thought possible, and for the first time account for the remarkable transformation in the reality of portraits that occurred early in the 15th century. By learning a few principles of geometrical optics the public gains insight into the working process of artists such as van Eyck, Bellini and Caravaggio. Acknowledgement: Portions of this work done in collaboration with David Hockney.