

Book reviews

New interviews help provide 'Quantum Man' intimate feel

Reality must take precedence over public relations, for nature cannot be fooled."

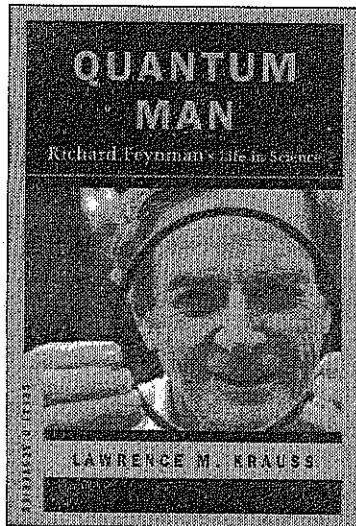
If you take a moment to reflect on the current assault on science by some politicians, pundits and various other pseudo-experts, this quote by Richard Feynman, which opens "Quantum Man: Richard Feynman's Life in Science," the new biography by Lawrence M. Krauss, starts to make a lot of sense.

"Feynman was a legend for a whole generation of physicists long before anyone in the public knew who he was," Krauss observes. "My modest goal is to focus on Feynman's scientific legacy as it has affected the revolutionary discoveries of twentieth-century physics, and as it may impact any unraveling of the mysteries of the twenty-first century."

Krauss is director of the Origins Project at Arizona State University. He is the author of more than 300 refereed publications as well as seven books, including "The Physics of Star Trek," a New York Times best-seller speculating on the potential of science to realize many of the technological achievements portrayed in the popular science fiction franchise.

When it comes to Feynman, most readers are probably more familiar with his personal life and eccentricities than his scientific accomplishments, primarily due to the popularity of two books he co-authored in the 1980s: "Surely You're Joking, Mr. Feynman: Adventures of a Curious Character," and its follow-up, "What Do You Care What Other People Think: Further Adventures of a Curious Character." For those looking for a description of his major scientific contributions, two volumes he co-authored with Robert B. Leighton and Matthew Sands should be considered required reading: "Six Easy Pieces: Essentials of Physics Explained by Its Most Brilliant Teacher," and "Six Not-So-Easy Pieces: Einstein's Relativity, Symmetry, and Space-Time."

Krauss draws extensively from each of these sources, as well as from "Genius: The Life and Science of Richard Feynman," the comprehensive biography by Jim Gleick, and "The Beat of a Different Drum: The Life and Science of Richard Feynman," by Jagdish Mehra. In fact, "Quantum Man" is based almost exclusively on previously



"Quantum Man: Richard Feynman's Life in Science" by Lawrence M. Krauss. New York: W.W. Norton & Company, 2011. 350 pages, \$24.95 (hardbound).

published works, although Krauss does supplement his book with interviews he conducted with several of Feynman's contemporaries, most notably Steven Weinberg, Murray Gell-Mann, Danny Hillis and James Bjorken. These individuals form an elite group who both knew the man and understood his work. As such, they are able to illuminate the significance of his achievements within a somewhat more intimate and humanistic context than has heretofore been the case.

Moreover, these interviews provide unique insights and perspectives on his science, his personality, and how the two were intricately intertwined. For example, Krauss explains how his relationship with his first wife, who died of tuberculosis while he was involved with the Manhattan Project, affected his approach to life in general and science in particular.

"Richard and Arline were soul mates. They were not clones of each other, but symbiotic opposites — each completed the other," Krauss writes. "Following Arline's death and his newfound nihilism after the Trinity bomb explosion, he responded to his inner turmoil by lashing out at convention. From then on, he began to revel in being different."

As has been noted by those who experienced him firsthand, Feynman was a masterful teacher. He could break complex explanations down into their constituent parts in

a way that few scientists of his caliber are able to do. Krauss seems to emulate this skill on virtually every page.

If one story captures the essence of who Feynman was both as a person and a physicist, it would perhaps be the one Krauss includes about Barry Barish, a colleague who would occasionally walk with him to Caltech in the mornings:

"One time Richard asked Barry if he had seen a certain house on a certain street and what he thought of it," Krauss writes. "Barry didn't know the house because, like most of us, he had found a route he favored and took that same route to work and back every journey. Richard, he learned, made a point of doing precisely the opposite. He tried never to take the same path twice."

Feynman, who shared the Nobel Prize in 1965 with Sin-Itiro Tomonaga and Julian Schwinger for their theoretical innovations in quantum electrodynamics, never accepted any nonacademic awards, such as honorary doctorates. "While there is little doubt he enjoyed celebrity," Krauss notes, "he didn't like pomp and circumstance, and motivated from the attitude he had gleaned from his father as a child, he truly distrusted honorific titles."

Or as Feynman put it: "The prize is the pleasure of finding things out."

In one of his last official functions, Feynman served on the commission that investigated the Challenger disaster, where "he personally helped uncover the reason for the tragic space shuttle explosion." He remained actively engaged in trying to solve fundamental problems in physics until his death from cancer on Feb. 15, 1988.

And his influence is still felt in the discipline he loved: "The only truly efficient and productive techniques for dealing with both the Yang-Mills gauge theories and gravity involved Feynman's path-integral formalism. Essentially no other formulation of quantum field theory is used by modern physicists."

If you have no clue what this means or why it is important, read "Quantum Man." Krauss will have you understanding this — and a lot more — before you finish the last page.

— Reviewed by Aaron W. Hughey, Department of Counseling and Student Affairs, Western Kentucky University.