

'Hippies' for anyone with a science interest

"If a culture cannot afford an area in itself where pure nonsense happens, and where it is not practical, it has no objectives ... then this culture is dead." This quote by Alan Watts (from 1967) sets the stage for "How the Hippies Saved Physics: Science, Counterculture, and the Quantum Revival," the new book by David Kaiser.

Kaiser is a professor at MIT, where he holds dual appointments in the Department of Physics and the Program in Science, Technology and Society. He is a fellow of the American Physical Society and a winner of the History of Science Society's Pfizer Award for "Drawing Theories Apart," which describes Richard Feynman's approach to quantum theory.

The book consists of 10 exceptionally well-researched chapters. There are no less than 38 pages of source notes and 32 pages of references at the conclusion of the main text. Moreover, Kaiser conducted some 19 interviews with many of those he profiles.

Most of "How the Hippies Saved Physics" revolves around the intellectual pursuits and other exploits of a group of free-thinkers known as the "Fundamental Fysiks Group," which formed at Berkeley in 1975. One of Kaiser's primary motivations for writing the book is his assertion that many of the contributions that had their genesis with this group have gone unrecognized and underappreciated. It is his intention to rectify that situation.

"While the physics profession floundered, members of the Fundamental Fysiks Group emerged as the full-color public face of the 'new physics' avant-garde," Kaiser writes. "Hovering on the margins of mainstream physics, they managed to parlay their interest into a widespread cultural phenomenon. Reserving a big seminar room at the lab, they established an open-door policy: anyone interested in the interpretation of quantum theory was welcome to attend their weekly meetings. The group's intense, unstructured brainstorming sessions planted seeds that would eventually flower into today's field of quantum information science; they helped make possible a world in which bankers and politicians shield their most critical missives within quantum encryption.

"Today we all trust these systems, whether we realize it or not, whenever we send an email or make a purchase on the Internet," Kaiser adds.

The book should be infinitely interesting to both amateur as well as professional scientists; indeed anyone with a rudimentary interest in physics, psychology or a related discipline should find "How the Hippies Saved Physics" fascinating. The personal detail Kaiser intertwines throughout the book is one of its most engaging qualities. As you read each anecdote – and the book is literally filled with them – you come away with the impression that you know who these peo-

ple are, not just what they achieved.

In chapter three, "Entanglements," for example, the reader is introduced to Elizabeth Rauscher, a graduate student in physics. "Rauscher grew up in the Berkeley area," Kaiser writes. "For as long as she can remember, she has been passionate about science. She published her first scientific article, on nuclear fusion, as an undergraduate, and completed a master's degree in nuclear physics early in 1965. Then other realities set in. She got married, had a son, and became the sole provider for herself and her family. To pay the bills, she took a job as a staff scientist at the Lawrence Livermore Laboratory.

"At that time, nationwide, women earned only 5 percent of the undergraduate degrees in physics, and just 2 percent of the physics PhDs," Kaiser continues. "Rauscher was a rarity indeed. She had learned to cope by wearing tweedy dresses and keeping her hair cut short, but still she stuck out."

Similarly, in chapter 8, "Fringe?!", the reader meets Brian Josephson.

"In the early 1960s, Josephson published a short paper on electrical currents that might tunnel between a thin slice of ordinary metal sandwiched between two superconductors," Kaiser notes. "Experimentalists observed the predicted effect within months and the 'Josephson junction' earned Josephson a Nobel Prize in 1973, at the tender age of thirty-three."

Then it gets interesting. "By the time Josephson accepted his prize in Stockholm, however, his research interests had turned squarely to Eastern mysticism, the nature of consciousness and parapsychology."

Kaiser is particularly adept at describing the often quirky nature of academic culture – a world that often seems bizarre and even nonsensical to those less familiar with its terrain. Witness his description of a paper by Nick Herbert on "superluminal signaling" that had "made waves among the remnants of the Fundamental Fysiks Group" once it was actually submitted to a journal: "The gears of academic peer review grind slowly, but grind they do. As Ghirardi and Weber tried to clarify their objections to the journal editor, and as Stapp argued with Herbert near Esalen's hot springs baths, parallel stories began playing out elsewhere. Copies of Herbert's paper made their way to other groups of physicists here and there, and a few began to take notice."

"How the Hippies Saved Physics" is an entertaining historical peek into the nature of the creative process; i.e., a well-constructed synthesis of scientific thought set within the context of the personalities who were at the vanguard of a major paradigm shift. I recommend it highly.

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