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Nota di contenuto	Chapter 1. Introduction -- Chapter 2. A Brief Tour of Cold -- Chapter 3. Discovery -- Chapter 4. Explaining He II: Quantum Mechanics and the Two-Fluid Model -- Chapter 5. What If You Had a Bucket? -- Chapter 6. Moving Heat -- Chapter 7. Transport in strongly ionized plasma across magnetic field -- Chapter 8. Early Applications -- Chapter 9. The Fabulous 80s: Tore Supra, IRAS and CEBAF -- Chapter

10. Can You Paddle a Canoe in He II? – Engineering Studies -- Chapter
11. Colliders: Super, Large and Otherwise -- Chapter 12. ILC, TESLA, &
SRF Everywhere -- Chapter 13. A Superfluid Space Odyssey -- Chapter
14. High Field Magnets -- Chapter 15. The Other Superfluid -- Chapter
16. The Future.

Sommario/riassunto

Unless you are a specialist or watch a lot of obscure YouTube videos you have probably never heard of He II or superfluid helium. This substance, a unique liquid form of the element helium, is produced and used in multi-ton quantities to enable much of modern science. Altogether, He II is at the heart of more than a dozen large scale scientific facilities world-wide representing an investment of tens of billions of dollars. It cools the magnets and cavities that contain and accelerate the particle beams at the Large Hadron Collider and is also used in accelerators for the study of rare isotopes and nuclear astrophysics. This little known liquid is, in reality, one of the enabling technologies of the future. A manifestation of quantum mechanics, He II exhibits amazing behaviors. It can flow up the side of a container against gravity, it can move through small openings without friction, and it can transfer heat extremely efficiently via a mechanism not seen elsewhere in nature. This book tells the story of He II. It describes the discovery of the fluid, the observation and understanding of its behavior, the development of underlying theory and the evolution of He II from a laboratory curiosity to an industrial-scale coolant. The current and possible future applications of He II are described. Like all science and engineering, the story of He II is a human story and the role that personalities, politics, communication, cooperation and competition play in the development of He II is captured here as well. World-famous physicists such as Lev Landau, Richard Feynman, Peter Kapitza and Kurt Mendelssohn are key players in the story, while secret police from two different countries have a walk-on role. This work is meant for the general reader. Without assuming any expertise in physics, engineering or mathematics, it illuminates for the general public a little-known area of science and engineering and shows why it matters. As it turns out, it's also a good story.
