

by David Tilley and John Tilley (Adam Hilger, Bristol, UK, 1986).

A reader familiar with the first edition will find many similarities in the second; several chapters are nearly identical to their originals in the first edition. The major strengths of the book continue to be excellent discussions of phonons, vorticity and dilute He^3 and He^4 solutions. The very good discussion of superfluid He^3

is entirely new and one of the best chapters in the book.

Superfluid He^3 is a complicated subject, but the authors provide a clear, if brief, picture of pairing and the quantum states. The discussion is most picturesque in its treatment of the vectors that are necessary to characterize the superfluid. In talking about the acoustical clapping and flapping modes, the authors actively

engage the reader: "The reader may imagine his back to represent $\mathbf{l}$ [the orbital angular momentum] and his arms, held horizontally and mutually perpendicular, to represent the other two [components of the complex vector $\mathbf{d}$] vectors. Then, 'clapping' corresponds to the arms oscillating in antiphase in the horizontal plane and 'flapping' to the arms oscillating in phase up and down." Delightful!

Chapters 12-14 constitute one of the best sections of the book: the discussion of rotation, vortices and critical velocities. Here the detail and motivation are at their best. The authors discuss the early experiments that insisted that flow in helium could not be everywhere irrotational and develop the notions of vortex lines and quantized circulation.

Wilks and Betts completed the manuscript in August of 1986—a bit too early to allow inclusion of the fascinating new quantum effect experiments of Eric Varoquaux and his colleagues at Université de Paris-Sud.

The book has considerable strengths. It also has several drawbacks. Missing almost entirely is any discussion of modern numerical calculations of the static properties of He^4 , the emerging work in the area of polarized He^3 , the substantial literature concerned with helium films or convective instability in He^3 - He^4 mixtures. The last two topics in particular represent areas in which helium physics allows one to study more general phenomena. For example, helium films provided the laboratory setting in which many of the details of the Kosterlitz-Thouless theory of two-dimensional phase transitions were first documented and the theoretical ideas tested.

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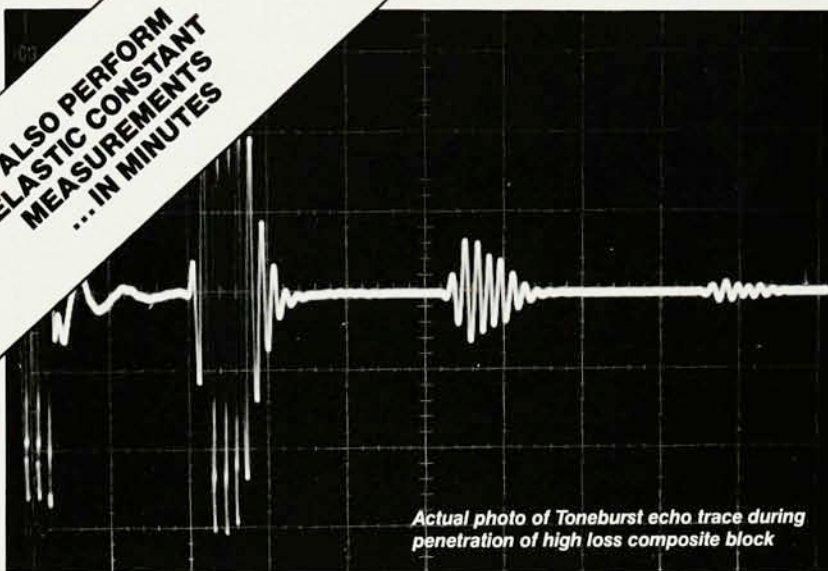
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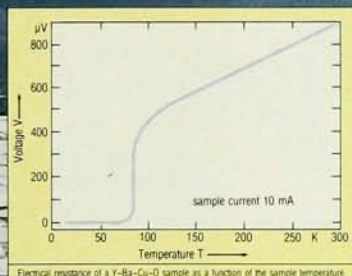
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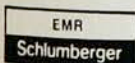
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