

multiple scattering theory used in LEED intensity calculations requires careful definitions, precise formulations and detailed derivations to be useful. The mathematical developments in the chapters on scattering of electrons by crystals, multiple-scattering calculations and kinematic theory are both too sketchy and marred by too many errors to be followed by readers new to the theory. The discussion of scattering potentials and phase shifts in chapter 3 is useful, although it contains perhaps too much material on phase shifts; there are errors in the radial equation and its solution and in the equations for the scattering amplitude. The plane-wave expansion formula is in error, and the corresponding figure referred to in the text is absent. The attribution of the KKR method of band theory to Hendrik Kramers, R. Kronig and Norman Rostoker (page 156) is incorrect. The mathematical formulation of kinematic theory in chapter 6 has too many errors and misprints to be useful and is not really needed in the informative discussion of kinematic theory applied to defects, steps, domains and so forth that follows in the chapter.

Clarke is to be commended for producing a readable, up-to-date, well-informed and critical text on a rich variety of topics in the application of LEED to surface structure studies. There is a wealth of practical lore that researchers will appreciate, as well as an extensive bibliography with which to pursue topics in detail. Personal taste of course enters into the choice of topics, but I would have preferred a chapter on the remarkable and fundamental phenomenon of relaxation on clean metal surfaces, which has been the subject of so much LEED work in the last few years, to the long chapter on temperature effects in LEED. The survey of other techniques (chapter 8) should have presented more discussion of ion scattering (particularly medium-energy ion scattering and the double alignment technique) in view of its many quantitative contributions to surface structure studies. I hope a second edition will be without the rather large number of misprints.

PAUL M. MARCUS

IBM Thomas J. Watson Research Center

book note

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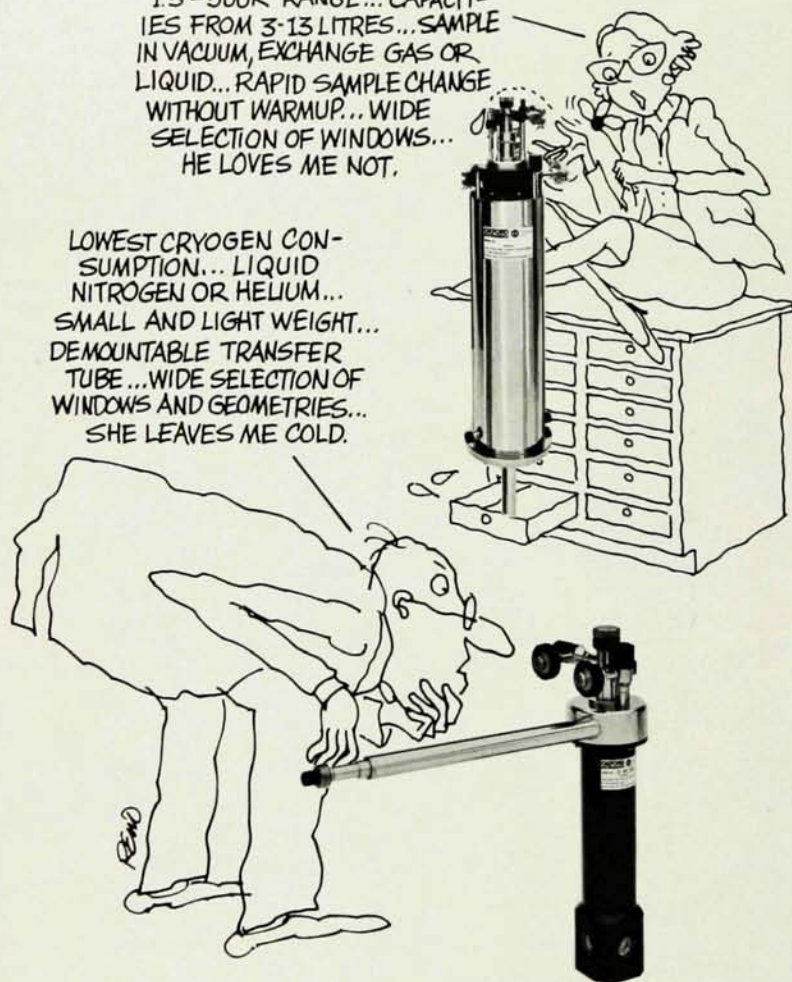


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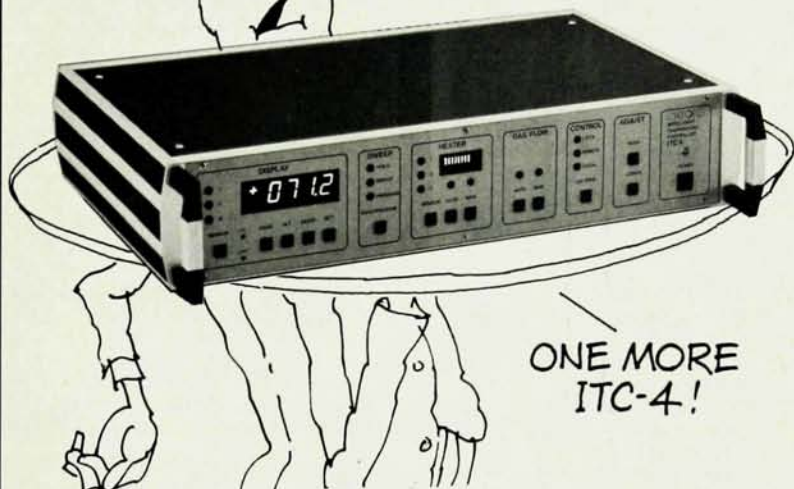
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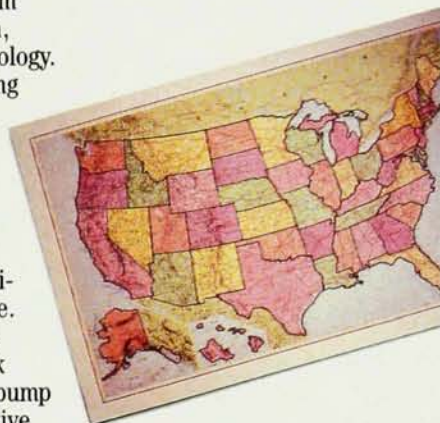
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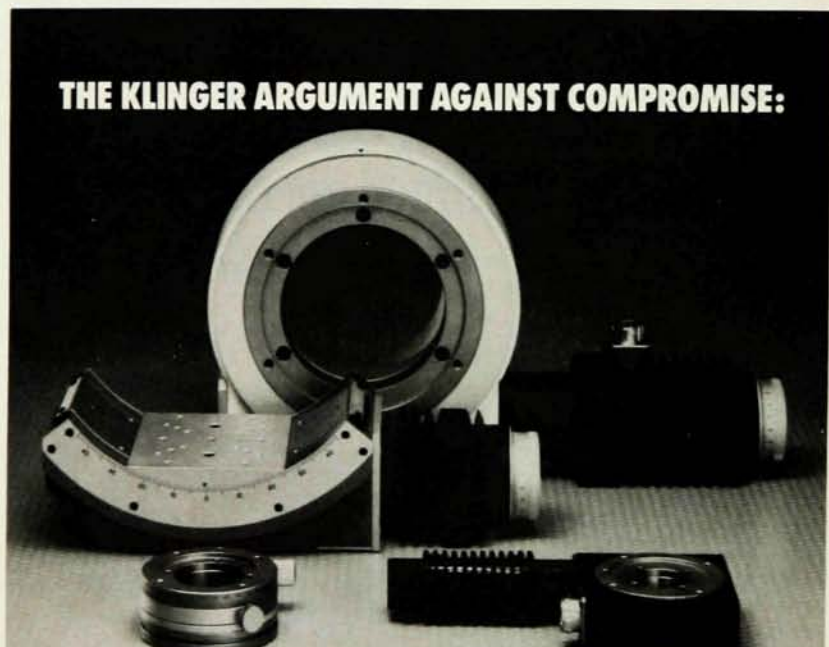
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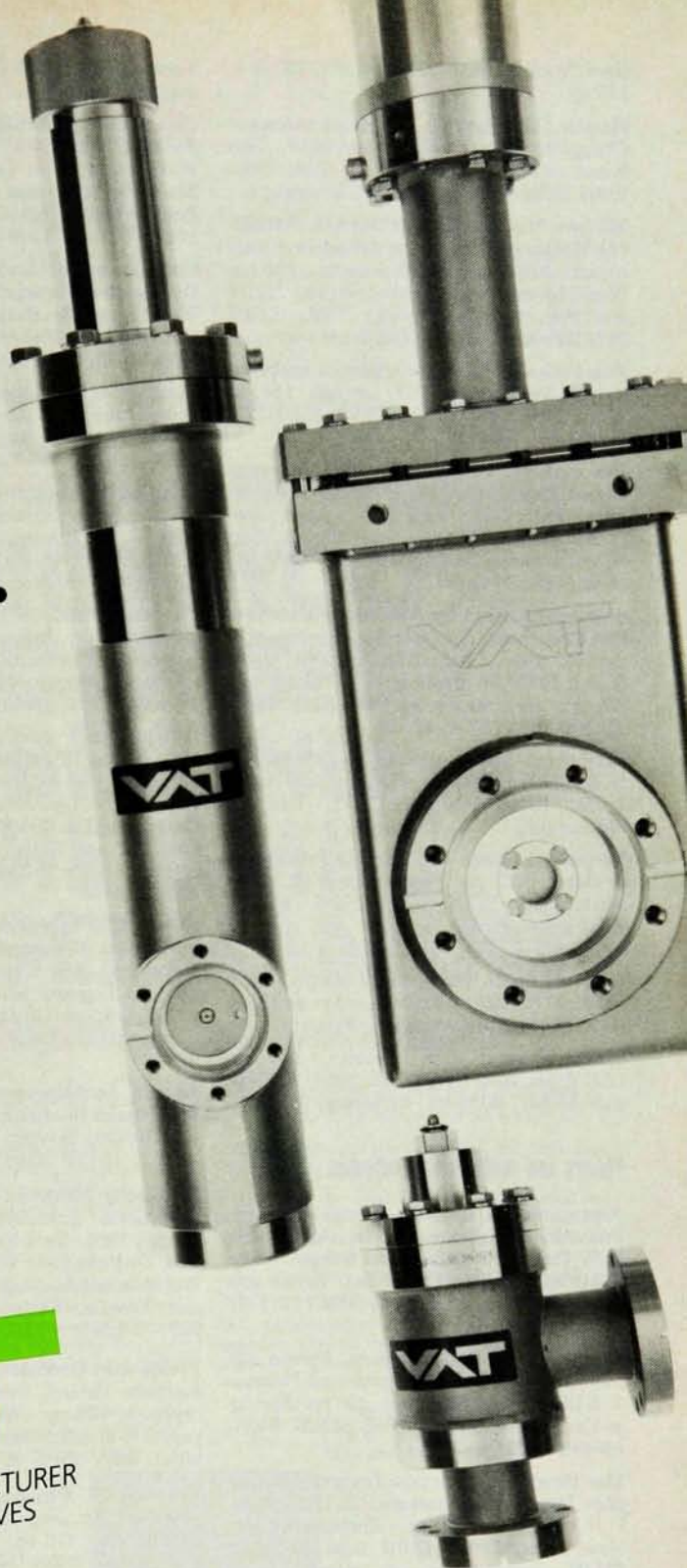
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Gravitational Collapse and Relativity. *Yamada Conference XIV.* Proc. Conf., Kyoto, Japan, April 1986. H. Sato, T. Nakamura, eds. 512 pp. World Scientific, Singapore (US dist. Taylor and Francis, Philadelphia), 1986. ISBN 9971-50-207-0. \$72.00

Gravitational Radiation and Relativity. *Proceedings of the Sir Arthur Eddington Centenary Symposium, Vol. 3.* J. Weber, T. M. Karade, eds. 465 pp. World Scientific, Singapore (US dist. Taylor and Francis, Philadelphia), 1986. ISBN 9971-978-88-1. \$49.00. *Compendium*

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International Directory of Professional Astronomical Institutions 1987. *Observatoire de Strasbourg Publication Spéciale du CDS 9.* A. Heck, J. Manfroid, eds. 276 pp. Centre de Données de Strasbourg, France, 1986. ISBN not stated. *Reference; price not stated*

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New Paths in the Use of Nuclear Techniques for Art and Archeology. Proc. Symp., Trieste, Italy, September 1985. G. Furlan, P. C. Guida, C. Tuniz, eds. 293 pp. World Scientific, Singapore (US dist. Taylor and Francis, Philadelphia), 1986. ISBN 0-9971-50-195-3. \$53.00

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edited by E.W. Montroll† and
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