

Bookshelf

"Crystal Channeling and Its Applications at High Energy Accelerators", V. M. Biryukov, Y. A. Chesnokov, and V. I. Kotov, Springer-Verlag Berlin Heidelberg New York, 1997 (DM 138) ISBN 3-540-60769-2.

This interesting book brings together two decades of developments in the area of high energy channeling. Prior to the seventies, channeling, the behaviour of particles moving near the planes and axes of a crystal, had been studied in the MeV regime. Outside of the intriguing process itself, physics interest was driven by solid state and nuclear physics investigations. Because the critical angle for channeling is small and shrinks with energy, there was little interest in high energy channeling. Then in the seventies pioneering experiments at CERN, Fermilab, Dubna, and Serpukhov demonstrated that channeling, and particularly channeling in bent crystals, could be applied at high energy. Channeling is now routinely used at CERN and Serpukhov. A recent Fermilab demonstration has shown that TeV-scale extraction can be handled easily.

The authors have had a key role in this development. With Tsyganov, Samsonov, and others they were winners of a 1996 Russian Federation state prize for their work. An important feature of the book is a coherent treatment of the transmission of bent channeling crystals, needed to reliably apply channeling in different high energy physics and accelerator applications. The book reexamines dechanneling data and gives useful formulations of dechanneling lengths that fit the data. Anyone setting out to apply

channeling at high energy should have a copy of the book in hand.

Reviewed by Richard Carrigan, Fermilab.

Books received

Symmetries, Lie Algebras and Representations: A Graduate Course for Physicists, by Jürgen Fuchs and Christoph Schweigert, Cambridge University Press.

In the prestigious series of Cambridge Monographs on Mathematical Physics, this book carefully presents Lie algebras with a view to their application for physics. It is rather detailed and contains exercises, but the typography makes it easy to select material for a first reading.

Mathematica in the Laboratory, by Samuel Dick, Alfred Riddle and Douglas Stein, Cambridge University Press: hardback £55/\$74.95, paperback £19.95/\$29.95

A hands-on guide on how to use Mathematica in the gathering and analysis of experimental data, with many examples.

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