



Icons and Symmetries

By Simon L. Altmann

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Here is a lucid introduction to the ideas of symmetry as they are so successfully used in the fields of physics, chemistry and other physical sciences. Using only elementary mathematics, the author discusses the subtle relationship between physical objects, models, and icons, and explains some of the so-called symmetry paradoxes. Each of the three chapters uses a case-study to illustrate the development of major concepts. In the first two chapters, the focus is on the concept and importance of an icon. The author explains the origins and applications of symmetry, and shows how rotations came to be described by Hamilton by means of quaternions. This approach gives insight into the symmetry properties of vectors and demonstrates the relevance of tensors and spinors. The third chapter illustrates the use of symmetry in the classification of energy levels in atoms and solids, and discusses broken symmetry. With its use of simple, easy-to-understand mathematics, the book will appeal to a wide range of readers interested in the philosophy and history of science, science in general, and physics specifically. It may also serve as useful supplementary reading for students in these fields.

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'The story is told with considerable charm and many attractive and informative figures... I could happily build a week or two of a liberal-arts physics course around the text of Altmann's first lecture... Altmann has made a first-class effort in these essays, rarely sacrificing accuracy for the illusion of intelligibility, always writing with good humour and grace, and maintaining considerable decency in the treatment.' *Nature*

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Aslib Book Guide, Vol. 57, No. 10, Oct 1992

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Professor J.A.D. Matthew, University of York, *Contemporary Physics*, Volume 33, Number 5, September/October 1992

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