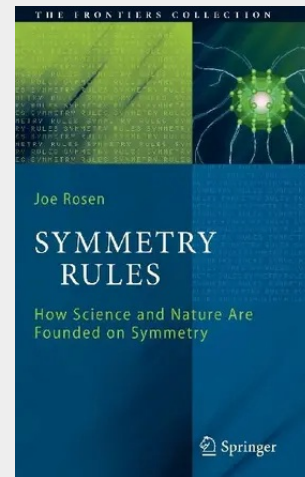


Symmetry Rules

How Science and Nature Are Founded on Symmetry

Ernest Rutherford (New Zealand–British physicist, 1871–1937), the 1908 Nobel Laureate who discovered the existence of atomic nuclei, is famously quoted as having said: "Physics is the only real science. All the rest is butterfly collecting." Or something to that effect. I like to include this quote in my introductory remarks at the first class meetings of the physics courses I teach. I have seen that there are those who interpret this as a put-down of amateurs (butterfly collectors) in science. However, my own interpretation of Rutherford's statement is that he is claiming that, except for physics, all of the rest of science is involved merely in collecting facts and classifying them (butterfly collecting). It is physics, unique among the sciences, that is attempting to find explanations for the classified data. The periodic table of the chemical elements, originally proposed by Dmitri Ivanovich Mendeleev (Russian chemist, 1834–1907), presents an example of this. Chemists toiled to discover the chemical elements and their properties and then classified the elements in the scheme that is expressed by the periodic table. Here was the chemists' butterfly collecting. It took physicists to explain the periodic table by means of quantum theory.

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64,19 €

59,99 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9783540759720

Medium: Buch

ISBN: 978-3-540-75972-0

Verlag: Springer

Erscheinungstermin: 04.03.2008

Sprache(n): Englisch

Auflage: 2008

Serie: The Frontiers Collection

Produktform: Gebunden

Gewicht: 647 g

Seiten: 305

Format (B x H): 160 x 241 mm

