

Butterfly in the Quantum World is a book about a marvelous mathematical object and its meaning in physics. I happened to be the first human being to glimpse that object, way back in 1974 in Regensburg, Germany, and that first sighting of the “butterfly”, as it has come to be known, was a spine-tingling thrill for me. Even today, I still feel extremely privileged to have been its discoverer. How can a shape be made of nothing but an infinite collection of smaller, distorted copies of itself? And how can such a crazy shape have any relevance to the nature of the physical world?

Indu Satija has written a book that explains how the infinitely self-nested butterfly is gradually becoming more and more important in solid-state physics (and even in other branches of physics!), and she celebrates its strangely meandering story in wonderfully human ways, including all sorts of fascinating anecdotes and historical material, charming photographs of many of the key people involved, countless engaging illustrations, sparkling quotations from some well-known and some lesser-known thinkers, and even a handful of poems.

This book is Indu’s profoundly personal homage to the centrality of beauty in the world of science. It shows that number theory and topology, once thought to play no role whatsoever in the laws of nature, have now become indispensable elements in the toolkit of theoretical physics. It shows how the butterfly is linked to many mysterious physical phenomena that had never been dreamt of when it first was glimpsed, and it explains how certain aspects of the butterfly are only now — over 40 years after it was theoretically computed using a desktop calculator and graphed by hand with felt-tip pens! — starting to be observed in the laboratory. I believe that Indu’s book will make fascinating and inspirational reading for many people, ranging all the way from professional physicists to physics students at all levels to high-schoolers who love science and math.

I had truly never imagined that such a book would be written, and its unlikely creation is deeply rewarding to me. What an intellectual, visual, and even spiritual treat for readers the world around!

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