

# Butterfly in the Quantum World

The story of the most fascinating quantum fractal

by [Michael J. Heuley](#)

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# Butterfly In The Quantum World Iopscience

**Judd E. Hollander**



## **Butterfly In The Quantum World Iopscience:**

*The Butterfly in the Quantum World* Indubala I Satija, 2016-09-06 *Butterfly in the Quantum World* by Indu Satija with contributions by Douglas Hofstadter is the first book ever to tell the story of the Hofstadter butterfly a beautiful and fascinating graph lying at the heart of the quantum theory of matter The butterfly came out of a simple sounding question What happens if you immerse a crystal in a magnetic field What energies can the electrons take on From 1930 onwards physicists struggled to answer this question until 1974 when graduate student Douglas Hofstadter discovered that the answer was a graph consisting of nothing but copies of itself nested down infinitely many times This wild mathematical object caught the physics world totally by surprise and it continues to mesmerize physicists and mathematicians today The butterfly plot is intimately related to many other important phenomena in number theory and physics including Apollonian gaskets the Foucault pendulum quasicrystals the quantum Hall effect and many more Its story reflects the magic the mystery and the simplicity of the laws of nature and Indu Satija in a wonderfully personal style relates this story enriching it with a vast number of lively historical anecdotes many photographs beautiful visual images and even poems making her book a great feast for the eyes for the mind and for the soul **The Butterfly in the Quantum World I I** Satija, 2016-09-06

*Butterfly in the Quantum World* Indubala I. Satija, Douglas R. Hofstadter, 2016 Preface Prologue Prelude part I The butterfly fractal 0 Kiss precise 0 1 Apollonian gaskets and integer wonderlands Appendix An Apollonian sand painting the world's largest artwork **The Mystery of the Quantum World** Euan J. Squires, 1986 **The Quantum World** NEW SCIENTIST., 2017 In *The Quantum World* leading physicists and *New Scientist* take us on journey through the quantum world its mind bending properties and the technologies transforming our world [The Trouble With Reality](#) New Scientist, 2017-03-21 Quantum theory is our very best description of the microscopic world of atoms and their constituents It has given us lasers computers and nuclear reactors and even tells us how the sun shines and why the ground beneath our feet is solid Yet the quantum world defies our sensibilities it is a place where objects can be in two places at once influence each other at opposite sides of the cosmos and nothing is as it seems until you measure it Why is the quantum world so strange Where does it begin and end And what does this mean for the bedrock of reality In attempting to address such frontier questions physicists have come to realise that the quantum world promises exciting new technologies the ability to communicate with absolute security computers more powerful than anything built before and even quantum teleportation In *The Trouble With Reality* leading physicists and *New Scientist* take us on journey through the quantum world its mind bending properties and the technologies transforming our world There is a sting in the tale is quantum theory truly the ultimate theory of reality [Language of Nature](#) David Judd Nutting, 2005-07-01 *Understanding The Quantum World and Scientific History* Science is truly one of the deepest the most complex and the most relevant forms of knowledge in human history It deals with such aspects like life energy matter and molecules But even until now the study of science has been

based on empirical knowledge since the time of Galileo and this fact brings out the call for a deeper form of scientific research which leads to the quantum world In his groundbreaking new picture book Language of Nature Quantum World Revealed author David Judd Nutting presents to the world his views and in depth study on science nature and the world itself Language of Nature begins with the task of explaining to its readers what the world of quantum physics is all about Since science is based on knowledge derived from the five senses researchers are unable to verify or demonstrate the quantum world which is actually transempirical Quantum physics explains nature s selective process while the transempirical world of nature becomes a creative process which experimental knowledge could never translate or explain effectively Aside from presenting the quantum world the book contains very rich information and photos on famous researchers including Albert Einstein and Thomas Edison technological development scientific history inventions video games the solar system and so much more There is no doubt that readers will have so much to learn from the author s findings Richly layered surprising and very intelligent Language of Nature is easily one of the most educational and most unique picture books about science today Readers including students researchers and scientists will enjoy immersing themselves with this picture book especially when it comes to getting an acceptable interpretation of the quantum world and getting all the details in the history of science Language of Nature Quantum World Revealed goes beyond conventional science and is truly an essential read

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