

FREE MATHEMATICS OF LIFE: UNLOCKING THE SECRETS OF EXISTENCE PDF



Ian Stewart, John Davey | 288 pages | 12 Sep 2012 | Profile Books Ltd | 9781846682056 | English | London, United Kingdom

Mathematics of Life: Unlocking the Secrets of Existence | Times Higher Education (THE)

Topic is very interesting, and Ian Steward is good at explaining some complex mathematical concepts. However, I think some important developments in mathematical Mathematics of Life: Unlocking the Secrets of Existence are completely missed such as distribution of species

Mathematics of Life: Unlocking the Secrets of Existence space or population genetics.

Pretty good, with some problems. Chapters 6 and 7 are best esp. Needs damn glossary like all these books. The Mathematics of Life.

Ian Stewart. Biologists have long dismissed mathematics as being unable to meaningfully contribute to our understanding of living beings. Within the past ten years, however, mathematicians have proven that they hold the key to unlocking the mysteries of our world -- and ourselves. In *The Mathematics of Life* Ian Stewart provides a fascinating overview of the vital but little-recognized role mathematics has played in pulling back the curtain on the hidden complexities of the natural world -- and how its contribution will be even more vital in the years ahead.

In his characteristically clear and entertaining fashion, Stewart explains how mathematicians and biologists have come to work together on some of the most difficult scientific problems that the human race has ever tackled, including the nature and origin of life itself. He is a fellow of the Royal Society. He lives in Coventry, UK.

Mathematics of Life: Unlocking the Secrets of Existence - IMA

Did you hear about the farmer who hired some mathematicians to help him increase his milk yield? Their report began: "Consider a Mathematics of Life: Unlocking the Secrets of Existence cow. This is a famous old joke about the disconnect between mathematics, the language of clear abstractions, and the life sciences, the domain of messy organic forms. For much of the history of science, biology and maths have barely been on speaking terms.

When I was at school, biology was the science you took precisely to avoid calculations and formulae. Maths was firmly in bed with physics, its muse. Ian Stewart says this is changing. He claims that for the next *Mathematics of Life: Unlocking the Secrets of Existence* the driving force behind mathematics will be biology, and that this marks a fundamental, and exciting, shift in how the sciences inter-relate.

Stewart is Britain's most brilliant and prolific populariser of mathematics, the author of at least 30 books, as well as academic texts and influential research papers. His recent collections of playful miscellany, Professor Stewart's Cabinet of Mathematical Curiosities and Hoard of Mathematical Treasures have been bestsellers.

Mathematics of Life is a much more serious book. Through mathematical eyes, Stewart chronicles the major advances of biology, from the invention of the microscope three centuries ago to the discovery in by Crick and Watson of the structure of DNA. He shows just what maths has done to explain elements of life, and where research is taking us next. One reason why biology is now attracting mathematicians is because much of the subject has been reduced to physics and chemistry.

Neurons can be understood in terms of networks, nerves as cables transmitting electricity and DNA as strings of different chemicals. A variety of mathematical fields are applicable to biology. Knot theory is used in the analysis of tangled strands of DNA. Abstract geometry in four, five or more dimensions can tell us a lot of useful things about real viruses in three dimensions. The computer pioneer Alan Turing's "reaction-diffusion" equations help us understand markings on animals such as stripes and dapples.

Stewart mentions his own work on types of animal gait based on a simple circuit in the *Mathematics of Life: Unlocking the Secrets of Existence* system called a central pattern generator. Neuroscience is particularly maths-friendly: for example, equations can explain why you see spirals when you take hallucinogenic drugs.

It's because of the arrangement of neurons on the visual cortex. If mathematicians are learning to love biology, then biologists *Mathematics of Life: Unlocking the Secrets of Existence* to take on board the peculiarities of mathematics. Stewart returns to the joke in the opening paragraph, which he says is not really a joke at all.

Spherical cows may indeed be useless for determining milk yields, but they might be a useful approximation for other problems, such as the spread of bovine skin disease. *Mathematics of Life* is dense with information, written with Stewart's characteristic lightness of touch and will please the dedicated maths reader.

I would like to think it will also appeal to the wider audience of *Curiousities* and *Hoard* but I fear they may struggle with the volume of conceptual ideas and the many scientific terms. This would be a shame since the book is a testament to the versatility of maths and how it is shaping our understanding of the world. Topics Science and nature books.

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plants to throw fresh light on the behaviour of entire organisms, how they interact and how changes in biological diversity affect the planet's ecological balance.

Mathematics offers new and sometimes startling perspectives on evolution and how patterns of inheritance and population work out over time-scales ranging from millions to hundreds of years - as well as what's going on to change us right now. Ian Stewart, in characteristically clear and entertaining fashion, explores these and a whole range of pertinent issues, including how far genes control behaviour and the nature of life itself.

He shows how far mathematicians and biologists are succeeding in tackling some of the most difficult scientific problems the human race has ever confronted and where their research is currently taking us.

Stewart is Britain's most brilliant and prolific populariser of mathematics Stewart has a lively humour and his book stretches the mind without pain. Time will tell. Added to basket.

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