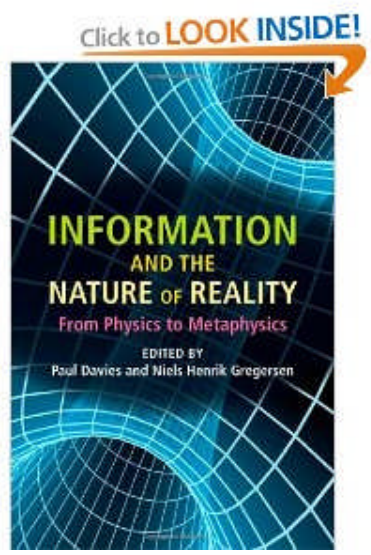


Share your own customer images
Search inside this book

Information and the Nature of Reality: From Physics to Metaphysics [Hardcover]

Paul Davies (Editor), Niels Henrik Gregersen (Editor)

(10 customer reviews) | (46)

List Price: ~~$30.00~~

Price: $18.26 & eligible for **FREE Super Saver Shipping** on orders over $25. Details

You Save: $11.74 (39%)

In Stock.

Ships from and sold by **Amazon.com**. Gift-wrap available.

Want it delivered Tuesday, March 20? Order it in the next 33 hours and 57 minutes, and choose **One-Day Shipping** at checkout. Details

43 new from $18.26 **23 used** from $14.99

FREE Two-Day Shipping for students on millions of items. Learn more

Formats	Amazon Price	New from	Used from
Kindle Edition	$15.20	--	--
Hardcover	$18.26	$18.26	$14.99

Book Description

Publication Date: **November 15, 2010** | ISBN-10: **0521762251** | ISBN-13: **978-0521762250** | Edition: **1**

Many scientists regard mass and energy as the primary currency of nature. In recent years, however, the concept of information has gained importance. Why? In this book, eminent scientists, philosophers and theologians chart various aspects of information, from quantum information to biological and digital information, in order to understand how nature works. Beginning with a historical treatment of the topic, the book also examines physical and biological approaches to information, and its philosophical, theological and ethical implications.

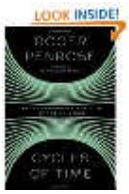
Frequently Bought Together

Customers buy this book with Information: A Very Short Introduction by Luciano Floridi Paperback $6.51

Price For Both: $24.77

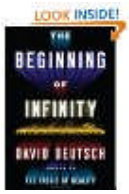
Show availability and shipping details

Customers Who Bought This Item Also Bought



Cycles of Time: An

A Universe from



The Beginning of

Consciousness and th

Editorial Reviews

Review

"This is the anthology we have been waiting for ... seminal papers deal with matter through the history o seventeenth-century materialism and twentieth-century dematerialism, the need for a new scientific worl quantum nature of the universe, and the storage and transmission of information in biological systems wi their genomes and development ... Philosophers, theologians and scientists all have their say, wrestling w the ultimate informational and structuring principle in the universe."
Professor Sir Brian Heap, St Edmund's College, President, European Academies Science Advisory Board, C Sciences

Book Description

Many scientists regard mass and energy as the primary currency of nature. In recent years, however, the has gained importance. In this book, eminent scientists, philosophers and theologians chart various aspec quantum information to biological and digital information, to understand how nature works.

See all Editorial Reviews

Product Details

Hardcover: 398 pages

Publisher: Cambridge University Press; 1 edition (November 15, 2010)

Language: English

ISBN-10: 0521762251

ISBN-13: 978-0521762250

Product Dimensions: 9.2 x 6.3 x 1 inches

Shipping Weight: 1.6 pounds (View shipping rates and policies)

Average Customer Review: (10 customer reviews)

Amazon Best Sellers Rank: #68,130 in Books (See Top 100 in Books)
#92 in Books > Professional & Technical > Professional Science > Astronomy & Space Science > **Co**

Would you like to **update product info**, **give feedback on images**, or **tell us about a lower price**?

Customer Reviews

10 Reviews

5 star:	(5)
4 star:	(2)
3 star:	(2)
2 star:	(1)
1 star:	(0)

Average Customer Review
(10 customer reviews)

Share your thoughts with other cus

Most Helpful Customer Reviews

183 of 189 people found the following review helpful

Opening Pandora's box?, November 20, 2010

By
Paul L. Nunez "brain physics" (Covington, Louisiana and Solana Beach California) - See all my reviews

Amazon Verified Purchase (What's this?)

This review is from: Information and the Nature of Reality: From Physics to Metaphysics (Hardcover)

Over the past century or so most scientists have regarded mass and energy as nature's primary actors on the universal stage with information allowed only a secondary role. Essays in this book by authors from varied fields advocate a radically different view, one that elevates information as the fundamental entity underlying all of physical reality, implying the conceptual hierarchy: information -> laws of physics -> matter. I will not attempt a comprehensive review here, just hit a few highlights. Check the web for more detailed reviews.

Why should one take this idea of [information-as-fundamental] seriously? A short answer addressed by several authors is that known physical laws, relativity, quantum mechanics, and thermodynamics, are all laws about information, especially limits on the speed, quantity, and quality of information transfer. Relativity limits speed; quantum mechanics limits quantity. The wave function of a system of quantum particles encapsulates all that is known about the system; it is essentially an information field. It is not clear (to me at least) if the fundamental information envisioned here might be embedded in space-time (as the usual quantum wavefunction) or if the information may create space-time itself. Probably there are proponents on both sides of this question.

What are the implications of this revolutionary new paradigm? For one thing it is bound to be quite controversial. For some scientists this may be likened to opening Pandora's box (or at least a large can of worms) releasing all kinds of wild ideas about the origins of consciousness, implications for religious beliefs, mysticism, and so forth. Others, especially those interested in the "hard problem" of consciousness, may welcome the new ideas. Consider the implications of the [information-as-fundamental] paradigm for living systems. A gene is a set of coded instructions for a molecular system to carry out a task. Take a step up to the cellular level in the nested hierarchy of living systems. Each cell seems to act much like a natural supercomputer, an information-processing and replicating system of enormous complexity. Furthermore, human brains are even much more powerful information-processing systems. In fact, limits on inter-person information transfer are apparently all that allows us to remain individuals. Minds and information process appear, in the information-based picture, to be integral parts of our universe rather than accidental products of evolution as assumed by many. If information is fundamental, then maybe consciousness is fundamental.

I found many of the ideas in this book to be quite compelling; however, one cannot discount the enormous success of relativity and especially quantum mechanics in describing our physical world. The proposed new information paradigm currently provides no equivalent mathematics to predict the outcomes of specific experiments or develop new technology. Large parts of this paradigm are currently non falsifiable, leaving them beyond scientific purview, at least for now. Also somewhat problematic for me was the last section (five chapters) on philosophy and theology. For example, one chapter raises the concept of God as an informational principle at work in the entire cosmic process (rather than a designer God outside the universe). I suppose the identification of information

Most Recent Customer

Part of my reg
diet...
This book, along with Paul Goldilock's Enigma, are pa diet almost every day. **Rea**
Published 1 month ago by Jimmie R

A vote for dive
I like the varying sections believe the views in each four parts will balance and open-minded reader about difficult to... **Read more**
Published 2 months ago by ManyPla

Is our univers with information?
In terms of classical physi reality may be defined as behaving according to the classical spacetime, and th a... **Read more**
Published 7 months ago by Rama R

Information is nature and philosophy a quantum physics, info-p give rise to Reality Itse
****
"a new scientific world vie the quantum nature of the storage and transmission biological systems with the **Read more**
Published 7 months ago by Didaska

Information a Reality: From Physics to
Information and the Natur brilliantly sheds light on a demands further explorati
Published 11 months ago by Whiffs

a compendium match perfect

with God depends critically on one's definition of the "G-word," but this seems like quite a large jump to me. Nevertheless, I was willing to seriously consider the arguments. In any case, this particular God (hopefully) bears little resemblance to the mean old ogre of the Old Testament.

While confronting the mind-brain issue (the hard problem) from several directions, this book has very little to say about neuroscience or its many conscious correlates, which are emphasized in the consciousness literature. I expect much future work to aim for more integration of such brain science with new thoughts about the putative fundamental information. A very modest attempt in this direction is provided in my new book (2010). The critical multiscale nature of life and (apparantly) consciousness is treated from a physical science perspective in Al Scott's Stairway to the Mind: The Controversial New Science of Consciousness (1995). The apparent critical importance to consciousness of nested hierarchy in brain tissue is emphasized from a medical perspective in Todd Feinberg's From Axons to Identity: Neurological Explorations of the Nature of the Self (Norton Series on Interpersonal Neurobiology) (2009). A neuroscience-based book that stresses complexity (and by implication information) is Gerald Edelman and Giulio Tononi's A Universe Of Consciousness How Matter Becomes Imagination (2000). A new book that successfully marries graph and complex systems theories to genuine brain (multi-scale) network anatomy is Olaf Spornes' Networks of the Brain (2010).

Help other customers find the most helpful reviews

Was this review helpful to you?

Report abuse | Permalink

Comments (6)

14 of 15 people found the following review helpful

a few great chapters, some less so, with a conclusion needed, September 5, 2011

By **Nigel Kirk** (Canberra, Australia) - See all my reviews

Amazon Verified Purchase (What's this?)

This review is from: Information and the Nature of Reality: From Physics to Metaphysics (Hardcover)

This is a rich topic with James Gleick's recent and eclectic volume stimulating more popular interest in the perspectives, small and large, that information theory may offer us. This book's treatment of `information' from different perspectives starts well but subsides into unnecessarily complex and discursive verbage. The volume assays a range of topics, and bibliographies accompany each chapter. The topics (chapters) are organised in the themes of history, physics and biology, with philosophy and theology combined at the end. Alas, the detail of this review trails off about half way through as I sped up my reading, finding less rewards and continuing with the main aim of getting it over with. A concluding chapter is definitely needed to wrap up the many strands of thinking. I dislike writing negative reviews, preferring to focus on the positive and noting that preferences vary. However, I felt it important to flag to readers of Paul Davies's books that he is only an editor here, writing one chapter, and that the collection of essays does not deliver the level of exposition that his books usually do.

In Part 1, History, Ernan McMullan surveys the changing theories of matter in Western philosophy. His writing and vocabulary reflect a philosophical review and may be considered poetic or opaque depending on reader preference. More importantly, it offers one of the most concise and intelligible accounts of our perception of matter from Aristotle to dark matter that this reviewer has ever read. As a philosopher reviewing science, his emphases are incisive and clear, and have no doubt benefited from the comments of the editors, as he states. His references break an academic tradition in slightly favouring the more recent and accessible assessments of theories rather than their

The book is constructed fr
different disciplines with a
authors. Although the sub
gives reason for reflection
theology and... **Read mor**

Published 12 months ago by A beta

Very disappoi

This collection of essays w
part, not worth the time t
The first essay (pp 13-37)
Ernan McMullin, is the bes
Read more

Published 12 months ago by deepw

Search Customer Revie

Only search this product's revie

› **See all 10 customer re**

original proponents. Philip Clayton challenges materialism, and thereby science, with less convincing arguments which give inadequate weight to empiricism and the scientific method.

Part 2, Physics, starts with an eclectic appraisal of information theory in physics by Paul Davies who is always interesting and entertaining. There were loose ends: I am not sure if the `measurement to infinite' precision question was answered in terms of all phenomena, or why the 10 to the power 90 particles in the universe included photons and not gravitons. Davies needs to focus more so that readers can get their head around a discrete topic rather than gain a general impression of a field of study. Please note, this won't stop me buying his books. Seth Lloyd introduces the concept of the universe being a quantum computer where events generate outcomes, each of which may be considered a bit of information and resulting in the "complex order and structure" we know. Henry Stapp made my heart race when he undertook to provide "a non-paradox-laden description of the quantum universe and the place of our minds in it". Stapp's claim that our mind have been conditioned by three centuries of orthodox physics extended this appeal but his arguments became impenetrable, with a conclusion that his analysis is concordant with the "idea of a powerful God" coming out of the blue. I would like to give his interesting theory another chance and a re-read, perhaps with a strong coffee. I also wonder if this is an overly distilled decant of his views in Mindful Universe.

In Part3, Biology, John Maynard Smith examines DNA transcription and central dogma predictably with examples below the par we see from Dawkins and others. He touches on epigenetics, although not by this newer name. Except for statements such as "genes and regulatory proteins carry information, but enzymes do not", one needs to read between the lines to decide what information means in the context of biology. In fairness, more clarity is occasionally offered by Deacon, often through helpful analogy, in his attempt to argue against sceptical paradigms that conclude "either content is fundamentally relativistic, holistic, and ungrounded or else is merely epiphenomenal and ineffectual except in its arbitrary correlation with the physical properties of the signs that convey it". Such word strings are common in this book. Chapters by Kuppers, Hoffmeyer and Rolston unfortunately maintain similarly loquacious arguments, using unnecessarily obscure terms and vocabulary to arrive precipitously at esoteric points. Rolston's treatment of group selection offers promise, but examination through the concept of `caring' is haphazard. These chapters trawl the literature up to a point, but their inefficient arguments make them a chore to read.

Chapters in Part 4, Philosophy and Theology, continued to attempt to answer interesting questions with sophistic and mangled logic, with embarrassing levels of self citation. These chapters would leave any reader concluding that studies of science and religion mix in the manner of oil and water.

I would buy the book again, at least to read a couple of great chapters and for the bibliographies.

Help other customers find the most helpful reviews

Was this review helpful to you?

Report abuse | Permalink

Comment

6 of 6 people found the following review helpful

Information: the ground of all being, October 30, 2011

By **David J. Kreiter** (Iowa City, Iowa USA) - See all my reviews

Amazon Verified Purchase (What's this?)

This review is from: Information and the Nature of Reality: From Physics to Metaphysics (Hardcover)

This book is divided into four main Categories: History, Physics, Biology, and Philosophy and Theology, with contributions by 15 prominent authors including the two editors, Paul Davies, and Niels Henrik Gregersen.

Information, like the concepts of matter and energy has been difficult to define. According to Terrence Deacon, the definition of energy wasn't fully realized until it was discovered that energy is not a substance, but rather, a dynamic process of change that is always conserved. Just as with the concept of energy, he said, we must give up the idea of thinking of information as some "artifact" or "commodity". In the broadest sense, says John F. Haught, information can mean whatever gives form, order, pattern, or identify to something.

Today most physicists divide information into two broad categories: syntactic information and semantic information. Syntactic information is sometimes called Shannon information after Claude Shannon who discovered that information can be thought of as a measure of entropy and probability. This is both a quantitative and physical definition, which describes how much information any system can carry and is not concerned with the meaning of the information. The more information a system carries the less entropy it contains, which also happens to be the least probable state of the system. Likewise, the most probable state of a system has a high degree of entropy and carries little information. So we can think of information as a complementarity between the message and the medium. Both are needed for a complete description of information. The second type of information is called semantic information, and it deals with the content of the message--what it means.

Paul Davies says that most physicists now believe that information and not particles and fields are the ground of all being. Beginning with the ancient Greeks up until recent times it has been assumed that the laws of physics, and their mathematically descriptive counterpart were objective aspects of the universe cast in stone, and it was the job of the physicist to uncover these objective truths. This idea was furthered by monotheistic thinking which suggested that the discovery of these objective truths were a window into the mind of God, an idea that has gone unchallenged for three centuries. Davis states: "The fusion of Platonism and Monotheism created the powerful orthodox scientific concept of the laws of physics as ideal, perfect infinitely precise, immutable, eternal unchanging mathematical forms that reside in an abstract platonic heaven beyond space and time. All of these assumptions must be jettisoned to come to an understanding that the laws and states of the universe co-evolve."

For many--from Plato to physicist/ mathematician, Roger Penrose--mathematics has been assumed to be an objective construct of the universe from which matter and information find expression, but an evolving view among physicists is that information is the basic entity of reality from which the laws of physics, and matter emerge. After all says Davies, "Laws are an informational statement." Mathematics has been successful in describing the laws of physics, not because mathematics is somehow an objective aspect of the universe, but because mathematics and the laws of physics co-emerge from computations carried out since the beginning of time by the ultimate quantum computer--the universe at large.

There can be no separation between the information processing nature of the universe and the information processing revolution of life itself. Both the syntactic and the semantic concept of information are involved in the interplay between organisms and their environment in the sense that far from equilibrium system (organisms) need to be associated with an environment that supports the organisms condition. Both the environment (the signal medium) and the organism (the message) are

needed for the co-evolution of the organism/environmental system.

According to Keith Ward and Arthur Peacocke, the information contained in DNA is not semantic information because no understanding is required for the translation and transcription processes that code for proteins. This kind of information belongs to a third category he calls "Shaping" or coded information and it requires no sentience. The functioning of the parts can only be explained by how they contribute to the organism as a whole, and this is true whether we are speaking of the universe as a whole or a living organism. Since consciousness is primordial and contains all possible states, we should not look to the simple to explain the complex, but rather the complex to explain the simple.

John Haught maintains that the idea of "God" as a designer is getting harder and harder to defend in light of the fact that the universe is constantly evolving. Information is a complementarity of order and disorder. Too much order is too rigid and does not allow for novelty and evolution. "If the universe or life were simply designed," says Haught, "it would be frozen in a fixed and eternally unchanging identity. Design is a dead end." Though Haught says that whether or not one calls such a primordial consciousness "God" is partly a matter of taste, it hasn't stopped him and other contributors to the last section of this work in making a desperate attempt to shoe-horn God into the equation.

This work was a very exhaustive and comprehensive treatment of the topic of information, and it greatly informed me on the subject. I would highly recommend this to anyone willing to wade through some fairly dense material in order to get to a clear understanding of the nature of information.

This review by David Kreiter author of: "Confronting the Quantum Enigma: Albert, Niels, and John" (2011), and "Quantum Reality: A New Philosophical Perspective."

Help other customers find the most helpful reviews

Was this review helpful to you?

Report abuse | Permalink

Comment

Share your thoughts with other customers:

› **See all 10 customer reviews...**

Inside This Book (learn more)

Browse Sample Pages:

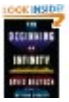
Front Cover | Table of Contents | First Pages | Index | Surprise Me!

Search Inside This Book:

What Other Items Do Customers Buy After Viewing This Item?

A Universe from Nothing: Why There Is Something Rather than Nothing by Lawrence M. Krauss Hard (106)

$15.30



The Beginning of Infinity: Explanations That Transform the World by David Deutsch Hardcover (32)

$17.24

Cycles of Time: An Extraordinary New View of the Universe by Roger Penrose Hardcover (14)

$17.62

Consciousness and the Universe: Quantum Physics, Evolution, Brain & Mind by Roger Penrose Hard (3)

$75.00

› **Explore similar items**

Tags Customers Associate with This Product (What's this?)

Click on a tag to find related items, discussions, and people.

Search Products Tagge

physics (4)
consciousness (2)
information science (2)
astrophysics (1)
cosmology (1)
information (1)
michelle lee (1)
quantum physics (1)
religion and science (1)

See all 14 tags...

Your tags: Add your first tag

Customer Discussions

This product's forum

Discussion	Replies	Latest Post
No discussions yet		

Ask questions, Share opinions, Gain insight

Start a new discussion

Topic:

Related forums

Astronomy forum (36 dis
Science forum (1023 discu
Textbook forum (61 discus
Textbook Buyback forum

Active discussions in related forums

Discussion	Replies	Latest Post
Science forum Scientist fired over Intelligent Design?	202	**3 minutes ago**
Science forum On the Predictive Value of Theory of Evolution Versus the Theory of God-Did-It	1252	**9 minutes ago**
Science forum Why are people here so scientifically illiterate	8706	**27 minutes ago**
Textbook Buyback forum Shall we let print books get burned at the stake ?	5	**2 hours ago**
Textbook Buyback forum My Book Listing!	2	**15 hours ago**
Textbook forum Attention all Textbook SELLERS!!!	2	2 days ago
Textbook forum sellers are deceivers	8	2 days ago
Astronomy forum Age of the universe	32	6 days ago

Search Customer Discussions

Search all Amazon discussions

Listmania!

Interesting Books, Part Seven: A list by J. Conder "favored by the gods"

Search Listmania!

popular science for a seeker: A list by nanyar

Some Essential Be Mindful Books: A list by Mark Minding

Create a Listmania! list

So You'd Like to...

Search Guides

Choose some soul stirring books: A guide by David

Discover How the Universe Works: A guide by Roger Guidry

Find Who Made God & Who Designed the Designer: A guide by John Philoponus "Ortho Arbiter"

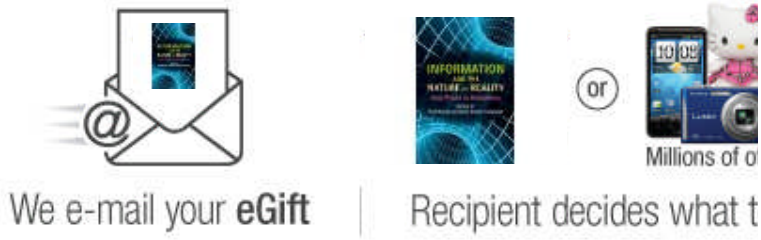
Create a guide

Amazon eGift: Send a Gift Card Suggesting This Item (What's this?)

Instant Delivery: E-mail a gift card suggesting this item

Flexible Gifting Choices: They can choose this, or pick from millions of other items.

Get Started



Look for Similar Items by Category

Books > New & Used Textbooks > Humanities > Library & Information Science

Books > New & Used Textbooks > Humanities > Philosophy > Metaphysics

Books > New & Used Textbooks > Science & Mathematics > Physics

Books > Politics & Social Sciences > Philosophy

Books > Politics & Social Sciences > Social Sciences

Books > Science & Math > Astronomy & Space Science > Cosmology

Books > Science & Math > History & Philosophy

Books > Science & Math > Physics

Look for Similar Items by Subject

Search Books by subject:

- Science/Mathematics
- Congresses
- Information science
- Philosophy
- Science
- Metaphysics
- PHILOSOPHY / Metaphysics
- Philosophy & Social Aspects
- Physics - General

- Science / Philosophy & Social Aspects
- Science / Physics / General
- History of science
- Physics
- The natural world, country life & pets
- Cosmology
- Library & Information Science - General
- Natural History: General
- Information Science (General)

Find books matching ALL checked subjects

i.e., each book must be in subject 1 AND subject 2 AND ...

Feedback

- If you need help or have a question for Customer Service, **contact us**.
- Would you like to **update product info**, **give feedback on images**, or **tell us about a lower price**?
- Is there any other feedback you would like to provide? **Click here**

Your Recent History (What's this?)

Loading.

Get to Know Us
Careers
Investor Relations
Press Releases
Amazon and Our Planet
Amazon in the Community

Make Money with Us
Sell on Amazon
Become an Affiliate
Advertise Your Products
Independently Publish with Us
› See all

Let Us Help You
Shipping Rates & Policies
Amazon Prime
Returns Are Easy
Manage Your Kindle
Help

amazon.com

Canada China France Germany Italy Japan Spain United Kingdom

AbeBooks Rare Books & Textbooks	AmazonLocal Great Local Deals in Your City	AmazonWireless Cellphones & Wireless Plans	Askville Community Answers	Audible Download Audio Books	BeautyBar.com Prestige Beauty Delivered	Book Depository Books With Free Delivery Worldwide	CreateSpace Indie Publishing Made Easy
Diapers.com Everything But The Baby	DPReview Digital Photography	Endless Shoes & More	Fabric Sewing, Quilting & Knitting	IMDb Movies, TV & Celebrities	MYHABIT Private Fashion Designer Sales	Shopbop Designer Fashion Brands	Small Parts Industrial Supplies