



# The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces

*By Chris McMullen*

Download now

Read Online ➔

**The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces** By Chris McMullen

**AUTHOR:** Chris McMullen earned his Ph.D. in particle physics from Oklahoma State University. Dr. McMullen currently teaches physics at Northwestern State University of Louisiana. His background on the geometry and physics of a possible fourth dimension of space includes a half-dozen research papers on the prospects of discovering large extra dimensions at the Large Hadron Collider.

**DESCRIPTION:** This book takes you on a visual tour of a fourth dimension of space. It is much more visual and conceptual than algebraic, yet it is detailed and technical, with the intention of satisfying the needs of mathematically-minded readers familiar with the fundamentals of algebra, geometry, and graphing. Here is a sample of what you will find:

- A fascinating tour of the second and lower dimensions, which will help to understand the fourth dimension by analogy.
- A chapter dedicated toward imagining what it might be like to live in a hypothetical 4D hyperuniverse. This includes details like 4D wheels with axles, a 4D staircase, and a 4D room.
- Pictures of flat 4D objects called polytopes, like the tesseract, pentachoron, and icositetrachoron. A unique graph of a hecatonicosachoron has 12 of its 120 bounding dodecahedra highlighted to help visualize its complicated structure.
- In-depth discussion of the hypercube, including numerical patterns, rotations, cross sections, and perspective. Watch a tesseract unfold.
- Visual intersections of 15 pairs of perpendicular planes and 6 pairs of orthogonal hyperplanes in 4D space.
- Unique graphs of curved hypersurfaces in 4D space, like the glome, spherinder, cubinder, and hyperparaboloid.

**PUZZLES:** Several puzzles are included to challenge the reader to contemplate the fourth dimension. Answers are included at the back of the book.

**AUDIENCE:** This book is highly visual and very conceptual such that anyone with an appreciation for geometry may understand it, while at the same time including ample detail to also satisfy readers with a strong background in mathematics.

 [Download The Visual Guide To Extra Dimensions: Visualizing ...pdf](#)

 [Read Online The Visual Guide To Extra Dimensions: Visualizin ...pdf](#)

# The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces

*By Chris McMullen*

## **The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces** By Chris McMullen

**AUTHOR:** Chris McMullen earned his Ph.D. in particle physics from Oklahoma State University. Dr. McMullen currently teaches physics at Northwestern State University of Louisiana. His background on the geometry and physics of a possible fourth dimension of space includes a half-dozen research papers on the prospects of discovering large extra dimensions at the Large Hadron Collider.

**DESCRIPTION:** This book takes you on a visual tour of a fourth dimension of space. It is much more visual and conceptual than algebraic, yet it is detailed and technical, with the intention of satisfying the needs of mathematically-minded readers familiar with the fundamentals of algebra, geometry, and graphing. Here is a sample of what you will find:

- A fascinating tour of the second and lower dimensions, which will help to understand the fourth dimension by analogy.
- A chapter dedicated toward imagining what it might be like to live in a hypothetical 4D hyperuniverse. This includes details like 4D wheels with axles, a 4D staircase, and a 4D room.
- Pictures of flat 4D objects called polytopes, like the tesseract, pentachoron, and icositetrachoron. A unique graph of a hecatonicosachoron has 12 of its 120 bounding dodecahedra highlighted to help visualize its complicated structure.
- In-depth discussion of the hypercube, including numerical patterns, rotations, cross sections, and perspective. Watch a tesseract unfold.
- Visual intersections of 15 pairs of perpendicular planes and 6 pairs of orthogonal hyperplanes in 4D space.
- Unique graphs of curved hypersurfaces in 4D space, like the glome, spherinder, cubinder, and hyperparaboloid.

**PUZZLES:** Several puzzles are included to challenge the reader to contemplate the fourth dimension. Answers are included at the back of the book.

**AUDIENCE:** This book is highly visual and very conceptual such that anyone with an appreciation for geometry may understand it, while at the same time including ample detail to also satisfy readers with a strong background in mathematics.

## **The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces** By Chris McMullen Bibliography

- Sales Rank: #737620 in Books
- Published on: 2008-08-17
- Original language: English

- Number of items: 1
- Dimensions: 8.50" h x .38" w x 5.50" l, .44 pounds
- Binding: Paperback
- 166 pages

 [Download The Visual Guide To Extra Dimensions: Visualizing ...pdf](#)

 [Read Online The Visual Guide To Extra Dimensions: Visualizin ...pdf](#)

## Download and Read Free Online The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces By Chris McMullen

---

### Editorial Review

From the Author

#### What Readers Like about Dr. McMullen's Books on the Fourth Dimension

Readers appreciate that these books are dedicated to the geometry (and science) of a fourth dimension of space, without detours into philosophy and religion. (There are philosophical and spiritual books on the subject for readers looking for those topics.) Readers also appreciate the numerous illustrations, including a variety of unique perspectives (like the 4D graphs of curved hypersurfaces in Extra Dimensions Vol. 1, or possible 4D structures from a 4D world). They also appreciate the range and depth of the geometric concepts, without having to navigate through advanced mathematical expressions to enjoy contemplating them.

#### More books on the fourth dimension by Chris McMullen, Ph.D.

Available in both paperback and Kindle editions.

- (1) *A Visual Guide to Extra Dimensions*, Volume 1. A clear, detailed introduction to the basic geometry of a fourth dimension of space. Packed with black-and-white illustrations.
- (2) *A Visual Guide to Extra Dimensions*, Volume 2. Gets into the physics of a possible fourth dimension of space. Explores what is meant by an extra compact dimension of space.
- (3) *A Visual Introduction to the Fourth Dimension*. Not quite as detailed as the books on Extra Dimensions, but in **full color**. The use of color helps to visualize the fourth dimension.
- (4) *Full-Color Illustrations of the Fourth Dimension*, Volume 1. Packed with color illustrations of tesseracts and glomes. Each page includes images and a paragraph of text describing the concept.
- (5) *Full-Color Illustrations of the Fourth Dimension*, Volume 2. Packed with color illustrations of tesseracts and glomes. Each page includes images and a paragraph of text describing the concept. Really shows you what it would be like to live in 4D space, from hyperchess to Rubik's tesseract to hyperhomes with hyperfurniture to hyperstairs to hypertelevision to hyperbowling to reading a hyperbook.

#### Popular science books by Chris McMullen, Ph.D.

- *An Introduction to Basic Astronomy Concepts*.
- *Understand Basic Chemistry Concepts*.
- The author has also published university-level introductory physics textbooks.

#### Math workbooks by Chris McMullen, Ph.D.

- The *Improve Your Math Fluency* series of math workbooks offers practice with essential math skills in arithmetic, fractions, decimals, percents, algebra, and trigonometry.

About the Author

Chris McMullen is a physics instructor at Northwestern State University of Louisiana. He earned his Ph.D. in phenomenological high-energy physics (particle physics) from Oklahoma State University in 2002. Originally from California, he earned his Master's degree from California State University, Northridge, where his thesis was in the field of electron spin resonance. He has published several papers on the prospects for discovering large superstring-inspired extra dimensions at the Large Hadron Collider, which is his area of specialization. Dr. McMullen published *The Visual Guide to Extra Dimensions*, Volumes 1 and 2, to share

his passion for the geometry and physics of the fourth dimension. He also wrote these books, Full-Color Illustrations of the Fourth Dimension, Volumes 1 and 2, to help illustrate the geometry of a fourth dimension of space. Dr. McMullen was fascinated with a fourth dimension of space when he first read Rudy Rucker's introduction to the subject during high school. He happened to be working on his Ph.D. in particle physics when Arkani-Hamed, Dimopoulos, and Dvali wrote a famous technical paper motivating large superstring-inspired extra dimensions, which transformed the subject of the fourth dimension from philosophy to a plausibly experimental science. Dr. McMullen has published these general-audience books on the fourth dimension to share his passion for the math and physics of extra dimensions. One of his favorite sayings is: May your contemplation of a fourth dimension of space enhance the dimensionality of your thoughts.

## **Users Review**

### **From reader reviews:**

#### **Jerry Gavin:**

Now a day folks who Living in the era wherever everything reachable by talk with the internet and the resources inside it can be true or not involve people to be aware of each info they get. How a lot more to be smart in acquiring any information nowadays? Of course the correct answer is reading a book. Examining a book can help folks out of this uncertainty Information particularly this The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces book because this book offers you rich information and knowledge. Of course the knowledge in this book hundred per cent guarantees there is no doubt in it you may already know.

#### **Jon Farris:**

Your reading 6th sense will not betray an individual, why because this The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces book written by well-known writer whose to say well how to make book that may be understand by anyone who else read the book. Written in good manner for you, still dripping wet every ideas and publishing skill only for eliminate your hunger then you still question The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces as good book but not only by the cover but also with the content. This is one book that can break don't determine book by its handle, so do you still needing another sixth sense to pick this kind of!? Oh come on your examining sixth sense already alerted you so why you have to listening to one more sixth sense.

#### **Pamela Rhodes:**

This The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces is great book for you because the content that is certainly full of information for you who else always deal with world and still have to make decision every minute. This book reveal it data accurately using great organize word or we can declare no rambling sentences within it. So if you are read it hurriedly you can have whole data in it. Doesn't mean it only gives you straight forward sentences but hard core information with lovely delivering sentences. Having The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces in your hand like finding the world in your arm, info in it is not ridiculous 1. We can say that no reserve that offer you world inside ten or fifteen small right but this book already do that. So , this is certainly good

reading book. Hello Mr. and Mrs. busy do you still doubt that will?

**Ruth Snider:**

Beside this specific The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces in your phone, it could possibly give you a way to get more close to the new knowledge or info. The information and the knowledge you may got here is fresh through the oven so don't become worry if you feel like an aged people live in narrow commune. It is good thing to have The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces because this book offers to your account readable information. Do you occasionally have book but you would not get what it's facts concerning. Oh come on, that wil happen if you have this inside your hand. The Enjoyable arrangement here cannot be questionable, such as treasuring beautiful island. Techniques you still want to miss that? Find this book and also read it from now!

**Download and Read Online The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces By Chris McMullen #ZI2GVEBSW53**

# **Read The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces By Chris McMullen for online ebook**

The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces By Chris McMullen Free PDF d0wnl0ad, audio books, books to read, good books to read, cheap books, good books, online books, books online, book reviews epub, read books online, books to read online, online library, greatbooks to read, PDF best books to read, top books to read The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces By Chris McMullen books to read online.

## **Online The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces By Chris McMullen ebook PDF download**

### **The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces By Chris McMullen Doc**

**The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces By Chris McMullen Mobipocket**

**The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces By Chris McMullen EPub**

**ZI2GVEBSW53: The Visual Guide To Extra Dimensions: Visualizing The Fourth Dimension, Higher-Dimensional Polytopes, And Curved Hypersurfaces By Chris McMullen**