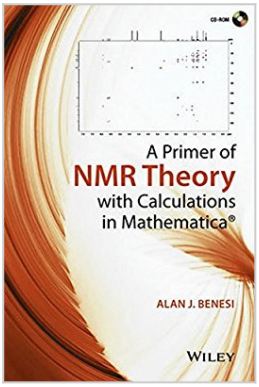

A Primer of NMR Theory with Calculations in Mathematica

By Alan J. Benesi

A Primer of NMR Theory with Calculations in Mathematica By Alan J. Benesi

Presents the theory of NMR enhanced with Mathematica© notebooks

- Provides short, focused chapters with brief explanations of well-defined topics with an emphasis on a mathematical description
- Presents essential results from quantum mechanics concisely and for easy use in predicting and simulating the results of NMR experiments
- Includes *Mathematica* notebooks that implement the theory in the form of text, graphics, sound, and calculations
- Based on class tested methods developed by the author over his 25 year teaching career. These notebooks show exactly how the theory works and provide useful calculation templates for NMR researchers

A Primer of NMR Theory with Calculations in Mathematica

By Alan J. Benesi

A Primer of NMR Theory with Calculations in Mathematica By Alan J. Benesi

Presents the theory of NMR enhanced with Mathematica© notebooks

- Provides short, focused chapters with brief explanations of well-defined topics with an emphasis on a mathematical description
- Presents essential results from quantum mechanics concisely and for easy use in predicting and simulating the results of NMR experiments
- Includes *Mathematica* notebooks that implement the theory in the form of text, graphics, sound, and calculations
- Based on class tested methods developed by the author over his 25 year teaching career. These notebooks show exactly how the theory works and provide useful calculation templates for NMR researchers

A Primer of NMR Theory with Calculations in Mathematica By Alan J. Benesi Bibliography

- Sales Rank: #1118002 in Books
- Published on: 2015-06-15
- Original language: English
- Number of items: 1
- Dimensions: 9.50" h x .80" w x 6.30" l, .0 pounds
- Binding: Hardcover
- 248 pages

Editorial Review

From the Back Cover

Presents the theory of NMR enhanced with Mathematica© notebooks in a clear and concise manner

A Primer of NMR Theory with calculations in Mathematica© presents the theory of NMR. Enhanced with Mathematica© notebooks that show exactly how the theory is implemented, the book rigorously covers NMR theory. The Mathematica© notebooks augment the book to demonstrate the theory and applications of NMR, as well as provide calculation templates for students and researchers.

Presented in short, focused chapters the book provides a concise exposition of well-defined topics with emphasis on a mathematical description including essential results from quantum mechanics for easy use in predicting and simulating the results of NMR experiments.

A Primer of NMR Theory with calculations in Mathematica© covers:

The NMR spectrometer
The NMR experiment
Classical magnetic dipole in a magnetic field
The Bloch equation(s)
The vector model of NMR
The density operator and density matrix
The Liouville von Neumann equation
Commutation relations of nuclear spin operators
Time independent perturbation theory
Average Hamiltonian theory
The Powder Average
Effects of exchange on liquid state and solid state NMR spectra
The fundamental connection between molecular motion and NMR relaxation times

While it is not necessary to have Mathematica© to gain understanding from this book, it is highly recommend as the reader can go through the theory presented step by step by executing the Mathematica notebooks. Readers can also copy and modify the Mathematica notebooks for assigned homework or for real research problems.

The Mathematica notebooks are particularly powerful. They can be used as teaching tools and as templates for full blown research calculations. The included notebooks are extremely useful for calculation of matrix representations of nuclear spin operators and for calculation of rotations used in solid state NMR. Other notebooks provide a set of powder average angles necessary for solid state spectral simulations as well as demonstrating simulations of solid state powder patterns, effects of exchange on both liquid state and solid state NMR spectra, and for calculating explicit NMR relaxation times that can be compared to experiment.

Alan J. Benesi was Director of the Pennsylvania State University NMR Facility from 1987-2012. He earned his Ph.D. in Biophysics at the University of California, Berkeley, in 1975. He has published many papers related to solid state and liquid state NMR, solid state and liquid state NMR relaxation, and rotational and

translational diffusion.

About the Author
Alan J. Benesi was Director of the Pennsylvania State University NMR Facility from 1987-2012. He earned his Ph.D. in Biophysics at the University of California, Berkeley, in 1975. He has published many papers related to solid state and liquid state NMR, solid state and liquid state NMR relaxation, and rotational and translational diffusion.

Users Review

From reader reviews:

Edward Phillips:

Book is written, printed, or outlined for everything. You can understand everything you want by a guide. Book has a different type. As we know that book is important issue to bring us around the world. Close to that you can your reading proficiency was fluently. A guide A Primer of NMR Theory with Calculations in Mathematica will make you to be smarter. You can feel considerably more confidence if you can know about every thing. But some of you think that will open or reading a new book make you bored. It is far from make you fun. Why they could be thought like that? Have you looking for best book or acceptable book with you?

Cheryl Kirkland:

Do you certainly one of people who can't read satisfying if the sentence chained inside the straightway, hold on guys this specific aren't like that. This A Primer of NMR Theory with Calculations in Mathematica book is readable by you who hate those perfect word style. You will find the data here are arrange for enjoyable reading experience without leaving possibly decrease the knowledge that want to deliver to you. The writer involving A Primer of NMR Theory with Calculations in Mathematica content conveys the thought easily to understand by most people. The printed and e-book are not different in the content but it just different such as it. So , do you nevertheless thinking A Primer of NMR Theory with Calculations in Mathematica is not loveable to be your top record reading book?

Adriana Cornell:

This A Primer of NMR Theory with Calculations in Mathematica is great book for you because the content which is full of information for you who have always deal with world and possess to make decision every minute. This particular book reveal it details accurately using great organize word or we can claim no rambling sentences in it. So if you are read this hurriedly you can have whole data in it. Doesn't mean it only offers you straight forward sentences but hard core information with beautiful delivering sentences. Having A Primer of NMR Theory with Calculations in Mathematica in your hand like keeping the world in your arm, info in it is not ridiculous one. We can say that no book that offer you world in ten or fifteen second right but this guide already do that. So , this is good reading book. Hello Mr. and Mrs. hectic do you still doubt in which?

Jane Pelley:

What is your hobby? Have you heard that question when you got students? We believe that that problem was given by teacher for their students. Many kinds of hobby, Every person has different hobby. And you also know that little person like reading or as reading become their hobby. You need to understand that reading is very important and book as to be the thing. Book is important thing to increase you knowledge, except your personal teacher or lecturer. You get good news or update with regards to something by book. Different categories of books that can you decide to try be your object. One of them is actually A Primer of NMR Theory with Calculations in Mathematica.

Read A Primer of NMR Theory with Calculations in Mathematica By Alan J. Benesi for online ebook

A Primer of NMR Theory with Calculations in Mathematica By Alan J. Benesi 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 A Primer of NMR Theory with Calculations in Mathematica By Alan J. Benesi books to read online.

Online A Primer of NMR Theory with Calculations in Mathematica By Alan J. Benesi ebook PDF download

A Primer of NMR Theory with Calculations in Mathematica By Alan J. Benesi Doc

A Primer of NMR Theory with Calculations in Mathematica By Alan J. Benesi Mobipocket

A Primer of NMR Theory with Calculations in Mathematica By Alan J. Benesi EPub

Q8UW2ATZL61: A Primer of NMR Theory with Calculations in Mathematica By Alan J. Benesi