



# Information, Physics, and Computation (Oxford Graduate Texts)

By Marc Mézard, Andrea Montanari



**Information, Physics, and Computation (Oxford Graduate Texts)** By Marc Mézard, Andrea Montanari

This book presents a unified approach to a rich and rapidly evolving research domain at the interface between statistical physics, theoretical computer science/discrete mathematics, and coding/information theory. It is accessible to graduate students and researchers without a specific training in any of these fields. The selected topics include spin glasses, error correcting codes, satisfiability, and are central to each field. The approach focuses on large random instances, adopting a common probabilistic formulation in terms of graphical models. It presents message passing algorithms like belief propagation and survey propagation, and their use in decoding and constraint satisfaction solving. It also explains analysis techniques like density evolution and the cavity method, and uses them to study phase transitions.

 [Download Information, Physics, and Computation \(Oxford Grad ...pdf](#)

 [Read Online Information, Physics, and Computation \(Oxford Gr ...pdf](#)

# Information, Physics, and Computation (Oxford Graduate Texts)

By Marc Mézard, Andrea Montanari

## Information, Physics, and Computation (Oxford Graduate Texts) By Marc Mézard, Andrea Montanari

This book presents a unified approach to a rich and rapidly evolving research domain at the interface between statistical physics, theoretical computer science/discrete mathematics, and coding/information theory. It is accessible to graduate students and researchers without a specific training in any of these fields. The selected topics include spin glasses, error correcting codes, satisfiability, and are central to each field. The approach focuses on large random instances, adopting a common probabilistic formulation in terms of graphical models. It presents message passing algorithms like belief propagation and survey propagation, and their use in decoding and constraint satisfaction solving. It also explains analysis techniques like density evolution and the cavity method, and uses them to study phase transitions.

## Information, Physics, and Computation (Oxford Graduate Texts) By Marc Mézard, Andrea Montanari Bibliography

- Sales Rank: #452807 in Books
- Published on: 2009-03-27
- Original language: English
- Number of items: 1
- Dimensions: 6.80" h x 1.50" w x 9.80" l, 2.80 pounds
- Binding: Hardcover
- 584 pages



[Download Information, Physics, and Computation \(Oxford Grad ...pdf](#)



[Read Online Information, Physics, and Computation \(Oxford Gr ...pdf](#)

## Download and Read Free Online Information, Physics, and Computation (Oxford Graduate Texts) By Marc Mézard, Andrea Montanari

---

### Editorial Review

#### Review

"This book is an excellent graduate-level text on the amazing connections between modern error-correcting codes (information theory), spin glass systems (condensed matter physics), and satisfiability problems (computational complexity). Each chapter has useful exercises and a great amount of background and references for further reading on the material covered. I would expect any researcher working near the intersection of information theory, statistical physics, and combinatorial optimization to find this book to be a highly-valued resource."--James W. Harrington for *Mathematical Reviews*

"The authors, who are experts in these domains, open the door to important results coming out of current research in the advanced treatment of complex systems and new ways to look at important problems in computer science, mathematics, and physics."--*Computing Reviews*

#### About the Author

##### Professor Marc Mezard

CNRS Research Director at Université de Paris Sud and Professor at Ecole Polytechnique, France

Marc Mezard received his PhD in 1984. He was hired in CNRS in 1981 and became research director in 1990 at Ecole Normale Supérieure. He joined the Université Paris Sud in 2001. He spent extensive periods in Rome University, in the KITP (Santa Barbara) and in MSRI (Berkeley). Author of about 150 publications, he has been

awarded the silver medal of CNRS in 1990 and the Ampere price of the French academy of science in 1996.

##### Dr Andrea Montanari

Assistant Professor, Stanford University and CNRS France

Andrea Montanari received a Laurea degree in Physics in 1997, and a Ph. D. in Theoretical Physics in 2001 (both from Scuola Normale Superiore in Pisa, Italy). He has been post-doctoral fellow at Laboratoire de Physique Théorique de l'Ecole Normale Supérieure (LPTENS), Paris, France, and the Mathematical Sciences Research Institute, Berkeley, USA. Since 2002 he is Chargé de Recherche (a permanent research position with Centre National de la Recherche Scientifique, CNRS) at LPTENS.

In September 2006 he joined Stanford University as Assistant Professor in the Departments of Electrical Engineering and Statistics.

In 2006 he was awarded the CNRS bronze medal for theoretical physics.

### Users Review

#### From reader reviews:

**Mary Barrientes:**

The book Information, Physics, and Computation (Oxford Graduate Texts) gives you the sense of being enjoy for your spare time. You can use to make your capable far more increase. Book can for being your best friend when you getting tension or having big problem together with your subject. If you can make studying a book Information, Physics, and Computation (Oxford Graduate Texts) to be your habit, you can get more advantages, like add your current capable, increase your knowledge about a number of or all subjects. You may know everything if you like open up and read a publication Information, Physics, and Computation (Oxford Graduate Texts). Kinds of book are several. It means that, science book or encyclopedia or other individuals. So , how do you think about this e-book?

**David Earnest:**

The book Information, Physics, and Computation (Oxford Graduate Texts) can give more knowledge and also the precise product information about everything you want. Why then must we leave a good thing like a book Information, Physics, and Computation (Oxford Graduate Texts)? A few of you have a different opinion about book. But one aim that will book can give many facts for us. It is absolutely proper. Right now, try to closer using your book. Knowledge or information that you take for that, you may give for each other; you are able to share all of these. Book Information, Physics, and Computation (Oxford Graduate Texts) has simple shape but you know: it has great and large function for you. You can seem the enormous world by open and read a reserve. So it is very wonderful.

**Donald Labelle:**

Spent a free the perfect time to be fun activity to try and do! A lot of people spent their down time with their family, or their very own friends. Usually they undertaking activity like watching television, going to beach, or picnic in the park. They actually doing same task every week. Do you feel it? Do you wish to something different to fill your own free time/ holiday? May be reading a book is usually option to fill your free time/ holiday. The first thing that you'll ask may be what kinds of publication that you should read. If you want to try out look for book, may be the guide untitled Information, Physics, and Computation (Oxford Graduate Texts) can be great book to read. May be it could be best activity to you.

**Kathleen Huckaby:**

You can spend your free time to learn this book this reserve. This Information, Physics, and Computation (Oxford Graduate Texts) is simple to deliver you can read it in the recreation area, in the beach, train and soon. If you did not possess much space to bring the actual printed book, you can buy the actual e-book. It is make you simpler to read it. You can save the particular book in your smart phone. Therefore there are a lot of benefits that you will get when one buys this book.

**Download and Read Online Information, Physics, and Computation  
(Oxford Graduate Texts) By Marc Mézard, Andrea Montanari  
#NXY0JSIRG5C**

# **Read Information, Physics, and Computation (Oxford Graduate Texts) By Marc Mézard, Andrea Montanari for online ebook**

Information, Physics, and Computation (Oxford Graduate Texts) By Marc Mézard, Andrea Montanari 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 Information, Physics, and Computation (Oxford Graduate Texts) By Marc Mézard, Andrea Montanari books to read online.

## **Online Information, Physics, and Computation (Oxford Graduate Texts) By Marc Mézard, Andrea Montanari ebook PDF download**

**Information, Physics, and Computation (Oxford Graduate Texts) By Marc Mézard, Andrea Montanari Doc**

**Information, Physics, and Computation (Oxford Graduate Texts) By Marc Mézard, Andrea Montanari MobiPocket**

**Information, Physics, and Computation (Oxford Graduate Texts) By Marc Mézard, Andrea Montanari EPub**