

# Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science)


By Zhong-Can Ou-Yang, Ji-Xing Liu, Yu-Zhang Xie

Download now

Read Online 

**Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science)** By Zhong-Can Ou-Yang, Ji-Xing Liu, Yu-Zhang Xie

This book contains a comprehensive description of the mechanical equilibrium and deformation of membranes as a surface problem in differential geometry. Following the pioneering work by W Helfrich, the fluid membrane is seen as a nematic or smectic — A liquid crystal film and its elastic energy form is deduced exactly from the curvature elastic theory of the liquid crystals. With surface variation the minimization of the energy at fixed osmotical pressure and surface tension gives a completely new surface equation in geometry that involves potential interest in mathematics. The investigations of the rigorous solution of the equation that have been carried out in recent years by the authors and their co-workers are presented here, among which the torus and the discocyte (the normal shape of the human red blood cell) may attract attention in cell biology. Within the framework of our mathematical model by analogy with cholesteric liquid crystals, an extensive investigation is made of the formation of the helical structures in a tilted chiral lipid bilayer, which has now become a hot topic in the fields of soft matter and biomembranes.

 [Download Geometric Methods in the Elastic Theory of Membran ...pdf](#)

 [Read Online Geometric Methods in the Elastic Theory of Membr ...pdf](#)

# Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science)


*By Zhong-Can Ou-Yang, Ji-Xing Liu, Yu-Zhang Xie*

**Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science) By Zhong-Can Ou-Yang, Ji-Xing Liu, Yu-Zhang Xie**

This book contains a comprehensive description of the mechanical equilibrium and deformation of membranes as a surface problem in differential geometry. Following the pioneering work by W Helfrich, the fluid membrane is seen as a nematic or smectic — A liquid crystal film and its elastic energy form is deduced exactly from the curvature elastic theory of the liquid crystals. With surface variation the minimization of the energy at fixed osmotic pressure and surface tension gives a completely new surface equation in geometry that involves potential interest in mathematics. The investigations of the rigorous solution of the equation that have been carried out in recent years by the authors and their co-workers are presented here, among which the torus and the discocyte (the normal shape of the human red blood cell) may attract attention in cell biology. Within the framework of our mathematical model by analogy with cholesteric liquid crystals, an extensive investigation is made of the formation of the helical structures in a tilted chiral lipid bilayer, which has now become a hot topic in the fields of soft matter and biomembranes.

**Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science) By Zhong-Can Ou-Yang, Ji-Xing Liu, Yu-Zhang Xie Bibliography**

- Sales Rank: #4995912 in Books
- Published on: 1999-03-25
- Original language: English
- Number of items: 1
- Dimensions: 8.60" h x .70" w x 6.20" l, 1.00 pounds
- Binding: Hardcover
- 234 pages

 [Download Geometric Methods in the Elastic Theory of Membran ...pdf](#)

 [Read Online Geometric Methods in the Elastic Theory of Membr ...pdf](#)

**Download and Read Free Online Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science) By Zhong-Can Ou-Yang, Ji-Xing Liu, Yu-Zhang Xie**

---

## **Editorial Review**

### **Users Review**

#### **From reader reviews:**

##### **Cornelius Callaghan:**

Do you have favorite book? Should you have, what is your favorite's book? Book is very important thing for us to learn everything in the world. Each e-book has different aim or goal; it means that book has different type. Some people truly feel enjoy to spend their a chance to read a book. They are really reading whatever they have because their hobby is actually reading a book. Consider the person who don't like looking at a book? Sometime, man feel need book if they found difficult problem or exercise. Well, probably you will want this Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science).

##### **Marie Boyd:**

Here thing why this particular Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science) are different and reputable to be yours. First of all examining a book is good but it really depends in the content from it which is the content is as delightful as food or not. Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science) giving you information deeper and different ways, you can find any publication out there but there is no publication that similar with Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science). It gives you thrill looking at journey, its open up your eyes about the thing in which happened in the world which is might be can be happened around you. You can bring everywhere like in playground, café, or even in your way home by train. In case you are having difficulties in bringing the printed book maybe the form of Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science) in e-book can be your substitute.

##### **Jennifer Mendoza:**

Now a day people that Living in the era exactly where everything reachable by match the internet and the resources inside can be true or not demand people to be aware of each details they get. How a lot more to be smart in having any information nowadays? Of course the solution is reading a book. Looking at a book can help people out of this uncertainty Information particularly this Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science) book because book offers you rich information and knowledge. Of course the details in this book hundred percent guarantees there is no doubt in it everbody knows.

**James Jackson:**

Spent a free time for you to be fun activity to accomplish! A lot of people spent their sparetime with their family, or their particular friends. Usually they performing activity like watching television, going to beach, or picnic from the park. They actually doing same every week. Do you feel it? Would you like to something different to fill your current free time/ holiday? May be reading a book might be option to fill your free of charge time/ holiday. The first thing you will ask may be what kinds of guide that you should read. If you want to test look for book, may be the guide untitled Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science) can be fine book to read. May be it could be best activity to you.

**Download and Read Online Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science) By Zhong-Can Ou-Yang, Ji-Xing Liu, Yu-Zhang Xie #RSBTL4VHP5K**

## **Read Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science) By Zhong-Can Ou-Yang, Ji-Xing Liu, Yu-Zhang Xie for online ebook**

Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science) By Zhong-Can Ou-Yang, Ji-Xing Liu, Yu-Zhang Xie Free PDF download, 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 Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science) By Zhong-Can Ou-Yang, Ji-Xing Liu, Yu-Zhang Xie books to read online.

## **Online Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science) By Zhong-Can Ou-Yang, Ji-Xing Liu, Yu-Zhang Xie ebook PDF download**

**Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science) By Zhong-Can Ou-Yang, Ji-Xing Liu, Yu-Zhang Xie Doc**

**Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science) By Zhong-Can Ou-Yang, Ji-Xing Liu, Yu-Zhang Xie Mobipocket**

**Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases (Advanced Series on Theoretical Physical Science) By Zhong-Can Ou-Yang, Ji-Xing Liu, Yu-Zhang Xie EPub**