

<<统计力学论题>>

图书基本信息

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## &lt;&lt;统计力学论题&gt;&gt;

## 前言

1)avid Goodstem..... 路德维希·玻尔兹曼1906年自杀身亡，他毕生的大部分时光都在从事统计力学的研究工作。

继续这项工作的保罗·厄仑菲斯同样于1933年自杀身亡。

现在轮到我们来研究统计力学了。

也许小心谨慎地接近这一学科才是明智的。

写于States of Matter, 1975, 纽约: Dover 统计力学与物理学的任何其他分支学科相比, 更易受到方法论和表述问题的困扰。

哲学家对概率的含义争论不休, 尤其是对单一“事件”应用概率时尤甚。

数学家则用回避物理解释的方法躲过了这一问题, 他们只是简单地把概率作为由一系列规则所限定的“测量”。

不过以这种方式脱离实际就不太适用于物理学了。

对物理学家而言, 概率和统计方法一直使他们非常苦恼。

统计方法是造成玻尔兹曼自杀的因素之一, 保罗·厄仑菲斯的自杀也可能出于这个原因。

即使到了今天, 量子力学中猜不透的谜也在于核心部位的概率在作祟。

统计力学中, 数学家的操作方法是同E. T. Jaynts True的信息论方法相似的, 这种方法经过几代杰出教育家的拼搏, 已近完美, 不过我承认这种方法并没有特别吸引人之处。

当然这种方法或许只是得到结果的一种权宜之计, 但是就我内心深处而言, 还只是模糊的理解而已。

真正理解是物理学家殚思竭虑的目标。

相比之下, T. L. Hill等学者的系综形式不但非常清晰而且物理含义明确。

有人或许发现系综太形式化了, 我却认为它十分迷人。

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## 内容概要

伦敦地区的几所大学，在硕士研究生的最后一年，都要联合起来，通过网络教育的方式，给硕士生讲授几门统一的高级课程，本书就是其中的教程之一。

本门教程在成书之前，作者已经系统地讲授了十多年，成书过程中又组织学生、同行和由出版社委派的专家一道，对书稿提出许多建议，然后再修改而成现在这个样子。

全书用一种统一的观点处理热力学和统计物理论题。

第一、第二章分别讲述统计力学的方法论和理想体系的实际计算。

其中差不多有一半内容属于本科期间已有的基础知识，但采用更高的、完全用统一的观点，看待热力学和统计力学。

第三章非理想气体，重点讲述维里展开、配分函数、节流和状态方程。

第四章相变，介绍相图、对称性、序参量、临界指数、标度理论、一级相变、二级相变、伊辛模型、朗道理论、铁电体、二元混合物、量子相变、平均场理论等等。

这是全书的重点。

第五章讲述涨落和动力学行为，重点是涨落的关联特性、布朗运动、朗之万方程和线性响应理论。

各章末尾都安排一定数量的习题，习题解答可通过<http://www.worldscibooks.com/physics/p365.htm/>取得。

书后还有4个附录，便于读者应用时查取。

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