

<<统计力学论题>>

图书基本信息

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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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