北京理工大學

数学与统计学院学术报告

Proof of Bose-Einstein-Condensation in Large Systems of Interacting Bosons

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个人简介：Søren Fournais 是哥本哈根大学数学科学系的教授，主要研究量子力学中的数学问题。他于1999年在奥胡斯大学获得博士学位，先后在维也纳的埃尔温·薛定谔研究所和巴黎第十一大学从事科研工作，2006年回到奥胡斯大学，历任副教授、教授，2023年起任哥本哈根大学教授。Søren 曾获得欧洲研究理事会（European Research Council）的 Starting Independent Researcher Grant（2009－2014），从事超导与玻色－爱因斯坦凝聚中的数学问题研究；还曾荣获 Sapere Aude DFF-Advanced 资助项目（2015－2020）。他于2014年当选丹麦皇家文理科学院院士，2018年被丹麦高等教育与科学部授予 EliteForsk 奖。他的研究成果发表在 Ann. Math.、Invent. Math.、Comm. Math. Phys. 等国际顶级数学期刊上。

Abstract:A main open problem in mathematical physics is to prove Bose—Einstein Condensation (BEC) in the ground state of the interacting, dilute Bose gas. The open problem concerns the thermodynamic limit, i.e. infinitely large systems. However, there is a range of finite but large systems for which we do have a proof of BEC. In this talk I will describe how to prove the currently best bounds on length scales for which there is condensation. The proof proceeds by using the gap in the kinetic energy for finite systems. By taking out a term corresponding to a fraction of this gap before localising to shorter length scales, and then obtaining optimal energy bounds on the localised systems, one is left with a positive term that allows to prove BEC in the original large system for a certain range of scales.