



北京理工大学

数学与统计学院学术报告

The isoperimetric inequality for the capillary energy outside convex cylinders

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时间: 2025 年 5 月 28 日 (周三下午) 15: 00—16: 00

地点: 文萃楼F101

报告人简介: Nicola Fusco is a Professor of Mathematical Analysis in the Department of Mathematics and Applications at the University of Naples Federico II. Professor Fusco's research interests include the calculus of variations, regularity theory for partial differential equations, symmetrization techniques, isoperimetric inequalities, and free discontinuity problems. He has received numerous prestigious honors and awards, including the Caccioppoli Prize in 1995. He was an invited speaker at ICM and he was awarded the Tartufari Prize in 2010. He followed by the Amerio Prize in 2014, and the Humboldt Research Award in 2019.

摘要: We will discuss the isoperimetric problem for capillary surfaces with a general contact angle $\theta \in (0, \pi)$, outside convex infinite cylinders with arbitrary two-dimensional convex section. We prove that the capillary energy of any surface supported on any such convex cylinder is strictly larger than that of a spherical cap with the same volume and the same contact angle on a flat support, unless the surface is itself a spherical cap resting on a facet of the cylinder. In this class of convex sets, our result extends for the first time the well-known Choe-Ghomi-Ritoré relative isoperimetric inequality, corresponding to the case $\theta = \pi/2$, to general angles. Joint paper with Vesa Julin and Massimiliano Morini.