

PLATEAU'S PROBLEM

Time 2021-12-13/14/17 8:00-9:00 pm

Online Zoom Meeting ID: 388 528 9728 Passcode: BIMSA



Speaker: Camillo De Lellis

Camillo De Lellis is a professor of Institute for Advanced Study, Princeton. He is a geometric analyst, has broad expertise in the calculus of variations, geometric measure theory, and fluid dynamics. Using modern tools and innovative approaches, De Lellis has contributed to central problems in analysis and geometry, resulting in the creation of a transparent proof of regularity and opening new lines of inquiry for geometric analysts to explore. De Lellis is also invited speaker at Hyderabad, ICM 2010; plenary speaker at St. Petersburg, ICM 2022; Member of the Academia Europaea and the German National Academy of Sciences Leopoldina.

DEC.13 Plateau's problem, the origins of geometric measure theory

In this lecture I will review the origins of several key concepts in geometric measure theory and how much development was motivated by giving suitable existence results for the problem of finding area-minimizing surfaces spanning a given contour. We will touch upon the concepts of rectifiability, sets of finite perimeter, currents, varifolds, and minimizing sets.

DEC.14 Plateau's problem, epsilon-regularity theory and tangent cones

In this lecture I will review the earliest results in the regularity theory of area-minimizing surfaces, namely the epsilon-regularity theorem of De Giorgi, the monotonicity formula, and Reifenberg's isoperimetric inequality. We will also see how a key idea of Federer grew into a powerful "stratification theory" for conical singularities.

DEC.17 Plateau's problem, the curse of higher multiplicity

In this lecture I will examine how the existence of "flat singular points" makes the analysis of certain type of singularities of minimal submanifolds very challenging. I will give a glimpse of the deep regularity theory developed by Almgren in the early eighties and how it has been developed further in recent years to tackle a variety of questions.