

國立陽明交通大學應用數學系演講

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Conformal Geometry on 4-manifolds

日期：2023年12月15日(五)
11:00 ~ 12:00

地點：國立陽明交通大學
(光復校區) 科學一館223室



In this talk, I will give a survey talk on results and PDE techniques in conformal geometry. On 4-manifolds, one of the key ingredients is the study of the integrand of the Chern-Gauss-Bonnet formula. The part that involves the Ricci tensor gives a fully non-linear PDE known as the second elementary symmetric equation. It turns out this PDE can be studied via a 4-th order linear operator (part of the family of GJMS operator) and its associated 4-th order curvature called the Q-curvature. I will explain the connection and give an application of using this concept to compute the renormalized volume.

As another application, we will study the problem of "conformal filling in" in ADS/CFT theory. Namely, given a manifold $(M_n, [h])$, when is it the boundary of a conformally compact Einstein manifold (X^{n+1}, g_+) with $r_{g_+}^2|_M = h$ for some defining function r on X^{n+1} ? The model example is the n -sphere as the conformal infinity of the hyperbolic $(n+1)$ ball.

【學歷】

1974 柏克萊加州大學博士
1970 國立台灣大學學士

【現職與經歷】

2016 Simons客座教授，MSRI，2016年1月-4月。
2010- 普林斯頓大學尤金希金斯數學教授
2009-2012 普林斯頓大學數學系系主任
2008-2009 普林斯頓大學高級研究院傑出客座教授
1998- 迄今 普林斯頓大學數學系教授
1989-1991 加州柏克萊大學分校教授
1986, 2000 瑞士蘇黎世聯邦理工學院訪問會員
1982-2000 加州大學洛杉磯分校教授
1980-1982 加州大學洛杉磯分校副教授
1981 瑞典 Mittag-Leffler 研究所訪問會員
1978-1980 馬裡蘭大學助理教授
1977, 1992, 2002 普林斯頓高等研究院訪問學者
1975-1977 加州大學洛杉磯分校 Hedrick 助理教授
1974-1975 紐約州立大學布阿洛分校助理教授

【專長】

幾何分析、共形幾何、非線性偏微分方程

【榮譽及獲獎】

- Fellow, Association for Women in Mathematics, 2019
- MSRI Simons Professor, 2015-2016
- Fellow, American Mathematical Society, 2015
- Doctor Honoris Causa, University Pierre and Marie Curie, 2013
- Academician, Academia Sinica, Taiwan 2012
- Fellow, American Academy of Arts and Sciences, 2008
- Member, American Academy of Arts and Sciences, 2008
- International Congress of Mathematics, Invited talk, Berkeley, USA, 1986; Plenary talk, Beijing, China, 2002; ICM Emmy Noether Lecture, Rio, Brazil, 2018
- Gibbs Colloquium Lectures, Annual AMS meeting, Phoenix, 2004.
- John Simon Guggenheim Memorial Foundation Fellowship, 1999-2000.
- Ruth Lyttle Satter Prize in Mathematics of the American Mathematical Society, 1995
- Vice president of the American Mathematical Society, 1989-1991
- Sloan Foundation Research Fellowship, 1979 - 1981.