DEPARTMENT OF
MATHEMATICS
THE CHINESE UNIVERSITY OF HONG KONG

WORKSHOP ON FRACTALS AND RELATED AREAS

THE WORKSHOP EMPHASIZES ON THE RECENT DEVELOPMENT ON FRACTALS AND RELATED AREAS

23 APRIL 2019 (TUESDAY)
ROOM 222,
LADY SHAW BUILDING, CUHK

organized by Department of Mathematics,
The Chinese University of Hong Kong

SPEAKERS:
PROF. XINRONG DAI (SUN YAT-SEN UNIVERSITY)
PROF. ESA JÄRVENPÄÄ (UNIVERSITY OF OULU)
PROF. MAARIT JÄRVENPÄÄ (UNIVERSITY OF OULU)
PROF. BING LI (SOUTH CHINA UNIVERSITY OF TECHNOLOGY)
PROF. HUOJUN RUAN (ZHEJIANG UNIVERSITY)

FOR ANY ENQUIRY, PLEASE CONTACT PROF. DEJUN FENG BY
DJFENG@MATH.CUHK.EDU.HK OR BY 3943-7965.

PROGRAM

9:00am-9:50am: Prof. Maarit Järvenpää (University of Oulu)

Random covering sets: an introduction and some resent results
Abstract: We give a short introduction to random covering   problems and describe some resent results concerning random covering sets defined by rectangles in products of regular spaces.

10:10am-11:00am: Prof. Esa Järvenpää (University of Oulu)

Random covering sets of rectangles in the Heisenberg group
Abstract: We calculate the Hausdorff dimension of random covering sets in the first Heisenberg group defined via horizontal and vertical rectangles.

11:20am-12:10 noon: Prof. Bing Li (South China University of Technology)

Fourier dimensions of random covering sets
Abstract: In the talk, we will introduce some results on Salem sets whose Hausdorff and Fourier dimensions coincide. We prove that the random covering sets in both the unit interval and the circle are Salem sets almost surely. In higher dimension, if the Hausdorff dimension of random covering set is less than 2, it will be shown that such set is almost surely Salem set. This is the joint work with Changhao Chen and Ville Suomala.

2:30pm-3:20pm: Prof. Xinrong Dai (Sun Yat-Sen University)

Peano (Hilbert) Curves on Connected Self-Similar Sets
Abstract: The problem of space -filling curve has been studied for almost one and a half centuries. A long-standing problem is that for each connected self -similar set E whether there exists a continuous map f rom [0,1] onto E satisfying both bi -dimensional Lipschitz property and bi -dimensional measure preserving property. In this talk, we provide an affirmative answer to the problem by constructing technique. This extends the result of Remes. Our study involves   techniques from measure theory, graph theory and fractal geometry.

3:40pm-4:30pm: Prof. Huojun Ruan (Zhejiang University)

Metrics on fractals by symmetric self-similar weight functions
Abstract: I will talk about the method (proposed by Kigami) of   defining metrics on two classes of fractals (nested fractals and generalized Sierpinski carpets) by using symmetric self-similar weight functions on its symbolic spaces.   We proved that there is a critical surface for the weights to give a geodesic metric.   These metrics are crucial in describing heat kernel bounds for time-change Brownian motions on these fractals via symmetric self similar measures. We also compute the critical surface for two examples, one is the Lindstrom snowflake and the other is the standard Sierpinski carpet. This is based on a join work with Qingsong Gu, Ka-Sing Lau and Hua Qiu.