

THE UNIVERSITY



OF HONG KONG

*Institute of Mathematical Research
Department of Mathematics*

CONFERENCE ON NUMBER THEORY

November 1 - 2, 2013

Room 210, Run Run Shaw Building, HKU

November 1 (Friday)

10:00 – 11:00	I.D. Shkredov , Steklov Mathematical Institute, Russia <i>The eigenvalues method in Combinatorial Number Theory</i>
<i>Coffee break</i>	
11:15 – 12:15	K.M. Tsang , The University of Hong Kong, Hong Kong <i>Squarefull numbers in arithmetic progressions</i>
<i>Lunch break</i>	
14:30 – 15:30	I. Rezvyakova , Steklov Mathematical Institute, Russia <i>Zeros of the Epstein zeta function on the critical line</i>
<i>Coffee break</i>	
15:45 – 16:45	M. Xiong , The Hong Kong University of Science and Technology, Hong Kong <i>Distribution of zeta zeros for trigonal curves over finite fields</i>

November 2 (Saturday)

10:00 – 11:00	B. Kane , The University of Hong Kong, Hong Kong <i>Sums of class numbers and mixed mock modular forms</i>
<i>Coffee break</i>	
11:15 – 12:15	Y.K. Lau , The University of Hong Kong, Hong Kong <i>The signs of the Fourier coefficients of newforms</i>

Organizers: B. Kane, Y.-K. Lau & K.-M. Tsang

All are welcome

Abstracts

B. Kane, The University of Hong Kong, Hong Kong

Sums of class numbers and mixed mock modular forms

In this talk, we look at sums of class numbers and relate them to a recent generalization of modular forms known as mixed mock modular forms. We investigate previously known results from this perspective and then prove recent conjectures about sums of class numbers in certain congruence classes.

Y.K. Lau, The University of Hong Kong, Hong Kong

The signs of the Fourier coefficients of newforms

Given an elliptic modular newform, a central problem is to investigate its normalized Fourier coefficients. There are a couple of interesting results on their signs by various writers. Our aim is to give a survey on these works.

I. Rezvyakova, Steklov Mathematical Institute, Russia

Zeros of the Epstein zeta function on the critical line

In the late 90s, Atle Selberg invented a new method which allowed one to prove under certain natural conditions that a general linear combination of L -functions contains a positive proportion of its nontrivial zeros on the critical line. In our talk we shall provide the details of this result for the Epstein zeta function of the positive definite binary quadratic form.

I.D. Shkredov, Steklov Mathematical Institute, Russia

The eigenvalues method in Combinatorial Number Theory

In the talk a family of operators (finite matrices) with interesting properties will be discussed. These operators appeared during attempts to give a simple proof of Chang's theorem from Combinatorial Number Theory. At the moment our operators have found several applications in the area connected with Chang's result as well as another problems of Number Theory such as : bounds for the additive energy of some families of sets, new structural results for sets with small higher energy, estimates of Heilbronn's exponential sums and others.

K.M. Tsang, The University of Hong Kong, Hong Kong

Squarefull numbers in arithmetic progressions

The distribution of arithmetical sequences on arithmetic progressions is a question of immense interests. In this talk we shall present some recent results on squarefull number on arithmetic progressions. Some estimates of the least squarefull number on arithmetic progressions will also be discussed. This is a joint work with T.H. Chan.

M. Xiong, The Hong Kong University of Science and Technology, Hong Kong

Distribution of zeta zeros for trigonal curves over finite fields

Relying on a recent work of Zhao, we prove two results on random trigonal curves over a finite field F_q . The first is to complement a result of Wood, showing that in the limit as the genus of the curve and the field size q both go to infinity, the distribution of the number of F_q -rational points on a random trigonal curve over F_q converges to a Gaussian distribution. The second is that as the genus of a random trigonal curve over F_q goes to infinity, the number of zeta zeroes lying in a prescribed arc is uniformly distributed and the variance follows a Gaussian distribution as well.