HONG KONG MATHEMATICAL SOCIETY

ANNUAL GENERAL MEETING 2010

27 March 2010 (Saturday)

2:00-6:10pm

The Chinese University of Hong Kong

Schedule of Events:

Invited Talks (Parallel Sessions):

Pure Mathematics Session	Applied Mathematics Session
Venue: G35 Lady Shaw Building	**Venue: G36 Lady Shaw Building**

Pure Mathematics Session

2:00-2:30pm

1. HUANG, Jing-Song (HKUST)

Title: *Dirac Operators and Lie Algebra Cohomology*

Abstract: Lie algebra cohomology is a fundamental tool to study representations of reductive Lie groups. Both nilpotent Lie algebra cohomology and (g,K)-cohomology are employed to solve many important problems in classification of irreducible representations, geometric construction of discrete series, branching rules and automorphic forms. The aim of the talk is to show that using Dirac operators we can simplify the calculations of Lie algebra cohomology and tackle many problems in a unifying theme.

Applied Mathematics Session

2:00-2:30pm

1. Li, Aobing (CityU)

Title: *Some Fully Nonlinear PDEs on the manifolds with boundaries*

Abstract: In this talk, we will use the Schouten tensor to restate the Yamabe Problem, the problem looking for a conformal metric with the constant scalar curvature. We will mainly focus on the manifolds with boundaries, consider the fully nonlinear Yamabe problem, and study the apriori estimates of the corresponding PDEs.

2:30-3:00pm

2.   CHANG, Huai Liang (HKUST)

Title: *On genus one Gromov Witten invariant of Quintic threefold*

Abstract: Recently I and Jun Li computed genus one Gromov Witten invariant of Quintic threefold. The proof verifies Li-Zinger conjecture which says GW invariants are linear combinations of reduced GW invariants.

 In this talk I will brief the part of our method which is used to seperate contributions. This part of our argument is applicable to Li-Zinger conjecture for higher genus cases.

3:00-3:30pm

3.   NG, Patrick Tuen Wai (HKU)

Title: *Finding exact meromorphic solutions of the Falkner-Skan differential equation*

Abstract: In this talk, we shall present a new method based on Nevanlinna theory or Wiman-Valiron theory to find all the meromorphic solutions of some interesting non-linear autonomous differential equations. In particular, we shall apply this method to the Falkner-Skan differential equation

$$f''' + ff'' + \beta(1-f'^2)=0.$$

This third order O.D.E describes the boundary-layer flow over a wedge of included angle $\beta\pi$ and it has been studied intensively in fluid mechanics. The solution f if

2:30-3:00pm

2.   YIU, Cedric Ka-Fai (PolyU)

Title: *Optimal Portfolios with a VaR constraint*

Abstract: In market risk management, it is widely accepted that Value-at-Risk (VaR) is a useful summary measure of market risks and an option to be used by regulators and large banks to set the requirement on capital reserves. In order to fulfill the requirement, a portfolio must be able to control the level of VaR. If the expected utility of wealth or consumption is maximized over a certain period of time without considering risks, the optimal allocation to the risky asset might violate the VaR restriction at some points and fall short of the regulatory requirement.

In this presentation, we impose the VaR as a dynamic constraint to the optimal portfolio problem. At each instant, the VaR is estimated and is applied to influence the investment decision. The optimal portfolio problem is formulated as a constrained maximization of the expected utility, with the constraint being the VaR level. By applying the VaR constraint continuously over time, we find that investments in risky assets are reduced whenever the VaR constraint becomes active.

3:00-3:30pm

3.   WANG, Chunpeng (Jilin U & CUHK)

Title: *Continuous Subsonic-Sonic Flows in a Convergent Nozzle*

Abstract: This talk concerns continuous subsonic-sonic flows in a convergent nozzle with straight solid walls. It is shown that for the given inlet being a perturbation of an arc centered at the vertex of the nozzle and the given incoming mass flux belonging to an open interval depending only on the adiabatic exponent and the length of the arc, there is a unique continuous subsonic-sonic flow from the given inlet with the angle of the velocity orthogonal to the inlet line and the given incoming mass flux. Furthermore, the sonic curve of this continuous

it exists, is called the shape function, or the dimensionless stream function and its first derivative, after suitable normalization, represents the velocity.

subsonic-sonic flow is a free boundary, where the flow is singular in the sense that while the speed is $C^{1/2}$ H\"older continuous at the sonic state, yet the acceleration blows up at the sonic state.

3:30-3:40pm   Break

Venue: LT6 Lady Shaw Building

3:40-4:10pm   Annual General Meeting and Council Election

4:10-4:30pm   HKMS Best Thesis Award Presentation Ceremony

4:30-5:20pm   Plenary Lecture by TODOROV, Andrey Nikolov (UC Santa Cruz & CUHK):

Title: *Applications if the Solution of Calabi Conjecture to Algebraic Geometry*

Abstract: One of the main achievement of Mathematics in the last century was the solution of the uniformization problem for Riemann surfaces. This problem was solved by Kobe and Poincare. The solution of Calabi conjecture can be interpreted as generalization of Kobe-Poincare Theorem. First I will describe the applications of Poincare-Kobe Theorem and then I will talk about how to generalize these applications to higher dimension. At the end of the talk I will mention some relations to Theoretical Physics.

5:20-6:10pm   Plenary Lecture by SHAO, Qi-Man (HKUST):

Title: *Limit Theory: From Deterministic Normalization to Self-normalization*

Abstract: The normalizing constants in classical limit theorems in probability theory are usually deterministic, i.e., sequences of real numbers. It is known that moment conditions or other related assumptions are necessary and sufficient for many classical limit theorems. However, self-normalization occurs more often in statistical inference. The Student t-statistic and Studentized statistics in general are typical examples of self-normalization. It is now well-understood that the self-normalization usually preserves much better properties than the deterministic normalization and that the self-normalized limit theorems require no moment assumption or much less moment assumptions.

In this talk a brief survey is given on recent developments on self-normalized limit theory and some open questions will also be discussed.

6:30-9:00pm   Dinner (Function Room 3 at **Chung Chi College Staff Club**)

For more information about campus transportation, please visit:
http://www.cuhk.edu.hk/transport_unit/