

**SCHEDULE AND ABSTRACTS OF TALKS PRESENTED AT
THE 2nd ANNUAL IPFW ANALYSIS MINI-SYMPOSIUM**

The 2nd Annual IPFW Analysis Mini-Symposium is Friday, November 9, 2012.

SPONSORED BY

- IPFW Department of Mathematical Sciences
- IPFW Office of Research, Engagement, and Sponsored Programs.

FRIDAY SCHEDULE

(Last update Friday Nov. 2 — subject to change...)

All talks in Kettler 218.

- Coffee starting before 9:00 in Tea Room, Kettler 200
- 9:00–9:50 N. Levenberg
- 10:00–10:50 S. Borodachov
- 11:00–11:50 Y. Yan
- Lunch Break
- 1:30–2:20 Y. Zhang
- Tea Break, Kettler 200
- 3:30–4:20 Y. Pan
- Dinner off-campus

ABSTRACTS OF TALKS

Presenter: Sergiy Borodachov, Towson University

Asymptotics for the discrete minimum Riesz energy problem

We will consider the problem of minimizing the energy of N repelling points on a given compact set in the m -dimensional Euclidean space that interact via an inverse power law potential. After briefly discussing known results for certain values of N on the sphere, our focus will be on the behavior of the main term of the minimum energy as N gets large, as well as the limiting behavior of optimal configurations on more general manifolds. We consider the case of short range interactions when the power of the potential is greater than or equal to the dimension of the manifold. In this case potential-theoretic methods cannot be applied and we use results and techniques from Geometric Measure Theory.

We will also discuss some variations of this problem such as the weighted energy problem and the truncated energy problem when pairs of points which are “too far” from each other are removed from the energy sum. Applications of these problems to discretization of manifolds will be discussed as well.

Presenter: Norm Levenberg, Indiana University Bloomington

Joint work with: John Anderson, Joe Cima, and Tom Ransford

Projective hulls and characterizations of meromorphic functions

We give conditions characterizing holomorphic and meromorphic functions in the unit disk of the complex plane in terms of certain weak forms of the maximum principle. Our work is directly inspired by recent results of John Wermer, and by the theory of the projective hull of a compact subset of complex projective space developed by Reese Harvey and Blaine Lawson.

Presenter: Yifei Pan, IPFW

Finding flat solutions of the Cauchy-Riemann equation with flat data

In an attempt to prove equivalence of two unique continuation problems for Laplace and $\bar{\partial}$ in the complex plane, I am led to study to how to find flat solutions of the Cauchy-Riemann equation for flat data. As a result, I prove a sufficient and necessary condition for existence. An open question is to prove (or disprove) that such a condition is met for any flat function, which would solve the equivalence problem.

Presenter: Yu Yan, Huntington University

Joint work with: Yifei Pan and Mei Wang

A Hopf lemma for higher order differential inequalities and its applications

Hopf's Lemma is one of the fundamental tools in the study of second order elliptic partial differential equations. Although it has been studied extensively, there appears to be no work in the literature on the Hopf Lemma for third or higher order equations. In this talk we will present a higher order Hopf lemma in one variable and discuss some of the applications.

Presenter: Yuan Zhang, IPFW

Joint work with: John Erik Fornaess and Lina Lee

Sup-norm estimates for $\bar{\partial}$ on infinite type convex domains in \mathbb{C}^2

In this talk, we study the $\bar{\partial}$ equation on some smooth convex domains of infinite type in \mathbb{C}^2 . In detail, we show that supnorm estimates hold for those infinite exponential type domains provided the exponent is less than 1.