

Graduate Workshop on 4-Manifolds Talk Schedule

Events for:
Monday, August 18th - Friday, August 22nd

Monday, August 18th

8:30am **Registration and breakfast - SCGP Lobby and Cafe**

9:30am **Tian-Jun Li - SCGP 102**

Title: The minimal genus problem for smooth surfaces

Abstract: The mini-course will be on Surfaces in four manifolds.

10:30am **Coffee break - SCGP Cafe**

11:00am **Burak Ozbagci - SCGP 102**

Title: Stein fillings of contact 3-manifolds I

Abstract: In the first talk, we will introduce Stein and symplectic fillings of contact manifolds, give examples of fillable and non-fillable contact 3-manifolds, and discuss results about classification of Stein fillings of some contact 3-manifolds. In the second talk, we will discuss the existence of Lefschetz fibrations on Stein surfaces and Giroux's correspondence between open books and contact structures. In the third talk we will discuss various examples of contact 3-manifolds with infinitely many distinct Stein fillings. Download lecture notes on workshop website (<http://scgp.stonybrook.edu/archives/9733>).

12:00pm **Lunch - SCGP Cafe**

2:15pm **Selman Akbulut - SCGP 102**

Title: Corks, Plugs and exotic structures

Abstract: TBA

3:30pm **Tea Time - SCGP Lobby/Patio**

5:00pm **Daniel Ruberman - SCGP 102**

Title: Introduction: connections and characteristic classes

Abstract: TBA

Tuesday, August 19th

8:30am **Breakfast - SCGP Cafe**

9:30am **Tian-Jun Li - SCGP 102**

Title: Symplectic and Lagrangian surfaces---existence and uniqueness

Abstract: The mini-course will be on Surfaces in four manifolds.

10:30am **Coffee break - SCGP Cafe**

11:00am **Robert Lipshitz - SCGP 102**

Title: Khovanov homology and homotopy I

Abstract: In the first talk we will give the original definition of Khovanov homology, as well as the Lee and Bar-Natan deformations and Rasmussen's concordance invariants. In the second talk we will introduce the notion of flow categories in Morse theory and Floer theory, and discuss Cohen-Jones-Segal's program for constructing Floer stable homotopy types. Using this idea, we will discuss a stable homotopy refinement of Khovanov homology; this is joint work with Sucharit Sarkar. In the third talk we will discuss a refinement of Rasmussen's s-invariant using the Khovanov homotopy type (again joint with Sarkar) and another construction of a Khovanov homotopy type (joint with Tyler Lawson and Sarkar).

12:00pm **Lunch - SCGP Cafe**

2:15pm **Burak Ozbagci - SCGP 102**

Title: Stein fillings of contact 3-manifolds II

Abstract: In the first talk, we will introduce Stein and symplectic fillings of contact manifolds, give examples of fillable and non-fillable contact 3-manifolds, and discuss results about classification of Stein fillings of some contact 3-manifolds. In the second talk, we will discuss the existence of Lefschetz fibrations on Stein surfaces and Giroux's correspondence between open books and contact structures. In the third talk we will discuss various examples of contact 3-manifolds with infinitely many distinct Stein fillings. Download lecture notes on workshop website (<http://scgp.stonybrook.edu/archives/9733>).

3:30pm **Tea Time - SCGP Lobby/Patio**

3:30pm **G2 Manifolds Seminar: Simon Donaldson "Overview of gauge theory and submanifold geometry on $G_{\{2\}}$ manifolds, I" - SCGP 102**

Speaker: Simon Donaldson

Title: "Overview of gauge theory and submanifold geometry on $G_{\{2\}}$ manifolds, I"

5:00pm **Daniel Ruberman - SCGP 102**

Title: Chern--Simons; construction of Floer homology as a Morse theory

Abstract: TBA

Wednesday, August 20th

8:30am **Breakfast - SCGP Cafe**

9:30am **Yasha Eliashberg - SCGP 102**

Title: Loose Legendrian knots and flexible Weinstein structures

Abstract: TBA

10:30am **Coffee break - SCGP Cafe**

11:00am **Robert Lipshitz - SCGP 102**

Title: Khovanov homology and homotopy II

Abstract: In the first talk we will give the original definition of Khovanov homology, as well as the Lee and Bar-Natan deformations and Rasmussen's concordance invariants. In the second talk we will introduce the notion of flow categories in Morse theory and Floer theory, and discuss Cohen-Jones-Segal's program for constructing Floer stable homotopy types. Using this idea, we will discuss a stable homotopy refinement of Khovanov homology; this is joint work with Sucharit Sarkar. In the third talk we will discuss a refinement of Rasmussen's s-invariant using the Khovanov homotopy type (again joint with Sarkar) and another construction of a Khovanov homotopy type (joint with Tyler Lawson and Sarkar).

12:00pm **Lunch - SCGP Cafe**

2:15pm **Tian-Jun Li - SCGP 102**

Title: Configurations of surfaces and applications

Abstract: The mini-course will be on Surfaces in four manifolds.

3:30pm **Tea Time - SCGP Lobby/Patio**

4:00pm **Nikolai Saveliev - SCGP 102**

Title: Floer homology of admissible bundles and examples

Abstract: TBA

Thursday, August 21st

8:30am **Breakfast - SCGP Cafe**

9:30am **Yasha Eliashberg - SCGP 102**

Title: Lagrangian caps and their applications

Abstract: TBA

10:30am **Coffee break - SCGP Cafe**

11:00am **Nikolai Saveliev - SCGP 102**

Title: Floer exact triangle, and various Floer homology theories of knots and links

Abstract: TBA

12:00pm **Lunch - SCGP Cafe**

2:15pm **Selman Akbulut - SCGP 102**

Title: Handlebodies of exotic 4-manifolds

Abstract: TBA

3:30pm **Tea Time - SCGP Lobby/Patio**

4:00pm **Burak Ozbagci - SCGP 102**

Title: Stein fillings of contact 3-manifolds III

Abstract: In the first talk, we will introduce Stein and symplectic fillings of contact manifolds, give examples of fillable and non-fillable contact 3-manifolds, and discuss results about classification of Stein fillings of some contact 3-manifolds. In the second talk, we will discuss the existence of Lefschetz fibrations on Stein surfaces and Giroux's correspondence between open books and contact structures. In the third talk we will discuss various examples of contact 3-manifolds with infinitely many distinct Stein fillings. Download lecture notes on workshop website (<http://scgp.stonybrook.edu/archives/9733>).

5:00pm **Tom Mrowka - SCGP 102**

Title: TBA

Abstract: TBA

6:00pm **Workshop Banquet - SCGP Cafe**

Friday, August 22nd

8:30am **Breakfast - SCGP Cafe**

9:30am **Yasha Eliashberg - SCGP 102**

Title: Construction of contact structures

Abstract: TBA

10:30am **Coffee break - SCGP Cafe**

11:00am **Tom Mrowka - SCGP 102**

Title: TBA

Abstract: TBA

12:00pm **Lunch - SCGP Cafe**

2:15pm **Selman Akbulut; Luke Williams - SCGP 102**

Title: Handlebodies of exotic 4-manifolds (Akbulut); On Stein rational balls (Williams)

Abstract: TBA

3:30pm **Tea Time - SCGP Lobby/Patio**

4:00pm **Robert Lipshitz - SCGP 102**

Title: Khovanov homology and homotopy III

Abstract: In the first talk we will give the original definition of Khovanov homology, as well as the Lee and Bar-Natan deformations and Rasmussen's concordance invariants. In the second talk we will introduce the notion of flow categories in Morse theory and Floer theory, and discuss Cohen-Jones-Segal's program for constructing Floer stable homotopy types. Using this idea, we will discuss a stable homotopy refinement of Khovanov homology; this is joint work with Sucharit Sarkar. In the third talk we will discuss a refinement of Rasmussen's s-invariant using the Khovanov homotopy type (again joint with Sarkar) and another construction of a Khovanov homotopy type (joint with Tyler Lawson and Sarkar).