

2023 Simons Summer Math Workshop - Week 2

**Events for:
Monday, August 14th - Friday, August 18th**

Monday, August 14th

9:00am **Workshop: Breakfast - SCGP Cafe**

Title: Breakfast

9:30am **Workshop: Brett Parker - SCGP 102**

Speaker: Brett Parker

Title: Degenerations of holomorphic curves, tropical geometry, gluing theorems, and exploded manifolds

Abstract: Holomorphic curves play a central role in symplectic topology. They can be regarded as 2-dimensional analogues of a geodesics within a symplectic manifold, or as trajectories traced out by interacting strings in string theory, and provide a rich geometric framework for understanding symplectic topology. In many situations, holomorphic curves can be studied using 1-dimensional piecewise-linear objects called tropical curves. In the first lecture, I will explain the geometry behind the appearance of tropical curves, and explain why it is useful to employ a category blending tropical geometry with usual differential or algebraic geometry. In the remaining lectures, I will introduce the category of exploded manifolds, and explain how using such a category provides a guiding framework for proving gluing formulae and understanding holomorphic curves under a wide class of degenerations including normal crossing degenerations. I will also link this to log geometry and logarithmic Gromov—Witten invariants.

10:45am **Workshop: Coffee - SCGP Cafe**

Title: Coffee

11:30am **Workshop: Bernd Siebert - SCGP 102**

Speaker: Bernd Siebert

Title: Logarithmic and punctured Gromov-Witten invariants, tropicalization, and gluing formalism

Abstract: I. Introduction to logarithmic geometry for geometers

1:00pm **Workshop: Lunch - SCGP 102**

Title: Lunch

3:30pm **Tea time - SCGP Cafe**

Title: Tea Time

Tuesday, August 15th

9:00am **Workshop: Breakfast - SCGP Cafe**

Title: Breakfast

9:30am **Workshop: Brett Parker - SCGP 102**

Speaker: Brett Parker

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10:45am **Workshop: Coffee - SCGP Cafe**

Title: Coffee

11:30am **Workshop: Bernd Siebert - SCGP 102**

Speaker: Bernd Siebert

Title: Logarithmic and punctured Gromov-Witten invariants, tropicalization, and gluing formalism

Abstract: II. Kato-Nakayama spaces of log spaces, tropicalization, stable log maps

1:00pm **Workshop: Lunch - SCGP 102**

Title: Lunch

4:00pm **Workshop and Public Tea - Lobby**

Title: Public Tea

5:00pm **- SCGP 103**

Title: Summer Concert Series - Leon Livshin Concert - Dandy in New York

Wednesday, August 16th

9:00am **Workshop: Breakfast - SCGP Cafe**

Title: Breakfast

9:30am **Workshop: Brett Parker - SCGP 102**

Speaker: Brett Parker

Title: Degenerations of holomorphic curves, tropical geometry, gluing theorems, and exploded manifolds

Abstract: Holomorphic curves play a central role in symplectic topology. They can be regarded as 2-dimensional analogues of geodesics within a symplectic manifold, or as trajectories traced out by interacting strings in string theory, and provide a rich geometric framework for understanding symplectic topology. In many situations, holomorphic curves can be studied using 1-dimensional piecewise-linear objects called tropical curves. In the first lecture, I will explain the geometry behind the appearance of tropical curves, and explain why it is useful to employ a category blending tropical geometry with usual differential or algebraic geometry. In the remaining lectures, I will introduce the category of exploded manifolds, and explain how using such a category provides a guiding framework for proving gluing formulae and understanding holomorphic curves under a wide class of degenerations including normal crossing degenerations. I will also link this to log geometry and logarithmic Gromov—Witten invariants.

10:45am **Workshop: Coffee - SCGP Cafe**

Title: Coffee

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

Title: Lunch

1:00pm - **Robert Moses State Park Field 3, Robert Moses State Pkwy, Babylon, NY 11702, USA**

Title: Beach Outing - Robert Moses State Park, Field 3, 1-5PM

Thursday, August 17th

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

Title: Breakfast

9:30am **Workshop: Bernd Siebert - SCGP 102**

Speaker: Bernd Siebert

Title: Logarithmic and punctured Gromov-Witten invariants, tropicalization, and gluing formalism

Abstract: III. Logarithmic Gromov-Witten invariants, Artin fans, punctured Gromov-Witten invariants

10:45am **Workshop: Coffee - SCGP Cafe**

Title: Coffee

11:30am **Workshop: Brett Parker - SCGP 102**

Speaker: Brett Parker

Title: Degenerations of holomorphic curves, tropical geometry, gluing theorems, and exploded manifolds

Abstract: Holomorphic curves play a central role in symplectic topology. They can be regarded as 2-dimensional analogues of a geodesics within a symplectic manifold, or as trajectories traced out by interacting strings in string theory, and provide a rich geometric framework for understanding symplectic topology. In many situations, holomorphic curves can be studied using 1-dimensional piecewise-linear objects called tropical curves. In the first lecture, I will explain the geometry behind the appearance of tropical curves, and explain why it is useful to employ a category blending tropical geometry with usual differential or algebraic geometry. In the remaining lectures, I will introduce the category of exploded manifolds, and explain how using such a category provides a guiding framework for proving gluing formulae and understanding holomorphic curves under a wide class of degenerations including normal crossing degenerations. I will also link this to log geometry and logarithmic Gromov—Witten invariants.

1:00pm **Workshop: Lunch - SCGP 102**

Title: Lunch

3:30pm **Tea time - SCGP Cafe**

Title: Tea Time

6:00pm **Workshop Banquet - Simons Center Cafe**

Title: Workshop Banquet

Friday, August 18th

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

Title: Breakfast

9:30am **Workshop: Bernd Siebert - SCGP 102**

Speaker: Bernd Siebert

Title: Logarithmic and punctured Gromov-Witten invariants, tropicalization, and gluing formalism

Abstract: IV. The gluing formalism for log Gromov-Witten theory via punctured logarithmic maps

10:45am **Workshop: Coffee - SCGP Cafe**

Title: Coffee

1:00pm **Workshop: Lunch - SCGP 102**

Title: Lunch

3:30pm **Tea time - SCGP Cafe**

Title: Tea Time