



# Oberwolfach Seminar

## Tropical Curves, Logarithmic Structures, and Enumerative Geometry

Organizers: Renzo Cavalieri, Fort Collins  
Hannah Markwig, Tübingen  
Dhruv Ranganathan, Cambridge UK  
Date (ID): 24 – 30 October 2021 (2143a)  
Deadline: 8 August 2021

Enumerative geometry and the theory of moduli spaces of curves are two cornerstones of modern algebraic geometry; the two subjects have had a significant influence on each other. In the last 15 years, discrete and combinatorial methods, systematized within tropical geometry, have begun to provide new avenues of access into these two subjects. These tropical methods find combinatorial limits in degenerations of algebraic varieties, and the resulting polyhedral combinatorics provides a fundamentally new tool to constrain and understand geometric questions. These ideas have led to new results in Brill-Noether theory, classical enumerative geometry, and the compactification of moduli spaces. This seminar will explore these ideas in the context of Gromov-Witten theory.

Logarithmic Gromov-Witten theory lies at the heart of modern approaches to mirror symmetry, but also opens up a number of new directions in enumerative geometry of a more classical flavour. Tropical geometry forms the calculus through which calculations in this subject are carried out. The seminar will cover the foundational aspects of this tropical calculus, geometric aspects of the degeneration formula for Gromov-Witten invariants, and the practical nuances of working with

and enumerating tropical curves. Our objective is to give participants an assisted entry route to the subject, focusing on examples and explicit calculations.

The seminar takes place at the Mathematisches Forschungsinstitut Oberwolfach. The Institute covers board and lodging. By the support of the Carl Friedrich von Siemens Foundation travel expenses can be reimbursed up to 150 EUR in average per person (against copies of travel receipts). The number of participants is restricted to 25.

### Applications including

- full name and address, incl. e-mail address
- short CV and publication list
- present position, university
- name of supervisor of Ph.D. thesis
- a short summary of previous work and interest
- title, ID and date of the intended seminar

should be sent preferably by e-mail (with attachments in pdf format) via [seminars@mfo.de](mailto:seminars@mfo.de) until 8 August 2021 to:

Mathematisches Forschungsinstitut Oberwolfach  
Vice Director  
Schwarzwaldstr. 9 – 11  
77709 Oberwolfach  
Germany

