MAT 280 Syllabus

Class will meet at 1:10 - 2:00 p.m. on Mondays, Wednesdays, and Fridays at MSB 1147.

Cluster algebra was introduced at the turn of the century and is a relatively new topic in mathematics. Since its creation, cluster algebras have been discovered in many areas of mathematics and have given rise to many new developments in those areas. In this course, we will learn about some fundamental properties of cluster algebras and discuss some basic examples of cluster varieties. Below is an incomplete list of topics that we plan to cover in the course:

- Rank 2 cluster algebras
- Grassmannian Gr(2,n)
- Laurent phenomenon
- Finite type classification
- Scattering diagram
- Positivity phenomenon
- Cluster duality conjecture
- Partial compactification and superpotential
- Grassmannian Gr(k,n) and reduced plabic graphs
- Double Bott-Samelson cells
- Augmentation varieties of rainbow closures of positive braids
- Legendrian weaves

Due to the fact that cluster theory is only 20+ years old, there have not been any published textbooks on the subject. There is a free draft version of a textbook available at Lauren Williams's website hereLinks to an external site..

Daping will try his best to keep an updated set of lecture notes, which you can access here Download here.

There will be 3 to 4 problem sets throughout the quarter and the course grade will be determined by these problem sets.

If zoom classes are needed, here is the class zoom link:
https://ucdavis.zoom.us/j/95170017312?pwd=UE43aEtrUUEzT09BcGUyV1dNUnQvQT09

Daping's office hours are 2:10 - 3:00 p.m. on Mondays and Wednesdays in MSB 3151. However, there may be many calculus students seeking help during those hours and Daping will have to prioritize them. Alternatively, please feel free to send Daping an email to set up an irregular meeting.

Daping's email is daping@math.ucdavis.edu