

STUDENT SEMINAR TOPICS

If you are interested in giving a talk in the student seminar, below is a list of topics you might consider choosing from. If something looks interesting, feel free to approach the faculty member whose name appears along the topic so that the two of you can discuss your interest further. Each professor will help you prepare your talk, which might include providing references, clarifying any confusion during your preparation, and perhaps even listening to a practice talk. If you are interested in giving a talk on a topic that is not listed below, let me know and I will try to direct you to the faculty member who is the most knowledgeable about it.

Faculty	Topics
Stanley Chang	<ul style="list-style-type: none"> • Applications of linear algebra to chemistry, economics, cryptography, graph theory, genetics, etc.
Alex Diesl	<ul style="list-style-type: none"> • Various topics in algebra and number theory
Megan Kerr	<ul style="list-style-type: none"> • Non-Euclidean geometry: the parallel postulate • Sphere packing • Minimal surfaces, soap films, Double Bubble Theorem
Marty Magid	<ul style="list-style-type: none"> • Various topics in geometry, including the Gauss-Bonnet Theorem, classification of surfaces, Theorem Egregium • Various topics in set theory, including Godel's Incompleteness Theorem • Non-parametric statistics tests
Brian Munson	<ul style="list-style-type: none"> • Topics in topology such as the Wirtinger presentation of a knot, linking numbers • topics in algebra such as applications of the Burnside lemma, generating functions • graph theoretic ideas like the neighborhood complex, hom complexes, and homotopy theory for graphs
Andy Schultz	<ul style="list-style-type: none"> • Number theoretic topics including error-correcting codes and check-digit schemes, primality testing and pseudoprimes, the nature of π (its irrationality, its decimal expansion, etc.), the Fibonacci numbers and the Golden Ratio, the partition function, Goldbach's conjecture, perfect numbers, covering congruences • Linear algebra topics including applications of the singular value decomposition to image compression and noise filtering, JPEGs and change of basis, Google's PageRank algorithm and eigenvectors
Alan Shuchat	<ul style="list-style-type: none"> • Infinite-dimensional vector spaces: Banach and Hilbert spaces • Linear programming • Applications of linear algebra • Queues and probability

Fred Shultz	<ul style="list-style-type: none"> • Linear algebra and applications, including applications to quantum mechanics • Analysis • Dynamical systems (“chaos theory”) • Functional analysis, including infinite dimensional linear algebra, quantum computing, Fourier series, topics in combinatorics
Ann Trenk	<ul style="list-style-type: none"> • Various topics in discrete math, including graph theory and combinatorics
Ismar Volic	<ul style="list-style-type: none"> • Various topics in topology, including classification of surfaces, fundamental group, topological groups, interplay between geometry and analysis • Various topics in knot theory, including knot invariants, Seifert surfaces, Jones polynomial, Poincaré Conjecture • Various topics in number theory, including famous open problems, Quadratic Reciprocity, Diophantine Equations, various topics in cryptography