Fall 2017 Projects

Skyler Thomas	Percolation	Physics, dynamics
Sam Mokhtar	Topological Data Analysis: Mapper and Cosheaves	Topology
Shannon Dang	Markov Chains: Absorbing and Ergodic	Dynamics, Probability
Maxim Zelenko	Brouwer's Fixed Point Theorem Proof via Sperner's Lemma	Topology
Kalyani Limaye	To Be or Knot to Be	Topology, Knot theory
Morgan Taylor	A Rational Tangle Calculus and Conway’s Theorem	Topology
Courtney Smith	Tricolorability of Knots	Topology
Anna Williams	Coherent and Non-coherent Band Surgeries	Topology
Jack Carlisle	Dehn Surgery by Numbers: How to build your own 3-manifold	Topology
Jacob Brown	Morse Theory	Geometry, Topology
Arjun Viyaywargiya	Isometries, Gluing, and Tessellating Polygons	Geometry, Topology
Nicholas Daniel	Chromatic Number of the Kneser Graph	Combinatorics / Graph Theory
Cameron Darwin	The Morse-Witten Complex	Geometry
Tam Cheetham-West	Morse functions and handle decompositions	Geometry, Topology
Jamie Sullivan	Maxwell’s Equations on Manifolds	Geometry, Physics
Nathan Guermond	A mere introduction to homotopy type theory	Topology
David Green	A Proof of the Yoneda Lemma	Algebra

Tomás Matzner	Push and Pull: Constructing Familiar Objects with Categories	Algebra
Francisco Estrella	Lie Group and Lie Algebra of SO(3)	Algebra, Geometry, Topology
Carl Marth	Clifford Algebras and Their Representation	Algebra, Geometry
Wyatt Reeves	Caution! YOu're About To Enter The SO/Spin Zone: Properties of Spin(n)	Geometry, Algebra
Devon Douglis	Colouring Theorems	Combinatorics / Graph Theory
Vivian Huynh	Cayley Graphs and the Geometry of Groups	Geometry, Algebra
John Carse	Constructing CAT(0) Cube Complexes	Geometry
Jeffrey Huang	Solving Multivariable Polynomial Systems	Algebra, Analysis
Minh Le	Problem Solving	Algebra
Yu Liu	Elliptical curves	Number Theory
Benjamin Maccini	Elliptic Curves and their Applications	Number Theory
Cameron Walsh	A New spECIES of cryptosystem	Number Theory
Austin Bell	Arithmetic Derivative	Number Theory
Souparna Purohit	The Hasse-Minkowski Principle	Number Theory
Akshat Gautam	Markov Chains	Probability
Srishtti Talwar	Game Theory	Probability, Combinatorics/ Graph Theory
Naman Mehra	Options Pricings	Financial Math, Combinatorics / Graph Theory, Probability
Mijolae Wright	An Introduction to Measure Theory for Mathematical Finance	Probability, Statistics, Financial Math, Analysis
Haocheng An	Investigation on Monte Carlo Methods	Probability, Statistics

Jenson Stevens	Solomonoff's Universal Inductive Inference	Statistics
Caroline Mahavier	Machine Learning with Python	Computer Science, Machine Learning
Nari Jeong	Optimization in Machine Learning	Machine Learning
Roxana Carcamo	Models for Supervised Machine Learning	Machine Learning
Anca Andrei	Method of Characteristics vs Discontinuous Galerkin	Machine Learning, Statistics
Meg Ashby	Sampling with R	Computer Science, Statistics
Isaiah George Meyers	Fractals and Dynamical Systems	Dynamics, Geometry
Ryan Rice	Introduction to Ergodic Theory	Dynamics
Brandon Whiteley	Convex Geometry and Applications	Geometry
Juan Lizano	Gradient Flow for Heat Diffusion and Ginzburg-Landau Functionals	Physics, Analysis
Emily Nguyen	Quantum Mechanics	Physics, Analysis
Kayleigh Jones	An Application of Fourier Series - the Heat Equation in 1D	Physics, Analysis