**SCHEDULE WEEK 7**

All times are CDT

August 2 – August 6
http://math.uchicago.edu/ may/REU2021/SEVENTH.pdf
==========
Talks take place Monday through Friday afternoons (and/or mornings, at the discretion of speakers and hosts) Talks and group meetings are open to all participants or aimed at focus groups; for focus group events, those interested in joining and are not on the list of people in the relevant group should email the host in advance. All talks are 45 minutes to an hour, with at least a half hour break between talks. Open program talks are live on Zoom; with the speaker's permission, talks will be recorded and made available on Zoom.
THIS IS THE LAST WEEK OF FACULTY TALKS
==========
SPECIAL EVENTS TUESDAY AND THURSDAY. COME TO THEM

TUESDAY 3:00: Seven guests, six NOT in academia, will give glimpses of what REAL WORLD employment is like and will answer any and all questions. From GOOGLE (software engineering), AMAZON (applied science), RADIX TRADING (quantative research and scientic trading), BLUEFIN TRADING (options trading), IDEO (Data science and design), MATH EDUCATION (UIC Phd program, a decade of teaching)

THURSDAY 3:00: Graduate school day: A diverse panel of graduate students will answer any and all questions about applying for graduate school. going to graduate school, what it is like in these miserable times. (As usual, I will be there to answer questions as long as wanted.)

==========
MW 2:30: The probability subprogram, two general interest talks by a new Chicago professor!!!
MW 2:30: Ewain Gwynne
TITLE: Random surfaces and Liouville quantum gravity
ABSTRACT: Random planar maps are random graphs embedded in the plane which can be thought of as discrete random surfaces. It is conjectured that the large-scale behavior of such graphs when the number of edges tends to infinity is described by so-called Liouville quantum gravity (LQG), a theory of random fractal surfaces. I will give a gentle introduction to random planar maps and Liouville quantum gravity, assuming only basic background knowledge in probability theory at the level of an introductory undergraduate class.
==========

Geometry/Analysis/Dynamics seminar

Tuesday 1:30: Zhenjiang Lin (NYU)

Title: A brief glimpse to nodal sets of solutions to linear elliptic equations

Abstract: We will first introduce some basic properties and examples of nodal sets of solutions to linear elliptic PDEs. And briefly discuss the class of solutions with the same nodal set locally or globally.

Thursday 1:30: Lvzhou (Joe) Chen (UT Austin)

Title: Gromov's simplicial norm

Abstract: The simplicial volume of an oriented closed manifold is a topological invariant that measures the (topological) "size" of the manifold. More generally, the simplicial norm measures the size of any homology class, which equips each homology group (with R-coefficient) with a semi-norm. I will give basic examples and explain how this refined structure helps us better understand manifolds.

https://uchicago.zoom.us/j/96027580738?pwd=SnNVM0ZrMmlsTmk4NkdjYkIzMHpPQT09

==========

Special analysis talks

1:00 MWF: Peter Morfe

Title: Viscosity Solutions of Elliptic and Parabolic PDEs

Abstract: These lectures will be an introduction to elliptic and parabolic PDEs and the theory of viscosity solutions. Elliptic and parabolic PDEs describe a number of natural phenomena, most notably diffusion, and also turn up in economics and computer science. The theory of viscosity solutions is a rather down-to-earth yet powerful approach to analyzing this class of PDEs. In the first lecture, I will introduce a few examples that either foreshadow or motivate the need for viscosity theory, including diffusion, wave propagation, and front propagation (e.g. the growth of a forest fire). The second lecture will treat the maximum principle and Perron's approach to the existence of solutions. Finally, in the third lecture, I will discuss the stability properties of viscosity solutions, which makes it particularly well suited to studying scaling limits. To follow the lectures, all you will need is familiarity with calculus and undergraduate-level analysis.

==========

MWF 4:00: Peter May

Title: Infinite loop spaces?!

Abstract: I will follow up on any requests and sketchily introduce the black box of infinite loop space theory.

==========

Wednesday 11:00: Andrew Blumberg (Columbia)

Title: Abstract homotopy theory and topological data analysis

Abstract: Persistent homology is a central invariant in topological data analysis. Whereas in classical algebraic topology, we view homology theories in terms of the Eilenberg-Steenrod axioms and the stable category, much less is understood about the homotopical underpinnings of persistent homology. This talk will explore this situation.

Friday 2:30: Andrew Blumberg (Columbia)

Title: Flow categories

Abstract: Floer homology is an infinite-dimensional analogue of Morse theory. I will give an overview of some of the connections to homotopy theory, focusing on the Cohen-Jones-Segal program for constructing spectra from "flow categories". ==========