SEMINAR ON STOCHASTIC PROCESSES 2017
UNIVERSITY OF VIRGINIA

Wednesday, March 8
1:00 - 1:30 *Check-In*
1:30 - 3:00 Elchanan Mossel (Tutorial Lecture)
3:00 - 3:30 *Coffee Break*
3:30 - 5:00 Elchanan Mossel (Tutorial Lecture)
5:00 - 6:00 Short talks session
6:30 Women in Probability Dinner

Thursday, March 9
9:00 - 9:20 *Check-In*
9:20 - 9:30 *Opening Remarks*
9:30 - 10:30 Nike Sun
10:30 - 11:00 *Coffee Break*
11:00 - 12:00 Short talks session
12:00 - 2:00 *Lunch*
2:00 - 3:30 Open problems session
3:30 - 4:00 *Coffee Break*
4:00 - 6:00 Short talks session
6:30 Conference dinner

Friday, March 10
9:30 - 10:30 Massimiliano Gubinelli
10:30 - 11:00 *Coffee Break*
11:00 - 12:00 David Nualart
          (Kai Lai Chung Lecture)
12:00 - 2:00 *Lunch*
2:00 - 3:30 Panel Discussion
3:30 - 4:00 *Coffee Break*
4:00 - 6:00 Poster session

Saturday, March 11
9:00 - 10:00 Jason Schweinsberg
10:00 - 10:30 *Coffee Break*
10:30 - 11:30 Paul Dupuis

All talks are held in Clark Hall, room 107

PLENARY TALKS

Elchanan Mossel (MIT) - Mixing in product spaces
Mixing properties of dynamical systems are a central topic of study in mathematics. In the lectures we will take a modern, probabilistic, short horizon quantitative view of this problem and see that it involves a number of areas in modern mathematics including isoperimetric theory, noise stability and additive combinatorics. We will explain where are we in a quest for a unified theory as well as some of the applications of this theory.

Nike Sun (Berkeley) - Supercritical minimum mean-weight cycles
We consider the minimum mean-weight cycle (MMWC) in the stochastic mean-field distance model, that is, in the complete graph on n vertices with edges weighted by independent exponential random variables (of unit rate). Mathieu and Wilson [MW] (2012) showed that the MMWC exhibits very different characteristics according to whether its mean weight is smaller or larger than $1/(ne)$, where both cases occur with asymptotically positive probability. While the behavior in the subcritical (below $1/(ne)$) regime is characterized in detail by [MW], much less was understood in the supercritical regime (above $1/(ne)$). I will describe some of the obstacles, and present our results determining the length and weight asymptotics for the supercritical MMWC. Joint work with Jian Ding and David B. Wilson.

Massimiliano Gubinelli (Bonn) - Weak universality of fluctuations and singular stochastic PDEs
Mesoscopic fluctuations of microscopic (discrete or continuous) dynamics can be described in terms of non-Gaussian random fields. These random fields are fully described by certain nonlinear stochastic partial differential equations which are universal: they depend on very few details of the microscopic model. However, due to the extreme irregular nature of the random field sample paths, these equations

turn out to not be well-posed in any classical analytic sense. In this talk I will review recent progress in the mathematical understanding of such singular equations and of their (weak) universality. If time permits I will discuss the case of the one dimensional Kardar-Parisi-Zhang equation and of the three dimensional Stochasic Allen-Cahn equation.

David Nualart (University of Kansas) - Malliavin calculus and central limit theorems

The aim of this talk is to present some recent applications of the stochastic calculus of variations to derive central and noncentral limit theorems in probability for random variables that can be represented as divergence integrals. In the first part, we will discuss Gaussian and mixed Gaussian approximations using Steins and interpolation methods for Wiener functionals. In the second part we will present a new method for proving tightness in the functional central limit theorem for the self-intresection local time of the fractional Brownian motion, using techniques of Malliavin calculus.

Jason Schweinsberg (UC San Diego) - Yaglom-type limit theorems for branching Brownian motion with absorption

We consider one-dimensional branching Brownian motion in which particles are absorbed at the origin. We assume that when a particle branches, the offspring distribution is supercritical, but the particles are given a critical drift towards the origin so that the process eventually goes extinct with probability one. We establish precise asymptotics for the probability that the process survives for a large time t, improving upon a result of Kesten (1978) and Berestycki, Berestycki, and Schweinsberg (2014). We also prove a Yaglom-type limit theorem for the behavior of the process conditioned to survive for an unusually long time, which also improves upon results of Kesten (1978). An important tool in the proofs of these results is the convergence of branching Brownian motion with absorption to a continuous state branching process.

Paul Dupuis (Brown) - A variational representation for functionals of a Poisson random measure and applications

When combined with weak convergence methods, the variational representation for positive functionals of infinite dimensional Brownian motion is very convenient for the large deviation analysis of many complicated process models, such as stochastic partial differential equations. More recently, a variational representation for functionals of a Poisson random measure has been developed, and it has likewise proven useful for problems with difficult features. After revisiting the formulation of the representation for the Brownian case and reviewing an elementary application, we focus on recent uses of the Poisson representation. By formulating process models as the solution to a stochastic differential equation driven by Poisson noise and establishing weak regularity properties of the mapping from noise space to state space, one can characterize the large deviation properties of processes that are hard to treat otherwise. Examples presented include the exploration process for a random graph model and a multiscale stochastic model.

SHORT TALKS

Wednesday 5:00-6:00

1. Amber Puha (California State University, San Marcos) "Asymptotically optimal scheduling for many server queues with abandonment" (Joint with Amy Ward, Marshall School of Business, USC)
2. Noah Forman (University of Washington) "Diffusions on a space of interval partitions"
3. Wenjian Liu (CUNY) "Ross Recovery in Continuous Time"
4. Abdelmalek Abdesselam (University of Virginia) "On a toy model for three-dimensional conformal probability"

Thursday 11:00-12:00

1. Zsolt Pajor-Gyulai (Courant) "Noise induced rare transitions along heteroclinic networks"
2. Joe Chen (Colgate University) "Limit shapes of internal DLA on fractal graphs"
3. Andrey Sarantsev (University of California, Santa Barbara) "Competing Brownian particles"
4. Ioannis Panageas (MIT and SUTD: CS and ESD) "Evolutionary Dynamics in finite populations mix rapidly"

Thursday 4:00-6:00

1. Dimitri Papadimitriou (Nokia - Bell Labs) "Stochastic Delay Differential Equation Modeling of Neural Networks"
2. Wai Fan (University of Wisconsin-Madison) "Stochastic reaction diffusion equations on graphs"
3. Christian Keller (University of Michigan) "Fully nonlinear stochastic and rough PDEs: Classical and viscosity solutions"
4. Jingyu Huang (University of Utah) "Dense blowup for parabolic SPDEs"
5. Michael Perlmutter (UNC Chapel Hill) "Martingale Transforms and Singular Integrals"
6. Tai-Ho Wang (Baruch College, CUNY) "Bridge representation and modal-path approximation"
7. Han Liang Gan (Northwestern University) "Dirichlet approximation for stationary distributions of genetic drift models"
8. Lingjiong Zhu (Florida State University) "Variational Approximations for an Exponential Random Graph Model"

POSTERS

1. Qi Feng (University of Connecticut) "Stochastic analysis on totally geodesic foliations"
2. Tushar Vaidya (Singapore University of Technology and Design, ESD) "Volatility smiles and learning agents"
3. Zhixin Yang (Ball State University) "Quantile credibility model with common effects"
4. Hongjuan Zhou (University of Kansas) "Parameter estimation for fractional Ornstein Uhlenbeck processes"
5. Abdullah Karakus (Koc University) "Correlated Coalescing Brownian Flows on R and the Circle"
6. Yerkin Kitapbayev (Boston University) "Optimal Mean-Reverting Spread Trading: Nonlinear Integral Equation Approach" (with T. Leung)
7. Guodong Pang (Penn State University) "The Method of Chaining and Queueing"
8. Phanuel Mariano (University of Connecticut) "Functional inequalities for hypoelliptic operators using coupling"
9. Daniele Cappelletti (University of Wisconsin-Madison) "Long-term behaviour of stochastic reaction networks"
10. Arturo Jaramillo (University of Kansas) "Asymptotic properties of the derivative of self-intersection local time of fractional Brownian motion"
11. Ruoyu Wu (Brown University) "The Large Deviation Principle for the Giant Component in Sparse Random Graph Models"
12. David Lipshutz (Brown University) "Pathwise differentiability of reflected diffusions"
13. Huanqun Jiang (Oregon State University) "Optimal barrier strategy of divident payment problem for spectrally negative Levy process discounted by a class of exponential Levy processes"
14. Jebessa Mijena (Georgia College State University) "Correlation structure of time-changed fractional Brownian motion"

CAFES AND RESTAURANTS (AN INCOMPLETE LIST)

Near Clark Hall		
Oakhurst Cafe	1616 Jefferson Park Ave	A good breakfast/lunch place; pretty good coffee; closes at 2 pm
The Corner (lots of options, most likely lunch locations)		
Bodo's Bagels	1609 University Ave	As suggested by the name, an excellent bagel place
Take It Away Sandwich Shop	115 Elliewood Ave	A highly recommended sandwich place
Two Guys Tacos	101 14th St NW	
Boylan Heights	102 14th St NW	Burgers
Revolutionary Soup	104 14th Street NW	A soup & sandwich shop, specializing in local and vegetarian food
Christian's Pizza	100 14th Street NW	One of the best pizzas in town! And open very late
Michael's Bistro	1427 University Ave	Slightly fancier, gastropub fare
Pigeon Hole	11 Elliewood Ave	Homestyle and breakfast food
Coffee on the corner		
Corner Joe	1325 West Main St Shop C	
Grit Coffee	19 Elliewood Ave	
Down Jefferson Park Avenue		
Fry's Spring Station	2115 Jefferson Park Ave	Fire-roasted pizza
Durty Nelly's	2200 Jefferson Park Ave	Deli sandwiches, bar
West Main Street		
Maya	633 West Main Street	American and some soul food
Orzo	416 West Main Street	Italian inspired in a trendy market
Public Fish and Oyster	513 W Main St	East Coast seafood, including a raw bar
Coffee on/near Downtown Mall		
Mudhouse	213 W Main St	
Milli Joe	400 Preston Ave #150	
Java	421 E Main St	
Belmont		
The Local	824 Hinton Avenue	Delicious, American style cuisine with a focus on local produce and meat
Tavola	826 Hinton Avenue	Up-scale, Italian food
Belmont BBQ	816 Hinton Avenue	A delicious BBQ place!
Mas	501 Monticello Road	Spanish Tapas

The Downtown Mall — pedestrian part of Main St (many more options than listed below)

- (**location of the banquet**) Himalayan Fusion — Indian and Nepalese food near the Downtown Pavilion.
- Citizen Burger Bar
- Commonwealth Restaurant and Skybar — New American
- Petit Pois — French restaurant with a fantastic outdoor seating area.
- Bizou — American food with a nice patio.
- Jack Brown's Beer & Burger Joint
- Red Pump Kitchen
- The Fitzroy
- The Alley Light
- Tastings
- Bang! Trendy, asian fusion served tapas style
- Mono Loco — Mexi-American reimagined
- Downtown Thai — Classic and tasty Thai food