UNIVERSITY OF SOUTH CAROLINA
College of Arts and Sciences

Math News

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Number Theory Seminar

Date & Time: Tuesday September 18th 11:00 AM
Location: LeConte 312
Speaker: Michael Filaseta, USC
Topic: 4959866698915122609810424451291 8
Information: This will be a seminar about Michael's new favorite number. Come and see why. This talk is on joint work with Sam Gross.

Applied and Computational Seminar

Date & Time: Tuesday September 18th 2:30-3:30 PM
Location: LeConte 312
Speaker: Xinli Wang, USC Upstate
Topic: Biased diffusion of Brownian Particles Confined by a Periodic Potential
Information: This work is motivated by novel separation strategies in microfluidic devices by taking advantage of the unprecedented control on geometry and chemistry of the stationary phase at scales that are comparable to the size of the transported species. Here we consider the transport of Brownian particles confined to a channel of periodically varying cross section, but the confinement is induced by a potential energy landscape instead of the solid boundaries of a channel. Asymptotic are mainly used to study two transport properties: average velocity and effective diffusivity in a narrow channel or weakly corrugated channel. The results show that leading order solution is equivalent to that obtained from the Fick-Jacobs approximation. Also higher order solutions are solved. The asymptotic results agree well with Brownian Dynamics simulations for transport properties over a wide a range of Peclet numbers.

Analysis Seminar

Date & Time: Wednesday September 19th 1:15-2:15 PM
Location: LeConte 312
Speaker: Steve Dilworth, USC
Topic: Uniform Quotients and Asymptotic Properties of Banach Spaces
Information: We review some of the known results in the uniform classification of Banach spaces and describe some new results on uniform quotients which make use of asymptotic properties of Banach spaces, especially asymptoic uniform smoothness and property beta, and their associated moduli.

Combinatorics Seminar

Date & Time: Wednesday September 19th 3:30-4:30 PM
Location: LeConte 312
Speaker: Linyuan Lu, USC
Information: Turán Problems on Non-uniform Hypergraphs Motivated by extremal poset problems, we will study the Turán problems on non-uniform hypergraphs. A (non-uniform) hypergraph *H* is a pair (*V*,*E*) with the vertex set *V* and the edge set $E \subseteq 2^V$ Here we have no restriction on the cardinalities of edges. The set $R(G) := \{|F| : F \in E\}$ is called the set of its edge types. For a non-uniform hypergraph *G* on *n* vertices, we define the Lubell function of *G* as $h(G) = \sum_{F \in E(G)} \frac{1}{\binom{n}{|F|}}$. For a given hypergraph *H*, we study the extremal hypergraphs with maximum Lubell values *h*(*G*) among all *H*-free hypergraphs *G* of the same edge types of *H*. (This a preliminary report, joint work with Travis Johnston.)

Algebra and Logic Seminar

Date & Time: Friday September 21st 3:30-4:30 PM
Location: LeConte 312
Speaker: William DeMeo, USC
Topic: The Finite Lattice Representation Problem and Intervals in Subgroup Lattices of Finite Groups
Information: A long-standing open problem in universal algebra is to characterize those lattices that are isomorphic to congruence lattices of finite algebras. Until this problem is resolved, our understanding of finite algebras is incomplete, since, given an arbitrary finite algebra, we cannot say whether there are a priori restrictions on the shape of its congruence lattice. If we find a finite lattice that does not occur as the congruence lattice of a finite algebra (as many suspect we will), then we can finally say that such restrictions exist. It has been shown that this problem is equivalent to the problem of characterizing those lattices that are intervals in subgroup lattices of finite groups. In this week's seminar, I will provide more background on both versions of the problem, and then describe some new approaches and recent progress.

Department Colloquium

Date & Time: Thursday October 4th 3:30 PM
Location: LeConte 412
Speaker: Steven Sam (Miller Fellow, Univ. of California at Berkeley)
Topic: The Combinatorics and Geometry of E_7
Information: Exceptional objects can be thought of as an accident in classification schemes, but often have a rich structure all to themselves. In this talk, we'll explore some of the combinatorics and geometry related to the exceptional object E_7 (its root system, Weyl group, Lie algebra, ...) which comes from the Cartan-Killing classification of simple Lie algebras. This object was studied by classical geometers long before this classification, and remains an object of interest today. We will discuss topics such as reflection arrangements, finite geometry, plane quartic curves, Kummer varieties, Vinberg's theta-representations, and toric geometry. The plan is to illustrate the beauty of this exceptional object in an accessible way.

Thank you for submitting information to be included in the weekly newsletter. Please keep your information coming! All information for the math newsletter should be sent to the Department by 10 AM on Monday of each week. Please e-mail it to ***sealeyt@mailbox.sc.edu***