Abstracts

Angel Chávez

"The Kontsevich-Suhov Loop Measures"

Werner has proven the existence and essential uniqueness of a conformally invariant family of measures on self-avoiding loops in Riemann surfaces. Kontsevich and Suhov have formulated a conjecture which asserts the existence of a deformation (parameterized by a real parameter c) of Werner's family. These deformed objects are positive measures having values in a real oriented (zeta determinant) line bundle. In this talk we will review the infinitesimal conformal invariance of Werner's measures and formulate its (conjectured) version for the Kontsevich-Suhov deformation.

"Half-Plane Capacity and Conformal Radius (Parts 1 and 2)"

Rohde and Wong have proven that the half-plane capacity of a subset of the upper-half plane is comparable to the euclidean area of the hyperbolic neighborhood of radius one of this set. This is achieved by showing a similar estimate for the conformal radius of a subdomain of the unit disk. Part 1 of this talk focuses on motivation and background. In part 2 we go through Rohde and Wong's proof of the estimate for the conformal radius.

"Werner's Measure on Self-Avoiding Loops and Welding"

Werner has proven the existence and essential uniqueness of a conformally invariant measure on self-avoiding loops in Riemann surfaces. This measure is determined by restricting to loops in the plane which surround the origin. Riemann's mapping theorem and conformal welding can be used to define a probability measure on coefficients of univalent holomorphic functions on the disk. In this talk I will discuss how one can compute moments of these coefficients using infinitesimal conformal invariance.

"Realizing Virasoro Verma Modules"

The Virasoro algebra is an infinite-dimensional Lie algebra widely used in conformal field theory. This talk will introduce the widely studied Virasoro Verma modules using the explicit geometric approach developed by Kirillov and Yuriev.

"Univalent Functions and their Coefficients"

Bieberbach's posed his famous conjecture about the coefficients of univalent functions in the disk in 1912. Very interesting mathematics was developed by Karl Loewner in hopes of proving the conjecture. Loewner never succeeded in giving a proof, but his ideas are now the cornerstone of SLE. In this talk I will describe how these seemingly different topics are related.

"Lie Groups (with Applications)"

I will give an elementary and brief introduction to the notion of a Lie group. I will provide several examples of Lie groups. Finally, I will conclude with some nice applications to physics.

"Moments of Coefficients of Univalent Functions on the Disk"

Werner has proven the existence and essential uniqueness of a conformally invariant measure on self-avoiding loops in Riemann surfaces. This measure is determined by restricting to loops in the plane which surround the origin. Riemann's mapping theorem can be used to define a probability measure on coefficients of univalent holomorphic functions on the disk. In this talk, I will give a progress report on a method for computing the moments of these coefficients.

"An Interesting Lie Algebra"

In this talk I will discuss some representation theory of a certain infinite-dimensional Lie algebra called the Virasoro algebra. This Lie algebra has practical applications in physics which, time permitting, I will introduce.

"Conformal Welding"

In this talk I will introduce the notion of a conformal welding, which is a type of factorization for a homeomorphism of the circle. Enjoy a bagel or two will I provide some illuminating examples (and non-examples) of conformal weldings.

"The Tropical Grassmannian"

Tropical geometry is a blend of algebraic and polyhedral geometry. Interestingly, several classical notions from algebraic geometry have tropical-geometric counterparts. This talk introduces the tropical version of the classical Grassmannian, the tropical Grassmannian.

"Tropical Geometry"

Tropical geometry is a blend of algebraic and polyhedral geometry. This talk will present known methods of transforming an algebraic variety into its tropical counterpart. Examples will be emphasized.

"Charmless B Decays to $b_1\rho$ Final States"

We present results of a search for B-meson decays to a b_1 meson in combination with a vector meson $\rho \to \pi\pi$ or $K^* \to K\pi$. The analysis was performed on a data sample consisting of 465×10^{-6} $B\overline{B}$ pairs collected $BaBar$ detector at the PEP-II asymmetric energy B factory at SLAC.