Schedule

Events for:
Monday, March 2nd - Friday, March 6th

Monday, March 2nd

8:30am **Breakfast and Registration - SCGP Cafe**

9:45am **Steffen Rohde - SCGP 102**

Speaker: Steffen Rohde

Title: Conformal welding in probability and dynamics

Abstract: Conformal welding is the process of glueing two Riemann surfaces along their boundaries to obtain a new surface with additional structure. I will discuss some results and open questions related to conformal welding, both in the deterministic and the probabilistic setting.

11:00am **Silvia Ghinassi - SCGP 102**

Speaker: Silvia Ghinassi

Title: Bishop-Jones' square functions and higher order rectifiability

Abstract: We will discuss sufficient conditions for higher order rectifiability of sets and measures. On the way we obtain sufficient conditions for a Reifenberg flat set to be parametrized by a Lipschitz map with Hölder derivatives. Finally, we will provide an example to show that the conditions are in fact not necessary.

11:30am **Lunch - SCGP Cafe**

1:20pm **Russell Lyons - SCGP 102**

Speaker: Russell Lyons

Title: Random Walks on Dyadic Lattice Graphs and Their Duals

Abstract: We will discuss recent work that has several surprising connections to our honoree, Chris Bishop. Dyadic lattice graphs and their duals are commonly used as discrete approximations to the hyperbolic plane. We use them to give examples of random rooted graphs that are stationary for simple random walk, but whose duals have only a singular stationary measure. This answers a question of Curien and shows behaviour different from the unimodular case. The consequence is that planar duality does not combine well with stationary random graphs. We also study harmonic measure on dyadic lattice graphs and show its singularity. Much interesting behaviour observed numerically remains to be explained. No background will be assumed for the talk. This is joint work with Graham White

2:20pm **Ten Minute Break**

2:30pm **Yilin Wang - SCGP 102**

Speaker: Yilin Wang

Title: The duality of Loewner energy and foliations by Weil-Petersson quasicircles

Abstract: TThe Loewner energy is the large deviation rate function of SLE_0+ and a Jordan curve has finite Loewner energy if and only if it is a Weil-Petersson quasicircle. The dual Loewner energy, introduced in a recent joint work with Morris Ang and Minjae Park (MIT), is the large deviation rate function of SLE_infinity. In this talk, I will present the duality between these two energies via foliations of the Riemann sphere by Weil-Petersson quasicircles. This is an upcoming joint work with Fredrik Viklund (KTH).

3:30pm **Tea Time - SCGP Lobby**

4:00pm **Simons Lectures: Stanislav Smirnov - SCGP 103**

Speaker: Stanislav Smirnov

Title: 2D percolation revisited Part 1

Abstract: Percolation is a mathematical model for the filtering of a liquid through a porous material or the spread of a forest fire or an epidemic: the edges of some graph are declared open or closed depending on independent coin tosses, and then connected open clusters are studied. While simple to define, this model exhibits very complicated behavior, with non-trivial scaling exponents and dimensions. Centering on the 2D setting, we will discuss simple proofs of some important theorems, connection of percolation to other models, as well as remaining open questions.In the first lecture, we will review the definition of the model, describe its properties and relation to other models, such as the Ising model of a ferromagnet. We will also give new short proofs of some important facts, such as the sharpness of phase transition — roughly speaking, if one increases proportion of open edges beyond some "critical value", the liquid suddenly starts percolating everywhere. In the second lecture, we will discuss the phenomenon of conformal invariance, which occurs at criticality. It allows to connect percolation scaling limit to the Oded Schramm's SLE process and establish exact values of various dimensions and exponents, rigorously proving predictions from Conformal Field Theory. We will also present a short version of the conformal invariance proof, based on joint work with Mikhail Khristoforov. In the third lecture, we will tell how a reaction-diffusion process in biological context leads to a rather surprising appearance of percolation and Ising-like colorings of the skin of Mediterranean lizards. The three lectures can be attended independently. Much of contents is accessible to advanced undergraduate students.

Tuesday, March 3rd

8:00am **Breakfast - SCGP Cafe**

9:00am **Xavier Tolsa - SCGP 102**

Speaker: Xavier Tolsa

Title: The ε^2-conjecture of Carleson

Abstract: In this talk I will explain a recent result obtained in collaboration with Ben Jaye and Michele Villa where we prove the so called ε^2-conjecture of Carleson. This result yields a characterization (up to sets of zero length) of the tangent points of a Jordan curve in the plane in terms of the finiteness of the associated Carleson's ε^2-function. The proof is based on blowup methods and techniques of quantitative rectifiability.

10:00am **Coffee Break - SCGP Cafe**

10:30am **Svitlana Mayboroda - SCGP 102**

Speaker: Svitlana Mayboroda

Title: Harmonic measure for domains with a high co-dimensional boundary I

11:30am **Lunch and Poster Session - SCGP Cafe - Poster Sessions in lower Lobby**

11:30am **Poster Session 1 - SCGP Cafe,**

Speaker: Jack Burkart on **Julia sets of transcendental entire functions with fractional packing dimensions**

Due to the work of Baker, along with explicit examples from McMullen, Stallard, and Bishop, it is known that the Julia sets of transcendental (non-polynomial) entire functions can have any value of Hausdorff dimension in $[1,2]$. What about other notions of dimension? If one instead considers packing dimension, a modified version of the Minkowski or box counting dimension, less is known. Bishop's example above has Julia set with packing dimension equal to 1, but all other computed packing dimensions are equal to 2. In my thesis, I partially fill in this gap by constructing explicit examples whose Julia sets have packing dimensions that form a dense subset of $[1,2]$. In this poster, I will outline how these examples are constructed.

Speaker: Christina Karafyllia on **Conformal invariants and membership of conformal maps in Hardy spaces**

A classical problem in geometric function theory is to find the Hardy number of a region by looking at its geometric properties. Poggi-Corradini gave necessary and sufficient conditions for conformal maps to belong to some Hardy space by studying the harmonic measure in the image region. Answering a question he posed in 1996, we also prove a necessary and sufficient integral condition for whether a conformal map of the unit disk belongs to some Hardy space by studying the hyperbolic metric in its image region. Moreover, in 2011 Kim and Sugawa proved a formula of computing the Hardy number of a simply connected domain in terms of harmonic measure. We also establish a limit formula of computing the Hardy number by studying the hyperbolic distance in the simply connected domain.

Speaker: Tania Gricel on **Julia continua of transcendental entire functions**

Recently Rempe-Gillen gave an almost complete description of the possible topology of the Julia continua of disjoint-type functions. In particular, he constructed a function where all Julia continua are pseudo-arcs, however this arises as a special case of a more general construction.
In this poster, we discuss how to construct a disjoint-type function such that all Julia continua are pseudo-arcs using a different technique which is more explicit, and as a result we obtain better control over the lower order of growth of the function.

Speaker: Leticia Pardo-Simon on **Entire functions whose maximum modulus set has prescribed discontinuities**

In 1909, Hardy gave an example of a transcendental entire function f so that the set of points where f achieves its maximum modulus, M(f), has infinitely many discontinuities. This is one of only two known examples of such a function. We significantly generalize these examples. In particular, we show that given an increasing sequence of positive real numbers tending to infinity, there is a transcendental entire function, f, such that M(f) has discontinuities with moduli at all these values. This is joint work with Dave Sixsmith.

11:31am **Poster Session 2 - SCGP Cafe,**

Speaker: Bruno Poggi on **Carleson perturbations of elliptic operators on domains with higher-codimensional boundaries**

We prove an analogue of a perturbation result for the Dirichlet problem of divergence form elliptic operators by Fefferman, Kenig and Pipher, for the degenerate
elliptic operators of David, Feneuil and Mayboroda, which were developed to study geometric and analytic properties of sets with boundaries whose co-dimension is higher than 1. These operators are of the form $?\operatorname{div}A\nabla$, where $A is a degenerate elliptic matrix carefully crafted to weigh the distance to the high co-dimension boundary in a way that allows the nourishment of an elliptic theory. When this boundary is a d?Alhfors-David regular set, we prove that the membership of the harmonic measure in A_{∞} is preserved under suitably small Carleson-measure perturbations of the degenerate elliptic matrix A, yielding in turn that the L_p?solvability of the Dirichlet problem is also stable under these perturbations (with possibly different p). The method of proof follows an analogue of the extrapolation technique of Hofmann and Martell applied to divergence form elliptic operators, and the use of projection operators to sawtooth domains.This is joint work with Svitlana Mayboroda.

Speaker: James Waterman on **Wiman-Valiron discs and the Hausdorff dimension of Julia sets of meromorphic functions.**

The Hausdorff dimension of the Julia set of transcendental entire and meromorphic functions has been widely studied. We review results concerning the Hausdorff dimension of these sets starting with those of Baker in 1975 and continuing to recent work of Bishop. In particular, Baranski, Karpinska, and Zdunik proved that the Hausdorff dimension of the set of points of bounded orbit in the Julia set of a meromorphic function with a particular type of domain called a logarithmic tract is greater than one. We discuss generalizing this result to meromorphic maps with a simply connected direct tract and certain restrictions on the singular values of these maps. In order to accomplish this, we develop tools from Wiman-Valiron theory, showing that some tracts contain a dramatically larger disk about maximum modulus points than previously known.

Speaker: Aron Wennman on **The emergence of quadrature domains on the hole event for Gaussian random zeros.**

The poster concerns the zero distribution of the planar Gaussian Entire Function, conditioned on the event that the zero set does not intersect a given domain. On this event, there is an accumulation of zeros on the boundary of the hole, but (surprisingly) they tend to avoid a larger forbidden region outside the hole.
In ongoing work with Alon Nishry, we study this problem, in particular the shape of the forbidden region. We find a curious connection to quadrature domains — a specific class of algebraic domains, which can be thought of as potential theoretic sums of disks.

1:20pm **Guy David - SCGP 103**

Speaker: Guy David Title : Harmonic measure for domains with a high co-dimensional boundary II Abstract. This lecture is seen as a complement of S. Mayboroda's, but I'll try to make it largely independent. The there is a study that we started with M. Engelstein, J. Feneuil, and S. Mayboroda, concerning the relation between the geometry of a domain Ω and the absolute continuity of harmonic measures when the boundary Γ is Ahlfors regular of some dimension $d n-1$. This forces us to use (slightly degenerate) elliptic operators other than the Laplacian. We claim A_∞-absolute continuity with the Hausdorff measure when Γ is uniformly rectifiable; for the converse we are currently trying to find other conditions that absolute continuity that are related to rectifiability.

2:20pm **Ten Minute Break**

2:30pm **Simons Lecture: Stanislav Smirnov - SCGP 103**

Speaker: Stanislav Smirnov

Title: 2D percolation revisited Part 2

Abstract: Percolation is a mathematical model for the filtering of a liquid through a porous material or the spread of a forest fire or an epidemic: the edges of some graph are declared open or closed depending on independent coin tosses, and then connected open clusters are studied. While simple to define, this model exhibits very complicated behavior, with non-trivial scaling exponents and dimensions. Centering on the 2D setting, we will discuss simple proofs of some important theorems, connection of percolation to other models, as well as remaining open questions.In the first lecture, we will review the definition of the model, describe its properties and relation to other models, such as the Ising model of a ferromagnet. We will also give new short proofs of some important facts, such as the sharpness of phase transition — roughly speaking, if one increases proportion of open edges beyond some "critical value", the liquid suddenly starts percolating everywhere. In the second lecture, we will discuss the phenomenon of conformal invariance, which occurs at criticality. It allows to connect percolation scaling limit to the Oded Schramm's SLE process and establish exact values of various dimensions and exponents, rigorously proving predictions from Conformal Field Theory. We will also present a short version of the conformal invariance proof, based on joint work with Mikhail Khristoforov. In the third lecture, we will tell how a reaction-diffusion process in biological context leads to a rather surprising appearance of percolation and Ising-like colorings of the skin of Mediterranean lizards. The three lectures can be attended independently. Much of contents is accessible to advanced undergraduate students.

3:30pm **Tea Time - SCGP Lobby**

4:00pm **Tatiana Toro - SCGP 103**

Speaker: Tatiana Toro

Title: Elliptic measure and the geometry of domains in Euclidean space

Abstract: In this talk we will discuss the correspondence between the properties of the solutions of a class of PDEs and the geometry of sets in Euclidean space. In particular we will examine the relationship between the behavior of the elliptic measure of a certain class divergence form uniformly elliptic operators on a domain and the structure of its boundary. This work mixes elements of geometric measure theory, free boundary regularity problems and harmonic analysis.

Wednesday, March 4th

8:00am **Breakfast - SCGP Cafe**

9:00am **Assaf Naor - SCGP 102**

Speaker: Assaf Naor

Title: A new decomposition of surfaces in the Heisenberg group.

Abstract: The main new theorem (forthcoming joint work with Robert Young) that we will present in this talk is that the L_4 norm of the vertical perimeter of any measurable subset of the 3-dimensional Heisenberg group H is at most a universal constant multiple of its perimeter. This isoperimetric inequality is optimal, and its proof uncovers the following structural description of surfaces in H: They admit a multi-scale hierarchical decomposition into pieces that are close to ruled surfaces; these pieces can be long and narrow, sometimes giving the decomposition the appearance of a Venetian blind, with many narrow slats. Consequences include solutions of several longstanding questions in metric geometry.

10:00am **Coffee Break - SCGP Cafe,**

10:30am **Jeremy Tyson - SCGP 102**

Speaker: Jeremy Tyson

Title: Densities of measures, tubular neighborhoods, and heat content in the Heisenberg group

Abstract: I will discuss several recent results in geometric measure theory, metric geometry and analysis in the sub-Riemannian Heisenberg group, specifically, Marstrand and Preiss Density Theorems for the Korányi metric, a classification of uniform measures in the first Heisenberg group, and volumes of tubular Carnot-Carathéodory neighborhoods and heat content asymptotics for smoothly bounded domains with noncharacteristic boundary. A unifying theme in these results is the role of the intrinsically sub-Riemannian differential geometry of curves and surfaces in the metric and analytic properties of measures and domains.

11:30am **Lunch and Poster Session - SCGP Cafe,**

1:20pm **Adi Glucksam - SCGP 103**

Speaker: Adi Glucksam

Title: Stationary random entire functions and related questions.

Abstract: Let T be the action of the complex plain on the space of entire functions defined by translations, i.e T_w takes the entire function f(z) to the entire function f(z+w). B.Weiss showed in `97 that there exists a probability measure defined on the space of entire functions, which is invariant under this action. In this talk I will present (almost) optimal bounds on the minimal possible growth of functions in the support of such measures, and discuss other growth related problems inspired by this work. In particular, I will focus on the question of minimal possible growth of frequently oscillating subharmonic functions, a project inspired by Chris. The talk is partly based on a joint work with L. Buhovsky, A.Logunov, and M. Sodin.

1:50pm **Angela Wu - SCGP 102**

Speaker: Angela Wu

Title: Weak Tangents of Metric Spaces

Abstract: A weak tangent of a metric space is the limiting metric space when one zooms in to a metric space. One would wonder how the weak tangents of a metric space is related to the original metric space. In this talk, we explore some of these relationships. We are especially interested in the conformal gauge of weak tangents, i.e. the equivalence classes of weak tangents under quasisymmetry, and their relationships with the conformal gauge of the original class.

2:20pm **Ten Minute Break**

2:30pm **Simons Lecture: Stanislav Smirnov - SCGP 103,**

Speaker: Stanislav Smirnov

Title: 2D percolation revisited Part 3

Abstract: Percolation is a mathematical model for the filtering of a liquid through a porous material or the spread of a forest fire or an epidemic: the edges of some graph are declared open or closed depending on independent coin tosses, and then connected open clusters are studied. While simple to define, this model exhibits very complicated behavior, with non-trivial scaling exponents and dimensions. Centering on the 2D setting, we will discuss simple proofs of some important theorems, connection of percolation to other models, as well as remaining open questions.In the first lecture, we will review the definition of the model, describe its properties and relation to other models, such as the Ising model of a ferromagnet. We will also give new short proofs of some important facts, such as the sharpness of phase transition — roughly speaking, if one increases proportion of open edges beyond some "critical value", the liquid suddenly starts percolating everywhere. In the second lecture, we will discuss the phenomenon of conformal invariance, which occurs at criticality. It allows to connect percolation scaling limit to the Oded Schramm's SLE process and establish exact values of various dimensions and exponents, rigorously proving predictions from Conformal Field Theory. We will also present a short version of the conformal invariance proof, based on joint work with Mikhail Khristoforov. In the third lecture, we will tell how a reaction-diffusion process in biological context leads to a rather surprising appearance of percolation and Ising-like colorings of the skin of Mediterranean lizards. The three lectures can be attended independently. Much of contents is accessible to advanced undergraduate students.

3:30pm **Tea Time - SCGP Lobby**

4:00pm **Mario Bonk - SCGP 103**

Speaker: Mario Bonk

Title: Fractals and the dynamics of Thurston maps

Abstract: A Thurston map is a branched covering map on a topological 2-sphere for which the forward orbit of each critical point under iteration is finite. Each such map gives rise to a fractal geometry on its underlying 2-sphere. The study of these maps and their associated fractal structures links diverse areas of mathematics such as dynamical systems, classical conformal analysis, hyperbolic geometry, Teichmüller theory, and analysis on metric spaces. In my talk I will report on some recent developments and open problems in this area.

Thursday, March 5th

8:00am **Breakfast - SCGP Cafe**

9:00am **Lasse Rempe-Gillen - SCGP 102**

Speaker: Lasse Rempe-Gillen

Title: Constructing Riemann surfaces from equilateral triangles

Abstract: We consider the following question. Suppose that a (finite or infinite) collection of equilateral triangles are glued together in such a way that each edge is identified with precisely one other edge, and each vertex is identified with only finitely many other vertices. If the resulting surface is connected and orientable, it naturally has the structure of a Riemann surface, i.e., a one-dimensional complex manifold. We ask which surfaces can arise in this fashion. The answer in the compact case is given by a famous classical theorem of Belyi, which states that a compact surface can arise from this construction if and only if it is defined over a number field. These Belyi surfaces and their associated "dessins d'enfants" have found applications across many fields of mathematics, including mathematical physics. In joint work with Chris Bishop, we give a complete answer of the same question for the case of infinitely many triangles (i.e., for non-compact Riemann surfaces).

10:00am **Coffee Break - SCGP Cafe,**

10:30am **Nuria Fagella - SCGP 102**

Speaker: Nuria Fagella

Title: Wandering domains in and out.

Abstract: In dynamics of holomorphic maps a wandering domain is a component of the normality set whose iterates never meet. In this talk we describe the dynamics of orbits inside simply connected wandering domains, in terms of their contracting properties or the convergence of orbits to the boundary. We relate this classification to the presence of singular orbits following the wandering components. Our results are related to non-autonomous holomorphic dynamical systems on the unit disk.

11:30am **Lunch and Poster Session - SCGP Cafe,**

1:20pm **Kari Astala - SCGP 102**

Speaker: Kari Astala

Title: Random tilings, Dimer models and Beltrami equation: Universality in geometry of frozen boundaries.

2:20pm **Ten Minute Break**

2:30pm **David Marti-Pete - SCGP 102**

Speaker: David Marti-Pete

Title: Constructing entire functions with wandering domains by a quasiconformal modification

Abstract: In 2015 Christopher Bishop constructed the first example of a bounded-type transcendental entire function with a wandering domain using a revolutionary new technique called quasiconfomal folding. It is easy to check that his method produces a function of infinite order. In a joint work with Mitsuhiro Shishikura, we constructed the first examples of functions in the Eremenko-Lyubich class of finite order with wandering domains. In Bishop's example, as well as in our construction, the wandering domains are of oscillating type, that is, with an unbounded non-escaping orbit. Our examples have order p/2 for any positive integer p and thus, since functions in the class B have order at least 1/2, we can achieve the smallest possible order. To build such functions, we performed a quasiconformal modification of the hyperbolic cosine map. In a work in progress with David Sixsmith, we also use this technique to construct transcendental entire functions with simply connected fast escaping wandering domains.

3:00pm **Vasiliki Evdoridou - SCGP 102**

Speaker: Vasiliki Evdoridou

Title: Constructing examples of simply connected wandering domains

3:30pm **Tea Time - SCGP Lobby**

4:00pm **SCGP-Math Colloquium: Scott Sheffield - SCGP 103**

Speaker: Scott Sheffield

Title: Laplacian determinants and random surfaces

Abstract: The Laplacian on a compact surface is an operator on the set of functions on that surface. It is has infinitely many non-zero eigenvalues, and the product of these eigenvalues is infinity. Nonetheless, the classical "zeta-regularization" provides a natural way to make sense of the "determinant" of the Laplacian operator. What is the geometric meaning of this "determinant"? What is the probabilistic or statistical physical meaning? How is it related to canonical random surfaces, like the so-called "Liouville quantum gravity" surfaces? How about heat kernels, Brownian motion, and the random collection of loops known as the "Brownian loop soup"? I will argue that these are natural questions spanning analysis, geometry, physics, and probability. And I will try to provide some answers. Using an appropriate regularization, we find that the "Brownian loop soup" of intensity c has a partition function described by the (-c/2)th power of the determinant of the Laplacian. In a certain sense, this means that decorating a random surface by a "Brownian loop soup" of intensity c corresponds to weighting the law of the surface by the (-c/2)th power of the determinant of the Laplacian. I will then introduce a method of regularizing a unit area "Liouville quantum gravity" sphere, and show that weighting the law of this random surface by the (-c'/2)th power of the Laplacian determinant has precisely the effect of changing a certain parameter that indicates the "roughness" of the surface. Taken together with the earlier results, this provides a way of interpreting LQG surfaces of general roughness parameters: they can all be obtained by starting with the simplest random surface and then decorating with Brownian loop soups. This is based on joint work with Morris Ang, Minjae Park, and Joshua Pfeffer.

Friday, March 6th

8:00am **Breakfast - SCGP Cafe**

9:00am **Mikhail Sodin - SCGP 102**

Speaker: Mikhail Sodin

Title: Random and pseudo-random Taylor series

10:00am **Coffee Break - SCGP Cafe,**

10:30am **Aleksandr Logunov - SCGP 102**

Speaker: Aleksandr Logunov

Title: Geometry of nodal sets of Laplace eigenfunctions

Abstract: We will discuss geometrical and analytic properties of zero sets of harmonic functions and eigenfunctions of the Laplace operator. For harmonic functions on the plane there is an interesting relation between local length of the zero set and the growth of harmonic functions. The larger the zero set is, the faster the growth of harmonic function should be and vice versa. Zero sets of Laplace eigenfunctions on surfaces are unions of smooth curves with equiangular intersections. Topology of the zero set could be quite complicated, but Yau conjectured that the total length of the zero set is comparable to the square root of the eigenvalue for all eigenfunctions. We will start with open questions about spherical harmonics and explain some methods to study nodal sets, which are zero sets of solutions of elliptic PDE.

11:30am **Lunch - SCGP Cafe,**

1:20pm **Joseph Mitchell - SCGP 102**

Speaker: Joseph Mitchell

Title: Approximation of Geometric Structures to Facilitate Optimization: A Computational Geometer's Perspective

2:20pm **Ten Minute Break**

2:30pm **Dimitrios Ntalampekos - SCGP 102**

Speaker: Dimitrios Ntalampekos

Title: Removability of fractal sets for conformal maps

Abstract: The problem of removability of a set, in general, asks whether one can glue functions of a given class along that set and obtain a function lying in the same class. In particular, removability of sets for the class of conformal maps has applications in Complex Dynamics, in Conformal Welding, and in other problems that require gluing of functions. We, therefore, seek geometric conditions on sets that guarantee their removability. In this talk, I will describe my work on the (non)removability of fractal sets with infinitely many complementary components, such as the Sierpinski gasket and Sierpinski carpets.

3:00pm **Kirill Lazebnik - SCGP 102**

Speaker: Kirill Lazebnik

Title: Univalent Polynomials and Hubbard Trees

Abstract: We study the coefficient region for a family of ``external" polynomials $\Sigma_d^*$ univalent in the external unit disc. We discuss a ``pinching" method for producing extremal points in the class Σ_d^*. We also discuss connections between the class Σ_d^* and (1) parameter spaces of certain reflection groups, and (2) anti-holomorphic polynomials having a maximal number of fixed points. This is joint work with Nikolai Makarov and Sabyasachi Mukherjee.

3:30pm **Tea Time - SCGP Lobby**

4:00pm **Yair Minsky - SCGP 102**

Speaker: Yair Minsky

Title: Fibered 3-manifolds and Weil-Petersson geometry

Abstract: When a 3-manifold fibers over the circle it often does so in infinitely many ways, and this gives a kind of laboratory for studying Teichmuller spaces and mapping class groups in many surfaces at once. Farb-Leininger-Margalit proved an influential theorem showing that fibered 3-manifolds organize the mapping classes of "short" Teichmuller translation length in all genera. We prove an analogous theorem for Weil-Petersson translation length. The proof uses recent theorems on renormalized volume as well as good old fashioned 3-manifold topology from the 1980s. Joint work with Leininger, Souto and Taylor. Form: Chalk