

Geometrisen analyysin seminaari

Geometrisen analyysin seminaari, 2017-2018

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Seminaari kokoontuu lukuvuonna 2017-18 pääsääntöisesti **tiistaisin kello 14-16 salissa C124**.
Aiheet vaihtelevat puhujista riippuen.

TERVETULOA!

Seuraavat esitelmät, Next talks

27.3.2018 klo 14-15 **C124**

Andrea Pinamonti (University of Trento):

"Maximal directional derivatives and universal differentiability sets in Carnot groups"

Abstract: Rademacher's theorem asserts that Lipschitz functions from \mathbb{R}^n to \mathbb{R}^m are differentiable almost everywhere. Such a theorem may not be sharp: if $n > 1$ then there exists a Lebesgue null set N in \mathbb{R}^n containing a point of differentiability for every Lipschitz mapping $f: \mathbb{R}^n \rightarrow \mathbb{R}^m$. Such sets are called universal differentiability sets and their construction relies on the fact that existence of an (almost) maximal directional derivative implies differentiability. We will see that maximality of directional derivatives implies differentiability in all Carnot groups where the Carnot–Carathéodory distance is suitably differentiable, which include all step 2 Carnot groups (in particular the Heisenberg group). Further, one may construct a measure zero universal differentiability set in any step 2 Carnot group. We will observe that in the Engel group, a Carnot group of step 3, things can go badly wrong. We will conclude with some recent results for higher step Carnot groups. Based on joint works with Enrico Le Donne and Gareth Speight.

Kevään 2018 esitelmää

20.3.2018 klo 14-16 **C124 (joint with Inverse Problems seminar)**

Hiroshi Isozaki (University of Tsukuba):

"Inverse scattering on graphen - vertex model and edge model".

13.3.2018 klo 14-16 **C124**

Jussi Väisälä:

"Konveksin etäisyyden avaruudet"

Tiivistelmä: Konveksin etäisyyden avaruus on pari (E, K) , missä E on vektoriavaruus, $2 \leq \dim E = n < \infty$ ja $K \subseteq E$:n kompakti konvekssi osajoukko, joka sisältää origon sisäpisteinä. K määrittelee E :n pisteille x, y etäisyyden $d(x, y)$, jolloin K on suljettu yksikkökuula $\{x: d(0, x) \leq 1\}$. Jos $K = -K$, niin ehto $|x| = d(0, x)$ määrittelee avaruuteen normin, mutta yleisessä tapauksessa ei tarvitse olla $d(x, y) = d(y, x)$, joten d ei yleensä ole metriikka.

Käsittelen näiden avaruuksien geometriaa, lähinnä dimensioissa 2 ja 3.

13.2.2018 klo 14-16 **C124**

Eleferios Soultanis (SISSA):

"Notions of homotopy for Sobolev maps between manifolds"

Abstract: Sobolev maps between manifolds need not be continuous. Nevertheless there is a notion of homotopy between them, due to B. White, based on the fact that the restriction of a Sobolev map to a generic lower dimensional skeleton of the manifold is continuous. This notion is well suited for variational problems in Sobolev spaces of maps between manifolds but does not generalize to a metric space setting. An approach based on quasicontinuity properties of Newton-Sobolev maps between metric spaces suggests another notion, quasihomotopy, which is useful for variational problems in Newton-Sobolev spaces, with nonpositively curved targets. In this talk I compare these notions in the setting of Riemannian manifolds, with and without nonpositive curvature assumptions on the target manifold.

Tiistai 16.1.2018 klo 14-16 **C124**

14-15 **Juan Souto** (Université de Rennes I)

"A remark about critical sets in \mathbb{R}^3 "

Abstract: I will explain a necessary condition for a closed subset of \mathbb{R}^3 to be the set of critical points of some smooth function. This proves in particular that the Whitehead continuum is not such a critical set.

15-16 **Eino Rossi** (Universidad Torcuato Di Tella, Buenos Aires)

"Hölder coverings of sets of small dimension"

Abstract: We study when a subset of an euclidean space can be covered by a graph of a function from a linear subspace to its orthogonal complement. We obtain, that when the box dimension of the set is small enough, then for almost every direction there exists a cover by a Höldercontinuous function. As a corollary we obtain that doubling measures can charge Hölder graphs, answering a question raised by Ojala and Rajala. Further we investigate the dimension of the set of the exceptional directions where a cover by a Hölder graph was not possible and obtain sharp bounds. For a specific class of sets, called homogenous sets, we find coverings by Lipschitz graphs.

Syksyn 2017 esitelmiä

Tiistai 19.12.2017 klo 14-16 **C124**

Séverine Rigot (Université Nice Sophia Antipolis)

Abstract: The Besicovitch covering property (BCP) originates from works of Besicovitch about differentiation of measures. It can more generally be used as a usefull tool to deduce global properties of a metric space from local ones. We will discuss in this talk the validity or non validity of the Besicovitch covering property on graded groups equipped with homogeneous distances. We will first give a characterization of graded groups that admit homogeneous distances for which BCP holds (joint work with E. Le Donne). We will next focus on the Heisenberg group and describe a large class of homogeneous distances satisfying BCP on this stratified group (joint work with S. Nicolussi Golo).

Tiistai 28.11.2017 klo 14-16 **C124**

Changhao Chen (Sydney)

"Fourier transforms of measures and discrete Fourier analysis"

Tiistai 24.10. 2017 klo 14-16 **C124**

Yusuke Okuyama (Kyoto)

"On the continuity problem of a potential of the bifurcation measure of a degenerating meromorphic family of rational functions"

Abstract: We study the potentials of the bifurcation measure of a family f_t of rational functions of degree $d > 1$ on the Riemann sphere whose $2d-2$ coefficients are holomorphic functions on the punctured open unit disk $\{0 < |t| < 1\}$ in the complex plane and extend meromorphically to $\{|t| < 1\}$. The problem whether the (canonical) potential of this measure having the order $o(\log|t|)$ around the puncture $t=0$ always extends continuously to $\{|t| < 1\}$ arises in the study of "special curves" in the moduli space of rational functions. In this talk, we see that this continuity is not necessarily the case. This is a joint work with Laura DeMarco (Northwestern University).

Tiistai 10.10. 2017 klo 14-16 **C124**,

Jean-Baptiste Casteras (Universite libre de Bruxelles)

"Stability of ground state and renormalized solutions to a fourth order Schrödinger equation"

Abstract: In this talk, we will be interested in standing wave solutions to a fourth order nonlinear Schrödinger equation having second and fourth order dispersion terms. This kind of equation naturally appears in nonlinear optics. In a first time, we will establish the existence of ground-state and renormalized solutions. We will then be interested in their qualitative properties, in particular their stability. Joint works with Denis Bonheure, Ederson Moreira Dos Santos, Tianxiang Gou, Louis Jeanjean and Robson Nascimento.

Maanantai 9.10. 2017 klo 16.15 - 17.15 **C124, (note the time!)**

Urs Lang (ETH Zurich)

"Higher rank hyperbolicity in spaces of non-positive curvature"

Abstract: The large scale geometry of Gromov hyperbolic metric spaces exhibits many distinctive features, such as the stability of quasi-geodesics (the Morse Lemma), the linear isoperimetric filling inequality for 1-cycles, the visibility property, and the homeomorphism between visual boundaries induced by a quasi-isometry. After briefly reviewing these properties, I will describe a number of closely analogous results for spaces of rank $n > 1$ in an asymptotic sense, under some weak assumptions reminiscent of non-positive curvature. A central role is played by a suitable notion of n -dimensional quasi-minimizing surfaces of polynomial growth of order n , which serve as a substitute for quasi-geodesics.

Torstai 5.10. 2017 klo 12-14 **C124, (joint with Functional Analysis seminar)**

Alberto Setti (Universita degli Studi dell'Insubria)

"Stochastic properties of manifolds with boundary and localized geometric conditions"

Abstract: We shed a new light on the L^1 -Liouville property for positive, superharmonic functions by providing many evidences that its validity relies on geometric conditions localized on large enough portions of the space. We also present examples in any dimension showing that the L^1 -Liouville property is strictly weaker than the stochastic completeness of the manifold. The main tool in our investigation is represented by the potential theory of a manifold with boundary subject to Dirichlet boundary conditions.

Tiistai 26.9. 2017 klo 14-16 **C124**

Antti Rasila (Aalto)

"On Gromov hyperbolicity and inner uniformity"

Tiistai 19.9. 2017 klo 14-16 **C124**

Esko Heinonen

"Existence and non-existence results for minimal graphic and p -harmonic functions"

Abstract: In the Euclidean space, by the celebrated result due to Bombieri, De Giorgi, and Miranda, all positive entire solutions of the minimal graph equation are constant. It turns out that on Riemannian manifolds similar results can be obtained for solutions with at most linear growth if the manifold has only one end and asymptotically non-negative sectional curvature. In this talk I will discuss about recent results concerning the existence and non-existence of entire minimal graphic and p -harmonic functions. Talk is based on joint work with Jean-Baptiste Casteras and Ilkka Holopainen.

Tiistai 12.9. 2017 klo 14-16 **C124**

Sirkka-Liisa Eriksson

Tiistai 5.9. 2017 klo 14-16 **C124**

Ilmari Kangasniemi

"Cohomological behavior of uniformly quasiregular mappings"

Kevään 2017 esitelmää

Tiistai 26.6. 2017 klo 14-16 **C124**

Herve Queffelec (Lille)

"To which extent can a weight improve the behavior of singular numbers of a given composition operator?"

Keskiviikko 24.5. 2017 klo 14-16 **C124 (Huom. poikkeuksellinen päivä)**

Bruno Franchi (Bologna)

"Differential forms in Carnot groups"

Tiistai 9.5. 2017 klo 14-16 **C124**

Fredrik Ekström

"Hausdorff dimension of random limsup sets"

Abstract: A random limsup set consists of the points that are covered infinitely often by a sequence of random subsets of some space, for example random translates of a sequence of subsets of the torus or balls in a metric space whose centres are chosen randomly. I will talk about the almost sure value of the Hausdorff dimension of the limsup set in various situations.

Tiistai 25.4. 2017 klo 14-16 **C124**

Daniel Meyer (Liverpool)

Thurston maps, visual metrics, and Lattes maps

Abstract: In this talk I will give an introduction to recently completed joint work with Mario Bonk. A Thurston map is a branched covering map of the S^2 -sphere that has the property that every critical point has a finite orbit. These maps appear in Thurston's celebrated characterization of rational maps. Roughly speaking this theorem answers the question when a Thurston map is "equivalent" to a rational map. We often assume that a Thurston map f is expanding in a suitable sense. In this case one may define a "visual metric". The sphere equipped with such a metric is called the "visual sphere" of f . It is quasimetric to the standard S^2 -sphere if and only if the corresponding map is conjugate to a rational map. Similarly, the visual sphere is "snowflake equivalent" to the standard sphere if and only if f is conjugate to a "Lattes map".

Tiistai 11.4. 2017 klo 14-16 **C124**

Jussi Väisälä (Helsinki)

Alkeisgeometriaa normitasossa.

Tiivistelmä: Esitelmä käsittelee geometrisia peruskysymyksiä normitasossa, pääasiassa dimensiossa 2. Puhuin melkein samasta aiheesta 18.11.2011, mutta päällekkäisyyttä on vain vähän. Erityisesti tarkastelen kolmion merkillisiä pisteitä.

Tiistai 4.4. 2017 klo 14-16 **C124**

Ville Tengvall (Jyväskylä)

"A Sobolev homeomorphism that cannot be approximated by diffeomorphisms in $W^{1,p}$ "

Abstract: The problem of approximating homeomorphisms by diffeomorphisms has proven to be both very challenging and of great interest in a variety of contexts. In the case of L^∞ -norm these questions can be traced back to works by Radó, Moise, Bing, Connell, Bing, Kirby, Kirby, Siebenmann and Wall, and Donaldson and Sullivan. In the case of Sobolev $W^{1,p}$ -homeomorphism with $1 \leq p < \infty$ the celebrated breakthrough in the planar case was given by Iwaniec, Kovalev and Onninen in [IKO1], [IKO2], where they found diffeomorphic approximations to any planar homeomorphism $f \in W^{1,p}$, for any $1 < p < \infty$ in the $W^{1,p}$ -norm. The remaining missing case $p=1$ was solved by Hencl and Pratelli, and these results were further generalized in the Orlicz-Sobolev setting by Campbell.

Quite recently Hencl and Vejnar proved that the approximation might fail in the higher dimensional case $n \geq 4$. We will now study further this problem by constructing for a given $p \in [1, n/2]$ a Sobolev homeomorphism $f \in W^{1,p}$ of an n -dimensional unit cube, $n \geq 4$, which cannot be approximated by diffeomorphism in $W^{1,p}$. Here $[a]$ stands for the integer part of real number a . This is joint work with Daniel Campbell and Stanislav Hencl.

Tiistai 28.3. 2017 klo 14-15 **C124**

Nageswari Shanmugalingam (Cincinnati)

"Notions of Dirichlet problem for functions of least gradient in the metric setting"

Abstract: In posing a Dirichlet problem for p -Laplacian, $1 < p < \infty$, one can insist on the solution having the stipulated boundary data as its trace. The situation corresponding to the case $p=1$ is more complicated. In this talk we will describe three distinct possible notions of Dirichlet problem for the 1-Laplacian. This talk is based on joint work with Panu Lahti, Riikka Korte, and Xining Li.

Tiistai 24.1. 2017 klo 14-16 **C124**

Juan Souto (Rennes)

"Finding surface groups in the group of diffeomorphism of the interval"

Abstract: In this talk I will explain how to prove that the group of smooth diffeomorphisms of the real line which pointwise fix the complement of the interval $(0,1)$ contains a subgroup isomorphic to the fundamental group of a closed surface of genus 2. This is joint work with Ludovic Marquis.

Tiistai 17.1.2017 klo 14-16 **C124**

Jouni Luukkainen

"Assouad dimension"

Abstract: I will consider basic properties of Assouad dimension. The Assouad dimension of a metric space is a nonnegative real number for doubling spaces and infinity otherwise. It measures the space in all scales, and it dominates the other, more familiar dimensions (at least on compact spaces). For a complete space it is related to doubling measures on the space. It is also related to the still open problem of bi-Lipschitz embeddability into Euclidean spaces. Assouad dimension of many fractals have been determined, but for a topologist as me there are no dimension-theoretic fractals.

Thursday 12.1.2017 klo **16-18** C124 (joint with the geometric analysis seminar: **note the new time !**)

Meng Wu (University of Oulu)

On a conjecture of Furstenberg about intersections of Cantor sets

Abstract: Two compact sets E, F of the real line are said to be strongly transverse if for each u and t , the Hausdorff dimension (\dim) of the intersection of E and $uF+t$ is bounded by $\dim(E)+\dim(F)-1$ or 0, whichever is larger. In the late 60's, Furstenberg conjectured that two closed sets E, F of $[0,1]$ are strongly transverse if E is invariant under multiplication by 2 (mod 1) and F is invariant under multiplication by 3 (mod 1). In this talk, we will recall some recent progress regarding this conjecture and present a solution.

Tiistai 10.1.2017 klo 14-16 **C124**

Vyron Vellis (University of Connecticut)

"Quasisymmetric and bi-Lipschitz extensions on Euclidean spaces"

Abstract: One of the oldest problems in Geometric Analysis is the extension problem: if $E \subset \mathbb{R}^n$ and $f: E \rightarrow \mathbb{R}^n$ is a quasisymmetric (resp. bi-Lipschitz) embedding, when is it possible to extend f to a quasisymmetric (resp. bi-Lipschitz) self homeomorphism of \mathbb{R}^n ? For $n=1$ we give a complete answer while for $n=2$ we generalize previous Schoenflies extension results of Beurling, Ahlfors and Tukia to uniform domains with relatively connected boundary. For $n \geq 3$ we show that any quasisymmetric (resp. bi-Lipschitz) map $f: E \rightarrow \mathbb{R}^n$ of a totally disconnected set $E \subset \mathbb{R}^n$ with bounded geometry can be extended to a quasisymmetric (resp. bi-Lipschitz) self homeomorphism of \mathbb{R}^{n+1} .

Syksyn 2016 esitelmiä

Tiistai, 13.9.2016 klo 14-16 **C124**

Esko Heinonen

"Dirichlet problem for f -minimal graphs"

Tiistai, 20.9.2016 klo 14-16 **C124**

No seminar

Tiistai, 27.9.2016 klo 14-16 **C124**

Viveka Erlandsson

"Word length in surface groups and counting curves"

Tiistai, 4.10.2016 klo 14-16 **C124**

Urs Lang

"Geometry of metric spaces with convex geodesic structures"

ABSTRACT: A geodesic bicombing on a metric space selects for every pair of points a geodesic connecting them. The existence of a geodesic bicombing satisfying a suitable convexity condition may be viewed as a weak (but non-coarse) global notion of nonpositive curvature that

allows for non-unique geodesics. The talk will give a survey of a number of recent results on such structures, pertaining to barycenter constructions, fixed points, flat (normed) subspaces, asymptotic geometry, and geometric group actions.

Tiistai, 11.10.2016 klo 14-16 **C124**

Martina Aaltonen

"On non-manifold monodromy spaces of branched coverings between manifolds."

Keskiviikko, 12.10.2016 klo 14.15-15.15 **D123 (Note the time and room!)**

Avner Kiro (Tel Aviv)

"On Taylor coefficients in Beurling classes of smooth function."

Abstract: The talk is will be devoted to two problems in the theory of Beurling and Carleman classes of smooth functions. The first one is to describe the image of a Beurling or Carleman class under Borel's map. The second one is how to construct a function in Beurling or Carleman class with prescribed Taylor coefficients. In the talk, I will present solutions to both problems in some Beurling and Carleman classes.

Tiistai, 18.10.2016 klo 14-16 **C124**

Yi Zhang

"A density problem for Sobolev spaces"

Abstract: The density of smooth functions in a Sobolev space is often taken as the basis for the definition. However, functions smooth up to the boundary or global smooth functions need not necessarily be dense. Classical results give this density under a segment condition. Later J. L. Lewis showed that global smooth functions are dense in $W^{1,p}(\Omega)$ for $1 < p < \infty$ when Ω is a planar Jordan domain. In 2007, A. Giacomini and P. Trebeschi showed that $W^{1,2}(\Omega)$ is dense in $W^{1,p}(\Omega)$ if Ω is a bounded simply connected planar domain. We describe our joint results with Pekka Koskela and Tapio Rajala that generalize the above results by Lewis, Giacomini and Trebeschi.

Tiistai, 25.10.2016 klo 14-16 **C124**

Adi Glücksam (Tel Aviv)

"Translation invariant probability measures on the space of entire functions."

Abstract: 20 years ago Benjy Weiss constructed a collection of non-trivial translation invariant probability measures on the space of entire functions. In this talk we will present another construction of such a measure, and give upper and lower bounds for the possible growth of entire functions in the support of such a measure. We will also discuss "uniformly recurrent" entire functions, their connection to such constructions, and their possible growth. The talk is based on a joint work with Lev Buhovski, Alexander Logunov, and Mikhail Sodin.

Tiistai, 1.11.2016 klo 14-16 **C124**

David Bate

"Differentiability and Poincare-type inequalities in metric measure spaces"

Tiistai, 8.11.2016 klo 14-16 **C124**

Hui Gao

"Some aspects of p-adic Hodge theory"

Abstract: In this talk, we start by motivating what is p-adic Hodge theory about (in particular, we will try to explain its analogy with classical complex Hodge theory). We will recall the notion of p-adic Galois representations, and illustrate why p-adic Hodge theory is useful to study them. In particular, we will discuss integral structures in p-adic Hodge theory. Later we move on to explain some recent work (joint work with Tong Liu) on overconvergence of p-adic Galois representations. The main method is a crystalline approximation technique.

Monday 14.11.2016 klo 14-16 **C122 (NOTE THE SPECIAL TIME!)**

Sylvester Eriksson-Bique (Courant Institute)

"Poincare inequalities via quantitative connectivity, synthetic Ricci curvature, and differentiability in metric measure spaces"

Abstract: The talk will outline a new characterization of Poincare inequalities in terms of a notion of quantitatively connecting pairs of points. The result allows to prove a "thickening" result that is used to resolve a question of Cheeger and Kleiner on PI-rectifiability of certain classes of differentiability spaces. The results build heavily on recent work of Bate and Li.

Further the characterization result is applied to a variety of spaces to exhibit Poincare inequalities, such as MCP-spaces with a very weak Ricci bound defined by Ohta, weighted metric measure spaces with Muckenhoupt-type weights and certain classes of Lipschitz differentiability spaces. New types of self-improvement results in the spirit of Keith-Zhong are presented.

Tiistai 13.12.2016 klo 14.00-15.00 **C124 (note the time!)**

Adam Harper (University of Warwick)

"Prime number races with very many competitors"

Abstract: 'The prime number race is the competition between different coprime residue classes mod q to contain the most primes, up to a point x . Rubinstein and Sarnak showed, assuming two L-function conjectures, that as x varies the problem is equivalent to a problem about orderings of certain random variables, having weak correlations coming from number theory. In particular, as q the number of primes in any fixed set of r coprime classes will achieve any given ordering for $1/r!$ values of x . In this talk I will try to explain what happens when r is allowed to grow as a function of q . It turns out that one still sees uniformity of orderings in many situations, but not always. The proofs involve various probabilistic ideas, and also some harmonic analysis related to the circle method. This is joint work with Youness Lamzouri.'

Torstai 21.12 klo 14-16 C124 **(joint with the stochastic models seminar, note the time!)**

Meng Wu (University of Oulu)

On a conjecture of Furstenberg about intersections of Cantor sets

Abstract: Two compact sets E, F of the real line are said to be strongly transverse if for each u and t , the Hausdorff dimension (\dim) of the intersection of E and $uF+t$ is bounded by $\dim(E)+\dim(F)-1$ or 0 , whichever is larger. In the late 60's, Furstenberg conjectured that two closed sets E, F of $[0, 1]$ are strongly transverse if E is invariant under multiplication by $2 \pmod{1}$ and F is invariant under multiplication by $3 \pmod{1}$. In this talk, we will recall some recent progress regarding this conjecture and present a solution.

Kevään 2016 esitelmää

Tiistai, 9.2.2016 klo 14-16 **B121**

Laura Venieri

"Dimension estimates for Kakeya sets generalized to certain metric spaces"

Tiistai, 16.2.2016 klo 14-16 **B121**

Eleferios (Teri) Soultanis

"Homotopy and lifts in Newtonian spaces"

Tiistai, 23.2.2016 klo 14-16 **B121**

Andrei Bondarenko (NTNU)

"Extreme values of the Riemann zeta function"

We prove that for every $\epsilon < 1/\sqrt{2}$ there exists arbitrarily large T with

\$\$

$|\zeta(1/2+iT)| > \exp\left(c \sqrt{\log T \log \log \log T / \log \log T}\right)$.

\$\$

This improves classical results by Montgomery, Balasubramanian-Ramachandra, and Soundararajan.

Our proof uses Soundararajan's resonance method, multiplicative functions, and a certain large greatest common divisor sum.

Tiistai, 22.3.2016 klo 14.15- 15.15 (HUOM AIKA) **B121**

Ville Kivioja (Jyu)

"Affine decomposition of Isometries in Nilpotent Lie groups."

Tiistai, 29.3.2016 klo 14-16 **B121**

Mikko Parviainen (JY)

"Gradient regularity for the game theoretic p-Poisson problem"

Tiistai, 12.4.2016 klo 14-16 **B121 (Joint with the seminar in Functional Analysis)**

Riikka Schroderus

"The spectra of linear fractional composition operators on weighted Dirichlet spaces ."

Syksyn 2015 esitelmää

Tiistai, 25.8.2015 klo 10-12 C123

Jonathan Fraser (University of Manchester)

"Fourier transforms of measures on the Brownian graph"

Tiistai, 8.9.2015 klo 14-16 C124

Esko Heinonen

"Minimal graph equation and the asymptotic Dirichlet problem"

Tiistai, 15.9.2015 klo 14-16 C124

Ilkka Holopainen

"Convexity at infinity and the asymptotic Plateau problem"

Tiistai, 22.9.2015 klo 14-16 C124

Ilkka Holopainen

"Convexity at infinity, currents, and the asymptotic Plateau problem (cont.)"

Tiistai, 29.9.2015 klo 14-16 C124

Oleg Ivrii

"Quasicircles of dimension $1+k^2$ do not exist. "

Tiistai, 6.10.2015 klo 14-16 C124

No seminar

Tiistai, 13.10.2015 klo 14-16 C124

No seminar

Tiistai, 27.10.2015 klo 14-16 C124

Rami Luisto

"A characterization result for BLD-mappings and applications"

Abstract: "We discuss a theorem characterizing BLD-mappings as discrete Lipschitz quotient mappings in a metric setting. As an application we obtain a new proof for a limit theorem of BLD-mappings. Martio and Väisälä showed in 1988 that between Euclidean domains the limit of L-BLD-mappings is L-BLD. This was generalized by Heinonen and Rickman to show that between generalized manifolds of type A the limits of L-BLD-mappings are K-BLD with a quantitative constant K. With the new characterization result we can show that in fact $K = L$."

Tiistai, 3.11.2015 klo 14-16 C124

Angel Arroyo

"On the Mean Value Property for p -harmonic functions"

Tiistai, 10.11.2015 klo 14-16 C124

Martina Aaltonen

"Abelian points of branched covers"

Tiistai, 17.11.2015 klo 14-16 C124

Scott Armstrong

"Stochastic homogenization: regularity and quantitative bounds"

ABSTRACT: will give an introduction to some recent quantitative results in elliptic homogenization. We consider the linear, uniformly elliptic equation in divergence form. The coefficients are assumed to be random, to have a periodic law and to have a finite range of dependence. The classical qualitative homogenization result asserts that, on large scales, the equation behaves like a constant coefficient equation (up to a change of variables, the Laplacian). We will discuss a strategy for obtaining quantitative estimates (i.e., rates of convergence) for this asymptotic behavior. Playing a central role in the story is a new regularity theory for equations with random coefficients which says that solutions behave much better than one expects from the deterministic regularity theory. The talk contains results obtained jointly with C. Smart (Chicago), T. Kuusi (Aalto) and J.-C. Mourrat (Lyon).

Tiistai, 8.12.2015 klo 10-12 C129 (Huom. poikkeuksellinen aika ja paikka)

Eden Prywes

"The Hodge Star Operator and the Beltrami Equation"

Abstract: An essentially unique homeomorphic solution to the Beltrami equation was found in the 1960s using the theory of Calderon-Zygmund and singular integral operators in L^p . I will present an alternative method to solve the Beltrami equation using the Hodge star operator and standard elliptic PDE theory. I will also discuss a different method to prove the regularity of the solution. This approach is partially based on work by B. Dittmar.

Kevään 2015 esitelmiä

Tiistai, 20.1.2015 klo 14-16 C123

Martina Aaltonen

"Monodromy representations of branched coverings"

Perjantai, 6.2.2015 klo 14-16 C123 (HUOM! päivä)

Matthew Badger

"Rectifiable measures without absolute continuity"

Tiistai, 10.2.2015 klo 14-16 C123

Vasilis Chousionis

"Square functions, uniform rectifiability and Wolff potentials"

Tiistai, 17.2.2015 klo 14-16 C123

Lauri Hitruhin

"Multifractal spectrum of quasiconformal mappings"

Tiistai, 3.3.2015 klo 14-16 C123

Vesa Ala-Mattila

"Intersections of conformally and geometrically finite Kleinian groups"

Perjantai, 6.3.2015 klo 13.00--14.00 (HUOM AIKA!)

Håkan Hedenmalm

"The Klein-Gordon equation, the Hilbert transform, and dynamics of Gauss-type maps."

ABSTRACT: This reports on recent joint work with A. Montes-Rodriguez. The main result is as follows: the functions $e^{i\pi n t}$ and $e^{-i\pi\beta m/t}$ with $m, n=0, 1, 2, \dots$ span a weak-star dense subspace of H^∞ of the upper half-plane if and only if the positive real β has $\beta \leq 1$. To obtain the result, we need to develop a theory of transfer operators acting on the Hilbert transforms of L^1 functions, and study these in detail.

Tiistai, 17.3.2015 klo 14-16 C123

Oleg Ivrii

Parabolic implosion and Blaschke products

Tiistai, 24.3.2015 klo 14-16 C123

Burak Erdogan

"Smoothing for nonlinear dispersive PDE and applications"

Tiistai, 31.3.2015 klo 14-16 C123

Mikko Parviainen

"Regularity for nonlinear stochastic games"

Syksyn 2014 esitelmiä

Tiistai, 23.9.2014 klo 14-16 C123

Marti Prats (Barcelona)

"Beurling transform in Sobolev spaces of a Lipschitz domain"

Tiistai, 30.9.2014 klo 14-16 C123

Rami Luisto

"Local-to-global properties of BLD-mappings"

Tiistai, 7.10.2014 klo 14-16 C123

Tomás Soto

"Triebel-Lizorkin spaces via hyperbolic fillings. Part I: Quasiconformal invariance"

Tiistai, 21.10.2014 klo 14-16 C123

Jouko Mickelsson:

"What is the Clay problem on Yang-Mills and Mass Gap?"

Tiistai, 4.11.2014 klo 14-16 C123

Oleg Ivrii

"The geometry of the Weil-Petersson metric in complex dynamics"

Tiistai, 11.11.2014 klo 14-16 C123

Istvan Prause

"Asymptotic variance of the Beurling transform"

Tiistai, 18.11.2014 klo 14-16 C123

Viveca Erlandsson

"On Margulis cusps of hyperbolic 4-manifolds"

Abstract: Consider a discrete subgroup G of the isometry group of hyperbolic n -space and a parabolic fixed point p . The Margulis region consists of all points in the space that are moved a small distance by an isometry in the stabilizer of p in G , and is kept precisely invariant under this stabilizer. In dimensions 2 and 3 the Margulis region is always a horoball, which gives the well-understood picture of the parabolic cusps in the quotient manifold. In higher dimensions, due to the existence of screw-translations (parabolic isometries with a rotational part), this is no longer true. When the screw-translation has an irrational rotation, the shape of the corresponding region depends on the continued fraction expansion of the irrational angle. In this talk we describe the asymptotic shape of the Margulis region in hyperbolic 4-space corresponding to an irrational screw-translation. Time permitting we show some consequences to this: that the corresponding parabolic cusps are bi-Lipschitz rigid as well as a necessary discreteness criterion, which can be viewed as a generalization of Shimizu's and Jorgensen's conditions in lower dimensions. This is joint work with Saeed Zakeri.

Tiistai, 25.11.2014 klo 14-16 C123

Laura Venieri

"Hausdorff dimension of Besicovitch sets with respect to the Heisenberg metric"

Tiistai, 2.12.2014 klo 14-16 C123

Antti Perälä

TBA

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