

## PUBLICATIONS

PEKKA KOSKELA

### Papers in journals with referee practise

- [1] P.Koskela, “Capacity extension domains,” *Ann. Acad. Sci. Fenn. Ser. A I Math. Dissertationes* 73 (1990), 1–42.
- [2] D.A.Herron and P.Koskela, “Quasiextremal distance domains and conformal mappings onto circle domains,” *Complex Variables* 15 (1990), 167–179.
- [3] P.Koskela and O.Martio, “Removability theorems for quasiregular mappings,” *Ann. Acad. Sci. Fenn. Ser. A I Math.* 15 (1990), 381–399.
- [4] K.Astala and P.Koskela, “Quasiconformal mappings and global integrability of the derivative,” *J. Analyse Math.* 57 (1991), 203–220.
- [5] B.Hanson and P.Koskela, “Higher integrability and the boundary dimension,” *Ann. Acad. Sci. Fenn. Ser. A I Math.* 16 (1991), 323–331.
- [6] D.A.Herron and P.Koskela, “Uniform, Sobolev extension and quasiconformal circle domains,” *J. Analyse Math.* 57 (1991), 172–202.
- [7] D.A.Herron and P.Koskela, “Uniform and Sobolev extension domains,” *Proc. Amer. Math. Soc.* 114 (1992), 483–489.
- [8] P.Koskela and F.Reitich, “Hölder continuity of Sobolev functions and quasiconformal mappings,” *Math. Z.* 213 (1993), 457–472.
- [9] P.Koskela, “Removable singularities for analytic functions,” *Michigan Math. J.* 40 (1993) 459–466
- [10] J.Heinonen and P.Koskela, “Sobolev mappings with integrable dilatations,” *Arch. Rat. Mech. Anal.* 125 (1993), 81–97.
- [11] P.Koskela and O.Martio, “Removability theorems for solutions of degenerate elliptic partial differential equations,” *Ark. Mat.* 31 (1993), 339–353.
- [12] P.Koskela, “An inverse Sobolev lemma,” *Rev. Mat. Iberoamericana* 10 (1994), 123–141.
- [13] J.Heinonen and P.Koskela, “ $A_\infty$ -condition for the Jacobian of a quasiconformal mapping,” *Proc. Amer. Math. Soc.* 120 (1994), 535–543.
- [14] S.Buckley and P.Koskela, “Sobolev-Poincaré inequalities for  $p < 1$ ,” *Indiana Univ. Math. J.* 43 (1994), 221–240.
- [15] P.Koskela, “The radial behavior of a quasiconformal mapping,” *Duke Math. J.* 74 (1994), 667–679.

- [16] P.Koskela, “The degree of regularity of a quasiconformal mapping,” *Proc. Amer. Math. Soc.* 122 (1994), 769–772.
- [17] J.Heinonen and P.Koskela, “The boundary distortion of a quasiconformal mapping,” *Pacific J. Math.* 165 (1994), 93–114.
- [18] T.Kilpeläinen and P.Koskela, “Global integrability of the gradients of solutions to partial differential equations,” *Nonlinear Analysis and Applications* 23 (1994), 899–909.
- [19] D.A.Herron and P.Koskela, “Locally uniform domains and quasiconformal homeomorphisms,” *Ann. Acad. Sci. Fenn. Ser. A I Math.* 20 (1995), 187–206.
- [20] T.Kilpeläinen, P.Koskela and O.Martio, “On the fusion problem for degenerate elliptic equations,” *Comm. Partial Differential Equations* 20, (1995), 486–497.
- [21] J.Heinonen and P.Koskela, “Definitions of quasiconformality,” *Inventiones Math.* 120 (1995), 61–79.
- [22] P.Hajłasz and P.Koskela, “Sobolev meets Poincaré,” *C. R. Acad. Sci. Paris* 320 (1995), 1211–1215.
- [23] S.Buckley and P.Koskela, “Sobolev-Poincaré implies John,” *Math. Res. Letters* 2 (1995), 577–594.
- [24] S.Buckley, P.Koskela and G.Lu, “Subelliptic Poincaré inequalities: the case  $p < 1$ ,” *Publ. Mat.* 39 (1995), 313–334.
- [25] P.Koskela, “A radial uniqueness theorem for Sobolev functions,” *Bull. London Math. Soc.* 27 (1995), 460–466.
- [26] D.A.Herron and P.Koskela, “Poincaré domains and quasiconformal mappings,” *Siberian Math. J.* 36 (1995), 1416–1434.
- [27] J.Heinonen and P.Koskela, “Weighted Sobolev and Poincaré inequalities and quasiregular mappings of polynomial type,” *Math. Scand.* 77 (1995), 251–271.
- [28] P.Koskela, “Normal solutions of elliptic equations,” *Math. Proc. Cambridge Phil. Soc.* 119 (1996), 363–371.
- [29] J.Heinonen and P.Koskela, “From local to global in quasiconformal structures,” *Proc. Nat. Acad. Sci. U.S.A.* 93 (1996), 554–556.
- [30] P.Koskela, J.Manfredi and E.Villamor, “Regularity theory and traces of  $A$ -harmonic functions,” *Trans. Amer. Math. Soc.* 348 (1996), 755–766.
- [31] P.Koskela and A.Stanoyevitch, “Poincaré inequalities and Steiner symmetrization,” *Illinois Math. J.* 40 (1996), 365–389.
- [32] S.Buckley and P.Koskela, “Criteria for imbeddings of Sobolev-Poincaré type,” *Internat. Math. Research Notices* 18 (1996), 881–902.
- [33] D.A.Herron and P.Koskela, “Quasihyperbolic boundary condition and capacity,” *Indiana Univ. Math. J.* 45 (1996), 333–359.

- [34] D.A.Herron and P.Koskela, “Continuity of Sobolev functions and Dirichlet finite harmonic measures,” *Potential Analysis* 6 (1997), 347–353.
- [35] P.Koskela and S.Rohde, “Hausdorff dimension and mean porosity,” *Math. Ann.* 309 (1997), 593–609.
- [36] S.Buckley and P.Koskela, “New Poincaré inequalities from old,” *Ann. Acad. Sci. Fenn. Math.* 23 (1998), 251–260.
- [37] P.Koskela and P.MacManus, “Quasiconformal mappings and Sobolev classes,” *Studia Math.* 131 (1998), 1–17.
- [38] M.Bonk, P.Koskela and S.Rohde, “Conformal metrics on the unit ball in Euclidean space,” *Proc. London Math. Soc.* 77 (1998), 635–664.
- [39] J.Heinonen and P.Koskela, “Quasiconformal maps in metric spaces with controlled geometry,” *Acta Math.* 181 (1998), 1–61.
- [40] P.Koskela, “Extensions and imbeddings,” *J. Funct. Anal.* 159 (1998), 1–15.
- [41] P.Hajłasz and P.Koskela, “Isoperimetric inequalities and imbedding theorems in irregular domains,” *J. London Math. Soc.* 58 (1998), 425–450.
- [42] S.Buckley, P.Koskela and D.Vukotic, “Fractional integration and differentiation and Bergman spaces,” *Math. Proc. Cambridge Phil. Soc.* 126 (1999), 369–385.
- [43] S.Buckley and P.Koskela “On the fusion problem for degenerate elliptic equations II,” *Comment. Math. Univ. Carolinae* 40 (1999), 1–6.
- [44] J.Heinonen and P.Koskela, “A note on Lipschitz functions, upper gradients and the Poincaré inequality,” *New Zealand J. Math.* 28 (1999), 37–42.
- [45] J.Kauhanen, P.Koskela and J.Maly, “On functions with derivatives in a Lorentz space,” *Manuscripta Math.* 100 (1999), 87–101.
- [46] P.Koskela, “Removable sets for Sobolev spaces,” *Ark. Mat.* 37 (1999), 291–304.
- [47] B.Franchi, P.Hajłasz and P.Koskela, “Definitions of Sobolev classes on metric spaces,” *Ann. Inst. Fourier* 49 (1999), 1903–1924.
- [48] Z.Balogh and P.Koskela, “Quasiconformality, quasisymmetry and removability in Loewner spaces,” *Duke Math. J.* 101 (2000), 554–577.
- [49] P.Hajłasz and P.Koskela, “Sobolev met Poincaré,” *Mem. Amer. Math. Soc.* 145 (2000), no. 688, 101 pp.
- [50] K.Astala, T.Iwaniec, P.Koskela and G.J.Martin, “Mappings of BMO-bounded distortion,” *Math. Ann.* 317 (2000), 703–726.
- [51] S.Kallunki and P.Koskela, “Exceptional sets for the definition of quasiconformality,” *Amer. J. Math.* 122 (2000), 735–743.
- [52] P.Koskela, N.Shanmugalingam and H.Tuominen, “Removable sets for the Poincaré inequality,” *Indiana Univ. Math. J.* 49 (2000), 333–352.
- [53] M.Bonk, J.Heinonen and P.Koskela, “Uniformizing Gromov hyperbolic spaces,” *Asterisque* 271 (2001), 99 pp.

- [54] J.Kauhanen, P.Koskela and J.Maly, “Mappings of finite distortion: Lusin’s condition N,” *Mich. Math. J.* 49 (2001), 169–181.
- [55] T.Iwaniec, P.Koskela and J.Onninen, “Mappings of finite distortion: Monotonicity and continuity,” *Invent. Math.* 144 (2001), no. 3, 507–531.
- [56] P.Koskela, J.Onninen and J.T.Tyson, “Quasihyperbolic boundary conditions and capacity: Hölder continuity of quasiconformal mappings,” *Comment. Math. Helv.* 76 (2001), 416–435.
- [57] J.Kauhanen, P.Koskela and J.Maly, “Mappings of finite distortion: Openness and discreteness,” *Arch. Ration. Mech. Anal.* 160 (2001), 135–151.
- [58] I.Holopainen and P.Koskela, “Volume growth and parabolicity,” *Proc. Amer. Math. Soc.* 129 (2001), no. 11, 3425–3435.
- [59] B.Hanson, P.Koskela and M.Troyanov “Boundary behavior of quasi-regular maps and the isodiametric profile,” *Conform. Geom. Dyn.* 5 (2001), 100–139.
- [60] M.Gonzalez and P.Koskela, “Radial growth of solutions to Poisson equation,” *Complex Variables* 46 (2001), 59–72.
- [61] J.Heinonen, P.Koskela, N.Shanmugalingam and J.Tyson, “Sobolev classes of Banach space valued functions and applications to quasisymmetric mappings,” *J. Analyse Math.* 85 (2001), 87–139.
- [62] P.Koskela, J.Onninen and J.T.Tyson, “Quasihyperbolic boundary conditions and Poincaré domains,” *Math. Ann.* 323 (2002), 811–830.
- [63] T.Iwaniec, P.Koskela and J.Onninen, “Mappings of finite distortion: Compact families,” *Ann. Acad. Sci. Fenn. Math.* 27 (2002), 319–417.
- [64] M.Bonk and P.Koskela, “Conformal metrics and size of the boundary,” *Amer. J. Math.* 124 (2002), 1247–1287.
- [65] T.Iwaniec, P.Koskela and G.Martin, “Mappings of BMO-distortion and Beltrami type operators,” *J. Anal. Math.* 88 (2002), 337–381.
- [66] P.Koskela and X.Zhong, “Minimal assumptions for the integrability of the Jacobian,” *Ricerche Mat.* LI (2002), 297–311.
- [67] P.Koskela and X.Zhong, “Hardy’s inequality and the boundary size,” *Proc. Amer. Math. Soc.* 131 (2003), 1151–1158.
- [68] M.J.Gonzalez, P.Koskela, J.Llorente and A.Nicolau, “Distributional inequalities for non-harmonic functions,” *Indiana Univ. Math. J.* 52 (2003), 191–226.
- [69] P.Koskela and J.Onninen, “Mappings of finite distortion: Sharp modulus of continuity,” *Trans. Amer. Math. Soc.* 355 (2003), 1905–1920.
- [70] T.Iwaniec, P.Koskela, G.Martin and C.Sbordone, “Mappings of finite distortion:  $L^n \log L^\alpha$ -regularity,” *J. London Math. Soc.* 67 (2003), 123–136.
- [71] P.Koskela and J.Onninen, “Sharp embeddings via truncation,” *J. Math. Anal. Appl.* 278 (2003), 324–334.

- [72] S.Kallunki and P.Koskela, “Metric definition of  $\mu$ -homeomorphisms,” *Mich. Math. J.* 51 (2003), 141–152.
- [73] P.Koskela and J.Malý, “Mappings of finite distortion: The zero set of the Jacobian,” *J. Eur. Math. Soc. (JEMS)* 5 (2003), 95–105.
- [74] P.Koskela, N.Shanmugalingam and K.Rajala, “Lipschitz continuity of Cheeger-harmonic functions in metric measure spaces,” *J. Funct. Anal.* 202 (2003), 147–173.
- [75] P.Koskela and T.Tossavainen, “Pathwise connectivity of a conformal boundary,” *Bull. London Math. Soc.* 35 (2003), 645–650.
- [76] P.Koskela and K.Rajala, “Mappings of finite distortion: Removable singularities,” *Israel J. Math.* 136 (2003), 269–283.
- [77] J.Kauhanen, P.Koskela, J.Malý, J.Onninen and X.Zhong, “Mappings of finite distortion: Sharp Orlicz-conditions,” *Rev. Mat. Iberoamericana* 19 (2003), 857–872.
- [78] D.A.Herron and P.Koskela, “Mappings of finite distortion: gauge dimension of generalized quasi-circles,” *Illinois J. Math.* 47 (2003), 1243–1259.
- [79] P.Hajłasz and P.Koskela, “Formation of cracks under elastic deformations,” *Calc. Var.* 19 (2004), 221–227.
- [80] P.Koskela, N.Shanmugalingam and J.T.Tyson, “Dirichlet forms, Poincaré inequalities and the Sobolev-spaces of Korevaar-Schoen,” *Pot. Anal.* 21 (2004), 241–262.
- [81] T.Coulhon and P.Koskela, “Geometric interpretations of  $L^p$ -Poincaré inequalities on graphs with polynomial volume growth,” *Milan J. Math.* 72 (2004), 209–248.
- [82] S.M.Buckley and P.Koskela, “Logarithmic Hardy inequalities,” *Illinois J. Math.* 48 (2004), 787–802..
- [83] D.Faraco, P.Koskela and X.Zhong, “Mappings of finite distortion: the degree of regularity,” *Adv. Math.* 190 (2005), 300–318.
- [84] P.Koskela and T. Nieminen, “Quasiconformal removability and the quasi-hyperbolic metric,” *Indiana Univ. Math. J.* 54 (2005), 143–152.
- [85] S. Hencl, P.Koskela and J.Onninen, “A note on extremal mappings of finite distortion,” *Math. Res. Lett.* 12 (2005), 231–238.
- [86] S. Hencl and P.Koskela, “Mappings of finite distortion: openness and discreteness for quasilight mappings,” *Ann. Inst. H. Poincaré Anal. Non Linéaire* 22 (2005), 331–342.
- [87] A. Gogatishvili and P.Koskela, “A non-doubling Trudinger inequality,” *Studia Math.* 170 (2005), 113–119.
- [88] P.Koskela and S.Rogovin, “Linear dilatation and absolute continuity,” *Ann. Acad. Sci. Fenn. Math.* 30 (2005), 385–392.
- [89] S. Hencl and P.Koskela, “Quasihyperbolic metric and capacity: uniform continuity of quasiconformal mappings,” *J. Analyse Math.* 96 (2005), 19–35.

- [90] S.M.Buckley and P.Koskela, “Ends of metric measure spaces and Sobolev inequalities,” *Math. Z.* 252 (2005), 275–285.
- [91] S. Hencl and P.Koskela, “The regularity of the inverse of a planar Sobolev homeomorphism,” *Arch. Ration. Mech. Anal.* 180 (2006), 75–95.
- [92] P.Koskela and J.Onninen, “Mappings of finite distortion: capacity and modulus inequalities,” *J. Reine Angew. Math.* 599 (2006), 1–26.
- [93] S.Hencl, P.Koskela and J.Maly, “Regularity of the inverse of a Sobolev mapping in space,” *Proc. Roy. Soc. Edinburgh Sect A.* 136 (2006), 1267–1285.
- [94] P.Koskela and J. Takkinen, “Mappings of finite distortion: formation of cusps,” *Publ. Mat.* 51 (2007), 223–242.
- [95] S. Hencl, P.Koskela and X.Zhong, “Mappings of finite distortion: reverse inequalities for the Jacobian,” *J. Geom. Anal.* 17 (2007), 253–274.
- [96] P.Koskela and J. Lehrbäck, “Growth of the quasihyperbolic metric and compact embedding of Sobolev spaces,” *Mich. Math. J.* 55 (2007), 183–193.
- [97] T.Heikkinen, P.Koskela and H.Tuominen, “Sobolev-type spaces from generalized Poincaré inequalities,” *Studia Math.* 181 (2007), 1–16.
- [98] Z.Balogh, P.Koskela and S.Rogovin, “Absolute continuity of quasiconformal mappings on curves,” *Geom. Funct. Anal.* 17 (2007), 645–664.
- [99] S. Hencl, P.Koskela and J.Onninen, “Homeomorphisms of bounded variation,” *Arch. Ration. Mech. Anal.* 186 (2007), 351–360.
- [100] S.Hencl and P.Koskela, “Mappings of finite distortion: composition operator,” *Ann. Acad. Sci. Fenn. Math.* 33 (2008), 65–80.
- [101] P.Hajłasz, P.Koskela and H.Tuominen, “Sobolev embeddings, extensions and measure density condition,” *J. Funct. Anal.* 254 (2008), 1217–1234.
- [102] P.Koskela and T.Nieminen, “Mappings of finite distortion: discrete length of radial images,” *Math. Proc. Cambridge Philos. Soc.* 144 (2008), 197–205.
- [103] P.Koskela and T.Nieminen, “Uniform continuity of quasiconformal mappings and conformal deformations,” *Conform. Geom. Dyn.* 12 (2008), 1–9.
- [104] P.Koskela and K.Wildrick, “Exceptional sets for quasiconformal mappings in general metric spaces,” and “Errata to:...,” *Int. Math. Res. Not. IMRN* 9 (2008).
- [105] P.Koskela and E.Saksman, “Pointwise characterization for Hardy-Sobolev functions,” *Math. Research Letters* 15 (2008), 727–744.

**Papers accepted for publication.**

- [106] K.Astala and P.Koskela, “ $H^p$ -theory for quasiconformal mappings,” *Pure. Appl. Math. Quat.* (to appear).
- [107] P.Hajłasz, P.Koskela and H.Tuominen, “Measure density and extendability of Sobolev functions,” *Rev. Mat. Iberoamericana* (to appear).
- [108] P.Koskela and J.Onninen, “Mappings of finite distortion: decay of the Jacobian in the plane,” *Adv. Calc. Var.* (to appear).

**Papers published (refereed conference proceedings).**

- [109] P.Koskela, “Natural weights for the Poincaré inequality,” Proc. of the Fourth Finnish-Polish Summer School in Complex Analysis, Ber. Univ. Jyväskylä Math. Inst. 55 (1993), 55–63.
- [110] S.Buckley, P.Koskela and G.Lu, “Boman equals John,” XVIth Rolf Nevanlinna Colloquium, Eds.: Laine/Martio, Proc. of the Intern. Conf. held in Joensuu, Finland, 1995, Walter de Gruyter & Co., Berlin - New York (1996), 91–99.
- [111] P.Koskela, “Old and new on the quasihyperbolic metric,” in Quasiconformal Mappings and Analysis, A Collection of Papers Honoring F. W. Gehring, Edited by Duren, Heinonen, Osgood and Palka, Springer-Verlag, 1998, 205–219.
- [112] P.Koskela, “Behavior of quasiconformal mappings at infinity,” in Papers on Analysis: A volume dedicated to Olli Martio on the occasion of his 60th birthday, Edited by Heinonen, Kilpeläinen and Koskela, Report. Univ. Jyväskylä 83 (2001).
- [113] P.Koskela, J.Onninen and K.Rajala, “Mappings of finite distortion: Injectivity radius of a local homeomorphism,” in Modern Trends in Geometric Function Theory, Edited by David Herron, Report. Univ. Jyväskylä (2003).

**Papers published (invited conference papers).**

- [114] P.Koskela, “Sobolev spaces and quasiconformal mappings on metric spaces,” in Proceedings of the third European Congress of Mathematics, Barcelona 2000, Progress in Mathematics, Vol. 201 (2001), Birkhäuser Verlag, pp. 457–367.

**Papers published (various lectures).**

- [115] P.Koskela, “Upper gradients and Poincaré inequalities,” in Lecture Notes on Analysis on Metric Spaces, Edited by Luigi Ambrosio and Francesco Serra Cassano, Scuola Normale Superiore, Pisa (2000), pp. 55–69.
- [116] P.Koskela, “Metric Sobolev spaces,” in Nonlinear Analysis, Function Spaces and Applications Vol. 7, Mathematical Institute of the Academy of Sciences of the Czech Republic, Praha (2003), pp. 133–147.