# Sławomir Kolasiński

Instytut Matematyki, Uniwersytet Warszawski

ul. Banacha 2

02-097 Warszawa, Poland

PHONE:  $+48\ 22\ 55\ 44\ 522$ 

E-MAIL: s.kolasinski@mimuw.edu.pl WWW: http://mimuw.edu.pl/~skola ORCID: orcid.org/0000-0002-7122-7275

## EDUCATION

May 2012	<b>Ph.D.</b> University of Warsaw - Mathematics - advisor: prof. Paweł Strzelecki. Thesis: "Integral Menger curvature for sets of arbitrary dimension and codimension"
Feb. 2008	M.Sc. University of Warsaw - Mathematics - advisor: dr hab. Andrzej Weber. Thesis: "CW-structure of a Space of Loops on a Lie Group"
June 2006	M.Sc. University of Warsaw - Computer Science - advisor: prof. Paweł Urzyczyn. Thesis: "Wajsberg-Ben-Yelles Algorithm for Intuitionistic Propositional Logic"

## EMPLOYMENT

Oct. 2016 – present	Adiunkt (assistant professor) at University of Warsaw (Poland)
Oct. 2012 – Sept. 2016	Junior scientist at MPI Albert-Einstein-Institute (Potsdam, Germany)
Oct. 2011 – Sept. 2014	Research and teaching assistant at the University of Warsaw (Poland)
Sept. 2009 – Feb. 2010	Early Stage Researcher at University of Helsinki (Finland) within the EU RTN "CODY"
Feb. 2006 – Aug. 2007	IT developer at TLS-Technologie Sp. z o.o. (Warsaw, Poland)
Mar. $2004 - Sept. 2004$	Magik programmer at Globema Sp. z o.o. (Warsaw, Poland)
June 2001 – Sept. 2001	C++ programmer at InterActive Vision Mind Beacon Sp. z o.o. (Szczecin, Poland)

## AWARDS

2013	Nomination to participate in the first Heidelberg Laureate Forum
2013	"START" stipend awarded by the Foundation for Polish Science
2013	Nomination in the $5^{th}$ edition of "International Banach Prize" awarded by the <i>Polish Mathematical Society</i> and <i>Ericpol Sp. z o.o.</i>
2012	Distinguished PhD thesis at University of Warsaw.
2006	Honorable mention in the contest for the best M.Sc. thesis in logic and its applications awarded by the <i>Polish Association for Logic and Philosophy of Science</i> .

## **Funding**

2017 - 2020	Polish National Science Center (NCN) scientific grant no. $2016/23/D/ST1/01084$ ; title: "Pointwise regularity theory for sets, measures, and varifolds"; role: $principal\ investigator$
2014 - 2017	Polish National Science Center (NCN) scientific grant no. $2013/10/M/ST1/00416$ ; title: "Curvature energies for non-smooth subsets of Euclidean spaces"; role: $team\ member$ ; PI: prof. Paweł Strzelecki
2011 - 2012	Polish Ministry of Science PhD grant no. N N201 611140 role: <i>PhD candidate</i>
2009 – 2012	Polish Ministry of Science scientific grant no. N N201 397737; title: "Nonlinear PDE: variational and geometric aspects"; role: team member; PI: prof. Paweł Strzelecki

# <u>LANGUAGES</u>: **Polish** (mother tongue), **English** (B2), **German** (B1).

DIDACTICS	AND	OTHER	PROFESSIONAL	ACTIVITIES
DIDACTION	I $I$ $I$ $I$ $I$	OILL	I TOT DODIONAL	ACTIVITED.

2017 - 2018	120 hours of teaching including a lecture on varifold theory
2016 - 2017	210 hours of teaching
2013 - present	Reviewer for the AMS Mathematical Reviews (MathSciNet)
2013 - 2014	Exercise class on PDE for graduate students (30 hours; University of Potsdam)
2010	Co-author of the appendix to the lecture notes on mathematical analysis for undergraduate students explaining how to use computer algebra systems (CAS) for performing computations
2007 - 2012	Exercise classes for undergraduate students (660 hours in 5 years; University of Warsaw)
2008 - 2009	Member of the MIM UW Faculty Council (20 months; University of Warsaw)
2004 - 2007	Member of the students' Association of Fans of Mathematics (UW) co-organiser of two workshops for master students in Wisełka (Poland)

#### OUTREACH

- Author and co-author of two popular articles in the Polish magazine *Delta* targeted at high-school students; http://www.deltami.edu.pl/; volumes 02/2015 and 10/2008
- Popular talk on nonstandard analysis at a workshop XLVI Szkoła matematyki poglądowej (School on Synoptic Mathematics) held in Warsaw targeted at high-school teachers; Jan. 2011; http://www.msn.uph.edu.pl/smp/?strona=szkola&nr=46
- Co-author of an educational portal for high-school students; 2009 2012; http://smurf.mimuw.edu.pl/uczesie

## RESEARCH INTERESTS

Geometric measure theory; structure and regularity of sets, measures and varifolds in Euclidean space; curvature in non-smooth setting; existence and regularity of solutions to geometric variational problems.

## Conferences, schools, and workshops

	2018
Nov, 22	Seminar: Geometric function and mapping theory, IM PAN, Warsaw (Poland) Seminar talk: Ellipticity in geometric variational problems. Part II
Oct. 23	Seminar: Algebraic Topology, University of Warsaw, Warsaw, (Poland) Seminar talk: Ellipticity in geometric variational problems
July 9 – 12	A Seminar on Geometric Measure Theory, Varifolds, and Their Applications, Portland State University, Portland, OR (USA) Invited speaker. Mini course: Theory of varifolds
June 4 – 8	Geometric Measure Theory and its Connections, Helsinki (Finland)
May 24	Seminar: Geometric function and mapping theory, IM PAN, Warsaw (Poland) Seminar talk: Ellipticity in geometric variational problems
Apr. $16 - 20$	MIM UW, Warsaw (Poland)
	Lecture series: Mini-course on the Allard Regularity Theorem
	2017
Nov. 13–17	Short term research visit in Beihang University, Beijing (China) Seminar talk: Solution of an anisotropic inhomogeneous Plateau problem
Oct. 1 – Jan. 26,	MIM UW, Warsaw (Poland) Full term course: Geometric measure theory – Varifolds
Oct. 1 – 6	Harmonic Analysis and Geometric Measure Theory, CIRM, Marseille (France)  Poster: The Plateau problem – old and new
July 17 – 21	Geometric analysis and related topics /in honour of Tadeusz Iwaniec's 70th birthday, Banach Center (MRCC), Będlewo (Poland)

	Poster: The Plateau problem – old and new
Apr. 6	Seminar: Geometric function and mapping theory, IM PAN, Warsaw (Poland) Seminar talk: Solution of an anisotropic inhomogeneous Plateau problem
Mar. 30 – Apr. 2	V Spring School of Analysis, Banach Center (MRCC), Będlewo (Poland)
	2016
Nov. 8, 15, 22	Institute of Mathematics, University of Warsaw (Poland)  Mini course: Three lectures on the theory of currents
Sept. 12 – 16	CIMI Thematic Semester, Université de Toulouse (France) Invited speaker. Mini course: An introduction to varifolds theory
June 23	X Forum of PDE, Banach Center (MRCC), Będlewo (Poland) Invited conference talk: New solutions to a generalised Plateau problem
June 14	Universität Leipzig (Germany) Seminar talk: New solutions to a generalised Plateau problem
May 5	Institute of Mathematics, Polish Academy of Sciences, Warsaw (Poland)  Seminar talk: Rectifiability of measures via discrete curvatures
Jan. 21	Institute of Mathematics, University of Warsaw (Poland)  Seminar talk: Curvature energies for non-smooth sets
	2015
Nov. 9–13	Short term research visit in Université Claude-Bernard Lyon 1 (France)
Sept. 7 – 12	6. Forum Matematyków Polskich, Warsaw (Poland) (The 6 <sup>th</sup> Forum of Polish Mathematicians) <b>Talk:</b> Some aspects of regularity theory for integral varifolds
Aug. 31 – Sept. 3	Workshop on Knots in Theory and the Sciences, Basel (Switzerland)  Poster: Geometric curvature energies in calculus of variations
June 29 – July 3	Geometric Measure Theory and Calculus of Variations: theory and applications, Grenoble (France)
	2014
Sept. 29 – Oct. 1	Short term research visit in RWTH Aachen, (Germany) Talk: Higher order rectifiability of sets having finite curvature energies
Sept. $17 - 20$	DMV-PTM joint meeting, Poznań (Poland)
30pt 2	Talk: Some regularity properties of surfaces having mean curvature in $L^p$
Nov. 91 92	2013  Now There do in Colombia of Variations and Dantiel Differential Equations Nanlas
Nov. 21 – 23	New Trends in Calculus of Variations and Partial Differential Equations, Naples (Italy)  Poster: Geometric curvature energies in calculus of variations
C + 00 07	
Sept. 22 – 27	Heidelberg Laureate Forum, Heidelberg (Germany)
Apr. 28 – May 4	Workshop: Geometric Knot Theory, Mathematisches Forschungsinstitut Oberwolfach (Germany)  Talk: Menger-type curvature in higher dimensions
	0 01
Sont 17 20	<b>2012</b> Workshop: Geometric curvature energies, Kloster Steinfeld, Kall (Germany)
Sept. 17 – 20	Talk: Compactness for the class of manifolds with uniformly bounded curvature energy
$\mathrm{July}\ 2-4$	Geometric Measure Theory, MPI-AEI Golm (Germany) 2011
Nov. $28 - 30$	2 <sup>nd</sup> EU Young and Mobile Workshop: Geometric Analysis and PDE's, Granada
- 20	(Spain)  Talk: Higher dimensional Menger curvature as a tool for proving regularity of sets
Sept. $25 - 30$	Short term research visit in RWTH Aachen, (Germany)

June 27 – July 8 Le séminaire de mathématiques supérieures: Metric Measure Spaces: Geometric and Analytic Aspects, Montréal (Canada)

### 2010

Dec. 13 – 17 Final "CODY" workshop: Renormalization in low dimensional dynamics and its applications, Warwick (UK)

Poster: Menger curvature for set of arbitrary dimension

Aug. 31 – Sept. 3 Workshop: Geometric Curvature Energies, Banach Center (MRCC), Będlewo (Poland)

Talk: Integral Menger curvature for surfaces in arbitrary codimension

Feb. 1-5 Winter School on Analysis, Bonn (Germany)

#### 2009

Sept. 14 – 19 "CODY" Summer School: Analysis on Metric Spaces and Quasiconformal Structuresa, Warsaw (Poland)

Aug. 10 – 14 Nonlinear problems for  $\Delta_p$  and  $\Delta$ , Linköping (Sweeden)

### **Publications**

- (1) Y. Fang and S. Kolasiński, "Existence of solutions to a general geometric elliptic variational problem", *Calc. Var. PDE*, Vol. 57(3), 2018. DOI: 10.1007/s00526-018-1348-4
- (2) S. Kolasiński and U. Menne, "Decay rates for the quadratic and super-quadratic tilt-excess of integral varifolds", *Nonlinear Differ. Equ. Appl. (NoDEA)*, Vol. 24(2), 2017. DOI: 10.1007/s00030-017-0436-z
- (3) S. Kolasiński, "Higher order rectifiability of measures via averaged discrete curvatures", Rev. Mat. Iberoamericana 33 (2017), 861–884, 2017. DOI: 10.4171/RMI/958
- (4) S. Kolasiński, P. Strzelecki and H. von der Mosel, "Compactness and isotopy finiteness for submanifolds with uniformly bounded geometric curvature energies", to appear in *Comm. Anal. Geom.*, Vol. 27(1), 2019. arXiv:1504.04538
- (5) S. Kolasiński, "Geometric Sobolev-like embedding using high-dimensional Menger-like curvature",  $Trans.\ Amer.\ Math.\ Soc.$ , Vol. 367, 775–811, 2015. DOI: 10.1090/S0002-9947-2014-05989-8
- (6) S. Blatt and S. Kolasiński, "Sharp boundedness and regularizing effects of the integral Menger curvature for submanifolds", *Adv. Math.*, Vol. 230(3),839–852, 2012. DOI: 10.1016/j.aim.2012.03.007
- (7) S. Kolasiński, P. Strzelecki and H. von der Mosel, "Characterizing  $W^{2,p}$  Submanifolds by p-Integrability of Global Curvatures",  $Geom.\ Funct.\ Anal.$ , Vol. 23(3), 937–984, 2013. DOI: 10.1007/s00039-013-0222-y
- (8) S. Kolasiński, M. Szumańska, "Minimal Hölder regularity implying finiteness of integral Menger curvature", *Manuscripta Math.*, Vol. 141, Issue 1, 125–147, 2013. DOI: 10.1007/s00229-012-0565-y
- (9) S. Kolasiński, "Regularity of weak solutions of n-dimensional H-systems", Differential and Integral Equations, Vol. 23, Num. 11-12, 1073–1090, 2010. URL: projecteuclid.org/euclid.die/1356019073