September 3, 2023

Curriculum Vita
Krzysztof Chris Ciesielski

WVU office address:
Department of Mathematics
West Virginia University
Morgantown, WV 26506-6310
phone: (304) 293-2011
e-mail: KCies@math.wvu.edu
Fax: (304) 293-3982

University of Pennsylvania address:
Department of Radiology, MIPG
e-mail: kcies@mail.med.upenn.edu

I. General Information

Areas of Research Interest

Applied Mathematics/data science: Image processing, especially image segmentation; Pure Mathematics: Real Analysis, Topology, Foundations of Mathematics

Areas of Teaching Interest

Undergraduate and graduate teaching, including: supervising individual students and publication of a graduate text, see [B2].

Education

Ph.D. in Mathematics (1985), Warsaw University, Poland. Awarded *Certificate of Recognition* of the (Polish) Department of Sciences and Higher Education *for Ph.D. Dissertation*, 1986.

Master of Mathematics with Distinction (1981), Warsaw University, Poland, 1981.

Employment History

Sabbatical appointment, Department of Radiology, MIPG, University Pennsylvania, Philadelphia, PA, Fall 2018 and Spring 2019.

Sabbatical appointment, Department of Radiology, MIPG, University Pennsylvania, Philadelphia, PA, Spring 2012.

Adjunct Professor, Department of Radiology, MIPG, University Pennsylvania, Philadelphia, PA, 2006-present.

Associate (NSF supported research appointment), Department of Radiology, MIPG, University Pennsylvania, Philadelphia, PA, 2006-2007.

Sabbatical appointment, Department of Radiology, MIPG, University Pennsylvania, Philadelphia, PA, Fall 2004.

Full Professor, West Virginia University, Morgantown, WV, 1998–present.

Associate Professor, West Virginia University, Morgantown, WV, 1995–1998.

Assistant Professor, West Virginia University, Morgantown, WV, 1989–1995.

Assistant Professor, Methodist College, Fayetteville, NC, 1988–1989.

Visiting Assistant Professor, University of Louisville, KY, 1987–1988.

Visiting Assistant Professor, Bowling Green State University, OH, 1986–1987.

Post-doctoral Fellow, Bowling Green State University, OH, 1985–1986.

Assistant (research fellow), Warsaw University, Poland, 1981–1985.

II. Teaching

PhD students

Francis Jordan, defended March 1998.

Marcin Szyszkowski, defended April 2000.

Krzysztof Płotka, defended April 2001.

Andrés Millán Millán, defended April 2005.

Timothy Glatzer, defended November 2013.

Cheng-Han Pan, defended November 2021.

Gbrel Albkwre, defended March 2022.

Daniel Luis Rodríguez-Vidanes, current, in the Univ. Complutense de Madrid, Spain. Co-advising with professors Juan B. Seoane-Sepúlveda and Gustavo A. Muñoz-Fernández; to defend in Fall 2023.

Teaching Experience

Graduate courses: Topology, Real Analysis, Set Theory, Geometry, Set-Theoretic Topology, Algebra, Logic.

Designed Set Theory course leading to publication of a graduate textbook [B2].

Coordinator of many seminars.

Directing multitude of independent study courses.

Undergraduate courses: various levels of Calculus, Probability and Statistics, Discrete Mathematics, Abstract Algebra, Introduction to Proofs.

Developed the use of Mathematica graphic tools in teaching multivariable calculus. Supported by Computers as Catalysts in Higher Education (CACHE) grant, West Virginia University, 1993.

Developed Capstone course for math majors. Supported by West Virginia University summer grant, 2000.

Presentations (teaching)

How mathematicians measure length, area and volume?, Twenty-second Annual Mathematics and Statistic Conference "Classical Analysis & General Topology in the Undergraduate Curriculum" and Twenty-first Annual Pi Mu Epsilon Student Conference, Miami University, Oxford, OH, September/October 1994.

Mathematica graphics packages for calculus, with special emphasis for multivariable calculus: discussion and demonstration, Colloquium at West Virginia University, October 1993.

III. Service

Departmental Level Committees

Executive Committee, 1999/2000

Graduate Committee and Graduate Selection Committee, 1999-2013

Capstone Course Committee, 2000-2001

Research Professor Selection Committee, 2002

Institute of Math Learning Selection Committee, 2002-2004

Faculty Evaluation (Personal) Committee, 2009-2011

Faculty Evaluation (Personal) Committee for Statistics Department, 2016-2017

Hiring Committee 2018-2019

Graduate Committee 2019-present

Faculty Evaluation (Personal) Committee, 2021-2022

Colloquium Committee, 1990-2003 and 2019-2022.

Research Committee, 2022-2023.

College Level Committees

College Faculty Promotion and Tenure Committee, 2013 and 2014

Dean's Advisory Committee, 1998-2003

College Outstanding Research Award Committee, 1998-99

University Level Committees

International Programs Advisory Committee, 1994-97

Benedum Distinguished Scholars Award Committee, 1999-2000

Professional Activities

Associate editor for Journal of Mathematical Imaging and Vision, 2018–2023.

Member of Inst. of Interdisciplinary Math., IMI, Sci. Committee, Complutense Univ. of Madrid, since 2017. (http://www.mat.ucm.es/imi/about/scientific_commitee.html)

Editor-In-Chief for Journal of Applied Analysis, since 2007.

Contributing editor for Real Analysis Exchange, 1993-2022.

The editor of the Set Theoretic Analysis web page, a section of Topology Atlas 1996-2005. (http://www.math.wvu.edu/~kciesiel/STA/STA.html)

Referee for multiple professional journals and grant agencies.

Reviewer for the Mathematical Reviews of the AMS.

Reviewing several professional books different publishers.

Organizing the US–Polish Workshop in Real Analysis, 1994.

IV. Research

Honors

West Virginia University Benedum Distinguished Scholar Award in the Physical Sciences and Technology category, 1998–99.

West Virginia University College's Outstanding Research Award, Spring 1998.

West Virginia University College's Outstanding Research Award, Spring 1993.

Kazimierz Kuratowski Prize, Polish Mathematical Society and Polish Academy of Sciences, 1986.

Certificate of Recognition of (Polish) Ministry of Science and Higher Education *for Ph.D. Dissertation*, 1986.

Certificate of Recognition of Polish Mathematical Society *for Young Mathematicians* for the paper "On the netweight of subspaces," 1983.

Other honors include: Representing Poland in the *International Olympiad in Mathematics* for High Schools (1976), *Master of Mathematics with Distinction* (1981) and *Wacław Sierpiński Prize for students in mathematics*, Polish Academy of Science (1980).

Founded Research Grants

North Carolina Board of Science and Technology Grant number 89SE09, Summer 1989.

West Virginia University Senate Research Grant, 1990–91.

West Virginia University Mini-Grant, 1991.

West Virginia University Faculty International Program Grant, Summer 1992.

NSF grant INT–9401673 for organizing the Joint US–Polish Workshop in Real Analysis, Łódź, Poland, July 1994.

NAS/NRC Collaboration in Basic Science Grant, 1994–95.

NATO Collaborative Research Grant, 1994–96.

West Virginia University Mini-Grant, 1995.

NSF International Collaboration Grant INT-9600548, 1996–99.

West Virginia University Senate Research Grant, 1996–97.

NATO Collaborative Research Grant, 1997–99.

West Virginia University Mini-Grant, 1998.

West Virginia University Mini-Grant, 2000.

NATO Collaborative Research Grant, 2001–03.

NAS/NRC Collaboration in Basic Science Grant, 2002–3.

West Virginia University Senate Research Grant, 2002–3.

NSF, *Medical Image Segmentation*, 2006–7.

Publications

Books

B1. K. Ciesielski, L. Larson, K. Ostaszewski, $\mathcal{I}$-density continuous functions, *Mem. Amer. Math. Soc.* **107** (1994), *no. 515*. MR 94f:54035.

B2. K. Ciesielski, Set Theory for the Working Mathematician, *London Math. Soc. Stud. Texts 39*, Cambridge Univ. Press 1997. MR 99c:04001.

B3. K. Ciesielski and J. Pawlikowski, Covering Property Axiom CPA. A combinatorial core of the iterated perfect set model, *Cambridge Tracts in Mathematics* **164**, Cambridge Univ. Press 2004. MR 2006f:03002.

Articles in Peer-reviewed Journals and Book Chapters; two conference proceedings papers

1. K. Ciesielski,Threshold logic, *Polish Acad. Sci. Inst. Philos. Sociol. Bull. Sect. Logic 7(3)* (1978), 107–114. MR 81d:03029.
2. K. Ciesielski, Generalized threshold logic, *Bull. Polish Acad. Sci. Math. 28(5-6)* (1980), 219–228. MR 82d:03035.
3. K. Ciesielski, On the netweight of subspaces, *Fund. Math. 117(1)* (1983), 37–46. MR 85h:54004.
4. K. Ciesielski, The topologies generated by graphs, *Proc. of Jadwisin Conference in 1981*, University of Leeds Press 1983, 67–92.*
5. K. Ciesielski and R. Pol, A weakly Lindelöf function space $C(K)$ without any continuous injection into $c_0(\Gamma)$, *Bull. Polish Acad. Sci. Math. 32(11-12)* (1984), 681–688. MR 86j:54031.

6. K. Ciesielski and F. Galvin, Cylinder problem, *Fund. Math. 127(3)* (1987), 171–176. MR 89e:03079.
7. K. Ciesielski and A. Pelc, Extensions of invariant measures on Euclidean spaces, *Fund. Math. 125(1)* (1985), 1–10. MR 87c:28017.
8. K. Ciesielski and W. Guzicki, Generic families and models of set theory with the Axiom of Choice, *Proc. Amer. Math. Soc. 106(1)* (1989), 199–206. MR 90k:03035.
9. K. Ciesielski, L-spaces without any uncountable 0-dimensional subspace, *Fund. Math. 125(3)* (1985), 231–235. MR 87d:54052.
10. K. Ciesielski, Martin's Axiom and a regular topological space with uncountable net weight whose countable product is hereditarily separable and hereditarily Lindelöf, *J. Symbolic Logic 52(2)* (1987), 396–399. MR 89d:03047.
11. K. Ciesielski, A short ordered commutative domain whose quotient field is not short, *Algebra Universalis 25(1)* (1988), 1–6. MR 89d:06035.
12. K. Ciesielski, How good is the Lebesgue measure?, *Math. Intelligencer 11(2)* (1989), 54–58. MR 90a:28001.
13. K. Ciesielski, K. Cios, and L. S. Goodenday, A recognition method for coronary artery stenoses, *Computers in Cardiology*, 123–26. Louven, Belgium, 1987: IEEE Computer Society 1988.*
14. K. Ciesielski, Algebraically invariant extensions of σ-finite measures on Euclidean spaces, *Trans. Amer. Math. Soc. 318(1)* (1990), 261–273. MR 90f:28010.
15. K. Ciesielski and L. Larson, The space of density continuous functions, *Acta Math. Hungar. 58(3-4)* (1991), 289–296. MR 92m:26004.
16. K. Ciesielski and R. Laver, A game of D. Gale in which one of the players has limited memory, *Period. Math. Hungar. 22(2)* (1990), 153–158. MR 92d:90137.
17. K. Ciesielski, L. Larson, and K. Ostaszewski, Density continuity versus continuity, *Forum Math. 2(3)* (1990), 265–275. MR 91c:26003.
18. K. Ciesielski, L. Larson, and K. Ostaszewski, Differentiability and density continuity, *Real Anal. Exchange 15(1)* (1989–90), 239–247. MR 91b:26007.
19. K. Ciesielski, 2^{2^ω} non-isomorphic short ordered commutative domains whose quotient fields are long, *Proc. Amer. Math. Soc. 113(1)* (1991), 217–227. MR 91k:03125.
20. K. Ciesielski and L. Larson, Level sets of density continuous functions, *Proc. Amer. Math. Soc. 116(4)* (1992), 963–969. MR 93d:26004.
21. K. Ciesielski, Isometrically invariant extensions of Lebesgue measure, *Proc. Amer. Math. Soc. 110(3)* (1990), 799–801. MR 91c:28012.
22. K. Ciesielski and L. Larson, The density topology is not generated, *Real Anal. Exchange 16(2)* (1990–91), 522–525. MR 92d:26004.
23. K. Ciesielski, Remarks about connected spaces, *Questions Answers Gen. Topology 10(2)* (1992), 181–185. MR 93g:54031.
24. K. Ciesielski and L. Larson, Refinements of the density and $\mathcal{I}$-density topologies, *Proc. Amer. Math. Soc. 118(2)* (1993), 547–553. MR 93g:26018.

25. K. Ciesielski and L. Larson, Baire classification of $\mathcal{I}$-approximately and $\mathcal{I}$-density continuous functions, *Forum Math. 7(4)* (1995), 405–417. MR 96e:26004.

26. K. Ciesielski and L. Larson, Category theorems concerning $\mathcal{I}$-density continuous functions, *Fund. Math. 140(1)* (1991), 79–85. MR 92m:54067.

27. K. Ciesielski and L. Larson, Various continuities with the density and $\mathcal{I}$-density topologies, *Real Anal. Exchange 17(1)* (1991–92), 183–210. MR 93b:26006.

28. K. Ciesielski, L. Larson, and K. Ostaszewski, Semigroups of $\mathcal{I}$-density continuous functions, *Semigroup Forum 45(2)* (1992), 191–204. MR 93i:26004.

29. K. Ciesielski and L. Larson, Analytic functions are $\mathcal{I}$-density continuous, *Comment. Math. Univ. Carolin. 35(4)* (1994), 645–652. MR 96e:26031.

30. K. Ciesielski, Density-to-deep-$\mathcal{I}$-density continuous functions, *Real Anal. Exchange 17(1)* (1991–92), 171–182. MR 93b:26005.

31. K. Ciesielski, Density and $\mathcal{I}$-density continuous homeomorphisms, *Real Anal. Exchange 18(2)* (1992–93), 367–384. MR 94g:26001.

32. K. Ciesielski and L. Larson, The Peano curve and $\mathcal{I}$-approximate differentiability, *Real Anal. Exchange 17(2)* (1991–92), 608–621. MR 93g:26003.

33. K. Ciesielski, Topologizing different classes of real functions, *Canad. J. Math. 46(6)* (1994), 1188–1207. MR 96e:54031.

34. K. Ciesielski, Linear subspace of $\mathbf{R}^\lambda$ without dense totally disconnected subset, *Fund. Math. 142(1)* (1993), 85–88. MR 93k:54010.

35. K. Ciesielski and Sam B. Nadler, Jr., An absorption property for the composition of functions, *Real Anal. Exchange 18(2)* (1992–93), 420–426. MR 94f:54027.

36. K. Ciesielski and L. Larson, Uniformly antisymmetric functions, *Real Anal. Exchange 19(1)* (1993-94), 226–235. MR 95a:26003.

37. K. Ciesielski and W. Wilczynski Density continuous transformations on $\mathbf{R}^2$, *Real Anal. Exchange 20(1)* (1994–95), 102–118. MR 96c:26018.

38. K. Ciesielski, On range of uniformly antisymmetric functions, *Real Anal. Exchange 19(2)* (1993-94), 616–619. MR 95d:26019.

39. K. Ciesielski and J. Jasinski, Topologies making a given ideal nowhere dense or meager, *Topology Appl. 63(3)* (1995), 277–298. MR 96f:54035.

40. K. Ciesielski, Ordinary and strong density continuity of complex analytic functions, *Period. Math. Hungar. 31(1)* (1995), 11–20. MR 96h:26015.

41. K. Ciesielski, Uniformly antisymmetric functions and K_5, *Real Anal. Exchange 21(1)* (1995–96), 147–153. MR 97c:26008.

42. K. Ciesielski and A. W. Miller, Cardinal invariants concerning functions whose sum is almost continuous, *Real Anal. Exchange 20(2)* (1994–95), 657–672. MR 96h:26003.

43. K. Ciesielski and D. Dikranjan, Uniformly approchable maps, *Topology Proc. 20* (1995), 75–89. MR 98e:54018.

44. K. Ciesielski and I. Recław, Cardinal invariants concerning extendable and peripherally continuous functions, *Real Anal. Exchange 21(2)* (1995–96), 459–472. MR 97f:26003.

45. K. Ciesielski, Sum and difference free partitions of vector spaces, *Colloq. Math. 71(2)* (1996), 263–271. MR 97f:26003.

46. K. Ciesielski and M. Burke, Sets on which measurable functions are determined by their range, *Canad. J. Math. 49(6)* (1997), 1089–1116. MR 99i:28004.

47. K. Ciesielski, M. Balcerzak, and T. Natkaniec, Sierpiński-Zygmund functions that are Darboux, almost continuous, or have a perfect road, *Arch. Math. Logic 37(1)* (1997), 29–35. MR 98k:26005.

48. K. Ciesielski, Density Topology, *Encyclopedia of Mathematics*, *Supplement vol. 1*, Kluwer Acad. Pub., Amsterdam, 1997, 219–220.

49. K. Ciesielski and A. Maliszewski, Cardinal invariants concerning bounded families of extendable and almost continuous functions, *Proc. Amer. Math. Soc. 126(2)* (1998), 471–479. MR 98d:26001.

50. K. Ciesielski and T. Natkaniec, Algebraic properties of the class of Sierpiński-Zygmund functions, *Topology Appl. 79(1)* (1997), 75–99. MR 99c:04003.

51. K. Ciesielski and J. Wojciechowski, Sums of connectivity functions on $\mathbf{R}^n$, *Proc. London Math. Soc. 76(2)* (1998), 406–426. MR 98k:26023.

52. K. Ciesielski and M. Szyszkowski, A symmetrically continuous function which is not countably continuous, *Real Anal. Exchange 22(1)* (1996–97), 428–432. MR 97h:26002.

53. K. Ciesielski, D. Dikranjan, and S. Watson, Functions characterized by images of sets, *Colloq. Math. 77(2)* (1998), 211–232. MR 99f:54013.

54. K. Ciesielski, Characterizing derivatives by preimages of sets, *Real Anal. Exchange 23(2)* (1997–98), 553–565. MR 99m:26004.

55. K. Ciesielski and T. Natkaniec, Darboux like functions that are characterizable by images, preimages and associated sets, *Real Anal. Exchange 23(2)* (1997–98), 441–457. MR 2000f:26008.

56. K. Ciesielski, Set Theoretic Real Analysis, *J. Appl. Anal. 3(2)* (1997), 143–190. MR 99k:03038.

57. K. Ciesielski and D. Banaszewski, Compositions of two additive almost continuous functions, *Real Anal. Exchange 23(1)* (1997–98), 193–202. MR 99f:26003.

58. K. Ciesielski and S. Shelah, A model with no magic set, *J. Symbolic Logic 64(4)* (1999), 1467–1490. MR 2001h:03094.

59. K. Ciesielski, Some additive Darboux-like functions, *J. Appl. Anal. 4(1)* (1998), 43–51. MR 99i:26002.

60. K. Ciesielski and M. Burke, Sets of range uniqueness for classes of continuous functions, *Proc. Amer. Math. Soc. 127(11)* (1999), 3295–3304. MR 2000b:26003.

61. K. Ciesielski and T. Natkaniec, On Sierpiński-Zygmund bijections and their inverses, *Topology Proc. 22* (1997), 155–164. MR 99k:26001.

62. K. Ciesielski, Decomposing symmetrically continuous functions and Sierpiński-Zygmund functions into continuous functions, *Proc. Amer. Math. Soc. 127(12)* (1999), 3615–3622. MR 2000h:26006.

63. K. Ciesielski and M. Balcerzak, On the sup-measurable functions problem, *Real Anal. Exchange 23(2)* (1997–98), 787–797. MR 2000f:28003.

64. K. Ciesielski, T. Natkaniec, and J. Wojciechowski, Extending connectivity functions on $\mathbf{R}^n$, *Topology Appl. 112(2)* (2001), 193–204. MR 2001m:26024.

65. K. Ciesielski, R. G. Gibson, and T. Natkaniec, κ-to-1 Darboux-like functions, *Real Anal. Exchange 23(2)* (1997–98), 671–687. MR 99f:26004.

66. K. Ciesielski and J. Jastrzębski, Darboux-like functions within the classes of Baire one, Baire two, and additive functions, *Topology Appl. 103(2)* (2000), 203–219. MR 2001g:26001.

67. K. Ciesielski and A. Rosłanowski, Two examples concerning almost continuous functions, *Topology Appl. 103(2)* (2000), 187–202. MR 2001b:26001.

68. K. Ciesielski and K. Kellum, Compositions of Darboux and connectivity functions, *Real Anal. Exchange 24(2)* (1998–99), 599–605. MR 2000f:26003.

69. K. Ciesielski and S. Shelah, Uniformly antisymmetric functions with bounded range, *Real Anal. Exchange 24(2)* (1998–99), 615–619. MR 2000f:26004.

70. K. Ciesielski, M. Balcerzak, and D. Rogowska, Remarks on meager Σ^0_2-supported σ-ideals on the real line, *Tatra Mt. Math. Publ. 19(2)* (2000), 187–192. MR 2001e:54052.

71. K. Ciesielski and D. Dikranjan, Between continuous and uniformly continuous functions on $\mathbf{R}^n$, *Topology Appl. 114(3)* (2001), 311–325. MR 2002c:54011.

72. K. Ciesielski and J. Wojciechowski, Topological Dimension and Sums of Connectivity Functions, *Topology Appl. 112(2)* (2001), 181–191. MR 2001k:54057.

73. K. Ciesielski and S. Shelah, Category analog of sub-measurability problem, *J. Appl. Anal. 6(2)* (2000), 159–172. MR 2002a:03096.

74. K. Ciesielski, R. C. Flagg, and Ralph Kopperman, Characterizing topologies with bounded complete computational models, *Electron. Notes Theor. Comput. Sci. 20* (1999) URL: http://www.elsevier.nl/locate/entcs/volume20.html 11 pages. MR 2001b:06033.

75. K. Ciesielski and H. Rosen, Two examples concerning extendable and almost continuous functions, *Real Anal. Exchange 25(2)* (1999–2000), 579–598. MR 2001h:26002.

76. K. Ciesielski, R. C. Flagg, and Ralph Kopperman, Polish spaces, computable approximations, and cocompact quasimetrizability, *Topology Appl. 119(3)* (2002), 241–256. MR 2003a:54032.

77. K. Ciesielski, J. P. Sacha, and K. J. Cios, Synthesis of Feedforward Networks in Supremum Error Bound, *IEEE Transactions on Neural Networks 11(6)* (2000), 1213–1227; doi: 10.1109/72.883398. PMID: 18249848.

78. K. Ciesielski, M. Balcerzak, and A. Bartoszewicz, On Marczewski-Burstin representations of certain algebras, *Real Anal. Exchange 26(2)* (2000–2001), 581–591. MR 2002e:03078.

79. K. Ciesielski, K. Muthuvel, and A. Nowik, On anti-Schwartz functions and functions with two-element range, *Fund. Math. 168(2)* (2001), 119–130. MR 2002f:26003.

80. K. Ciesielski and J. Pawlikowski, On sums of Darboux and nowhere constant continuous functions, *Proc. Amer. Math. Soc. 130(7)* (2002), 2007–2013. MR 2003a:26003.

81. K. Ciesielski and J. Pawlikowski, On the cofinalities of Boolean algebras and the ideal of null sets, *Algebra Universalis 47(2)* (2002), 139–143. MR 2003d:06018.

82. K. Ciesielski and J. Pawlikowski, Small combinatorial cardinal characteristics and theorems of Egorov and Blumberg, *Real Anal. Exchange 26(2)* (2000–2001), 905–911. MR 2002m:26001.

83. K. Ciesielski and J. Pawlikowski, Crowded and selective ultrafilters under the Covering Property Axiom, *J. Appl. Anal. 9(1)* (2003), 19–55. MR 2005c:03091.

84. K. Ciesielski and J. Pawlikowski, Small coverings with smooth functions under the Covering Property Axiom, *Canad. J. Math. 57(3)* (2005), 471–493. MR 2006c:03075

85. K. Ciesielski, Measure zero sets whose algebraic sum is non-measurable, *Real Anal. Exchange 26(2)* (2000–2001), 919–922. MR 2002e:28001.

86. K. Ciesielski, Generalized continuities, *Encyclopedia of General Topology* (K.P. Hart, J.I. Nagata, and J.E. Vaughan, eds.), Elsevier (2004), 126–130.

87. K. Ciesielski and A. Bartoszewicz, MB-representations and topological algebras, *Real Anal. Exchange 27(2)* (2001–2002), 749–755. MR 2003f:54065.
Errata, *Real Anal. Exchange 29(1)* (2002–2003), 7–8. MR 2005a:54041.

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89. K. Ciesielski, H. Fejzic, and C. Freiling, Measure zero sets with non-measurable sum, *Real Anal. Exchange 27(2)* (2001–2002), 783–793. MR 2003f:28004.

90. K. Ciesielski, A. Millán, and J. Pawlikowski, Uncountable γ-sets under axiom $\mathrm{CPA}^{\mathrm{game}}_{\mathrm{cube}}$, *Fund. Math. 176(2)* (2003), 143–155. MR 2004b:03077.

91. K. Ciesielski and T. Natkaniec, A big symmetric planar set with small category projections, *Fund. Math. 178(3)* (2003), 237–253. MR 2004m:03177.

92. K. Ciesielski and J. Pawlikowski, Nice Hamel bases under the Covering Property Axiom, *Acta Math. Hungar. 105(3)* (2004), 197–213. MR 2005f:26007.

93. K. Ciesielski and M. Laczkovich, Strong Fubini properties for measure and category, *Fund. Math. 178(2)* (2003), 171–188. MR 2005a:28002.

94. K. Ciesielski, M. Balcerzak, and A. Bartoszewicz, Algebras with inner MB-represention, *Real Anal. Exchange 29(1)* (2003–2004), 265–273. MR 2005c:06010

95. K. Ciesielski and L. Bukovský, Spaces on which every pointwise convergent series of continuous functions converges pseudo-normally, *Proc. Amer. Math. Soc. 133(2)* (2005), 605–611. MR 2005h:54037

96. K. Ciesielski and J. Pawlikowski, Uncountable intersections of open sets under $\mathrm{CPA}_{\mathrm{prism}}$, *Proc. Amer. Math. Soc. 132(11)* (2004), 3379–3385. MR 2005c:06010.

97. K. Ciesielski and J. Pawlikowski, On additive almost continuous functions under $\mathrm{CPA}^{\mathrm{game}}_{\mathrm{prism}}$, *J. Appl. Anal. 11(2)* (2005), 153–170. MR 2006i:03079.

98. K. Ciesielski and A. Millán, Separately nowhere constant functions; n-cube and α-prism densities, *J. Appl. Anal. 11(1)* (2005), 49–62. MR 2006a:03070.

99. K. Ciesielski and J. Pawlikowski, Continuous images of big sets and additivity of s_0 under $\mathrm{CPA}_{\mathrm{prism}}$, *Real Anal. Exchange 29(2)* (2003–2004), 755–762. MR 2005f:03075.

100. K.C. Ciesielski, J. Udupa, P. Saha, and Y. Zhuge, Iterative relative fuzzy connectedness for multiple objects with multiple seeds, *Comput. Vis. Image Underst. 107(3)* (2007), 160–182; 10.1016/j.cviu.2006.10.005. PMID: 18769655 [PubMed].

101. K.C. Ciesielski and J. Udupa, Affinity functions in fuzzy connectedness based image segmentation I: Equivalence of affinities, *Comput. Vis. Image Underst.* **114** (2010), 146–154; http://dx.doi.org/10.1016/j.cviu.2009.09.006.

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Presentations at Professional Meetings

Linearly continuous maps discontinuous on the graphs of twice differentiable functions, 44th Summer Symposium in Real Analysis XLIV, Paris and Orsay, France, June 21, 2022.

Differentiability versus continuity: Restriction and extension theorems and monstrous examples, Function Theory on Infinite Dimensional Spaces XVI, Madrid, Spain, November 19, 2019.

A century of Sierpiński-Zygmund functions, 34th Summer Conference on Topology and its Applications, Johannesburg, South Africa, July 3, 2019.

Optimization of Max-Norm Objective Functions in Image Processing and Computer Vision, 21st International Conference on Discrete Geometry for Computer Imagery, DGCI 2019, Paris, France, March 28, 2019. Talk delivered by a coauthor, Filip Malmberg.

Graph-based Segmentation with Local Band Constraints, 21st International Conference on Discrete Geometry for Computer Imagery, DGCI 2019, Paris, France, March 26, 2019. Talk delivered by a coauthor, Caio de Moraes Braz.

Tutorial on Martin's Axiom, by example, Workshop: Topological and Algebraic Genericity II, Spain, November 13, 2018.

Higher level differentiability: Generalized Ulam-Zahorski problem and small coverings by smooth maps, Talk 2 of special session on *Different levels of smoothness: Restriction, extension, and covering theorem*, Summer Symposium in Real Analysis XLII, Saint-Petersburg, Russia, June 11, 2018.

Differentiability versus continuity: Restriction and extension theorems and monstrous examples, Talk 1 of special session on *Different levels of smoothness: Restriction, extension, and covering theorem*, Summer Symposium in Real Analysis XLII, Saint-Petersburg, Russia, June 10, 2018.

Less than 2^ω-many continuous functions that almost cover every continuous function, Pitt Conference on Function Spaces, University of Pittsburgh, Pittsburgh, OH, February 10, 2018.

Differentiable pointwise contractive auto-homeomorphism of a Cantor set, Pitt Topology Conference, University of Pittsburgh, Pittsburgh, OH, June 25, 2017.

Differentiability versus continuity: monstrous examples and extension theorems, Summer Symposium in Real Analysis XLI, The College of Wooster, Wooster, OH, June 20, 2017.

Differentiable pointwise contractive minimal dynamical systems, 51st Spring Topology Conference, Jersey City, NJ, March 10, 2017.

Lineability and additivity cardinals for real-valued functions: old results and new developments, 14th Conference on Function Theory on Infinite Dimensional Spaces, Madrid, Spain, February 9, 2016.

An auto-homeomorphism of a Cantor set with zero derivative everywhere, The Cows and Colleges Symposium 2015, Summer Symposium in Real Analysis XXXIX, Northfield, Minnesota, June 9, 2015.

Generalized distances in image segmentation, invited 90 minutes talk, Special Session on Asymmetric Topology, 29th Summer Topology Conference College of Staten Island, New York, July 26, 2014.

Smooth Peano functions for perfect subsets of the real line, invited address, Workshop on Set Theory and its Applications to Topology And Real Analysis, in memory of Irek Recław, Gdańsk, Poland, July 4-6, 2013.

On functions with continuous restrictions to various sets, invited address, The Symposium in Real Analysis XXXVII, São Carlos, Brazil, June 4, 2013.

On functions on $\mathbf{R}^n$ continuous when restricted to nice curves or surfaces, Special Session on *Separate versus Joint Continuity*, AMS Central Fall Sectional Meeting, University of Akron, OH, October 20-21, 2012.

Continuous, differentiable, and twice differentiable functions; Generalized Peano curve, The Summer Symposium in Real Analysis XXXVI, Reading, PA, June, 2012.

A unifying graph-cut image segmentation framework: algorithms it encompasses and equivalences among them, Medical Imaging Conference, SPIE Medical Imaging, San Diego, February 2012.

Fuzzy connectedness and graph cut image segmentation — similarities and differences, Medical Imaging Conference, SPIE Medical Imaging, Orlando, February 2011.

Linear time algorithms for exact distance transform: elaboration on Maurer et al. *algorithm*, Medical Imaging Conference, SPIE Medical Imaging, Orlando, February 2009.

Affinity functions: recognizing essential parameters in fuzzy connectedness based image segmentation, Medical Imaging Conference, SPIE Medical Imaging, Orlando, February 2009.

A general theory of image segmentation: level set segmentation in the fuzzy connectedness framework, Medical Imaging Conference, SPIE Medical Imaging, San Diego, February 2007.

Segmentation of digital images: continuous models and related digital algorithms, The Summer Symposium in Real Analysis XXX, Asheville, NC, June, 2006.

Finding Objects in the Images; New Segmentation Algorithms, The First Meeting of the Center for Vision Enhancement Technology, Morgantown, West Virginia, May 2006.

Set theoretical aspects of Fubini theorem; some remarks around separate continuity, International Conference on Real Functions Theory in Rowy, Poland, May 2005.

Uncountable intersections of open sets under CPA_{prism}, The Boise Extravaganza in Set Theory, BEST 12, Boise, Idaho, March 2003.

Set theoretical aspects of Fubini theorem and separate continuity, ASL invited address, AMS and MAA Joint Mathematics Meetings, Baltimore, Maryland, January 2003.

Minicourse on the Covering Property Axiom CPA, Sixth Summer School in Set Theory and Topology (Szósta Letnia Szkoła Teorii Mnogości i Topologii), Martiany, Poland, July 2002.

A big symmetric planar set with small category projections, The Summer Symposium in Real Analysis XXVI, Lexington, Virginia, June, 2002.

Strange Hamel bases under the Covering Property Axiom CPA, Fourteenth Spring Mini-Conference in Real Analysis, Louisville, Kentucky, March 2001.

Covering Property Axiom CPA and its consequences the theory of real functions and topology, The Boise Extravaganza in Set Theory, BEST 10, Boise, Idaho, March 2001.

On anti-Schwartz functions and functions with two element range, Summer Symposium in Real Analysis XXIV, Denton, Texas, May, 2000.

Covering Property Axiom — a core of the iterated perfect set model, The Boise Extravaganza in Set Theory BEST, Boise, Idaho, March-April 2000.

Covering Property Axiom — a core of the iterated perfect set model, 2000 Spring Topology and Dynamical Systems Conference, San Antonio, Texas, March 2000.

A combinatorial core of the iterated perfect set model and its consequences to real functions, 23nd Summer Symposium in Real Analysis, Łódź, Poland, June 1999.

Combinatorial principles in the iterated perfect set model, The Workshop on Set Theory and Applications to Topology and Real Analysis, Wieżyca near Gdańsk, Poland, June 1999.

What is known about extendable functions, 13-th Spring Miniconference on Real Analysis, Auburn University, Auburn, Alabama, March 1999.

Each Polish space is cocompactly quasimetrizable, Special Session on Set-Theoretic Topology, the Annual Winter Meeting of the Canadian Mathematical Society, Kingston, Ontario, Canada, December 1998.

Darboux-like functions on $\mathbf{R}^n$ *within the classes of Baire one, Baire two, and additive functions*, 22nd Summer Symposium in Real Analysis, Santa Barbara, California, June 1998.

On composition of connectivity functions, The Workshop on Set Theory and Applications to Topology and Real Analysis, Wieżyca near Gdańsk, Poland, April 1998.

On sup-measurable functions problem, Special Session on Real Analysis, 931th AMS Meeting, Louisville, Kentucky, March 1998.

Darboux-like functions on $\mathbf{R}^n$ *within the classes of Baire one, Baire two, and additive functions*, Spring Topology Conference, Fairfax, Virginia, March 1998.

Set theoretic real analysis, Special Session on Set-Theoretic Techniques in Topology and Analysis, 926th AMS Meeting, Atlanta, Georgia, October 1997.

Some Darboux-like functions, 21st Summer Symposium in Real Analysis, Chattanooga, Tennessee, June 1997.

Model with no magic set, Topology Meeting, Slippery Rock University of Pennsylvania, April 1997.

Model with no magic set, The Boise Extravaganza in Set Theory BEST, Boise, Idaho, March 1997.

Functions characterized by images of sets, II Congreso Iberoamericano de Topologia y sus Aplicationes II-CITA City of Morelia, Mexico, March 1997.

Sums of Connectivity Functions on $\mathbf{R}^n$, Seventh Meeting on Real Analysis and Measure Theory, Ischia, Italy, July 1996.

Classes of functions characterized by images of sets, 20th Summer Symposium in Real Analysis, Windsor, Canada, June 1996.

Sets of Range Uniqueness, The Boise Extravaganza in Set Theory BEST, Boise, Idaho, March 1996.

Sets of Range Uniqueness, 11-th Auburn Miniconference on Real Analysis, Auburn, Alabama, March 1996.

Sum and difference free partitions of vector spaces, 11-th Summer Conference on General Topology and Applications, Portland, Maine, August 1995.

Cardinal functions in analysis, 19th Summer Symposium in Real Analysis, Erice, Italy, June 1995.

Set theoretic analysis, Tenth Auburn Miniconference on Real Analysis, Auburn, Alabama, April 1995.

Sum and difference free partitions of vector spaces, The Boise Extravaganza in Set Theory BEST, Boise, Idaho, March 1995.

Sum and difference free partitions of vector spaces, The Symposium on Abstract Analysis, Youngstown St. University, OH, March 1995.

How mathematicians measure length, area and volume?, Twenty-second Annual Mathematics and Statistic Conference "Classical Analysis & General Topology in the Undergraduate Curriculum" and Twenty-first Annual Pi Mu Epsilon Student Conference, Miami University, Oxford, OH, September/October 1994.

Topologies making a given ideal nowhere dense or meager, II, Tenth Summer Conference on General Topology and Applications, Amsterdam, the Netherlands, August 1994.

Uniformly antisymmetric functions, uniformly anti-Schwarz functions, US-Polish Workshop in Real Analysis, Łódź, Poland, July 1994.

Where analysis, topology and set theory meet, International Conference in Real Analysis "Problems in Real Analysis", Łódź, Poland, July 1994.

Ordinary and strong density continuous functions on the plane, 18th Summer Symposium in Real Analysis, Charlottesville, VA, June 1994.

Topologies making a given ideal nowhere dense or meager, Spring Topology Conference, Auburn, AL, March 1994.

Topologies making a given ideal nowhere dense or meager, UNCG Topology Miniconference, Greensboro, NC, November 1993.

An antisymmetric function, Summer Symposium in Real Analysis XVII, St. Paul, Minnesota, June 1993.

Uniformly antisymmetric functions, The Boise Extravaganza in Set Theory BEST, Boise, Idaho, April 1993.

Totally antisymmetric function, Special Session on Set-Theoretic Topology, 876th AMS Meeting, Dayton, Ohio, October 1992.

Topologizing different classes of real functions, Logic Colloquium 1992, Veszprem, Hungary, August 1992.

Linear subspace of $\mathbf{R}^\lambda$ *without dense totally disconnected subset*, Twenty-Sixth Annual Spring Topology Conference, Charlotte, NC, April 1992.

Topologizing different classes of real functions, Eight Auburn Miniconference on Real Analysis, Auburn, Alabama, March 1992.

Topologizing classes of real functions, Small Conference on Topology in Honor of A. V. Arhangiel'skii, University of Pittsburgh, Pittsburgh, Pennsylvania, February 1992.

$\mathcal{I}$-density continuous functions, Special Session on Real Analysis, AMS and MAA Joint Mathematics Meetings, Baltimore, Maryland, January 1992.

Topologizing different classes of real functions, A Short Conference on Topology, Kansas State University, Manhattan, Kansas, January 1992.

The density and $\mathcal{I}$-density topologies, Seventh Summer Conference on Topology: Mary Ellen Rudin and her Work, Madison, Wisconsin, June 1991.

Density and $\mathcal{I}$-density continuous functions, Seventh Auburn Miniconference on Real Analysis, Auburn, Alabama, October 1990.

Various continuities of real functions with respect to density, $\mathcal{I}$-density and ordinary topologies, NC/SC/Va Fall Topology Conference, Raleigh, NC, October 1990.

Refinements of the density and $\mathcal{I}$-density topologies, Fourteen Summer Symposium in Real Analysis, California State University at San Bernardino, June 1990.

Topological properties of the density topology, NC/SC/Va Fall Topology Conference, Durham, NC, October 1989.

$\mathcal{I}$-density continuous functions, Thirteen Summer Symposium in Real Analysis, East Lansing, Michigan, June 1989.

Algebraically invariant extensions of σ-finite measures on Euclidean spaces, Sixth Annual Auburn Miniconference on Real Analysis, Auburn, Alabama, April 1989.

Algebraically invariant extensions of σ-finite measures on Euclidean spaces, AMS and MAA Joint Mathematics Meetings, Phoenix, Arizona, January 1989.

Continuity versus density continuity, 845th Meeting of the American Mathematical Society, Special Session in Real Analysis, Lawrence, Kansas, October 1988.

Density continuous functions, Probability Conference, Ohio State University, Columbus, Ohio, June 1988.

Hereditarily Lindelöf non-separable regular topological space without uncountable 0-dimensional subspaces, Topology Conference, Slippery Rock University, Slippery Rock, Pennsylvania, February 1986.

Solutions of Roitman and Arhangelskii's Problems: L-spaces without any uncountable 0-dimensional subspace, The 13-th Winter School in Abstract Analysis, Srni, Czechoslovakia, January 1985.

L-spaces without any uncountable 0-dimensional subspace, The first Conference in Set Theory and Applications, Zemplinska Šírava near Košice, Czechoslovakia, September 1984.

Independent results in Topology, Analysis and Functional Analysis, Annual Meeting of Polish Mathematical Society, Wrocław, Poland, August 1984.

L-spaces without any uncountable 0-dimensional subspace, General Topology Semester, Banach International Mathematical Center, Polish Academy of Sciences, Warsaw, Poland, May 1984.

Solution of Sierpiński problem concerning isometrically invariant extensions of Lebesgue measure, The 12-th Winter School in Abstract Analysis, Srni, Czechoslovakia, January 1984.

Extensions of invariant measures on Euclidean spaces, Logic Colloquium 1983, Aachen, West Germany, July 1983.

The topologies generated by graphs, Open Days in Set Theory and Logic, Jadwisin Conference, Jadwisin, Poland, September 1981.

Invited Talks

Optimization of Max-Norm Objective Functions, Instituto de Ciência e Tecnologia, Universidade Federal de São Paulo UNIFESP, São José dos Campos, Brazil, June 3, 2019.

Optimization of Max-Norm Objective Functions, Institute of Computing, University of Campinas, Brazil, May 30, 2019.

Optimization of Max-Norm Objective Functions, Institute of Mathematics and Statistics, University of São Paulo, Brazil, May 27, 2019.

Optimization of Max-Norm Objective Functions in Image Processing and Computer Vision, Department of Radiology, MIPG, University of Pennsylvania, March 7, 2019.

Differentiability versus continuity: Restriction and extension theorems and monstrous examples, Department of Mathematics, Universidad Complutense de Madrid, Spain, November 8, 2018.

Hierarchical segmentation in a directed graph setting which optimizes a graph cut energy, Dept of Radiology, MIPG, University of Pennsylvania, November 1, 2018.

Path-value functions for which Dijkstra's algorithm returns optimal mapping, Department of Mathematics, CoSy, Uppsala University, Sweden, September 11, 2018.

Hierarchical segmentation in a directed graph setting which optimizes a graph cut energy, Centre for Image Analysis, Uppsala University, Sweden, September 10, 2018.

Hierarchical segmentation in a directed graph setting which optimizes a graph cut energy, ESIEE, Paris, France, September 5, 2018.

Fuzzy connectedness segmentations with different non-symmetric affinities, University of Campinas, Brazil, May 19, 2017.

Path-value functions for which Dijkstra's algorithm returns optimal mapping, Department of Radiology, MIPG, University of Pennsylvania, December 15, 2016.

Minimal degree of Genocchi-Peano function of n variables, Combinatorics seminar, WVU, November 9, 2016.

Characterization of the cost functions for which Dijkstra algorithm returns desired optimal mapping, Dept of Radiology, MIPG, University of Pennsylvania, December 17, 2015.

General theory of fuzzy connectedness segmentations: reconciliation of two tracks of FC theory, Department of Radiology, MIPG, University of Pennsylvania, March 6, 2015.

From one variable to multivariable calculus: Separate continuity and beyond, Department of Mathematics, Łódź Technical University, Łódź, Poland, June 23, 2014.

New results on the minimum barrier distance, Department of Radiology, MIPG, University of Pennsylvania, April 11, 2014.

Separate continuity and its generalizations: history, recent progress, and open problems, Dept. of Mathematics, Warsaw University, Poland, October 15, 2013.

The minimum barrier distance, University of São Paulo, Brazil, June 10, 2013.

The minimum barrier distance, University of Campinas, Brazil, June 7, 2013.

Delineating objects in images via minimization of ℓ_p energies: Fuzzy Connectedness, Graph Cut, and Random Walk algorithms, CUNY Graduate Center CS Colloquium, May 9, 2013

Delineating objects in images via minimization of ℓ_p energies; spanning forests via Dijkstra's and Kruskal's algorithms, CCNY joint CS-Math Colloquium, May 8, 2013

The minimum barrier distance, Department of Radiology, MIPG, University of Pennsylvania, November 16, 2012.

Linear time Relative Fuzzy Connectedness image segmentation algorithms as variations of Kruskal's and Dijkstra's algorithms, Department of Radiology, MIPG, University of Pennsylvania, March 16, 2012.

Image segmentation algorithms—tools for finding meaningful objects in digital images, Imaging Sciences International, i-CAT Company, Hatfield, PA, March 15, 2012.

Graph Cut and Relative Fuzzy Connectedness segmentation algorithms as ℓ_p-norms energy optimizers; fast Fuzzy Connectedness algorithms via spanning forests, Department of Radiology, MIPG, University of Pennsylvania, March 2, 2012.

Maximal and Optimal Forests in image segmentation, Combinatorics Seminar, West Virginia University, November 30 and December 7, 2011.

Fuzzy connectedness and graph cut image segmentation — similarities and differences; including comments on "new" literature on the subject, Department of Radiology, MIPG, University of Pennsylvania, March 25, 2011.

Delineating objects in digital images: comparison on Graph Cut and Fuzzy Connectedness algorithms, Mathematics/Computer Science Colloquium, West Virginia University, February 7, 2011.

How good is Lebesgue measure?, Łódź Technical University, Łódź, Poland, July 2010.

Linear Time Exact Signed Distance Transform, Department of Radiology, MIPG, University of Pennsylvania, October 12, 2009.

Connecting Continuous Segmentation Models With Their Discretization—A Unifying Approach, Department of Radiology, MIPG, University of Pennsylvania, May 19, 2008.

Continuous and Discrete Segmentation models: Is the Relationship Established According to the Scientific Method Standards?, Department of Radiology, MIPG, University of Pennsylvania, November 5, 2007.

Fundamental concepts in image segmentation and how they are combined to form different algorithms, Department of Radiology, MIPG, University of Pennsylvania, April 16, 2007.

Independence results in real analysis: Fubini theorem and covering the plane by smooth functions, Department of Mathematics, University of Pennsylvania, February 5 and 12, 2007.

On some imaging fundamentals, or how to find level set image delineation without curve propagation, Department of Radiology, MIPG, University of Pennsylvania, October 16, 2006.

Continuous Model for FC Segmentation and Its Relation to Other Segmentation Models, Department of Radiology, MIPG, University of Pennsylvania, March 27, 2006.

Covering Property Axiom CPA, Lehigh University, PA, March 15, 2005.

Affinity Based Image Segmentation Theory, Department of Radiology, MIPG, University of Pennsylvania, February 28, 2005.

Iterative Relative Fuzzy Connectedness for Multiple Objects, Department of Radiology, MIPG, University of Pennsylvania, October 2004.

Image Segmentation via Fuzzy Methods, Neuroimaging Seminar at Center of Advanced Imaging, West Virginia University, March 2004.

Computer approximations in Polish spaces, Drexel University, Philadelphia, PA, November 24, 2003.

Set theoretical aspects of Fubini theorem, Warsaw University, Warsaw, Poland, June 24, 2003.

Paradoxes in mathematics and the meaning of truth, University of Scranton, PA, April 24, 2003.

Covering Property Axiom CPA, a combinatorial core of the iterated perfect set model, Penn State University, PA, April 22, 2003.

New axioms consistent with set theory and their applications to the theory of real functions, Warsaw University, Warsaw, Poland, January 5, 2000.

New axioms consistent with the set theory, Gdańsk University, Gdańsk, Poland, December 20, 1999.

Paradoxes in mathematics and the meaning of truth, West Virginia University Benedum Distinguished Scholar Award Lecture, WV, April 20, 1999.

Set theoretic real analysis, University of Scranton, PA, December 16, 1998.

Set theoretic real analysis, University of Udine, Udine, Italy, May 7, 1998.

Characterizing derivatives by preimages of sets, Łódź Technical Univ., Łódź, Poland, April 30, 1998.

Set theoretic real analysis, Polish Mathematical Society, Łódź, Poland, April 28, 1998.

Set theoretic real analysis, Pedagogical University, Bydgoszcz, Poland, April 24, 1998.

Set theoretic analysis, Polish Mathematical Society, Gdańsk, Poland, April 16, 1998.

Adding connectivity functions on $\mathbf{R}^n$, Gdańsk University, Gdańsk, Poland, April 15, 1998.

Set theoretic analysis, Warsaw University, Warsaw, Poland, April 8, 1998.

Set theoretic real analysis, Boise State University, Boise, Idaho, January 1998.

Set theoretic analysis, Colloquium at West Virginia University, February 1997.

Set theoretic analysis, York University, Toronto, Canada, February 1996.

Set theoretic analysis, Slippery Rock University, Slippery Rock, PA, February 1996.

Set theoretic analysis, University of Louisville, Louisville, KY, January 1996.

Sum and difference free partitions of vector spaces, Carolinae University, Prague, Czech Rep., July 1995.

Where analysis, topology and set theory meet, Carolinae University, Prague, Czech Rep., July 1995.

Set theoretic analysis, Carolinae University, Prague, Czech Rep., July 1995.

How good is Lebesgue measure?, University of Udine, Udine, Italy, June 1995.

How good is Lebesgue measure?, California State University, San Bernardino, March 1994.

Uniformly antisymmetric functions, City College of New York, New York, NY, February 1994.

Mathematica graphics packages for calculus, with special emphasis for multivariable calculus: discussion and demonstration, Colloquium at West Virginia University, October 1993.

Topologizing different classes of real functions, Boise State University, Boise, Idaho, April 1993.

Uniformly antisymmetric functions, University of Pittsburgh, Pittsburgh, PA, November 1992.

Topologizing different classes of real functions, Warsaw University, Warsaw, Poland, August 1992.

Topologizing different classes of functions, Łodź University, Łodź, Poland, July 1992.

$\mathcal{I}$-density and density topologies: continuity and refinements, Łodź University, Łodź, Poland, July 1992.

$\mathcal{I}$-density topology and continuity, Ohio University at Athens, Athens, March 1991.

Density and $\mathcal{I}$-density continuous homeomorphisms, University of Louisville, Louisville, KY, November 1990.

Functions continuous with respect to the density topology, Ohio University at Athens, Athens, November 1990.

Some set theoretical problems in real analysis, Mathematical Sciences Research Institute, Berkeley, June 1990.

A game of D. Gale in which one of the players has limited memory, University of California, Berkeley, June 1990.

My achievements in mathematics, University of Southwestern Louisiana, Lafayette, Louisiana, February 1989.

Structure of density continuous functions, West Virginia University, Morgantown, West Virginia, February 1989.

How good is Lebesgue measure?, Colloquium at the University of Louisville, Louisville, Kentucky, April 1988.

How good is Lebesgue measure?, Methodist College, Fayetteville, North Carolina, March 1988.

Solution of Sierpiński Problem: Isometrically invariant extensions of Lebesgue measure, University of Mississippi, University, Mississippi, February 1988.

Isometrically invariant extensions of Lebesgue measure, Catholic University of America, Washington, D.C., May 1987.

Real valued sequentially continuous functions on the product space 2^κ, University of Colorado, Boulder, Colorado, November 1986.

How good is Lebesgue measure?, University of Michigan, Ann Arbor, Michigan, October 1986.

How good is Lebesgue measure?, Colloquium at Bowling Green State University, Bowling Green, Ohio, September 1986.

Isometrically invariant extensions of Lebesgue measure, University of Toronto, Toronto, Ontario, Canada, November 1985.

Cylinder and rectangular problems, Gdańsk University, Gdańsk, Poland, April 1982.

Topologies generated by graphs, Hungarian Institute of Mathematics, Budapest, Hungary, April 1981.