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VITA

Jan Mycielski

PERSONAL: Birthdate: February 7, 1932
Birthplace: Wisniowa, Poland

Married: 1959 to Emilia Przezdziecka

U.S. Citizen: 1975 in Denver

DEGREES:	M.A. in Mathematics	University of Wroclaw, Poland	1956
	Ph.D. in Mathematics	University of Wroclaw, Poland	1957

THESIS ADVISOR: Stanislaw Hartman

THESIS TITLE: Applications of free groups to geometrical constructions

POSITIONS HELD:

1957–58	Centre National de la Recherche Scientifique in Paris
1958–63	Institute of Mathematics of the Polish Academy of Sciences, as adjunct
1961–62	University of California at Berkeley, as visiting professor
1967	Case Western Reserve University in Cleveland, OH, as visiting professor
1967	University of Colorado, as visiting professor
1968	Nominated professor by the Polish government and advanced to position of professor at the Institute of Mathematics of the Polish Academy of Sciences
1969–	University of Colorado, permanent professorship
1970	University of California at Berkeley, visiting professor
1977–78	Institut des Hautes Etudes Scientifiques, Visitor
1984–	Member of the Cultural Advisory Committee of the Alfred Jurzykowski Foundation
1987	University of Hawaii at Manoa, Visitor
1989–90	Los Alamos National Laboratory, Visitor
1991	University of Warsaw (Poland), Visitor

EDITOR OF:

1971–	The journal *Algebra Universalis.*
1975–	The series of monographs *Encyclopedia for Pure and Applied Mathematics*
1980–85	The journal *Transactions of the American Mathematical Society*
1983–89	The AMS series of monographs *Contemporary Mathematics*
1984–	The journal *Fundamenta Mathematicae*
1985–92	The journal *Games and Economic Behavior*

HONORS AND AWARDS:

1965 Stephan Banach Prize of the Polish Mathematical Society.
1978 Invited Address to the American Mathematical Society.
1978 The Alfred Jurzykowski Foundation Award.
1990 The W. Sierpinski Medal of the University of Warsaw and the Polish Mathematical Society.
1990 The University of Colorado 78-th lecture on research and creative work.

PUBLICATIONS:

Abbreviations of Journal Titles

BAP	= Bulletin de l'Academie Polonaise des Sciences, Serie des sciences mathematiques, astronomiques et physiques
CM	= Colloquium Mathematicum
FM	= Fundamenta Mathematicae
JSL	= Journal of Symbolic Logic
NAMS	= Notices of the American Mathematical Society
SM	= Studia Mathematica

1951

1. *Sur les représentations des nombres naturels par des puissance à base et exposant naturels*, CM **2**, 254–260. [MR 14-20].

1954

2. *On a problem of Sierpiński concerning congruent sets of points*, BAP vol 2, 125–126. [MR 16-227].

1955

3. *About sets with strange isometrical properties (I)*, FM **42**, 1–10. [MR 17-244].
4. *On the paradox of the sphere*, FM **42**, 348–355. [MR 18-324].
5. *Generalizations of the theorems on the paradoxical decompositions of the sphere*, BAP **3**, 199–200. [MR 18-323].
6. *On powers*, BAP **3**, 129–132. [MR 17-945].
7. (with A. Zięba), *On infinite games*, BAP **3**, 133–136. [MR 16-1135].
8. *Sur le coloriage des graphs*, CM **3**, 161–162 + P130 R1, P131 R1; *ibidem* **7** (1961), 7308. [MR 16-1044].

1956

9. *Quelques indentités de la théorie analytique des nombres*, CM **4**, 68–70. [MR 17-1188].
10. (with S. Paszkowski), *Sur un problème du calcul de probabilité (I)*, SM **15**, 188–200. [MR 19-599].
11. (with S. Balcerzyk), *On free subgroups of topological groups*, BAP **4**, 415. [MR 18-403].

12. *On the deomposition of Euclidean spaces*, BAP **4**, 417–418. [MR 18-661].

13. *On the congruence of sets*, BAP **4**, 419–421. [MR 18-661].

14. (with S. Swierczowski and A. Zięba), *On finite positional games*, BAP **4**, 485–488. [MR 19-232].

1957

15. *On the method of category in analytic manifolds*, FM **4**, 259–299. [MR 19-1187].

16. *On the extension of equalities in connected topological groups*, FM **44**, 300–302. [MR 20 #934].

17. (with S. Balcerzyk), *On the existence of free subgroups in topological groups*, FM **44**, 303–308. [MR 20 #935].

18. *On the decomposition of a segment into congruent sets and related problems*, CM **5**, 24–27 + P193 R1; *ibidem*, 233. [MR 20 #7249].

19. *Some theorems on connected compact groups*, BAP **5**, 1023. [MR 20 #1725].

20. *A characterization of arithmetical classes*, BAP **5**, 1025–1027. [MR 20 #5].

21. (with S. Balcerzyk), *Some theorems on the representations of free products*, BAP **5**, 1029–1030. [MR 20 #1706].

1958

22. (with S. Swierczkowski), *On free groups of motions and decompositions of the Euclidean space*, FM **45**, 283–291. [MR 24 #2294].

23. *About sets with strange isometrical properties (II)*, FM **45**, 292–295. [MR 24 #A1829].

24. *About sets invariant with respect to denumerable changes*, FM **45**, 296–305. [MR 24 #A2295].

25. *Some properties of connected compact groups*, CM **5**, 162–166. [MR 20 #6479].

26. (with S. Hartman), *On the imbedding of topological groups into connected topological groups*, CM **5**, 167–169. [MR 20 #6480].

27. (with B. Knaster and A. Lelek), *Sur les decompositions d'ensembles connexes*, CM **6**, 227–246. [MR 21 #6572].

1960

28. (with S. Paszkowski), *A generalization of Tshebyshev polynomials*, BAP **8**, 433–438. [MR 23 #A2679].

1961

29. *On a problem of interpolation by periodic functions*, CM **8**, 95–97. [MR 23 #A3415].

30. *Some remarks and problems on the colouring of infinite graphs and the theorem of Kuratowski*, Acta Math. Acad. Sci. Hung. **12**, 125–129. [MR 24 #A546]; and Errata, *ibidem* **18** (1967), 339–340. [MR 36 #2526].

31. (with A. Lelek), *Some conditions for a mapping to be a covering*, FM **49**, 295–300. [MR 30 #5278].

32. (with S. Balcerzyk), *On faithful representations of free products of groups*, FM **50**, 63–71. [MR 24A #A3192].

<u>1962</u>

33. (with H. Steinhaus), *A mathematical axiom contradicting the axiom of choice*, BAP **10**, 1–3. [MR 25 #3850].

<u>1964</u>

34. *On the axiom of determinateness*, FM **53**, 202–224. [MR 28 #4991].

35. (with S. Swierczkowski), *On the Lebesgue measurability and the axiom of determinateness*, FM **54**, 67–71. [MR 28 #4992].

36. *Continuous games with perfect information*, in the collection Advances in Game Theory, Princeton, pp. 103-111. [MR 29 #1074].

37. *Independent sets in topological algebras*, FM **55**, 139–147. [MR 30 #3855].

38. *α-compactness of N^α*, BAP **12**, 437–438. [MR 35 #2746].

39. *Two remarks on Tychonoff's product theorem*, BAP **12**, 439–441. [MR 35 #6566].

40. *Some compactifications of general algebras*, CM **13**, 1–9. [MR 37 #3986].

41. *Definitions of arithmetical operations in the Ackermann model,* (Russian), Algebra i Logika Sem. **3,** No. 5-6, 64-65. [MR 31 #2134].

42. (with S. Bergman, R. Duda, B. Knaster and A. Schinzel), *Kazimierz Zarankiewicz*, CM **12**, 277–288. [MR 30 #4658].

<u>1965</u>

43. (with S. Hartman, S. Rolewicz and A. Schinzel), *Concerning the characterization of linear spaces*, CM **13**, 199–208. [MR 32 #1284].

44. *On unions of denumerable models*, Algebra i Logika Sem. **4,** No. 2, 57–58. [MR 31 #5799].

<u>1966</u>

45. (with A. Hulanicki and E. Marczewski), *Exchange of independent sets in abstract algebras (I)*, CM **14**, 203–215. [MR 33 #1263].

46. (with W. Sierpiński), *Sur une propriété des ensembles linéaires*, FM **58**, 143–147. [MR 34 #4140].

47. *On the axiom of determinateness (II)*, FM **59**, 203–212. [MR 35 #1489].

<u>1967</u>

48. *Complete subgraphs and measure*, article in Théories des graphes, Journées Internationales d'Etude, Rome, 1966, (Dunod, ed.), pp. 255-256.

49. *Algebraic independence and measure*, RM **61**, 165–169. [MR 37 #361].

50. (with A. Lelek), *On convex metric spaces IV*, RM **61**, 171–176. [MR 36 #4520].

51. *Obroty i slowa*, Wiadomosci Matematyczne **10**, 3–5. [MR 37 #5306].

52. *Comments on the paper of Banach "Sur le probléme de la mesure",* S. Banach, Oeuvres **I,** Warszawa, 318–322.

53. *Comments on the paper of Banach "Un théoreme sur les transformations biunivoques",* S. Banach, Oeuvres **I,** Warszawa, 324–325.

54. *Comments on the paper of S. Banach and A. Tarski "Sur la décomposition des ensembles de points en parties respectivement congruentes"*, S. Banach, Oeuvres **I,** Warszawa, 325–327.

55. *Comments on the paper of S. Banach "Sur les transformations biunivoques"*, S. Banach, Oeuvres **I,** Warszawa, 350.

1968

56. (with C. Ryll-Nardzewski), *Equationally compact algebras II*, FM **61**, 271–281; and Errata, *ibidem* **62**, 309. [MR 37 #1238].

57. (with S. Fajtlowicz, W. Holsztyński and B. Węglorz), *On powers of bases in some compact algebras*, CM **19**, 43–46. [MR 37 #127].

1969

58. *Some new ideals of sets on the real line*, CM **20**, 71–76. [MR 39 #2934].

59. (with S. M. Ulam), *On the pairing process and the notion of genealogical distance*, Journal of Combinatorial Theory **7**, 227–234. [MR 38 #6854].

1970

60. *Polynomials with preassigned values at their branching points*, Amer. Math. Monthly **77**, 853–855.

1971

61. *On some consequences of the axiom of determinateness*, Proceedings of Symposia in Pure Mathematics **XIII,** part 1, Axiomatic Set Theory, 265–266. [MR 43 #3111].

62. (with A. Ehrenfeucht), *Abbreviating proofs by adding new axioms*, Bull. Amer. Math Soc. **77**, 366–367. [MR 43 #1838].

63. (with R. McKenzie and D. Thompson), *On Boolean functions and connected sets*, Math. Systems Theory **5**, 259–270. [MR 54 #11876].

1972

64. *Review of the book "Perceptrons"* of M. Minsky and S. Papert, Bull. Amer. Math. Soc. **78**, 12–15.

1973

65. (with A. Ehrenfeucht), *Interpolation of functions over a measure space and conjectures about memory*, Journal of Approximation Theory **9**, 218-236. [MR 53 #6978].

66. *Almost every function is independent*, FM **81**, 43–48. [MR 49 #3854].

67. (with V. Faber), *Graphs with valency k, edge connectivity k, chromatic index $k+1$ and arbitrary girth*, Discrete Mathematics **4**, 339–345. [MR 47 #4839].

68. (with A. Ehrenfeucht), *Organization of memory*, Proc. Nat. Acad. Sci. U.S.A. **70,** No. 5, 1478–1480.

69. (with A. Ehrenfeucht, V. Faber and S. Fajtlowicz), *Representations of finite lattices as partition lattices*, Proc. Conf. on Lattice Theory, Houston, 17-35. [MR 53 #217].

1974

70. (with A. Ehrenfeucht), *On families of intersecting sets*, Journal of Combinatorial Theory **17**, 259–260. [MR 50 #120].

71. (with J. Malitz and W. Thron), *A remark on filters, ultrafilters and topologies*, BAP **22**, 47–48. [MR 49 #6118].

72. *Remarks on invariant measures in metric spaces*, CM **32**, 109–116. [MR 50 #13452].

73. (with S. Fajtlowicz), *On convex linear forms*, Algebra Universalis **10**, 23–28. [MR 51 #10245].

74. *Commentaries to some papers of S. M. Ulam*, in S. M Ulam, Sets, Numbers and Universes, selected papers edited by W. A. Beyer, J. Mycielski and G.-C. Rota, MIT Press, pp. 673–683, 689 and 696-697.

1976

75. (with W. Taylor), *A compactification of the algebra of terms*, Algebra Universalis **6**, 159–163. [MR 55 #7886].

1977

76. *A conjecture of Ulam on the invariance of measure in Hilbert's cube*, SM **60**, 1–10. [MR 55 #3222].

77. (with A. Ehrenfeucht), *Learnable functions*, Proc. Fifth International Congress of Logic Methodology and Philosophy of Science (Butts & Hintikka, eds.), pp. 251-256.

78. *A lattice of interpretability types of theories*, JSL **42**, 297–305.

79. *Two problems on geometric bodies*, Amer. Math. Monthly **84**, 116–118.

80. (with M. Makkai), *An $L_{\omega_1\omega}$ complete and consistent theory without models*, Proc. Amer. Math. Soc. **62**, 131–133. [MR 55 #12464].

81. (with W. Holsztyński and W. Kuperberg), *On compact families of nowhere dense subsets of $\mathbb{R}^n$*, Houston J. of Math. **3**, 475–476.

82. *Can one solve equations in groups?*, Amer. Math. Monthly **84**, 723–726.

1978

83. *Equations unsolvable in $GL_2(C)$ and related problems*, Amer. Math. Monthly **85**, 263–265.

84. *Two constructions of Lebesgue's measure*, Amer. Math. Monthly **85**, 257-259.

85. *Keyboards for pure music*, J. of the Acoustical Society of America **63**, 1933–1935.

1979

86. (with A. Ehrenfeucht and S. Fajtlowicz), *Homomorphisms of direct powers of algebras*, FM **103**, 189–203.

87. *Linear dynamic approximation theory*, Journal of Approximation Theory **25**, 369–383.

88. (with J. Fickett), *A problem of invariance of Lebesgue's measure*, CM **42**, 123–125.

89. (with A. Ehrenfeucht), *An infinite solitaire game with a random strategy*, CM **42**, 115–118.

90. *Finitely additive invariant measures. I*, CM **42**, 309–318.

91. (with A. Ehrenfeucht), *Positional strategies for mean payoff games*, International Journal of Game Theory **8**, 109–113.

92. (with A. Ehrenfeucht), *On k-stable functions*, Journal of Combinatorial Theory, Series A, **27**, 282–288.

1980

93. *On the conjugates of the function* $2|x| - 1$ *in* $[-1, 1]$, Bulletin of the London Mathematical Society **12**, 4–8.

94. (with A. Ehrenfeucht, S. Fajtlowicz and J. Malitz), *Some problems on the Universality of words in groups*, Algebra Universalis **11**, 261–263.

1981

95. *Problems on finitely additive invariant measures*, in the collection General Topology and Modern Analysis, Academic Press, pp. 431-436.

96. (with P. Perlmutter), *Model completeness of some metric completions of absolutely free algebras*, Algebra Universalis **12**, 137–144.

97. *Analysis without actual infinity*, JSL **46**, 625–633.

98. *Finitistic real analysis*, Real Analysis Exchange **6**, 127–130.

1982

99. (with H. Abelson, A. Ehrenfeucht and J. Fickett), *Compositional complexity of Boolean functions*, Discrete Applied Mathematics **4**, 1–10.

100. (with A. Ehrenfeucht, J. Kahn and R. Maddux), *On the dependence of functions on their variables*, J. of Comb. Theory, Series A, **33**, 106–108; and Addendum, *ibidem* **42** (1986), 317.

101. *An essay about old model theory*, Reports on Mathematical Logic **14**, 49–58.

102. *Solutions of Problems 16, 100, 111, 146 and 152, and Commentaires on 19 other problems*, The Scottish Book, Birkhauser-Verlag.

1983

103. *The meaning of the conjecture* $P \neq NP$ *for mathematical logic*, Amer. Math. Monthly **90**, 129–130.

104. (with A. Meir and J. W. Moon), *Hereditarily finite sets and identity trees*, J. of Comb. Theory, Series B, **35**, 142–155.

1984

105. *Pursuit and evasion in a circle*, Amer. Math. Monthly **91**, 415–416.

106. (with V. Faber and P. Pedersen), *On the shortest curve which meets all the lines which meet a circle*, Annales Polonici Mathematici **44**, 249–266.

107. (with S. Wagon), *Large free groups of isometries and their geometrical uses*, L'Enseignement Mathématique **30**, 247–267.

108. *Remarks on the space of monotonic functions*, CM **48**, 139–143.

1985

109. *Sullivan's lamination of a planar region*, L'Enseignement Mathématique **31**, 67–70.
110. *Can mathematics explain natural intelligence?*, Los Alamos Report, LA-10492-MS, UC-32, pp. 1-13.
111. *What is a mathematical theory?*, Rivista Colombiana de Matemáticas **19**, 173–176.
112. *Remarks on infinite systems of equations*, Algebra Universalis **21**, 307–309.

1986

113. *Locally finite theories*, J. of Symb. Logic **51**, 59–62.
114. (with V. Faber), *The shortest curve that meets all the lines that meet a convex body*, Amer. Math. Monthly **93**, 796–801.
115. *Can mathematics explain natural intelligence?*, Physica **22D**, 366–375. (A second edition with minor changes of #111).
116. (with W. Taylor), *Remarks and problems on the lattice of equational chapters*, Algebra Universalis **23**, 24–31.

1987

117. *Representations of infinite permutations by words*, Proc. of the Amer. Math. Soc. **100**, 237–241.
118. *On random convex hulls*, CM **51**, 263–265.
119. *Review of the book "The Banach-Tarski Paradox"* by Stan Wagon, Amer. Math. Monthly **94**, 698–700.
120. (with S. Swierczkowski), *A model of the neocortex*, Los Alamos Report, LA-11140-MS, UC-32, pp. 1–19.
121. *Learning from Ulam: Measurable Cardinals, Ergodicity, and Biomathematics*, Los Alamos Science **15**, 107–113.

1988

122. *Theories of pursuit and evasion*, Journal of Optimization Theory and its Applications **56**, 271–284.
123. *A learning theorem for linear operators*, Proc. Am. Math. Soc. **103**, 547–550.
124. (with S. Swierczkowski), *A model of the neocortex*, Advances in Applied Mathematics **9**, 465–480. (A second edition with minor changes of #120).

1989

125. *The meaning of pure mathematics*, Journal of Philosophical Logic **18**, 315–320.
126. *The Banach–Tarski paradox for the hyperbolic plane*, Fund. Math. **132**, 143–149.
127. *Primes and power-primes*, Colloquium Mathematicum **58**, 145–150.

1990

128. (with B. Grünbaum), *Some models of plane geometries*, Amer. Math. Monthly **97** (9), 839–846.

129. *Stanislaw Marcin Ulam (1909–1984)*, Wiadomosci Matematyczne **29**, 20–37.

130. (with P. Pudlak and A. S. Stern), *A lattice of chapters of Mathematics (interpretations between theories)*, Memoirs of the Amer. Math. Soc. **84** (426), iv + 70.

131. (with V. Faber), *The vanishing of certain integrals*, Houston Journal of Mathematics **16** (3), 313–316.

<u>1991</u>

132. (with J. Malitz and W. Reinhardt), *The Axiom of Choice, the Löwenheim–Skolem Theorem and Borel rdinary models*, Fund. Math. **137**, 53–58 and Errata *ibidem* **140** (1992), 197.

133. (with V. Faber), *Applications of learning theorems*, Fundamenta Informaticae **15**, 145–167.

134. (with D. Niwinski), *Cellular automata on trees, a model of parallel computation*, ibidem, 139–144.

135. (with V. Faber and M. Kuczma), *Some models of plane geometries and a functional equation*, Coll. Math **62**, 279–281.

<u>1992</u>

136. *Quantifier-free versions of first order logic and their psychological significance*, Journal of Philosophical Logic **21**, 125–147.

137. *Games with perfect information*, Handbook on Game Theory, Chapter 3, Elsevier Science Publ., pp. 41–70.

138. (with A. Ehrenfeucht), *A pseudo-random sequence — How random is it?*, American Mathematical Monthly **99**, 373–375.

139. *Some unsolved problems on the prevalence of ergodicity, instability and algebraic independence*, Ulam Quarterly **1** (3), 30–37.

<u>1994</u>

140. (with R. Dougherty), *The prevalence of permutations with infinite cycles*, FM **144**, 89–94.

141. *On the existence of a shortest arc between two points of a metric space*, Houston Journal of Mathematics **20**, 491–494.

<u>1995</u>

142. *Equational treatment of first order logic*, Algebra Universalis **33**, 26-39.

143. *New set-theoretic axioms derived from a lean metamathematics*, Journal of Symbolic Logic **60**, 191–198.

<u>1996</u>

144. (with S. Swierczkowski), *Uniform approximation with linear combinations of reproducing kernels*, SM **121**, 105–114.

<u>1998</u>

145. *Non-amenable groups with amenable action and some paradoxical decompositions in the plane*, Coll. Math. **75**, 149–157.

146. (with Z. Frajzyngier) *On some fundamental concepts of mathematical linguistics: Means and functional domains*, in the collection “Studies in Functional and Structural Linguistics”, ISSN **45**, 295–310.

1999

147. (with R. Dougherty) *Representations of infinite permutations by words (II)*, Proceedings Amer. Math. Soc. **127**, 2233–2243.

Submitted

148. *An approximation algorithm for continuous functions.*

149. *On the structure of irreducible closed 3-manifolds.*

150. *Natural set-theoretic axioms imply CH.*

ABSTRACTS OF UNPUBLISHED PAPERS AND SHORT NOTICES:

1. (with S. Paszkowski), *Sur la fonction de Mobius*, CM **4** (1956), p. 145; and Errata, *ibidem* **7** (1960).
2. *Sur une generalisation de quelques inégalites*, CM **5** (1958), 250–251.
3. *On the coincidence of two mappings of the n-cell into itself*, CM **8** (1961), 283–284.
4. *Connected spaces without infinite sigma-connected sets*, NAMS **9** (1962), p. 315.
5. *Probleme P 317*, CM **8** (1961), 138; *et Solution R1*, CM **15** (1966), 319.
6. *Some conditions for a mapping to be a homeomorphism*, NAMS **16** (1969), p. 990.
7. *Reviewer's remark in #50*, Math. Rev. **39** (1970), 10–11.
8. *Remarks on capacitability*, NAMS **19** (1972), p. A-765.
9. *Probléme P563*, CM **15** (1966), 320; *et Solution R1*, CM **37** (1977), 175.
10. *Measure and category of some sets of models*, NAMS **22** (1975), p. A-475; The proofs were published in the thesis of J. Lynch. *Almost sure theories*, Annals of Math. Logic **18** (1980), 91–135.
11. (with W. Holsztynski and R. Laver), *The existence of some closed sets*, NAMS **25** (1978), p. A-367.
12. (with F. Galvin and R. M. Solovay), *Strong measure zero sets*, NAMS **26** (1979), p. A-280; A proof was published by A. Miller, *Special subsets of the real line*, in the Handbook of Set-Theoretic Topology (K. Kunen, J.E. Vaughan, eds.), North–Holland, 1984, p. 209ff.
13. (with W. Taylor), *Letter to the editor*, Scientific American, February 1980.
14. *Consistency proofs in FIN*, AMS Abstracts **1** (1980), p. 402.
15. (with M. Stallmann), *Decidability of quantified equations*, ibidem **2** (1981), p. 568.
16. *A new proof of a theorem of Läuchli*, published as proof of Theorem 4 in R. H. Cowen, *Two hypergraph theorems equivalent to BPI*, Notre Dame Journal of Formal Logic **31** (1990), 232–240.
17. *A number of Problems and Solutions*, in the American Mathematical Monthly and one in the Mathematics Magazine **71** (1998), 143 and 151.

Ph.D. THESES SUPERVISED:

Bogdan Weglorz, Equationally compact algebras.
Leonard Gallagher, Independence in topological and measure structures.
Paul Perlmutter, Completions of algebras of terms.
James Lynch, Almost sure theories.
James Fickett, Isometries, approximate isometries and measure.