

# CURRICULUM VITAE

**NAME:** DOUGLAS CENZER

**PRESENT POSITION:** Professor

## ADDRESS

Department of Mathematics  
P.O. BOX 118105  
University of Florida  
358 Little Hall  
Gainesville, FL 32611-8105  
email: cenz@ufl.edu  
URL: <https://people.clas.ufl.edu/cenzer/>  
phone: 352-294-2350

## EDUCATION

University of Michigan, Ph.D., Mathematics, 1972 (NSF Graduate Fellow)  
Michigan State University, B.S., Mathematics, 1968 (Ford Motor Co. Fund Scholar)

## PROFESSIONAL EXPERIENCE

Professor of Mathematics, University of Florida, 1987–  
Research Member, Math. Sciences Research Institute, Berkeley, Fall 2020 Chair, Department  
of Mathematics, University of Florida, 2013–2018  
Visiting Fellow, Newton Institute, Cambridge, Spring 2012  
Visiting Fellow, Mathematical Science Institute, Singapore, Summer 2011  
Visiting Scholar, University of California at San Diego, 2002  
Member, Math. Sciences Research Institute, Berkeley, 1989-1990  
Visiting Professor, University of Michigan, Summer 1989,1998,2000,2005  
Associate Professor Mathematics, University of Florida, 1977-1987  
Visiting Associate Professor, North Texas State University, 1981-1982  
Assistant Professor Mathematics, University of Florida, 1972-1977  
NSF Graduate Fellow, University of Michigan, 1968-1972  
Research Assistant, National Security Administration, 1967

## AWARDS

Anderson Scholar, CLAS, 1995, 1999, 2000, 2005, 2007  
Exemplary Mentor Award from SEAGEP (Southeastern Alliance for Graduate Education  
and the Professoriate), 2006.  
STEP (Sustained Performance Award), University of Florida, 2001 and 2009  
CLAS Bonus Award, University of Florida 1997  
TIP Teaching Award, University of Florida, 1998

## GRANTS

NSF Conference grant, Southeastern Logic Symposium (SEALS), Co-PI \$48,000, 2020–2023  
NSF Conference grant, Southeastern Logic Symposium (SEALS), Co-PI \$45,000, 2014–2018  
NSF Computability in Europe 2011 (Conference Grant), PI \$20,000  
NSF Focused Research Group, PI, \$580, 000(\$65,000 UF), 2007-2011, (NSF DMS 0652732)  
NSF Collaboration in Computability (Binational Travel Grant with Russia and Kazakhstan, co-PI (Julia Knight, Notre Dame PI), 2000-2004 (\$30,000);  
renewed for 2006-2009 (\$75,000);  
renewed for 2011-2014 (\$75,000)  
Effectively Closed Sets, UF Faculty Enhancement Opportunity, PI, \$22,824, 2010-2011.  
DSR Award, University of Florida 1978 (\$5000) and 1991 (\$8000)  
NSF Special Year in Logic Award, co-PI, 2005-2008 \$138,000 (NSF DMS 0532644)  
External support for participation in numerous conferences, for example:  
Workshop on Algorithmic Randomness, American Institute of Mathematics, San Jose, August 2020, \$1500  
Colloquium Logicum, Bayreuth, Germany, September 2019, \$2000  
Workshop on Constructive Mathematics, LMU (Munich), April 2018 \$2700  
Aspects of Computation, National University of Singapore, September 2017, 2 weeks food and lodging  
Workshop on Incomputability, Newton Institute, Cambridge, England, June 2012: \$2000 plus 1 week food and lodging  
Recursion Theory Workshop, Computational Prospects for Infinity, National University of Singapore, 2011 \$2400 plus 2 weeks food and lodging;  
Logic Seminar, Notre Dame University, April 2009: \$500 plus 3 days food and lodging;  
Computability, Reverse Mathematics and Combinatorics, Banff Research Station, 2008: 1 week food and lodging;  
Workshop on Effective Randomness, Chicago, 2007: \$800 plus 1 week food and lodging;  
American Institute of Mathematics workshop on algorithmic randomness, 2006: \$1000 plus 1 week food and lodging

## LISTINGS

American Men and Women of Science  
Who's Who in America;  
Who's Who in Frontier Science; Who's Who in American Teachers

## ORGANIZATIONS

Association for Symbolic Logic, Chair, Membership Committee, 2001–2007  
Phi Beta Kappa, Chapter President, 1994  
CCA (Network for Computability and Complexity in Analysis  
CiE (Association for Computability in Europe)  
American Mathematical Society; Pi Mu Epsilon;

## **EDITORIAL ACTIVITIES**

Archive for Mathematical Logic (Springer-Verlag) Editorial Board, 2002–  
Chinese Journal of Mathematics, Editorial Board, 2013–2019  
The Scientific World Journal, 2013– 2019  
Edited special issue of Annals of Pure and Applied Logic, vol. 93 (1998).

Referee for numerous journals, including Amer. Math. Monthly, Ann. Pure and Appl. Logic, Trans. Amer. Math. Soc., Proc. Amer. Math. Soc., J. Math. Logic, Bull. Symbolic Logic, Contemporary Math., Theor. Comp. Science, J. Logic and Computation, Math. Logic Quarterly, Algorithmica, J. Math. Anal. and Applications, J. Symbolic Logic, Archive Math. Logic, Electronic Notes in Comp. Sci., Tohoku Math. J., Information and Computation, Real Analysis Exchange, J. Comp. Sci. and Technology, JK. Logic and Computation.

Refereed papers for several conferences, including CiE (Computability in Europe).

### **Program Reviews**

Program Review for Math. Department at Southern Illinois U., Spring 2019  
Reviewed proposed Ph.D. program at Charleston College, Spring 2019

## **CONFERENCES ORGANIZED**

1. Program Committee for Colloquium Logicum 2020
2. Organized Special Session on Computability at ASL annual meeting, New York, May 2019
3. Co-organized 5 recent Southeastern Logic Symposia (SEALS 2020, 2018, SEALS 2017, SEALS 2016, SEALS 2015) in Gainesville.
4. Program Committee for CiE 2016, Paris.
5. Organizing Committee for joint AMS-ASL special session on Probability and Logic, Joint Math Meetings, Baltimore, January 2014.
6. Program Committee for CIE 2012 (Cambridge).
7. Organized Special Session at AMS Regional Meeting in Washington, D.C., March 2012
8. Organizing Committee and also Chair of Special Session on Classical Computability Theory at CIE 2011 (Sofia).
9. Organizing Committee, 5th Conference on Logic, Computability and Randomness, Notre Dame, May 24-28, 2010, with support from National Science Foundation.
10. Program Committee, Seventh International Conference on Computability and Complexity in Analysis, Zhenjiang, China, June 21-25, 2010.

11. Co-organized SEALS 2010, February 2010.
12. Organized Summer School in Algorithmic Randomness, Gainesville, June 2008.
13. Program Committee, Computability and Complexity in Analysis (CCA 2007), Siena, Italy, June 2007
14. Local Organizing Committee, Association for Symbolic Logic, Annual Meeting, March 2007.
15. Co-organized Workshop on Model Theory and Computable Model Theory, Gainesville, February 2006
16. Organized Computability and Complexity in Analysis (CCA 2006), Gainesville, November 2006
17. Co-organized SEALS 2006, 2005, 2004, Gainesville, April 2006
18. Program Committee for Computability and Complexity in Analysis (CCA 2004), Cincinnati, August 2003
19. Organized AMS Special Session Computability and Models, Annual Meeting, Baltimore, January 2003
20. Organized AMS Special Session on Computability Theory, Annual Meeting, San Diego, January 2002
21. Organized AMS Special Session on Computability Theory, Gainesville, Florida, March 1999
22. Organized AMS Special Session on Recursive and Feasible Mathematics, Orlando, Florida, January 1996
23. Local Organizing Committee, ASL Annual Meeting, Gainesville, Spring 1994

#### **OTHER PROFESSIONAL ACTIVITIES**

Reviewer for funding agencies:

National Science Foundation;

National Research Council of Canada;

Marsden Fund (New Zealand)

Research Foundation - Flanders (Fonds Wetenschappelijk Onderzoek - Vlaanderen, FWO);

France-Berkeley Foundation

Nazarbayev University, via Oak Ridge

Reviewed dissertation for Ackermann Award of European Association of Computer Science Logic;

External Member of Ph.D. Committees at Auckland U. (New Zealand), Nanyang U. (Singapore, Notre Dame U., U. Waterloo (Canada)

Reviewer for Habilitation: U. Vienna (Austria);, Universitat Bundeswehr, Munich, Germany

External reference for hiring, tenure and promotion at U. Michigan, Penn State, U. San Francisco, U. Connecticut George Washington U., National U. Australia, U. West Florida, U. Cincinnati, Arcadia University, Kenyon College, Auckland U. (New Zealand).

### **THESES AND DISSERTATIONS**

Francis Adams, 2017 (Co-directed with J. Zapletal), Ph.D. Dissertation "Anticliques in Borel Graphs on Polish Spaces and Computable Ultrahomogeneous Structures"

Ferit Toska, 2013 Ph.D. Dissertation "Effective Symbolic Dynamics and Complexity"

Sebastian Wyman, 2013 Ph.D. Dissertation, "Closed Sets, Continuous Functions and Symbolic Dynamics in the Arithmetic Hierarchy"

Paul Brodhead, 2008 Ph.D. Dissertation "Computable Aspects of Closed Sets"

S. Ali Dashti, 2008 Ph.D. Dissertation "Effective Symbolic Dynamics"

Zia Uddin, 2004 Ph.D. Dissertation "Structures Subject to Space Complexity"

Farzan Riazati, 2001 Ph.D. Dissertation "On the Lattice of  $\Pi_1^0$  Classes"

Amy Vanderbilt, 2000 Ph.D. Dissertation "Common Derivations in Locally Determined Non-monotonic Rule Systems and their Complexity"

William Moser, 1996 Ph.D. Dissertation "Approximation Methods in Inductive Inference

(Undergraduate) Diego Rojas, McNair Scholar and NSF Grad Fellow, "Computability and Differentiability of Functions on the Cantor Space", 2017

(Undergraduate) Marc Betinsky, 1995 Senior Honors Thesis "Implications and Explorations of the Wronskian" - Undergraduate Research Symposium winner 1995

Reviewer for Habilitations at U. Heidelberg (Germany), U. Vienna (Austria), U. Bundeswehr (Germany)

External reviewer for Ph.D. candidates at U. Notre Dame, U. Waterloo (Canada), U. Auckland (New Zealand)

### **UNIVERSITY SERVICE**

Council on Academic Freedom, Faculty Quality and Faculty Welfare, 2004-2007 and 2014-Faculty Senate Nominating Committee, 2005-2007

Committee on Academic Freedom, Tenure, Professional Relations and Standards, 2004-2007 Goldwater Scholarship Committee, 2006-09

University Library Committee, 1976-80

Member, Faculty Senate 2004-2007, 1988-1990

CLAS Tenure and Promotion Committee, 1980-81, 2007-2009

CLAS Library Committee, 1979-81

CLAS Committee on Teaching and Advising Awards, 1998-1999 DSR Review Committee, 1992-1993

Phi Beta Kappa Vice President, 1991-1992; President 1992-1993

CLAS Search Committee for Department of Mathematics Chair, 1988

## DEPARTMENT SERVICE

Department Chair (July 2013 to August 2018) Tenure and Promotion Committee (Chair 1993-2013, 2019)

Library Committee (Chair since 1975) Hiring Plan Committee

Steering Committee: 1983-85, 1986-88, 1998-2000, 2009-2011

## SELECTED LECTURES (since 2000)

1. "Generically Computable Structures", Math. Sci. Research Institute Seminar, October 2020
2. "Extraction Rate for Random Functionals", CCA 2020 (Computability and Complexity in Analysis), Bologna, Italy, September 2020
3. "Extraction Rate for Almost Total Functionals", Special Session on Computability, Canadian Math. Society Winter Meeting, Toronto, CA, December 2109
4. "Generically Computable Structures", Special Session on Computability, AMS sectional meeting, Hartford, CT, April 2019.
5. "Extraction Rates for Turing Functionals", Special Session on Computability, AMS sectional meeting, Honolulu, Hawaii, March 2019.
6. "Computability and Complexity in Structure Theory", Special Session on Computability in honor of Jeffrey B. Remmel, Joint Math Meetings, Baltimore, January 2019.
7. "Weakly Homogeneous Structures", ASL Hour Talk at Joint Math Meetings, Baltimore, January 2019.
8. "Complexity of Automatic Structures and Isomorphisms", Colloquium talk, College of Charleston, October 2018.
9. "Automatic Structures and Isomorphisms", Keynote Address, Colloquium Logicum, Bayreuth, Germany, September 2018.
10. "Generically Computable Structures", Workshop on Computability Theory and Its Applications", Waterloo, Canada, June 2018, sponsored by Fields Institute.
11. "Random and Online Continuous Functions", Keynote Speaker at LMU (Munich) workshop on constructive mathematics, April 2018.
12. "Weakly Ultrahomogeneous Structures", Aspects of Computation, National University of Singapore, September 2017.
13. "Injection structures specified by finite state transducers", Computability and Complexity 2017, Raunati, New Zealand, January 2017
14. "Random members of  $\Pi_1^0$  classes", AMS Sectional Meeting, Minneapolis, October 2016

15. "Random numbers as probabilities of machine behaviour", Computability, Randomness and Applications, CIRM, Luminy, France, June 2016
16. "Index sets for Logic Programming", Logical Foundations of Computer Science (LFCS 2016), Deerfield Beach, Florida, January 2016.
17. "Algorithmically random functions and effective capacities", Universitat der Bundeswehr, Munich, December 2015.
18. "Algorithmically random functions and effective capacities", Varieties of Algorithmic Information, Heidelberg, June 2015.
19. "Compressibility of closed sets", CCR 2015, Heidelberg, June 2015.
20. "Randomness and capacity", TAMC 2015, Singapore, May 2015.
21. "Weakly ultrahomogeneous structures", Special Session on Computable Structure Theory, AMS Sectional Meeting, Washington, D.C., March 2015.
22. "Algorithmically random functions and effective capacities", Winter Meeting of Canadian Math. Society, Hamilton, Ontario, December 2014.
23. "Ultrahomogeneous structures", Colloquium Talk, College of Charleston, November 2014.
24. "Automatic Injection Structures", Computability in Europe (CiE 2014), Budapest, June 2014
25. "Computability and Categoricity of Ultrahomogeneous Structures", Computability in Europe (CiE 2014), Budapest, June 2014
26. "Effective Symbolic Dynamics and Complexity", AMS Special Session, Ames, Iowa, April 2013.
27. "Finite-to-one Structures", AMS-ASL Special Session, San Diego, January 2013.
28. "Sub-computable Bounded Randomness", LFCS 2013 (Logical Foundations of Computer Science, San Diego, January 2013.
29. "Conservatively Approximable Functions", CCA 2012, Cambridge, England, June 2013
30. "Bounded Randomness", Computability in Europe 2012, Cambridge, UK, June 2012
31. "Effective Injection Structures", Workshop on Incomputability, Newton Institute, Cambridge, England, June 2012
32. " $\Pi_1^0$  structures", Logic Seminar, George Washington University, March 2012

33. “Random Sets”, Recursion Theory Workshop, Computational Prospects for Infinity, National University of Singapore, August 2011
34. “Effective Categoricity of Injection Structures”, CiE 2011, Bulgaria, June 2011
35. “Structures and Isomorphisms in the Difference Hierarchy”, Workshop on Computability (Annual ASL meeting), March 2011
36. “Effective Randomness and Capacity”, Algorithmic Randomness Conference, Notre Dame, May 2010.
37. “Effective Symbolic Dynamics”, Colloquium Talk, College of Charleston, October 2009.
38. “Algorithmic Randomness”, Pi Mu Epsilon Talk, University of Florida, September 2009.
39. “ $\Sigma_1^0$  and  $\Pi_1^0$  Equivalence Structures”, Computability in Europe (CIE 2009), Heidelberg, July 2009
40. “Immunity of Closed Sets”, Computability in Europe (CIE 2009), Heidelberg, July 2009
41. “Effective randomness and Capacity of Closed Sets”, Computability in Europe (CIE 2009), Heidelberg, July 2009
42. “Random Union, Intersection and Membership”, Fourth International Conference on Algorithmic Randomness, Luminy, France, June 2009
43. “ $\mu$ -randomness of Closed Sets and Elements”, Algorithmic Randomness Workshop, Madison, Wisconsin, May 2009.
44. “Structures in the Difference Hierarchy”, Logic Seminar, Notre Dame University, April 2009.
45. “Randomness and Capacity”, Informal Random Gathering, UC Berkeley, March 2009.
46. “Countable Subshifts”, AMS Special Session on Computable Dynamics, January 2009.
47. “Complexity Theory in Algebra and Combinatorics”, Computability, Reverse Mathematics and Combinatorics, Banff Research Station, December 2008
48. “Algorithmic Randomness”, Colloquium Talk, College of Charleston, April 2008
49. “The Cantor-Bendixson Derivative and the Well-founded Semantics of Logic Programming”, Tenth International Symposium on Artificial Intelligence and Mathematics, Fort Lauderdale, January 2008.
50. “Algorithmic Methods for Equivalence Relations”, AMS Special Session on Algorithmic Methods for Algebraic Structures, Murfreesboro, Tennessee, November 2007



51. “Random Closed Sets and Continuous Functions”, Workshop on Effective Randomness, Chicago, September 2007
52. “Effective Symbolic Dynamics”, CCA 2007 (Computability and Complexity in Analysis), Siena, July 2007
53. “ $K$ -Trivial Closed Sets and Continuous Functions”, CIE 2007 (Computability in Europe), Siena, July 2007
54. “Pseudajump Operators and  $\Pi_1^0$  Classes”, CIE 2007 (Computability in Europe), Siena, July 2007
55. “Random Closed Sets and Continuous Functions”, Special Session on Computability, AMS Regional Meeting, Storrs, November 2006.
56. “Random Closed Sets and Continuous Functions”, American Institute of Mathematics workshop on algorithmic randomness, August 2006
57. “Random Closed Sets”, Computability in Europe, Swansea, July 2006
58. “Space Complexity of Structures”, Computability in Europe, Swansea, July 2006
59. “Effectively Closed Sets”, ASL Winter Meeting, January 2006, invited hour talk
60. “Complexity of Inductive Definability”, Computability in Europe, Amsterdam, June 2005.
61. “Reverse Mathematics and the Stable Marriage Problem”, Special Session on Reverse Mathematics, AMS Annual Meeting, Atlanta, January 2005.
62. “Logic Programming and Computability”, Special Session on Computability Theory and Applications, AMS Regional Meeting, Chicago, October 2004.
63. “Logic programming with infinite sets”, 8th International Symposium on Artificial Intelligence and Mathematics, Fort Lauderdale, January 2004
64. “Index Sets for Computable Differential Equations”, International Conference on Computability and Complexity in Analysis, Cincinnati, August 2003
65. “Well-ordered intervals in the lattice of  $\Pi_1^0$  classes”, Workshop on Computability and Logic, Heidelberg, June 2003
66. “Effectively Closed Sets”, Colloquium Talk, East Carolina University, March 2003
67. “Categoricity of Equivalence Structures”, Special Session on “Computability and Models”, Annual AMS Meeting, Baltimore, January 2003
68. “ $\Delta_2^0$ -categoricity of  $p$ -groups”, Special Session on “Effectiveness Questions in Model Theory”, AMS Sectional Meeting, Madison, Wisconsin, October 2002.

69. "On the Lattice of  $\Pi_1^0$  Classes", Logic Seminar – University of Michigan, May 2002.
70. "Minimal and Thin Extensions of  $\Pi_1^0$  Classes", Special Session on Computability Theory with Applications, Annual AMS Meeting, San Diego, January 2002.
71. "Index Sets for  $\omega$ -languages", Workshop on Computability and Complexity in Analysis, Schloss Dagstuhl, Germany, November, 2001.
72. "Degrees of Difficulty of  $\Pi_1^0$  Classes", ASL Special Session on Reverse Mathematics, Annual Meeting of the Association for Symbolic Logic, Philadelphia, March 2001
73. "The lattice of  $\Pi_1^0$  classes", Computability Theory Meeting. Oberwolfach, January 2001
74. "Locally Determined Nonmonotonic Rule Systems", Colloquium, UC San Diego, May 11, 2000.
75. "The Lattice of  $\Pi_1^0$  Classes", ASL Special Session on Computable Model Theory, Winter Meeting of Association for Symbolic Logic, Washington, January 23, 2000.

#### **POSTDOCS SUPERVISED**

Rebecca Weber, Fall 2006 (Assistant Professor, Dartmouth)  
 George Barmpalias, Fall 2006 (Postdoctoral Fellow, Leeds)  
 Christopher Porter, Fall 2014-Spring 2016 (Assistant Professor, Drake University)  
 Ethan McCarthy, Fall 2018-Spring 2020

#### **PUBLICATIONS**

123. (with J. Remmel) Effectively Closed Sets ( $\Pi_1^0$  Classes), draft of 350 pages, Perspectives in Mathematical Logic, Cambridge University Press (2021).
122. (with Calvert and Valentina Harizanov) Generically computable structures, submitted.
121. (with Jean Larson, Chris Porter and Jindrich Zapletal) Set Theory and Foundations of Mathematics: An Introduction to Mathematical Logic, Volume 2: Foundations of Mathematics, World Scientific Press (2021).
120. (edited with Chris Porter and Jindrich Zapletal) Structure and Randomness in Computability and Set Theory, World Scientific Press (2020), 366 pages.
119. (with W. Marek and J. Remmel) Effectively Closed Sets and Logic Programming, in *Structure and Randomness in Computability and Set Theory*, World Scientific Press (2020), 197-283.
118. (Jean Larson, Chris Porter and Jindrich Zapletal) Set Theory and Foundations of Mathematics: An Introduction to Mathematical Logic, Volume 1: Set Theory, World Scientific Press (2020).
117. (with Jacob Carson and Jeffrey Remmel) Effective categoricity of automatic equivalence and nested equivalence structures, *Theory of Computing Systems* 64 (2020), 1110-1139.

116. (with W. Marek and J.B. Remmel) On the complexity of index sets for finite predicate logic programs which allow function symbols, *J. Logic and Computation* 30 (2020), 107-156, DOI: 10.1093/logcom/exaa005
115. (with Francis Adams and Selwyn Ng) Computability and Categoricity of Weakly Homogeneous Boolean Algebras and Abelian p-Groups, accepted for Downey Festschrift, World Scientific Press, to appear.
114. (with Diego Rojas) Online Computability and differentiation in the Cantor space, *Sailing Routes ion the World of Computation*, Proc. 14th CiE, Springer Lecture Notes in Computer Science 10936 (2018) , 136-145.
113. (with George Barmpalias and Christopher Porter) The probability of a computable output from a random oracle, *ACM Transactions on Computational Logic* 18 (2017), 15 pp. <https://arxiv.org/abs/1612.08537>ear (2019).
112. (with Christopher Porter) The random members of a  $\Pi_1^0$  class, *Theory of Computing Systems* 62 (2018) 1637-1671. <https://arxiv.org/abs/1611.05818>
111. (with G. Barmpalias and C. Porter) Random numbers as probabilities of machine behaviour, *Theoretical Computer Science* 673 (2017), 1–18. <https://arxiv.org/abs/1605.05838>
110. (with S. Buss, M. Minnes and J. Remmel), Injection structures specified by finite state transducers, in *Computability and Complexity 2017*, Downey Festschrift, eds. Noam Greenberg, B. Khossainov, A. Day, M. Fellows, S. Melnikov, Springer Lecture Notes in Computer Science 10010 (2017), 1-24.
109. (with Francis Adams) Computability and Categoricity of Weakly Ultrahomogeneous Structures, *Computability* 6 (2017), 465-389. <https://arxiv.org/abs/1608.01254>
108. Index sets for finite normal predicate logic programs with function symbols (with V. Marek and J.B. Remmel), in *Logical Foundations of Computer Science (LFCS 2016)*, Springer Lecture Notes in Computer Science vol. 9537 (2015), 60-75.
107. (with Chris Porter) Algorithmically random functions and effective capacities. *Theory and Methods of Computation (TAMC 2015)*, Springer Lecture Notes in Mathematics 9076 (2015), 22-37.
106. (with S. Buss and J. Remmel) Sub-computable Bounded Randomness, *Logical Methods in Computer Science* 10 (2014).
105. (with F. Adams) Computability and categoricity of ultrahomogeneous structures, in *Language, Life, Limits (Proceedings of CiE 2014 ,Computability in Europe)*, Springer Lecture Notes in Computer Science 8493 (2014), 1-10.
104. (with M. Minnes and J. Remmel), Injection structures specified by finite state transducers, accepted by CiE 2014, *Electronic Proceedings*.
103. (with V. Harizanov and J. Remmel) Two-to-One Structures, *Journal of Logic and Computation* 23 (2013), 1195-1223.
102. (with V. Harizanov and J. Remmel) Computability theoretic properties of injection structures, *Algebra and Logic* 53 (2014), 39-69.
- 101 Various papers on  $\Pi_1^0$  classes (Review), *Bulletin for Symbolic Logic* 18 (2012), 409-412.

- 100 (with J. Remmel) Subcomputable bounded pseudorandomness, in LFCS 2013 (Logical Foundations of Computer Science), San Diego, January 2013, Springer Lecture Notes in Computer Science 7734 (2013), 104-118.
99. (with R. Weber) Effective randomness of unions and intersections, *Theory of Computing Systems* 52 (2013), 48-64.
98. (with J.B. Remmel) A connection between the Cantor-Bendixson derivative and the well-founded semantics of finite logic programs, *Ann.Math. and Artificial Intelligence* 65 (2012), pp. 1-24.
97. (with A. Dashti, F. Toska and S. Wyman) Computability of countable subshifts in one dimension, *Theory of Computing Systems* 51 (2012), pp. 352-371.
96. (with P. Brodhead, F. Toska and S. Wyman) Algorithmic randomness and capacity of closed sets, *Logical Methods in Computer Science* 6 (2011), 1-16.
95. (with V. Harizanov and J. Remmel) Effective categoricity of injection structures, *CiE 2011*, Springer Lecture Notes in Computer Science (2011), 51-60.
94. (with V. Harizanov and J. Remmel)  $\Sigma_1^0$  and  $\Pi_1^0$  structures, *Annals of Pure and Applied Logic* 162 (2011), 490-503.
93. (with J. Franklin, Jiang Lu and Guohua Wu) A superhigh diamond in the c.e. *tt*-degrees, *Arch. Math. Logic* 50 (2011), 33-44.
92. (with J.B. Remmel) A connection between the Cantor-Bendixson derivative and the well-founded semantics of finite logic programs, *Nonmon@30 (30 Years of Nonmonotonic Reasoning)*, Lexington, Kentucky, October 2010, URL: <http://www.cs.uky.edu/~marek/nonmonat30.dir/cenzerRemmel.pdf>
91. (with A. Dashti, F. Toska and S. Wyman) Computability of countable subshifts, in *Programs, Proofs and Processes, CIE 2010*, eds. F. Ferreira et al. Springer Lecture Notes in Computer Science 6158 (2010) 88-97.
90. (with Paul Brodhead) Effective capacity and randomness of closed sets, in *Computability and Complexity in Analysis, CCA 2010*, eds. X. Zheng and N. Zhong, Springer Electronic Proceedings in Theoretical Computer Science 24 (2010), 67-76.
89. (with G. LaForte and J. Remmel) Equivalence structures and isomorphisms in the difference hierarchy, *J. Symbolic Logic* 74 (2009), 535-556.
88. (with G. Laforte and G. Wu) Pseudojumps and  $\Pi_1^0$  Classes, *J. Logic and Computation* 19 (2009), 77-87.
87. (with G. Barmpalias, J. Remmel and R. Weber) *K*-triviality of closed sets and continuous functions, *J. Logic and Computation* 19 (2009), 3-16.
86. (with T. Kihara, R. Weber and G. Wu) Immunity and non-cupping for closed sets, *Tbilisi Math. Journal* 2 (2009), 79-96.
85. (with R. Downey, J. Remmel and Z. Uddin), Space Complexity of Abelian Groups, *Archive for Math. Logic* 48 (2009), 63-76.
84. (Editor, with Valentina Harizanov, David Marker and Carol Wood) Proceedings of the Model Theory and Computable Model Theory Workshop, Gainesville, February 2007, *Archive for Math. Logic* 48 (2009), 1-6.

83. (with W. Calvert, V. Harizanov and A. Morozov) Effective categoricity of Abelian  $p$ -groups, *Ann. Pure and Applied Logic* 59 (2009), 187-197.
82. (with B. Csima and B. Khossainov) Linear orders with distinguished function symbols, *Archive for Math. Logic* 48 (2009), 115-140.
81. (with V. Harizanov and J.B. Remmel)  $\Sigma_1^0$  and  $\Pi_1^0$  equivalence structures, in *CIE 2009*, K. Ambos-Spies, B. Lowe and W. Merkle (eds.) Springer Lecture Notes in Computer Science 5635 (2009), 99-108.
80. (with R. Weber and G. Wu) Immunity of closed sets, Springer Lecture Notes in Computer Science, in *CIE 2009*, K. Ambos-Spies, B. Lowe and W. Merkle (eds.) Springer Lecture Notes in Computer Science 5635 (2009), 109-117.
79. (with J. Franklin, Jiang Lu and Guohua Wu) Embedding the diamond lattice in the c.e. tt-degrees with superhigh atoms, TAMC 2009 (Theory and Applications of Models of Computation), J. Chen and S.B. Cooper (Eds.), Springer Lecture Notes in Computer Science 5532 (2009), 420-429.
78. (with S. Ali Dashti and Jonathan L.F. King) Computable Symbolic Dynamics, *Math. Logic Quarterly* 54 (2008), 524-533.
77. (with P. Brodhead, Enumerations of  $\Pi_1^0$  classes, *Archive for Mathematical Logic* 45 (2008), 565-582.
76. (with Peter Hinman) Degrees of difficulty of generalized r.e. separating classes, *Archive for Mathematical Logic* 45 (2008), 629-647.
75. (with J.B. Remmel) A connection between Cantor-Bendixson derivatives and the well-founded semantics of logic programs, ISAIM 2008, The Tenth International Symposium on Artificial Intelligence and Mathematics (2008).  
URL <http://isaim2008.unl.edu/index.php?page=proceedings>
74. (with Rebecca Weber) Preface to Special Issue of *Archive for Math. Logic* (Proceedings of CCA 2006) 45 (2008), 529-531.
73. (with G. Barmalias, P. Brodhead, J. Remmel and R. Weber) Algorithmic randomness of continuous functions, *Archive for Mathematical Logic* 45 (2008), 533-546.
72. (with S. Ali Dashti and Jonathan L.F. King) Effective Symbolic Dynamics, *CCA 2007 (Computability and Complexity in Analysis, Siena, June 2007)*, Eds. R. Dillhage, T. Grubb, A. Sorbi, K. Weihrauch and N. Zhong, Springer Electronic Notes in Computer Science 202 (2008), 89-99.
71. (with G. Barmalias, P. Brodhead, A. Dashti and R. Weber) Algorithmic randomness of closed sets, *Journal for Logic and Computation* 17 (2007), 1041-1062.
70. (with George Barmalias, Jeffrey Remmel and Rebecca Weber)  $K$ -trivial closed sets and continuous functions, in *Computation and Logic in the Real World – Proceedings CIE 2007*, Editors S.B. Cooper, B. Loewe and A. Sorbi, Springer Lecture Notes in Computer Science 4497 (2007), 135-145.
69. (with G. Laforte, and G. Wu) Pseudajump operators and  $\Pi_1^0$  classes, in *Computation and Logic in the Real World – Proceedings CIE 2007*, Editors S.B. Cooper, B. Loewe and A. Sorbi, Springer Lecture Notes in Computer Science 4497 (2007), 146-151.

68. (Editor, with R. Dillhage, T. Grubb and K. Weihrauch) Third International Conference on Computability and Complexity in Analysis, Information Berichte, FernUniversität (2006), 366 pages, and Springer Electronic Notes in Computer Science 167 (2007).
67. (with Peter Hinman) Medvedev degrees of generalized r.e. separating classes, Proc. CCA 2006, D. Cenzer, R. Dillhage, T. Grubb and Klaus Weihrauch (eds.): Third International Conference on Computability and Complexity in Analysis, Information Berichte, FernUniversität (2006), 125-142, and Springer Electronic Notes in Computer Science 167 (2007).
66. (with Paul Brodhead and Jeffrey Remmel) Random continuous functions, Proc. CCA 2006, D. Cenzer, R. Dillhage, T. Grubb and Klaus Weihrauch (eds.): Third International Conference on Computability and Complexity in Analysis, Information Berichte, FernUniversität (2006), 76-89, and Springer Electronic Notes in Computer Science 167 (2007).
65. (with J. Remmel) On the complexity of inductive definitions, Mathematical Structures in Computer Science 16 (2006), 763-788.
64. (with Zia Uddin) Space complexity of structures, in Logical Approaches to Computational Barriers, Proc. CIE 2006, A. Beckmann, U. Berger, B. Loewe, and J. Tucker (eds.): Springer Lecture Notes in Computer Science, Vol. 3988 (2006), 76-85.
63. (with P. Brodhead and S. Dashti) Random closed sets, in Logical Approaches to Computational Barriers, Proc. CIE 2006, A. Beckmann, U. Berger, B. Loewe, and J. Tucker (eds.): Springer Lecture Notes in Computer Science, Vol. 3988 (2006), 55-64.
62. (with W. Calvert, V. Harizanov and A. Morozov)  $\Delta_2^0$ -categoricity of Equivalence Structures, Annals of Pure and Applied Logic 141 (2006), 61-78.
61. Decidability, completeness and complexity, Journal of Symbolic Logic 71 (2006), 399-424.
60. (with J. Remmel) The complexity of inductive definability, in *New Computational Paradigms*, eds. S. Cooper, B. Loewe and L. Torenvliet, Springer-Verlag Lecture Notes in Computer Science vol. 3526 (2005), 75-85.
59. (with F. Riazati) Minimal extensions of  $\Pi_1^0$  classes, Mathematical Logic Quarterly 51 (2005), 206-216.
58. (with W. Marek and J. Remmel) Logic programming with infinite sets, Annals of Artificial Intelligence and Mathematics 44 (2005), 309-339.
57. (with J. Remmel) Proof-Theoretic Strength of the Stable Marriage Theorem and Other Problems, in "Reverse Mathematics 2001", edited by S. Simpson, ASL Lecture Notes in Logic vol. 21, A.K. Peters (2005), 67-103.
56. (with J. Remmel) Index sets for computable differential equations, pages, Math. Logic Quarterly 50 (2004), 329-344.
55. (with J. Remmel and A. Vanderbilt) Locally Determined Logic Programs and Recursive Stable Models, Annals of Mathematics and Artificial Intelligence 40 (2004), 225-262.
54. (with A. Nies) Global properties of the lattice of  $\Pi_1^0$  classes, Proceedings Amer. Math. Society 132 (2004), 239-249.

53. (with W. Marek and J. Remmel) Using logic programs to reason about infinite sets, 8th International Symposium on Artificial Intelligence and Mathematics (2004), <http://rutcor.rutgers.edu/~amai/aimath04>.
52. (with J. Remmel) Index sets for computable real functions, Proceedings of Computability and Complexity in Analysis, Cincinnati, 2003, Information Berichte 302, FernUniversität in Hagen (2003), 163–182.
51. (with P. Hinman) The Medvedev Lattice of  $\Pi_1^0$  classes, Archive for Mathematical Logic 42 (2003), 583–600.
50. (with J. Remmel) Index sets in  $\omega$ -languages, Mathematical Logic Quarterly 49 (2003), 22–33.
49. (with J. Remmel) Effectively closed sets and graphs of computable real functions, Theoretical Computer Science 284 (2002), pp. 279–318.
48. (with A. Vanderbilt) Common Derivations in Locally Determined Logic Programs, conference paper, 7th International Symposium on AI and Mathematics, December 2001, URL: <http://rutcor.rutgers.edu/~amai/aimath02>.
47. (with A. Nies) Initial segments of the lattice of  $\Pi_1^0$  Classes, Journal of Symbolic Logic 66 (2001), 1749–1765.
46. (with C. Jockusch)  $\Pi_1^0$  Classes – Structure and Applications, in *Computability Theory and Its Applications*, eds. P. Cholak, S. Lempp, M. Lerman and R. Shore, Contemporary Mathematics 257, American Mathematical Society (2000), 39–59.
45. (with J. Remmel and A. Vanderbilt) The complexity of the set of the extensions of nonmonotonic rule systems, “Artificial Intelligence and Mathematics” conference paper, Fort Lauderdale, January 2000, <http://rutcor.rutgers.edu/~amai/aimath00>.
44. (with J. Remmel and A. Vanderbilt) Locally Determined Logic Programs, “Logic Programming and Nonmonotonic Reasoning, El Paso, December 1999”, eds. M. Gelfond, N. Leone and G. Pfeifer, Springer Lectures Notes in Artificial Intelligence 1730 (1999), 34–48.
43. (with J. Remmel) Polynomial time versus computable Boolean algebras, in “Recursion Theory and Complexity” (Proc. 1997 Kazan Workshop) eds. M. Arslanov and S. Lempp, de Gruyter (1999), pp. 15–53.
42.  $\Pi_1^0$  Classes in Computability Theory, in *Handbook of Computability* (ed. E. Griffor), North-Holland Studies in Logic 140 (1999), pp. 37–85.
41. (with V. Marek and J. Remmel) Index Sets for Finite Predicate Logic Programs, FLOC ’99 Workshop on “Complexity-theoretic and Recursion-theoretic methods in Databases, Artificial Intelligence and Finite Model Theory” (1999), pp. 72–80.
40. (with J. Remmel) Index Sets in Computable Analysis, Theoretical Computer Science 219 (Special Issue for 1997 Dagstuhl meeting on Computability and Complexity in Analysis) (1999), pp. 111–150.
39. (with J. Remmel) Feasible graphs with standard universe, Proceedings Recursion Theory Week, Oberwolfach 1996, Annals of Pure and Applied Logic 94 (1998), pp. 21–35.

38. (with J. Remmel) Index sets for  $\Pi_1^0$  classes, Proceeding of AMS Special Session, Orlando 1996, *Annals of Pure and Applied Logic* 93 (1998), pp. 3-61.
37. (with J. Remmel)  $\Pi_1^0$  Classes in Mathematics, "Handbook of Recursive Mathematics, Vol. 2" (eds. Y. Ersov, S. Goncharov, W. Marek, A. Nerode, J. Remmel), North-Holland Studies in Logic 139 (1998), pp. 623-821.
36. (with J. Remmel) Complexity theoretic model theory and algebra, "Handbook of Recursive Mathematics, Vol. 1" (eds. Y. Ersov, S. Goncharov, W. Marek, A. Nerode, J. Remmel), North-Holland Studies in Logic 138 (1998), pp. 381-513.
35. (Editor, with J. Remmel) Proceedings of AMS Special Session (Orlando 1996), *Annals of Pure and Applied Logic* 93 (1998), pp. 1-2.
34. (with W. Moser) A Good Oracle is Hard to Beat, *Algorithmica* 22 (1998), pp. 18-34.
33. (with J. Remmel) Complexity and Categoricity, *Information and Computation* 140 (1998), 2-25.
32. (with J. Remmel) Feasibly categorical Abelian groups, in "Proc. Feasible Math II" (eds. P. Clote and J. Remmel), Birkhauser (1995), 91-153.
31. (with J. Remmel) Feasibly Categorical Models, in *Logic and Computer Science (Proc. LCC '94)* Springer-Verlag Lecture Notes in Computer Science 960 (1995) 300-312.
30. (with W. Moser) Inductive inference of functions on the rationals, in *COLT '95 (Proc. 8th Annual Conf. Computational Learning Theory)*, ACM (1995) 178-181.
29. (with J. Remmel) Feasible graphs and colorings, *Math. Logic Quarterly* 41 (1995), 327-352.
28. (with R. Downey, C. Jockusch, R. Shore) Countable thin  $\Pi_1^0$  classes, *Ann. Pure and Appl. Logic* 59 (1993), 79-139.
27. Effective Dynamics, in *Logical Methods (in honor of A. Nerode)*, eds. J. Crossley, J. Remmel, R. Shore, M. Sweedler, Birkhauser (1993), 162-177.
26. (with J. Remmel) Polynomial-time Abelian groups, *Ann. Pure and Appl. Logic* 56 (1992), 313-363.
25. (with J. Remmel) Recursively presented games and strategies, *Math. Social Sciences* 24 (1992), 117-139.
24. (with J. Remmel) Polynomial-time versus recursive models, *Annals of Pure and Applied Logic* 54 (1991), 17-58.
23. (with R.L. Smith) On the ranked points of a  $\Pi_1^0$  set, *J. Symbolic Logic* 54 (1989), 975-991.
22. (with P. Clote, R. Smith, R. Soare, S. Wainer), Members of countable  $\Pi_1^0$  classes, *Ann. Pure and Appl. Logic* 31 (1986), 45-63.
21. The stability problem, new results and counterexamples, *Letters in Math. Physics* 10 (1985), 367-372.
20. (with R.D. Mauldin), Borel equivalence and isomorphism of coanalytic sets, *Dissertationes Math.* 228 (1984), 1-32.
19. Monotone reducibility and the family of finite sets, *J. Symbolic Logic* 49 (1984), 774-782.



18. (with R.D. Mauldin), On the Borel class of the derived set operator, II, Bull. Soc. Math de France 111 (1983), 367-372.
17. (with R.D. Mauldin), Representations of well-founded preference orders, Canadian J. Math. 35 (1983), 496-508.
16. (with R.D. Mauldin), The Borel class of the derived set operator, Bull. Soc. Math. France 110 (1982), 357-380.
15. (with R.D. Mauldin), Faithful extensions of analytic sets to Borel sets, Houston J. Math. 6 (1980), 19-29.
14. Non-generable formal languages, Fund. Informaticae 3 (1980), 95-104.
13. (with R.D. Mauldin), Inductive definability, measure and category, Advances in Math. 38 (1980), 55-90.
12. The stability problem for transformations of the circle, Proc. Royal Soc. of Edinburgh 84A (1979), 279-281.
11. Parametrized inductive definitions and recursive inductive operators over the continuum, Fundamenta Mathematica 100 (1978), 10-15.
10. (with R.D. Mauldin) Measurable parametrizations and selections, Trans. Amer. Math. Soc. 245 (1978), 399-408.
9. (with E. Howorka) On vertex  $k$ -partitions of certain infinite graphs, Discrete Math. 23 (1978), 105-113.
8. Non-generable r.e. sets, in Fundamentals of Computation Theory (Proc. Conf. Posnan 1977), Springer Lecture Notes in Computer Science 56 (1977), 379-385.
7. Inductive definitions, positive and monotone, in Set Theory and Hierarchy Theory (Proc. Conf. Bierutowice 1975), Springer Lecture Notes in Math. 537 (1976), 51-63.
6. Monotone inductive definitions over the continuum, J. Symbolic Logic 41 (1976), 188-198.
5. Analytic inductive definitions, J. Symbolic Logic 39 (1974), 310-312.
4. Inductively defined sets of reals, Bull. Amer. Math. Soc. 80 (1974), 485-487.
3. (with A.R. Blass) Cores of  $\Pi_1^1$  sets of reals, J. Symbolic Logic 39 (1974), 649-654.
2. The boundedness principle in ordinal recursion, Fund. Math. 71 (1974), 203-212.
1. Ordinal recursion and inductive definitions, in Generalized Recursion Theory (Proc. Conf. Oslo 1972), eds. J. Fenstad and P. Hinman, North-Holland (1974), 221-264.