

Curriculum Vitae

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EDUCATION:

B.A.	1965	Westmar College
M.A.	1967	University of Massachusetts
Ph.D.	1969	Wesleyan University (Dissertation <i>On P-like spaces and their product with P-spaces</i> written under the direction of W. W. Comfort.)

PROFESSIONAL EXPERIENCE:

January 1980	– June 2017	Associate Professor and Professor, Howard University
September 1970	–December 1979	Assistant Professor, Associate Professor and Professor, California State University, Los Angeles (Except September 1975 – August 1976, Visiting Associate Professor, SUNY at Binghamton)
September 1969	–June 1970	Visiting Assistant Professor, Wesleyan University

RESEARCH PUBLICATIONS:

(With W. Comfort and S. Negrepontis) *F' -spaces and their product with P -spaces*, Pacific J. Math. **28** (1969), 489-502. (MR **39** #3440)

On the existence of \mathfrak{c} -points in $\beta\mathbb{N}\setminus\mathbb{N}$, Proc. Amer. Math. Soc. **21** (1969), 277-280. (MR **39** #922)

Minimal n -prime ideal spaces, Math. Ann. **199** (1972), 97-114. (MR **38** #291)

The existence of certain ultrafilters on \mathbb{N} and a conjecture of Graham and Rothschild, Proc. Amer. Math. Soc. **36** (1972), 341-346. (MR **46** #7041)

Basically bounded sets and a generalized Heine–Borel Theorem, Amer. Math. Monthly **80** (1973), 549-552. (MR **48** #3000)

Preimages of points under the natural map from $\beta(\mathbb{N} \times \mathbb{N})$ to $\mathbb{N} \times \mathbb{N}$, Proc. Amer. Math. Soc. **37** (1973), 603-608. (MR **50** #11154)

The product of F -spaces with P -spaces, Pacific J. Math. **47** (1973), 473-480. (MR **48** #9643)

- Finite sums from sequences within cells of a partition of \mathbb{N}* , J. Comb. Theory (Series A) **17** (1974), 1-11. (MR **50** #2067)
- (With M. Cates) *Partition theorems for subspaces of vector spaces*, J. Comb. Theory (Series A) **19** (1975), 13-25. (MR **52** #112)
- (With M. Cates, P. Erdős, and B. Rothschild) *Partition theorems for subsets of vector spaces*, J. Comb. Theory (Series A) **20** (1976), 279-291. (MR **53** #10583)
- (With W. Comfort) *Refining families for ultrafilters*, Math. Zeit. **149** (1976), 189-199. (MR **55** #285)
- Partitions and sums of integers with repetition*, J. Comb. Theory (Series A) **27** (1979), 19-32. (MR 81b:05018)
- Partitions and sums and products of integers*, Trans. Amer. Math. Soc. **247** (1979), 227-245. (MR 80b:10022)
- Simultaneous idempotents in $\beta\mathbb{N}\setminus\mathbb{N}$ and finite sums and products in \mathbb{N}* , Proc. Amer. Math. Soc. **77** (1979), 150-154. (MR 80f:05005)
- Ultrafilters and combinatorial number theory*, in Number Theory Carbondale 1979, M. Nathanson ed., Lecture Notes in Math. **751** (1979), 119-184. (MR 81m:10019)
- Partitions and sums and products – two counterexamples*, J. Comb. Theory (Series A) **29** (1980), 113-120. (MR 82b:05020)
- Sums equal to products in $\beta\mathbb{N}$* , Semigroup Forum **21** (1980), 221-255. (MR 81m:54040)
- On a conjecture of Erdős, Faber and Lovasz about n -colorings*, Canadian J. Math. **33** (1981), 563-570. (MR 82j:05058)
- Minimal ideals and cancellation in $\beta\mathbb{N}$* , Semigroup Forum **25** (1982), 291-310. (MR 83m:22007)
- On density, translates, and pairwise sums of integers*, J. Comb. Theory (Series A) **33** (1982), 147-157. (MR 84b:10075)
- (With P. Erdős) *Enumeration of intersecting families*, Discrete Math. **48** (1984), 61-65. (MR 84b:10075)
- Partitions and pairwise sums and products*, J. Comb. Theory (Series A) **37** (1984), 46-60. (MR 85g:05019)
- (With J. Berglund) *Filters and the weak almost periodic compactification of a discrete semigroup*, Trans. Amer. Math. Soc. **284** (1984), 1-38. (MR 85e:22005)
- (With P. Milnes) *The ideal structure of X^X* , Semigroup Forum **30** (1984), 41-51. (MR 85i:22004)
- (With J. Pym) *Free groups and semigroups in $\beta\mathbb{N}$* , Semigroup Forum **30** (1984), 177-193. (MR 86c:22002)

- Ramsey's Theorem for sums, products, and arithmetic progressions*, J. Comb. Theory (Series A) **38** (1985), 82-83. (MR 86c:05024)
- The minimal ideals of a multiplicative and additive subsemigroup of $\beta\mathbb{N}$* , Semigroup Forum **32** (1985), 283-292. (MR 87g:20106)
- The ideal structure of the space of κ -uniform ultrafilters on a discrete semigroup*, Rocky Mountain J. Math. **16** (1986), 685-701. (MR 88d:54031)
- Summable ultrafilters and finite sums*, in Logic and Combinatorics, S. Simpson ed., Contemporary Mathematics **65** (1987), 263-274. (MR 88h:03070)
- (With W. Deuber) *Partitions and sums of (m,p,c) -sets*, J. Comb. Theory (Series A) **45** (1987), 300-302. (MR 89a:05013)
- (With A. Blass) *On strongly summable ultrafilters and union ultrafilters*, Trans. Amer. Math. Soc. **304** (1987), 83-99. (MR 88i:03080)
- (With D. Davenport) *Subprincipal closed ideals in $\beta\mathbb{N}$* , Semigroup Forum **36** (1987), 223-245. (MR 89h:54031)
- Some equivalents of the Erdős sum of reciprocals conjecture*, European J. Comb. **9** (1988), 39-47. (MR 89j:11007)
- (With P. Milnes) *The \mathcal{LMC} -compactification of a topologized semigroup*, Czechoslovak Math. J. **38** (1988), 103-119. (MR 89c:22008)
- (With V. Bergelson) *Density versions of two generalizations of Schur's Theorem*, J. Comb. Theory (Series A) **48** (1988), 32-38. (MR 90b:05017)
- (With V. Bergelson) *A combinatorially large cell of a partition of \mathbb{N}* , J. Comb. Theory (Series A) **48** (1988), 39-52. (MR 89m:04003)
- Is there a point of ω^* that sees all others?* Proc. Amer. Math. Soc. **104** (1988), 1235-1238. (MR 89d:04008)
- Solving equations in $\beta\mathbb{N}$* , Annals N. Y. Acad. Sci. **552** (1989), 69-73. (MR 90m:54036)
- (With V. Bergelson) *Ultrafilters and multidimensional Ramsey theorems*, Combinatorica **9** (1989), 1-7. (MR 91f: 03101)
- Ultrafilters and Ramsey Theory – an update*, in Set Theory and its Applications, J. Steprāns and S. Watson eds., Lecture Notes in Math. **1401** (1989), 97-118. (MR 91f:03101)
- (With V. Bergelson, H. Furstenberg, and Y. Katznelson) *An algebraic proof of van der Waerden's Theorem*, L'enseignement Mathématique **35** (1989), 209-215. (MR 91g:11010)
- (With A. Blass) *Sums of ultrafilters and the Rudin-Keisler and Rudin-Frolík orders*, in General Topology and Applications, R. Shortt ed., Lecture Notes in Pure and Applied Math. **123** (1990), 59-70. (MR 91i:03093)

On creating sets with large lower density, Discrete Math. **80** (1990), 153-157. (MR 91k:28002)

(With V. Bergelson) *Nonmetrizable topological dynamics and Ramsey Theory*, Trans. Amer. Math. Soc. **320** (1990), 293-320. (MR 90k:03046)

The semigroup $\beta\mathbb{N}$ and its applications to number theory, in The Analytical and Topological Theory of Semigroups – Trends and Developments, K. Hofmann, J. Lawson, and J. Pym eds., de Gruyter Expositions in Math. **1** (1990), 347-360.

(With A. Lisan) *Does \mathbb{N}^* contain a topological and algebraic copy of $\beta\mathbb{N}$?* Topology and its Applications **35** (1990), 291-297. (MR 91h:54026)

Strongly summable ultrafilters on \mathbb{N} and small maximal subgroups of $\beta\mathbb{N}$, Semigroup Forum **42** (1991), 63-75. (MR 92a:54025)

(With J. Pym) *Closures of singly generated subsemigroups of βS* , Semigroup Forum **42** (1991), 147-154. (MR 92a:22004)

(With D. Davenport) *A proof of van Douwen's right ideal theorem*, Proc. Amer. Math. Soc. **113** (1991), 573-580. (MR 92f:54025)

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(With J. Baker and J. Pym) *κ -topologies for right topological semigroups*, Proc. Amer. Math. Soc. **115** (1992), 251-256. (MR 92h:22005)

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(With W. Woan) *Central sets in semigroups and partition regularity of systems of linear equations*, Mathematika **40** (1993), 169-186. (MR 95d:20105)

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(With I. Leader) *Image partition regularity of matrices*, Comb. Prob. and Comp. **2** (1993), 437-463. (MR 95j:05167)

(With V. Bergelson, W. Deuber, and H. Lefmann) *Rado's Theorem for commutative rings*, J. Comb. Theory (Series A) **66** (1994), 68-92. (MR 95f:05011)

(With V. Bergelson and A. Blass) *Partition theorems for spaces of variable words*, Proc. London Math. Soc. **68** (1994), 449-476. (MR 95i:05107)

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(With J. Lawson and A. Lisan) *Separating points of $\beta\mathbb{N}$ by minimal flows*, Canadian J. Math. **46** (1994), 758-771. (MR 95e:22010)

(With D. Strauss) *Cancellation in the Stone-Čech compactification of a discrete semigroup*, Proc. Edinburgh Math. Soc. **37** (1994), 379-397. (MR 95j:22006)

(With V. Bergelson) *On IP^* -sets and central sets*, Combinatorica **14** (1994), 269-277. (MR 96e:05013)

(With D. Strauss) *Topological and algebraic copies of \mathbb{N}^* in \mathbb{N}^** , New York J. Math. **1** (1995), 111-119. (MR 96j:22003)

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- (With D. Strauss) *Compact subsemigroups of $(\beta\mathbb{N}, +)$ containing the idempotents*, Proc. Edinburgh Math. Soc. **39** (1996), 291-307. (MR 97h:22002)
- (With A. Maleki and D. Strauss) *Central sets and their combinatorial characterization*, J. Comb. Theory (Series A) **74** (1996), 188-208. (MR 98d:22002)
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- Algebra in βS and its applications to Ramsey Theory*, Math. Japonica **44** (1996), 581-625. (MR 97k:03059)
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- (With H. Lefmann) *Canonical partition relations for (m,p,c) -systems*, Discrete Math. **162** (1996), 151-174. (MR 98a:05150)
- (With V. Bergelson, P. Erdős, and T. Łuczak) *Dense difference sets and their combinatorial structure*, in The Mathematics of Paul Erdős, I, R. Graham and J. Nešetřil, eds., Springer, Berlin, (1997), 165-175. (MR 97i:11007)
- (With W. Deuber, D. Gunderson, and D. Strauss) *Independent finite sums for K_m -free graphs*, J. Comb. Theory (Series A) **78** (1997), 171-198. (MR 98d:05140)
- (With V. Bergelson and B. Weiss) *All-sums sets in $(0, 1]$ – Category and measure*, Mathematika **44** (1997), 61-87. (MR 98m:03099)
- (With D. Strauss) *An algebraic proof of Deuber's Theorem*, Comb. Prob. and Comp. **7** (1998), 167-180. (MR 99g:05177)
- (With I. Protasov and D. Strauss) *Strongly summable ultrafilters on abelian groups*, Matem. Studii **10** (1998), 121-132. (MR 2001d:22003)
- (With I. Leader) *Partition regular inequalities*, European J. Comb. **19** (1998), 573-578. (MR 99g:05178)
- (With V. Bergelson and R. McCutcheon) *Notions of size and combinatorial properties of quotient sets in semigroups*, Topology Proceedings **23** (1998), 23-60. (MR 2001a:20114)
- (With I. Protasov and D. Strauss) *Topologies on S determined by idempotents in βS* , Topology Proceedings **23** (1998), 155-190. (MR 2001j:54048)
- (With V. Bergelson and I. Leader) *Additive and multiplicative Ramsey Theory in the reals and the rationals*, J. Comb. Theory (Series A) **85** (1999), 41-68. (MR 99m:05159)
- (With I. Leader) *The semigroup of ultrafilters near 0*, Semigroup Forum **59** (1999), 33-55. (MR 2002h:22004)

(With S. García-Ferreira and D. Strauss) *Orderings of the Stone-Čech remainder of a discrete semigroup*, *Topology and its Applications* **97** (1999), 127-148. (MR 2000j:54027)

(With R. McCutcheon) *Weak VIP systems in commutative semigroups*, *Topology Proceedings* **24** (1999), 199-221. (MR 2002k:20108)

(With A. Maleki and D. Strauss) *Linear equations in the Stone-Čech compactification of \mathbb{N}* , *Integers* **0** (2000), #A02, 1-20. (MR 2001i:54020)

(With D. Davenport, I. Leader, and D. Strauss) *Continuous homomorphisms on $\beta\mathbb{N}$ and Ramsey Theory*, *New York J. Math.* **6** (2000), 73-86. (MR 2001a:05148)

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(With V. Bergelson) *Partition regular structures contained in large sets are abundant*, *J. Comb. Theory (Series A)* **93** (2001), 18-36. (MR 2002i:05116)

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(With R. McCutcheon) *VIP systems in partial semigroups*, *Discrete Math.* **240** (2001), 45-70. (MR 2003b:20085)

(With I. Leader and D. Strauss) *Image partition regular matrices – bounded solutions and preservation of largeness*, *Discrete Math.* **242** (2002), 115-144. (MR 2002j:05146)

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- (With I. Leader and D. Strauss) *Separating Milliken-Taylor systems with negative entries*, *Proc. Edinburgh Math. Soc.* **46** (2003), 45-61. (MR 2004a:05155)
- (With I. Leader and D. Strauss) *Open problems in partition regularity* *Comb. Prob. and Comp.* **12** (2003), 571-583. (MR 2005e:05147)
- (With R. Kopperman) *Order compactifications of discrete semigroups*, *Topology Proceedings* **27** (2003), 479-496. (MR 2005d:05148)
- (With D. Strauss) *Independent sums of arithmetic progressions in K_m -free graphs*, *Ars Combinatoria* **70** (2004), 221-243. (MR 2005a:05148)
- (With R. McCutcheon) *Partition theorems for left and right variable words*, *Combinatorica* **24** (2004), 271-286. (MR 2005e:05148)
- (With T. Carlson and D. Strauss) *The Graham-Rothschild Theorem and the algebra of βW* , *Topology Proceedings* **28** (2004), 361-399. (MR 2006h:54018)
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- (With D. Strauss) *Cartesian products of sets satisfying the Central Sets Theorem*, Topology Proceedings **35** (2010), 203-223. (MR2534785)
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(With C. Gordon) *Elementary set theory – proof techniques*, Hafner Press, New York, 1975.

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(With D. Strauss) *Algebra in the Stone-Čech compactification – theory and applications, second revised and extended edition*, Walter de Gruyter & Co., Berlin, 2012.

GRANTS ADMINISTERED:

Combinatorics: partition theory and refining families, National Science Foundation, MCS 7606995. June 1, 1976 – November 30, 1977.

Partition theory: sums, products, and ultrafilters, National Science Foundation, MCS 7802330. July 1, 1978 – December 31, 1980.

Ultrafilters and combinatorial partition theory, National Science Foundation, MCS 8100733. June 1, 1981 – November 30, 1984.

Ultrafilter combinatorics: Ramsey Theory and semigroups, National Science Foundation, DMS 8320383 and DMS 8520873. June 1, 1984 – November 30, 1988.

Combinatorics: ultrafilters, semigroups, and Ramsey Theory, National Science Foundation, DMS 8901058 and DMS 9025025. June 1, 1989 – May 31, 1995.

Ramsey Theory, the theory of compact left topological semigroups, and their interactions, National Science Foundation, DMS 9424421. June 1, 1995 – May 31, 1998.

Semigroup algebra at infinity and its combinatorial applications, National Science Foundation, DMS 0070593 and DMS 0243586. July 1, 2000 – June 30, 2006.

Algebra in Stone-Čech compactifications and its combinatorial applications, National Science Foundation, DMS-0554803 and DMS-0852512. July 1, 2006 – June 30, 2012.

Ramsey Theory: Central sets and related combinatorially rich sets, National Science Foundation, DMS-1160566 and DMS-1460023. July 1, 2012 – June 30, 2015 and September 1, 2015 – June 30, 2017.

DOCTORAL DISSERTATIONS DIRECTED:

Dennis E. Davenport, *The algebraic properties of closed semigroups of ultrafilters on a discrete semigroup*, Howard University, 1987.

Hanson M. Umoh, *The ideal of products in $\beta S \setminus S$* , Howard University, 1987.

Amha Tume Lisan, *The ideal structure of the space of ultrafilters on a discrete semigroup*, Howard University, 1988.

Patty J. Anthony, *Ideals in the Stone-Čech compactification of noncommutative semigroups*, Howard University, 1994.

Gregory L. Smith, *Partition regularity of sums of products of natural numbers*, Howard University, 1994.

Dan Tang, *Separating sums from products in \mathbb{N}* , Howard University, 1997.

Elaine Terry, *Finite sums and products in Ramsey Theory*, Howard University, 1997.

Shea D. Burns, *The existence of disjoint smallest ideals in the left continuous and right continuous structures in the Stone-Čech compactification of a semigroup*, Howard University, 2000.

Jillian E. McLeod, *Notions of size in adequate partial semigroups*, Howard University, 2001.

Iris Gugu Moche, *The sizes of preimages of points under the natural map from $K(\beta(\mathbb{N} \times \mathbb{N}))$ to $K(\beta\mathbb{N}) \times K(\beta\mathbb{N})$* , Howard University, 2002.

Irene S. Moshesh, *Image partition regularity of affine transformations*, Howard University, 2006.

Chase G. Adams, III, *Largeness of the set of finite sums of sequences in \mathbb{N}* , Howard University, 2006.

Lakeshia R. Legette, *Maximal groups in the Stone-Čech compactification of a discrete semigroup*, Howard University, 2008.

Kendall Williams, *Separating Milliken-Taylor systems and variations thereof in the dyadics and the Stone-Čech compactification of \mathbb{N}* , Howard University, 2010.

John H. Johnson, *Some differences between an ideal in the Stone-Čech compactification of commutative and noncommutative semigroups*, Howard University, 2011.

Henry Jordan, *Minimal Hales-Jewett sets*, Howard University, 2011.

Kourtney Fulton Miller, *Continuous homomorphisms from βS to S^** , Howard University, 2013.

Monique A. Peters, *Characterizing differences between the left and right operations on βS* , Howard University, 2013.

Dev Phulara, *A generalization of the Central Sets Theorem with applications and some additive and multiplicative Ramsey numbers*, Howard University, 2014.

Kendra Pleasant, *Some new results in Ramsey Theory*, Howard University, 2017.