

FACULTY VITA

November 2001

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POSITION: Chair and Professor, Mathematical Sciences
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<u>EDUCATION:</u> <u>Study</u>	<u>Year</u>	<u>Degree</u>	<u>Institution</u>	<u>Area of</u>
	1965	B.A.	Univ. of Santa Clara	Mathematics
	1967	M.A.	Univ. of Oregon	Mathematics
	1974	Ph.D.	Univ. of New Mexico	Mathematics

WORK EXPERIENCE:

<u>Year(s)</u>	<u>Institution/Organization</u>	<u>Position</u>	<u>Responsibilities</u>
1991-present	Univ. of Northern Colorado	Professor, Chair	Teaching/Admin/ Research
1989-91	Muhlenberg College	Assoc. Prof.	Teaching/Research
1981-89	Univ. of New Mexico	Assoc. Prof.	Teach/Res/Admin
1974-81	Univ. of New Mexico	Assist. Prof.	Teach/Res/Admin
1969-74	Univ. of New Mexico	Instructor	Teaching/Research
1968-69	Univ. of San Diego	Instructor	Teaching/Research

RESEARCH AREAS/INTEREST:

Mathematics Education, problem solving, plane partition theory, combinatorics, undergraduate research.

HONORS AND AWARDS:

- National Defense Education Act Graduate Fellowship University of Oregon 1965-1968.
- University of New Mexico Summer Research Grant 1981.
- One of two recipients of 1988-89 Outstanding Teachers Award at UNM.

- New Mexico representative to the Jaime Escalante Conference in Chicago.
- Named the Truman L. Koehler Professor of Mathematics at Muhlenberg College, 1989-91.
- Recipient of a Muhlenberg College summer research grant 1991.
- 1997 Co-recipient of \$1,000 award presented by ICTCM for the work "Re-tooling" Discrete Mathematics. One of five awards given nationally.
- Recipient of \$4500 UNC Summer Faculty Research Stipend.

JURIED PUBLICATIONS:

Papers 1 – 9 are coauthored with T. Mingus, a mathematics educator at Western Michigan University.

1. Nurturing The Mathematically Gifted – Brain's Story, accepted July 2001, in Research Briefs, sponsored by NAGC Service Publications and the Research and Evaluation Division.
2. Peak numbers, accepted November 2000 by The Mathematical Gazette (MAA). (to appear March 2002).
3. Preservice teacher beliefs about proofs, School Science and Mathematics, Vol. 99 No. 8 December 1999 pp 438-444.
4. What constitutes a nurturing environment for the growth of mathematically gifted students?, School Science and Mathematics, Vol. 99, No.6, October 1999 pp 286-293.
5. Discrete mathematics retooled (with T. Mingus), Mathematics and Computer Education, Winter 1999 Vol.33. No. 1, pp 16-26.
6. Using technology to enhance problem solving and critical thinking skills, Mathematics and Computer Education, Fall 1997, Vol 31, No. 3 pp 293-300.
7. Nurturing growth of young mathematicians through mathematics contests, Chapter 32 in the 1999 NCTM book Developing Mathematically Promising Students.
8. Keep counting those boxes, there's more, Mathematics Teacher, February 1998, Vol 91,

#2, pp 122-127.

9. Algorithmic and recursive thinking: current beliefs and their implications for the future, Chapter 4 in the 1998 NCTM Yearbook on Algorithms.
10. Counting tile patterns, Mathematics Teacher (NCTM) Vol 89, No 1, January 1996, pp 8-1.
11. The squares do fit, The Mathematical Gazette (MAA), Vol 79, July 1995, pp 361-364.
12. Equivalence classes and a familiar combinatorial identity (with T. Mingus), The Mathematical Gazette (MAA) March 1998 issue, Vol 82, #493.
13. Lattice paths to hyperplanes (with K. Johnson), Expositiones Mathematicae, 11 (1993), 419-431.
14. Where have you seen $n(n-1)/2$ before? (with Robert Lochel), the Mathematical Gazette, Vol. 76, Nov. 1992, pp. 378-389.
15. Pascalian rectangles modulo- m (with K. Johnson, Joseph McCanna, and L. A. Székely), Quaestiones Mathematicae, 14 (1991), pp. 383-400.
16. Euler numbers and skew hooks, Mathematics Magazine, Vol. 66, No. 3, June, 1993, pp. 181-188.
17. Composition of positive integers (with K. Johnson and R. Vickrey), Mathematics Teacher, Vol. 84, No. 3, March 1991, pp. 228-233.
18. Hook and shifted hook numbers (with A. P. Mullhaupt), Discrete Mathematics 79 (1989/90), pp. 153-167.
19. Enumerating 3 by 3 N -matrices with given row and column sums (with A. P. Hillman), Congressus Numeratum, December 1986, pp. 103-108.
20. Reverse plane partitions and tableau hook numbers. Reprinted in Young Tableaux in Combinatorics, Invariant Theory and Algebra, pp. 23-28, an Anthology, edited by Joseph P. S. Kung, Academic Press, 1982.
21. Slicing skew-tableau frames with (A. Hillman), European Journal of Combinatorics, 3 (1982), pp. 143-151.
22. Self-generating sequences, The Fibonacci Quarterly, Nov. (1982), Vol. 20, No. 4, pp. 299-310.

23. Polynomial ring generated by tableau shapes (with A. Hillman), European Journal of Combinatorics, 2 (1981), pp. 27-39.
24. Skew tableau and the insertion algorithms (with A. Hillman), Journal of Combinatorics, Information and System Sciences, Vol. 5, No. 4, 1980, pp. 305-316.
25. Functions on tableau frames (with A. Hillman), Discrete Mathematics 25 (1979), pp. 245-255.
26. Polynomials in denumerable indeterminates, Pacific Journal of Mathematics, Vol. 97, No. 2, 1981, pp. 415-423.
27. Multisectioned partitions of integers, Pacific Journal of Mathematics, Vol. 69, No. 2, 1977, pp. 415-424.
28. Reverse plane partitions and tableau hook numbers (with A. Hillman), Journal of Combinatorial Theory, Ser. A., September 1976, pp. 216-221.
29. Fibonacci Numbers and Zigzag Hasse diagrams (with A.P. Hillman and M.T. Stroot) The Fibonacci Quarterly, Vol 1, No 3, 1963, pp43-45.

SUBMITTED PAPERS

“On the shoulders of technology: calculators as cognitive amplifiers”, International J. of Math. Ed. in Science and Tech., August, 2001.

TEXTBOOKS:

1. Discrete and Combinatorial Mathematics, A. P. Hillman, G. L. Alexanderson, and R. M. Grassl, Dellen-MacMillan Publishing Company, August 1986.
2. A study guide Vol. I to accompany, Calculus With Analytic Geometry, (6th edition), by E. Swokowski, January 1991(Revised September, 1993).
3. A study guide Vol. II to accompany Swokowski, with T. Cavanagh, March 1992 (Revised January, 1994).
4. Discrete and Combinatorial Mathematics – an interactive study, with T. Mingus, McGraw-Hill Primis Custom Publishing, July 2001.

UNPUBLISHED CURRICULUM MATERIAL

1. Problem Solving For Preservice and Inservice Secondary Teachers – 200pp.
2. Discrete Mathematics – Explorations using the TI-89/TI-92 – an interactive workbook – 60 pp.
3. Abstract Algebra – An interactive workbook – 55pp.

RECENT JURIED PRESENTATIONS:

1. An MA Problem Solving Course for Secondary Teachers at the CCTM meeting in Denver, October 1995.
2. Using Technology to Improve Undergraduate Education , a poster session at the 8th Annual International Conference on Technology in Collegiate Mathematics, Houston, November 1995.
3. Invited member of panel discussion (with Joan Ferrini-Mundy, John Dossey, Henry Pollak) on Ph.D. programs in Mathematics Education at the national AMS-MAA meeting in Orlando, January 1996.
4. “Using Groups to Discover Discrete Mathematics” (with T. Mingus) a three hour workshop at the CCTM Denver meeting, October 1996.
5. Problem Solving for Secondary Teachers (Co-presented with T. Mingus) - a one hour invited interactive presentation at the NCTM Western Regional meeting in Albuquerque, November 1996.
6. Technology: An Aid in Problem Solving and Critical Thinking. 9th annual ICTCM, Reno November 1996.
7. Reforming Linear, Discrete, and Abstract Algebra , MAA Mathfest, Atlanta, August 1997.
8. Connecting Linear Algebra, Discrete Mathematics, and Abstract Algebra: Promoting Mathematical Maturity in Pre-service Teachers , a joint presentation with T. Mingus at the RUMEC (Research in Undergraduate Mathematics Education Community) conference at CMU, September 1997.
9. Using Groups to Discover Discrete Mathematics , (with T. Mingus) a three hour workshop at the CCTM, Denver meeting, October 1997.

10. ReTooling Discrete Mathematics , 10th annual ICTCM in Chicago, November 1997.
11. A Shift in Pedagogical and Curricular Focus: Impacting Students' Understanding and Attitudes , an invited presentation jointly presented with T. Mingus in the AMS-MAA-MER special session on Mathematics and Education Reform, Baltimore, January 1998.
12. Try Something New in Abstract Algebra , contributed paper presented at the MAA session on Rethinking Upper-level Core Mathematics in Baltimore, January 1998.
13. Creating Mathematical Liaisons for Lasting Influence. Contributed paper, Summer 1998 MATHFEST, MAA in Toronto, July 1998.
14. Evolution of the Educational Mathematics Ph.D Program at UNC. Invited colloquium talk presented at Western Michigan University, October 1998.
15. How are Problem Solving and Mathematics Contests related to learning mathematics? One hour CCTM session in Denver, CO, October 1998.
16. Using the TI-92 as an aid in learning discrete mathematics. A two hour workshop-presentation (with T. Mingus) at the ICTCM in New Orleans, November 1998.
17. Discrete Mathematics: A basis and gateway for learning mathematics , Joint AMS - MAA meetings, San Antonio January 1999.
18. Abstract Algebra – Integrating mathematical structures and intuition in K – 14. National NCTM meeting, San Francisco, April 1999.
19. Selected by the MAA committee on programs to co-organize a session on “Research in Mathematics Education” at the August 1999 MATHFEST in Providence. Session was subsequently merged with the ARUME program.
20. Teaching the mathematically gifted, CCTM, Denver, October 1999.
21. The TI-92 – An effective tool in discrete mathematics, ICTCM, Burlingame, CA, November 1999.
22. Continuous vs discrete mathematics, one hour presentation at the national NCTM meeting, Chicago, April 2000.
23. Competitions, problem solving, learning mathematics, NCTM Regional Meeting August 2001 in Laramie.

24. Teaching Abstract algebra at the secondary level, invited presentation at the Cherry Creek Math K-12 District Articulation Meeting November 2000.
25. Nurturing the mathematically gifted, presentation at the National Association for Gifted Children Conference, November 2001 in Cincinnati.