CURRICULUM VITAE

James Joseph Madden

INTERESTS:

- Research: Real algebraic geometry, ordered rings, ordered algebraic structures.
- Education: Interface between mathematics departments and K-12 teacher preparation.

EDUCATION:	1975	B.A., Anthropology, *Reed College*, Portland, OR.
	1983	Ph.D., Mathematics, *Wesleyan University*, Middletown, CT. Dissertation title: "Two methods in the study of k-vector lattices." Adviser: Anthony W. Hager.

ACADEMIC EMPLOYMENT:	'78–'83	Teaching Assistant, Deptartment of Mathematics, Wesleyan University, Middletown, CT.
	'83–'86	Post-doctoral Instructor, *University of Kansas, Lawrence.*
	'86–'89	Assistant Professor, *Indiana University South Bend.*
	'89–'90	Associate Professor, *Indiana University at South Bend.*
	'90–'96	Associate Professor, *Louisiana State Univ.*
	'96–	Professor, *Louisiana State Univ.*

GRANTS:

1. NSF Summer Research Experience.
   Summers 1967, 68; research in metallurgy at Carnegie–Mellon Univ.
2. University of Kansas General Research Fund.
   Summer 1984; research in semialgebraic geometry.
3. University of Kansas General Research Fund.
   Summer 1985; research in lattice theory.
4. Indiana University at South Bend Faculty Fellowship.
   Summer 1987; research in semialgebraic geometry.
5. Nagoya University and Tokyo Institute of Technology,
   December 1989; support for scientific visits.
6. NSF Grant DMS-9104427 (with C. N. Delzell).
   Summers 1991–92; $40,000 for research in algebraic geometry.
7. Nagoya University.
   May–June 1992; support for scientific visit.
8. LEQSF (Louisiana Educational Quality Support Fund)(with N. W. Stoltzfus).
   Summers 1993, 94; $108,000 for Research Experience for Undergraduates at LSU.
9. NSF Grant DMS-9322278 (with N. W. Stoltzfus).
   Summers 1994, 95; $60,000 for Research Experience for Undergraduates at LSU.
10. NSF Grant DMS-9401509 (with C. N. Delzell).
    Summers 1994, 95, 96; $60,000 for research in algebraic geometry.

11. LEQSF(1995-98)-RD-A-24 (with S. Woodward).
    Summers 1995, 96, 97; \$60,000, research competitiveness grant primarily supporting Woodward.
12. Louisiana Collaborative for Excellence in the Preparation of Teachers (LaCEPT) (with M. Oliver).
    1996; \$120,000, multiple projects aimed at curriculum reform.
13. LEQSF96-98-ENH-TR-09 (with N. W. Stoltzfus).
    Summers 1996, 97; \$90,000 for Research Experience for Undergraduates at LSU.
14. Louisiana Collaborative for Excellence in the Preparation of Teachers (LaCEPT) (with M. Oliver).
    1996; \$95,000, continuation and elaboration of 12.
15. Louisiana Board of Regents Center for Innovative Teaching and Learning.(with R. Lafayette)
    June 1998–May 1999; \$189,000 for collaborative project with LSU College of Education and East Baton Rouge Public Schools to improve teacher training.
16. LEQSF (with M. Oliver and N. Kestner).
    June 1998– June 2000; Undergraduate Science, Math and Technology Education \$112,000 for designing and building an Internet-based guide to science and math reform efforts in Louisiana.
17. Louisiana Collaborative for Excellence in the Preparation of Teachers (LaCEPT).
    December 1999–June 1999; \$30,000 for workshop on elementary statistics and research on statistics curriculum statewide.

PUBLICATIONS of James J. Madden:

1. A note on generic properties of continuous maps (with E. Coven and Z. Nitecki), in: *Ergodic Theory and Dynamical Systems*, Katok (ed.), Birkhauser, Boston (1982), 97–101.
2. Extensions of l-homomorphisms (with E. R. Aron and A. W. Hager), *Rocky Mountain J. Math.* **12** (1982), 482–90.
3. Majorizing-injectivity in abelian lattice-ordered groups (with A. W. Hager), *Rend. Sem. Mat. Univ. Padova* **69** (1983), 181–94.
4. Algebraic classes of abelian torsion-free and lattice-ordered groups (with A. Hager), *Bull. Greek Math. Soc.* **25** (1984), 53–63.
5. The word problem versus the isomorphism problem (with A. M. W. Glass), *J. Lond. Math. Soc.* **92**(30) (1984), 53–61.
6. Essential reflections versus minimal embeddings (with A. W. Hager), *J. Pure & Appl. Algebra* **37** (1985), 27–32.
7. l-groups of piecewise linear functions, *Ordered Algebraic Structures*, W. Powell and C. Tsinakis (eds.), Marcel-Dekker, New York, 1985, 117–24.
8. Lindelöf locales and realcompactness (with J. Vermeer), *Proc. Camb. Phil. Soc.* **99** (1986), 473–80.
9. Pierce-Birkhoff rings, *Arch. der Math.* **53** (1989), 565–70.
10. Vector-lattices and a problem in geometry, *Ordered Algebraic Structures*, J. Martinez (ed.), Kluwer (1989), 235–45.

11. Epicomplete archimedean l-groups via a localic Yosida theorem (with J. Vermeer), *J. Pure & Appl. Algebra* **68** (1990), 243–252.
12. On the Yosida representation, *General topology and applications: proc. 1988 Northeast conference*, R. Shortt (ed.), Marcel Dekker (1990), 183–192.
13. Frames associated with an abelian l-group, *Trans. Amer. Math. Soc.* **331** (1992), 265–279.
14. κ-frames, *J. Pure & Appl. Algebra* **70** (1991), 107–127.
15. Epimorphisms of frames (with A. Molitor), *J. Pure & Appl. Algebra* **70** (1991), 129–132.
16. One-dimensional Nash groups (with C. Stanton), *Pacific J. Math.* **154** (1992), 331–344.
17. A completely normal spectral space that are not a real spectra (with C.N. Delzell), *J. Algebra* **169**(1) (1994), 71–7.
18. Lattice-ordered rings and semialgebraic geometry: I (with C.N. Delzell), *Real analytic and Algebraic Geometry. Proc. Intenat. Conf., Trento, Italy September 21–25, 1992*, F. Broglia , M. Galbiati, A. Tognoli, eds., Walter de Gruyter (1995), 103–29.
19. Complete ideals defined by sign conditions and the real spectrum of a two-dimensional local ring (with D. Alvis and B. Johnston), *Mathematische Nachrichten* **174** (1995), 21–34.
20. Monoreflections of commutative rings (with J. Martinez), *Communications in Algebra* **26** (1998), 29–35.
21. Separating ideals in dimension 2 (with N. Schwartz), Proceedings of Segovia Conference on Real Algebraic Geometry, 1997.
22. Monoreflections of partially-ordered rings (with N. Schwartz), research monograph to appear in *Springer Lecture Notes in Mathematics, 1999*.

INVITED TALKS of James J. Madden:

At conferences:

1. Jan. 1984, "On f-modules over commutative f-rings," AMS Special Session on Ordered Algebraic Structures, Louisville, KY.
2. January 1986, "Lattice-ordered rings and semialgebraic geometry," AMS Special Session on Ordered Algebraic Structures, New Orleans, LA.
3. March 1986, "Epicomplete archimedean l-groups," Conference in Honor of B. Banaschewski, Hamilton, Ontario, Canada.
4. Jan. 1988, "Semialgebraic geometry and equational theories of ordered algebras," AMS Special Session on Ordered Algebraic Structures, Atlanta, GA.
5. June 1988, "On the Yosida theorem," Northeast Conference on General Topology, Middletown, CT.
6. Aug. 1988, "Geometry and l-groups," Conference on Ordered Algebraic Structures, Curacao, N.A.
7. May, 1989, "Nash groups" (with C. Stanton), AMS Special Session on Quadratic Forms and Real Algebraic Geometry, Chicago, IL.
8. June 1989, "Partial frames," Northwest Conference on General Topology, Staten Island.

9. Aug. 1989, “Partial frames,” Conference on Locales and Topological Groups, Curacao, N.A.
10. April 1990, “Separating ideals,” AMS Special Session on Real Algebraic Geometry, Albuquerque, NM.
11. Jan. 1991, AMS Special Session on Real Algebraic Geometry, San Francisco, CA.
12. March 1991, Seminar of the Special Year in Real Algebraic Geometry and Quadratic Forms, University of California, Berkeley, CA.
13. Dec. 1991, “Separating ideals and the real spectrum,” Conference in Honor of P. Conrad, Gainesville, FL.
14. June 1992, “Infinitely near base conditions and the Pierce-Birkhoff problem in real algebraic geometry,” Seminar on Real Singularities, RIMS Kyoto.
15. Sept. 1992, “Infinitely near base conditions and the real spectrum,” Conference on Real Algebraic and Real Analytic Geometry, Trento, Italy.
16. Jan. 1993, “A completely normal spectral space that is not a real spectrum,” AMS Special Session on Ordered Algebraic Structures, San Antonio, TX. (Announced under a different title.)
17. June 1994, “Infinitely near base conditions in real algebraic geometry,” Conference on Real and Complex Algebraic Geometry, Soesterberg, Netherlands.
18. June 1995, “Monoreflections of partially ordered rings,” Conference on Ordered Algebraic Structures, Curacao, N.A.
19. April 1996, “On f-modules,” Special Semester on Real Algebraic Geometry, Baton Rouge.
20. April 1997, “The Pierce-Birkhoff Conjecture and Infinitely near points.” Workshop on Valuation Theory, The Fields Institute, Toronto.
21. March 1997, “Totally ordered rings with nilpotents,” Conference on Ordered Algebraic Structures, U. Florida, Gainesville.

In other venues:

1. Wesleyan Univiversity, June 1985.
2. McGill University, June 1985.
3. Bowling Green State University, Math. Colloquium. March 1988.
4. Tokyo Institute of Technology, Dec. 1989.
5. Northwestern Louisiana University, Nov. 1993.
6. University of Florida, Gainesville, Algebra Seminar, March 29, 1994.
7. University of Passau, Math. Colloquium, May 17, 1994.
8. University of Munich, Math. Colloquium, May 19, 1994.
9. University of Regensburg, Math. Colloquium, May 20, 1994.

Comments on activities related to math education:

During the 1996 and 1997 LaCEPT projects (see “GRANTS,” Madden studied the exceptionally effective courses in Number Sense and Geometry (LSU-M1201/1202) that were developed between 1992 and 1996 by Professor Anderson and Instructor Lynne Tullos and began testing experimental curricula for the Freshman course “The Nature of Mathematics,” LSU-M1100. He served on the LaCEPT steering committee and contributed a featured essay on institutional reform to the 1997 LaCEPT publication *Through the eyes of* *faculty* (republished at `http://webserv.regents.state.la.us/lacbroc.htm`). In 1997, together with Dr. Oliver and Professor Neal Kestner (LSU Department of Chemistry), Madden authored a successful proposal to the Louisiana Educational Quality Support Fund for a web-based clearinghouse for information math/science reform activities in Louisiana; see GRANTS 16.

In spring 1998, Madden proposed a collaboration between the LSU Department of Mathematics and the LSU College of Education that was incorporated in the design of the LSU Center for Innovative Teaching and Learning (LSU-CITAL). A proposal for LSU-CITAL, with Professor Robert Lafayette, Chair of the LSU Department of Curriculum and Instruction and Madden as co-PI's, was submitted to the Louisiana Board of Regents in winter 1998, and it received an award of $195,000 in summer 1998 for work to be completed prior to summer 1999. LSU-CITAL aims to improve the teacher training program at LSU by creating around it a community of students, teachers and scholars that crosses the boundaries that have traditionally separated academic departments from one another and have separated the university from the public school system. The mathematics department, the college of education, the university lab school and three inner city elementary schools in Baton Rouge have joined hands for this purpose. Madden spends two mornings a week in the field, interacting with principals, teachers, teachers-in-training and elementary school students, and he frequently teaches and observes in 4th and 5th grade classrooms. Madden created a multi-component web site for LSU-CITAL, and in spring 1999 he will work with Tullos to make much of Tullos' M1201/1202 course available in web format. In addition, he is helping one of the participating elementary schools create its own site and he advises the CITAL project on the use of the web to enhance collaboration. (Web-based support for the project will begin to play a significant role only when participating public schools are adequately equipped and wired. This is not under the control of LSU-CITAL, but is projected soon to be the case.) As a result of his participation in LSU-CITAL, Madden has acquired a unique perspective on the entire system by which mathematical understanding is created and shared by mathematicians, by teachers-in-training, by teachers and school systems and ultimately by children in classrooms.

In 1993–1997, Madden was co-director with Professor Neal Stoltzfus (Professor of Mathematics, LSU) of the LSU Research Experiences for Undergraduates in Mathematics, which was funded by the Louisiana Educational Quality Support Fund and by NSF. He has 5 years experience in programming in *Mathematica*, and is presently using this program to create a collection of animated graphics for demonstrating ideas in probability. The web page for his elementary statistics course (`http://math.lsu.edu/~madden/M1101`) features student writing and also incorporates some of these graphics.