

MOHAMED ELHAMDADI, PH.D.

University of South Florida -- Department of Mathematics ♦ 4202 East Fowler Avenue, PHY114, Tampa, FL 33620
Ph.: 813-974-9561 ♦ Fax: 813-974-2700 ♦ emohamed@math.usf.edu ♦ <http://www.math.usf.edu/~emohamed>

EDUCATION

<i>Ph.D. in Mathematics</i> , University of Nice-Sophia Antipolis (France)	June 1996
<i>Masters in Mathematics</i> , University of Nice-Sophia Antipolis	June 1991
<i>B.S. in Mathematics</i> , University of Nice-Sophia Antipolis	June 1990

PROFESSIONAL EXPERIENCE

• Assistant Professor, University of South Florida, Tampa, FL	2007 – Present
• Instructor, University of South Florida, Tampa, FL	2000 – 2007
• Adjunct Professor, University of South Florida, Tampa, FL	1999 - 2000
• Visiting Scientist, International Centre for Theoretical Physics, Trieste, Italy	1999 - 1999
• Adjunct Professor, University of South Florida, Tampa, FL	1997 - 1998
• Visiting Researcher, Purdue University at Indianapolis, Indianapolis, Indiana	1996 - 1997
• Research and Teaching Assistant, University of Nice-Sophia Antipolis, Nice, France	1991 - 1996

SERVICE TO THE MATHEMATICAL COMMUNITY

- American Mathematical Society Reviewer
- Referee for research mathematical journals

TEACHING EXPERIENCE

Mathematics courses, including but not limited to the following:

- Graduate: Graph Theory, Topology I, Topology II, Independent study
- Undergraduate: College Algebra, College Algebra and Trigonometry, Business Calculus, Elementary Calculus, Calculus I - III, Engineering Calculus I - III, Vector Calculus, Geometry, Elementary Number Theory, Introduction to Topology, Linear Algebra, Differential Equations, Abstract Algebra, Probability, Statistics, & Independent Study
- Secondary Education: Pre-Algebra, Algebra I & II, and Calculus

AWARDS, CERTIFICATIONS, & MEMBERSHIPS

- *Florida Promise*, Hillsborough County School district, Dept of Math. and Stat., and college of Education 2008-2009
- *Project A.C.E.*, Hillsborough County School district, Dept of Math. and Stat., and college of Education 2007
- *Faculty Development Grant*, College of Arts and Sciences, University of South Florida 2005
- *Faculty Research Mentor Award*, University of South Florida, McNair Scholars Program April 25, 2002
- *Award for Outstanding Adjunct Professor*, University of South Florida 1997 - 1998
- *Certificate of Appreciation* for Outstanding Effort in Stimulating Student Interest in Mathematics by the National Society of Professional Engineers for coaching advanced Secondary students at the Annual MathCounts Competition February 14, 1998
- *Member of American Mathematical Society* 1998 - present
- *Member of Mathematical Association of America* 1998 - present

CURRENT AND FUTURE RESEARCH

Low dimensional Topology, Quantum Algebra, Knot Theory and K-Theory

THESIS***Ph.D. Thesis "On the Lambda-Operations and the L-theory"***

In the first part of the thesis, I have defined for all rings A with involution a λ -ring structure on the orthogonal K-theory of A by using a Witt's theorem of extension of isometries. I have proven that the morphism from L-theory to K-theory induced by forgetful functor is a morphism of λ -rings.

The second part is devoted to an analogue of Goodwillie's theorem relating algebraic K-theory to cyclic homology. By using a Volodin relative model in L-theory and the relationship given by Malcev theory between nilpotent Lie algebra over \mathcal{Q} and uniquely divisible groups, I have argued that rationally relative L-theory is the same as relative Dihedral homology.

In the third part, I have shown that there is no crossed simplicial group with geometric realization S^3 . I have constructed a long exact sequence connecting S^3 -equivariant homology of an S^3 -space with its $Pin(2)$ -equivariant homology. I have deduced the obstruction to the equality of the two homologies. I also interpreted the periodicity exact sequence in quaternionic homology as the Gysin exact sequence of an S^3 -fibration.

PUBLICATIONS

- "A note on lambda-operations in orthogonal K-theory," Proc. Amer. Math. Soc. 128, #1, (2000), pp 1-4.
- "On S^3 -Equivariant Homology," Int. J. Math. Math. Sci. 26, #4, (2001), pp 193-197.
- "Twisted Quandle homology theory and cocycle knot invariants," with J. S. Carter & M. Saito, Algr.Geom.Topol. 2 (2002), pp 95-135.
- "Extensions of Quandles and cocycle knot invariants," with J. S. Carter, M. A. Nikiforou, & M. Saito, J. Knot Theory Ramifications. Vol. 12, #6, (2003), pp 725-738.
- "On the Steenrod operations on cyclic homology," with Y. Gouda, Int. J. Math. Math. Sci. 2003, # 72, (2003), pp 4539-4545.
- "Homology Theory for the Set-Theoretic Yang-Baxter Equation and Knot Invariants from Generalizations of Quandles," with J. S. Carter & M. Saito, Fundamenta Mathematicae 184, (2004), pp 31-54.
- "Cocycle Knot Invariants from Quandle Modules and Generalized Quandle Cohomology," with J. S. Carter, M. Grana, and M. Saito, Osaka Journal of Mathematics 42, no. 3, (2005), pp 499-541.
- "A Lower bound for the number of Reidemeister moves of type III," with J. S. Carter, M. Saito and S. Satoh, Topology and Its Applications 153 (2006) pp 2788-2794.
- "Cohomology of the adjoint of Hopf Algebras" with J. S. Carter, A. Crans and M. Saito, Journal of Generalized Lie Theory and applications 2, (2008), no 1, pp 19-34.

- "Cohomology of categorical self-distributivity," with J. S. Carter, A. Crans and M. Saito, *Journal of Homotopy and related Structures*, Vol. 3, no 1, 2008, pp 13-63.
- "Cohomology of Frobenius algebras and the Yang-Baxter Equation" with J. S. Carter, A. Crans, E. Karadayi and M. Saito, *Communications in Contemporary Mathematics*, Vol. 10, Suppl. 1, 2008, pp 791-814.
- "Tangle embeddings and quandle cocycle invariants" with K. Ameer, T. Rose, M. Saito and C. Smudde, *Experimental Mathematics* 17, no 4, 2008, pp 487-497.
- "Virtual knot invariants from biquandles and their cocycles" with S. Carter, M. Saito, D. Silver and S. Williams, *Journal of Knot Theory and its Applications*, Vol. 18, no 7, 2009, pp 957-972.
- "Hermitian Algebraic K-theory and Dihedral Homology" *International Journal of Algebra*, Vol. 4, no 3, 2010, pp143-152.
- "Cocycle Deformations of Algebraic Identities and R-matrices" with J. S. Carter, A. Crans and M. Saito, submitted, arXiv:0802.2294 GT 2008.
- "Cohomology and Formal Deformations of Alternative Algebras" with N. Makhlouf, submitted, arXiv:0907.1548 RA 2009.
- "Non-Abelian Quandle Cohomology and Invariants of Knots" with M. Niebrzydowski, to be submitted, 2010.
- "Alternative Algebra deformations of associative algebras" with N. Makhlouf, to be submitted, 2010.

VISITING PROFESSORSHIPS AND RESEARCH

- Instituto Nacional de Matematica Pura e Aplicada (IMPA), Rio de Janeiro, Brazil June, 2008
- International Centre for Theoretical Physics (ICTP), Trieste, Italy June, 2007

SELECTED INVITED LECTURES

- "On the Cohomology of a Non-Associative Algebraic Structure with Applications to Knot Theory," (in French)
Seminar Lecture, Universite' des Haute Alsace, France April 2009
- "Khovanov homology of Knots," Seminar Lecture, University of South Florida November 2008
- "From the Jones polynomial to Khovanov homology," Seminar Lecture, University of South Florida November 2008
- "Self-distributive groupoids from an algebraic point of view," 5th Internal Conference, Fez, Morocco June 2008
- "Generalized Quandle homology and cocycle knot invariants," AMS-SBM, Rio de Janeiro, Brazil June 2008

- “Generalized Quandle homology and Applications,” AMS meeting # 1037, Baton Rouge LA March 2008
- “Self-distributivity, cohomology and knot invariants” Geometry, Topology and Dynamical systems, Marrakech University May 28 2007
- “The adjoint of Hopf algebras and cohomology” Knots in Washington XXIII, George Washington Univ. Nov 18 2006
- “Biquandles and knot invariants” Knots in Washington XXII, George Washington University, May 5 2006
- “Quandle cohomology and knot invariants” Topology Seminar, University of Kentucky, April 11 2006
- “Homological Algebra of Racks and Quandles II” Algebra Seminar, University of South Alabama, March 11 2005
- “Homological Algebra of Racks and Quandles I” Topology Seminar, University of South Alabama, March 8 2005
- “Quandle Modules and Cocycle knot Invariants “ Port City Conf., Univ. of South Alabama, February 27 2005
- “Biquandles and Cocycle knot Invariants “ Seminar Lecture, University of South Alabama, March 2004
- “On Knot Invariants” Colloquium Lecture at Marshal University, Huntington, WV, February 2004
- “A spectral sequence in quandle homology” AMS Meeting #982 (Session: Invariants of Knots and Low-Dimensional Topology), Orlando, Florida November 2002
- “A generalization of Quandles and Homology theory of set-theoretic Yang-Baxter equations.” AMS Meeting #978 Quantum Topology, Portland, Oregon June 2002
- “Part IV: Cyclic homology of Algebras,” Seminar Lecture, University of South Florida March 2001
- “Part III: Cyclic homology of Algebras,” Seminar Lecture, University of South Florida March 2001
- “Part II: Cyclic homology of Algebras,” Seminar Lecture, University of South Florida February 2001
- “Part I: Cyclic homology of Algebras,” Seminar Lecture, University of South Florida February 2001
- “An approach to quaternionic homology,” International Centre for Theoretical Physics, Trieste, Italy April 1999
- “Part I: Introduction to Algebraic K-theory,” Seminar Lecture, University of South Florida February 1998
- “Part II: Introduction to Algebraic K-theory,” Seminar Lecture, University of South Florida February 1998
- “ S^3 -equivariant homology & quaternionic homology,” Seminar Lecture, P. U. at W. Lafayette December 1996
- “Homology Stability of Orthogonal Groups,” Seminar Lecture, University of Nice-Sophia Antipolis April 1996

PROFESSIONAL MEETINGS ATTENDED

- “Commutative Algebra and Applications,” 5th Internal Conference, Fez, Morocco June 2008
- “Low Dimensional Topology,” AMS-SBM, Rio de Janeiro, Brazil June 2008

- Recent Advances in Knot theory, AMS meeting # 1037, Baton Rouge, LA May 2008
- Geometry Topology and Dynamical systems, Marrakech University, Morocco, May 2007
- Knots in Washington XXII, George Washington University, Washington, DC, May 2006
- Joint Mathematics Meeting, St Antonio, TX January 2006
- Quantum Topology, Summer Research Conference, Snowbird, Utah, June, 2005
- Port City Conference, University of South Alabama, Mobile, AL February, 2005
- Knots in Washington XX, George Washington University, Washington, DC, February 2005
- Joint Mathematics Meeting, Atlanta, GA January 2005
- Joint Mathematics Meeting, Phoenix, AZ January 2004
- American Mathematical Society meeting, Orlando, Florida November 2002
- American Mathematical Society meeting, Portland, Oregon June 2002
- Clifford Lecture Series conference, Tulane University, New Orleans, Louisiana December 2000
- Joint Mathematics Meeting, Washington, DC January 2000
- Conference on “Quadratic forms and their Applications,” University College, Dublin, Ireland July 1999

COMPUTER SKILLS AND LANGUAGES

Latex, Maple, Word, WordPerfect, MS-DOS, UNIX, and Pascal.

LANGUAGES

English, Arabic, French, Italian, and Spanish