

## Dr. Guy R. Biyogmam: Curriculum Vitae

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### Education

- 2006-2010: Ph.D. at New Mexico State University (NMSU), Las Cruces, NM.  
Advisor: Dr. Jerry Lodder  
Title: On the Leibniz (Co)Homology of the Lie Algebra of the Euclidean group.
- 2005-2006: Pre-Ph.D. Diploma Programme at the International Center for Theoretical Physics, Trieste, Italy.  
Title: The Poincaré Duality
- 2001-2002: Masters with Thesis at the University of Yaoundé 1, Cameroon.  
Title: On the Structures of Hopf algebras
- 1999-2001:
  - Masters at the University of Yaoundé 1, Yaoundé, Cameroon.
  - Diploma of Higher School Teacher's Training College (Teaching Certificate) in Mathematics, Yaoundé, Cameroon
- 1995-1998: B.S. in Mathematics at the University of Douala, Cameroon.

### Employment

- August 2014 - Present: Associate Professor at Southwestern Oklahoma State University.
- 2010 - 2014: Assistant Professor at Southwestern Oklahoma State University.
- 2006-2010: Teaching Assistant at New Mexico state University.
- 2002-2005:
  - Tutor in the Mathematics Department of the University of Yaoundé 1, Cameroon.
  - Head of the Mathematics Department, Bilingual High School Lolodorf, Cameroon.
  - Mathematics teacher, Catholic High School St Charles Borrome, Douala, Cameroon.

### Teaching Experience

- COURSES AT SOUTHWESTERN OKLAHOMA STATE UNIVERSITY
  1. **Basic Algebra** (MATH 0124):  
Fall 2010, Summer 2011, Summer 2012, Fall 2012.

2. **Intermediate Algebra** (MATH 1103):  
Fall 2010, Fall 2011.
3. **Fundamentals of Algebra 2** (MATH 0133):  
Summer 2016.
4. **College Algebra** (MATH 1513):  
Fall 2010, Spring 2011, Summer 2011, Spring 2012 (2 sections), Spring 2013 (2 sections), Summer 2013, Fall 2013, Spring 2014 (2 sections), Summer 2014, Fall 2014, Fall 2016 (2 sections)
5. **Applied Calculus** (MATH 2823):  
Fall 2010, Spring 2011, Fall 2011 (2 sections), Spring 2012, Summer 2012, Fall 2012, Spring 2013, Fall 2013 (2 sections), Spring 2014, Fall 2014(2 sections), Spring 2016, Fall 2016.
6. **College Trigonometry** (MATH 1613):  
Summer 2013, Summer 2014, Spring 2015, Spring 2016, Fall 2016.
7. **Math Applications** (MATH 3653):  
Spring 2016.
8. **Calculus I** (MATH 1834):  
Spring 2011.
9. **Calculus II** (MATH 2834):  
Fall 2012.
10. **Statistical Methods 1** (MATH 3413):  
Fall 2014.
11. **Calculus III** (MATH 3834):  
Fall 2011, Spring 2013.
12. **Linear Algebra** (MATH 3653):  
Spring 2012, Spring 2016.
13. **Advanced Algebra** (MATH 4853):  
Spring 2013.
14. **Math Capstone** (MATH 4101):  
Fall 2012, Fall 2014.
15. **Modern Algebra** (MATH 4653):  
Fall 2013.

• COURSES AT NEW MEXICO STATE UNIVERSITY

1. A supplemental class for **Intermediate Algebra** (Math 101) :  
Spring 07.
2. **Practicum for Calculus 1** (Math 191L):  
Fall 2008, Spring 2009.

3. **Practicum for Calculus 2** (Math 192L) :  
Fall 2007 (3 sections), Spring 2008.
4. **Trigonometry and Pre-calculus** (MATH 190):  
Fall 2009.
5. **Calculus for the Biological and Management sciences** (MATH 142) :  
Spring 2010.
6. **Calculus 1** (MATH 191):  
Fall 2008, Summer 2009, Spring 2009.
7. **Calculus 2** (Math 192):  
Spring 2008, Summer 2008.
8. **Calculus 3** (MATH 291) :  
Summer 2010.

- COURSES IN CAMEROON

1. Teaching Assistant for **Linear Algebra** at the University of Yaoundé 1, Cameroon (From 2002 to 2005).
2. Taught mathematics at Catholic High School St Charles Borrome Douala, Cameroon (From 2003 to 2004). Course materials included **Elementary Algebra, Trigonometry, Euclidean Geometry, Functions, Probabilities and Statistics**.
3. Taught mathematics at Bilingual High School Lolodorf, Cameroon (From 2002 to 2005). Course materials included **Elementary Algebra, Trigonometry, Euclidean Geometry, Functions, Probabilities and Statistics**.

### Research Interests

I am a pure mathematician focusing on Leibniz (co)homology. My research combines Algebraic Topology, Representation Theory, Lie Theory, Differential Geometry and Homological Algebra. Current research includes the Leibniz homology of abelian extensions of Lie algebras and infinite dimensional Lie algebras. I also have interest in BCK-algebras,  $n$ -racks and fuzzy logic.

### Publications

1. G. R. B., On the Leibniz (Co)Homology of the Lie algebra of the Euclidean group, *Journal of Pure and Applied Algebra* **215**, (2011) 1889-1901.
2. G. R. B., Lie  $n$ -racks, *C. R. Acad. Sci. Paris* **349**, Issues 17-18, (2011) 957-960.
3. G. R. B., O. Heubo, J.Nganou, Super Implicative Hyper BCK-Algebras, *Int. J. of Pure and Applied Math.* **76(2)**, (2012) 267-275.
4. G. R. B., A Fuzzy Approach on  $n$ -racks. *Int. Journal of Math. and Stat.* **13(1)**, (2013) 20-27.

5. G. R. B., A Study of n-Subracks, *Quasigroups and Related Systems* **21** (2013), 11-20.
6. G. R. B., Leibniz (Co)Homology of the Galilei Algebra, *Journal of Mathematical Physics* 54, 073514 (2013).
7. G. R. B., Introduction to gb-Triple systems, *ISRN Algebra*, vol. 2014, Article ID 738154, 5 pages, 2014.
8. G. R. B., Low Dimensional (Co)Homology of the Orthosymplectic Lie Superalgebra  $\mathfrak{osp}(1,2)$ , *Euro. J. of Pure and Applied Math* 7(4) (2014), 395-404.
9. G. R. B., Lie Central triple Racks, *I. E. J. of Algebra*, 17 (2015) 58-65.
10. G. R. B., A Note on Intuitionistic Fuzzy n-racks, *Scientiae Mathematicae Japonicae*, e-2015, 109-115
11. G. R. B., A Relative Theory for Leibniz  $n$ -Algebras, *Algebra Colloquium* 23 : 2, (2016), 219-226.
12. G. R. B., On the Harmonic Oscillator Algebra, *Communications in Algebra*, 44, Issue 1, (2016), 164-173.
13. G. R. B., Leibniz (Co)Homology of the Indefinite orthogonal Lie Algebra, *African Diaspora Journal of Mathematics*, Volume 19, Number 1, pp. 37-48 (2016).

### Paper in preparation

- On the Schrödinger Group. (Submitted to Journal of Algebra).
- Ultraproduct of Leibniz Algebras.

### Other Peer-reviewed Notes completed

- A History of De Rham Cohomology (A teaching Module with historical sources)[2008]
- A translation of Euler's paper (from French to English) posted on Euler's archives: Recherches sur quelques integrations remarquables dans l'analyse des fonctions a deux variables connues sous le nom de differences partielles [2009].

### Undergraduate Research

- Supervisor of SAMANTHA DRISKILL in an undergraduate research work. In this project entitled A STUDY OF SUBRACKS, SAMANTHA established certain results known for subgroups on racks. The results in this project appeared in the *American Journal of Undergraduate Research*, 13(2) (2014), 19-27. This project won the 3rd prize at the 75th Annual MAA Oklahoma -Arkansas Section Meeting in Stillwater, OK in April 2013.

- I Supervised Tyler Gorshing in an undergraduate research work entitled CENTERS OF SOME NON RELATIVISTIC LIE ALGEBRA. The physical result in this project are known, but the mathematical proof was either hidden or taken for granted. Tyler won the 2<sup>rd</sup> prize for undergraduate paper presentations at the 76<sup>th</sup> MAA OK-AR sectional meetings in Arkansas. Tyler's paper appeared in the Rose-Hulman Undergraduate Mathematics Journal, Vol. 16, Issue 1, 2015.

### **Professional Service**

- Associate Editor and Referee, Journal of Mathematics Research (3 papers reviewed since 2012)
- Referee, Journal of Algebra.
- Reviewer, Mathematical Reviews (Wrote already 3 review articles).
- Referee, Discussiones Mathematicae: General Algebra and Applications.
- Referee, The Euler Archives.
- French Translator, The Euler Archives.
- Judge for YMC 2014 (national Young Mathematicians conference) held at Ohio State University.

### **Professional service at SWOSU**

- Faculty Senate Representative (since Fall 2016)
- Faculty Sponsor of the SWOSU Soccer Club (2011-present)
- Faculty Sponsor of the SWOSU African Students Association Club (2016-present)
- Faculty (co)Sponsor of the SWOSU International Students Club (2014-2015)
- Member of the SWOSU Intellectual Property committee (FS 2016)
- Member of the SWOSU Academic Appeals committee (2013-2014)
- Member of the SWOSU Benefit committee (2011-2013)
- Member of the SWOSU International Students Task Force
- Member of the scheduling committee (Fall 2010, Spring 2011, Fall 2011, Fall 2012, Spring 2014)
- SWOSU Mathematics Seminar Organizer (2011-present)
- KME and student research committee (2011-2013)
- Equipment/Technology committee (2011-2012)

- MAA Liaison (2011-present)
- Scholarship committee (2012-present)
- Translator and Evaluator of transcripts from french to english for Physics and Mathematics departments (Spring 2012)
- SWOSU State Fair Booth representative (Fall 2011, Fall 2012, Fall 2013).
- SWOSU Major Fair: Mathematics Department representative (Fall 2011, Fall 2012, Fall 2013, Fall 2014)
- Member of the Search committee (2013-2014)

### Community Involment and service

- Member of Weatherford Young Professionals (W' Forward)
- Burcham Elementary School Volunteer (Fall 2012, Spring 2013).
- Sharing and Caring Volunteer (December 2012).
- Member of Counting group at Catholic Church.

### Talks

- *Some Applications of Lodder's Structure Theorem for Leibniz Homology.* Workshop on Lie Theory and Mathematical Physics, Centre de Recherches Mathematiques, Montreal, Canada, May 2014.
- *Intuitionistic Fuzzy n-racks.* 76<sup>th</sup> Annual MAA Oklahoma -Arkansas Section Meeting, Searcy, AR, April 2014.
- *A Fuzzy Approach on n-racks.* Cameron University Mathematics Seminar, Lawton, OK, March 2014.
- *A Study of Fuzzy racks.* Southwestern Oklahoma State University Mathematics Seminar, Weatherford, OK, February 2014.
- *A survey: Leibniz homology of Affine Lie Algebras.* University of Douala, Mathematics Colloquium Series, Douala, Cameroon, May 2013.
- *Leibniz homology of Non Relativistic Algebras.* New Mexico State University, Mathematics Colloquium Series, Las Cruces, NM, April 2013.
- *Leibniz homology of The Generalized Poincaré Algebra.* 75th Annual MAA Oklahoma -Arkansas Section Meeting, Stillwater, OK, April 2013.
- *Leibniz homology of The Schödinger Algebra .* Southwestern Oklahoma State University Mathematics Seminar, Weatherford, OK, February 2013.

- *(Co)homology of The Orthosymplectic Lie Superalgebra osp(1, 2)*. Southwestern Oklahoma State University Mathematics Seminar, Weatherford, OK, October 2012.
- *Lie n-Rack and Fuzzy Logic*. 74<sup>th</sup> Annual MAA Oklahoma -Arkansas Section Meeting, Arkadelphia, AR, March 2012.
- *Introduction to n-racks and their homology*. Knots in Washington XXXIV; Categorification of Knots, Quantum Invariants and Quantum Computing, Washington, DC, March 2012.
- *Super Implicative BCK-Algebras*. Southwestern Oklahoma State university Mathematics Seminar, Weatherford, OK, March 2012.
- *The Quaternions: History and Geometry*. Southwestern Oklahoma State university Mathematics Club, Weatherford, OK, November 2011.
- *Leibniz cohomology and Invariant theory*. 73<sup>th</sup> Annual MAA Oklahoma -Arkansas Section Meeting, Edmond, OK, April 2011.
- *Elementary Invariant Theory and Leibniz cohomology*. Southwestern Oklahoma State university Mathematics Seminar, Weatherford, OK, March 2011.
- *Leibniz cohomology of "Affine" simple Lie algebras*. Arts and Science Colloquium at Saginaw Valley State University, MI, March 2011.
- *On the Leibniz (Co)Homology of the Lie algebra of the Euclidean Group*. AMS Spring Western Section Meeting, Albuquerque, NM, April 2010.
- *On the Leibniz (Co)Homology of an Abelian Extension of the Orthogonal Lie Algebras*. Georgia International Topology Conference 2009: The Session for Young Mathematicians, University of Georgia, May 2009.
- *Fundamental Theorem of Calculus and Forms*. NMSU Graduate Research and Art Symposium 2008.
- Numerous talks in the Topology Seminar in the Mathematical Department at NMSU.

### **Seminars Attended**

- Workshop on Lie Theory and Mathematical Physics, Centre de Recherches Mathématiques, Montreal, Canada, May 2014.
- 76<sup>th</sup> Annual MAA Oklahoma -Arkansas Section Meeting, Searcy, AR, April 2014.
- 75<sup>th</sup> Annual MAA Oklahoma -Arkansas Section Meeting, Stillwater, OK, April 2013.
- 74<sup>th</sup> Annual MAA Oklahoma -Arkansas Section Meeting, Arkadelphia, AR, March 2012.
- Knots in Washington XXXIV; Categorification of Knots, Quantum Invariants and Quantum Computing, Washington, DC, March 2012.

- Conference on Deformation Theory, North Carolina State university, NC, May 2011
- 73<sup>th</sup> Annual MAA Oklahoma -Arkansas Section Meeting, Edmond, OK, April 2011.
- 2010 AMS Spring Western Section Meeting, Albuquerque, NM, April 2010.
- 2010 Joint Mathematics Meetings, San Francisco,CA.
- 2009 Georgia International Topology Conference , The University of Georgia, Athens, Georgia, May 2007.
- 2008 Topology Festival, Cornell University, Ithaca, New york, May 2008.
- 2008 New Mexico State University Graduate Research and Art Symposium.
- Summer School on Resolution of Singularities, ICTP Diploma Program Workshop, Trieste, Italy, June 2006.
- University of Yaoundé, Algebra and Logic Seminar, April 2003.
- Numerous Algebra seminars and Topology seminars at New Mexico State University.
- Numerous seminars at Southwestern Oklahoma state University.

### Honors and Awards

- 2006-2010 Teaching Assistantship at New Mexico State University.
- 2008-2009: Outstanding Graduate Assistant AWARD (New Mexico State University)  
This award recognizes a graduating student for outstanding contributions to the graduate life at New Mexico State University, the University community and the broader community while maintaining academic excellence in a graduate program.
- 2007-2008: Outstanding Graduate Assistant AWARD (New Mexico State University)
- 2005-2006: UNESCO Scholarship for International Center for Theoretical Physics Diploma Programme (Trieste, Italy)

### Language

French, English, Bassa , Fang (beti).

**References will be provided upon request.**