

STELLA THISTLETHWAITE

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EDUCATION

Ph.D. University of Massachusetts at Amherst
awarded: Feb 1 1996
Advisor: Hans Fischer
Dissertation: *Unitary Representations of Gauge Groups*

M.S. University of Massachusetts at Amherst, May 1991

M.S. National University of Colombia
awarded: August 1988
Advisor: Jairo Charris
M.S. Thesis: *Duality on Spaces of Analytic Functions*

B.S. National University of Colombia, Bogotá, August, 1984
All degrees are in Pure Mathematics.

TEACHING EXPERIENCE

Current **Lecturer**
Department of Mathematics, University of Tennessee

Spring 2010 **Visiting Professor**
Department of Mathematics, University of Tennessee

1997 – 2010 **Associate Professor**
Mathematics Department, National University of Colombia
Taught Measure Theory, Differential Geometry, Riemannian Geometry, Mathematical Analysis, Theory of critical points (Morse Theory), Topology, and Homological Algebra to advanced mathematics majors and graduate students at the Master's and Ph.D levels.

1996 – 1997 **Assistant Professor**
Mathematics Department, University of Antioquia
Taught Topology, Calculus on Manifolds, Measure Theory and an Introduction to Differential Geometry to advanced mathematics majors.

1995 – 1996 **Instructor**
Mathematics Department, Southwestern Oklahoma State University
Taught Geometry to majors in mathematics education, and College Trigonometry to students in intermediate level mathematics.

1989 – 1994 **Teaching Assistant**
Mathematics Department, University of Massachusetts at Amherst
Taught courses in Linear Algebra, Calculus and Precalculus.

1987 – 1988 **Instructor**
Mathematics Department, National University of Colombia, Bogotá
Taught Multivariable Calculus courses.

1984 – 1985 **Instructor**
Mathematics Department, INNCA University, Bogotá
Taught courses in Set Theory and Differential Equations.

RESEARCH GRANTS

2007 – 2009 **Khovanov homology and 3&4 Manifolds**
US\$29,000 (COL\$58,000,000) Colciencias-National University of Colombia research grant, Colciencias code number PRE00405002032, National University code number 2010100-1162. To promote the graduation of my first PhD student Hernando Burgos Soto, and to support the continuation of the research activities of the Colciencias group: “Representation Theory at the National University of Colombia”.

2008 – 2009 **Open-Closed Topological Quantum Field Theories, OC-TQFT**
US\$ 15,000 (COL\$30,000,000) National University of Colombia HERMES research grant, code number 1101-05-11445. The participating student visited the University of George Washington in Washington D.C, to present her Master’s thesis results on the research subject.

2007 – 2008 **Representation Theory**
US\$ 15,000 (COL\$30,000,000) National and University of Colombia HERMES research project, code number 2010100-9143. To finance the activities of the Colciencias group: “Representation Theory at the National University of Colombia” from August 2007 to August 2008.

2006 – 2006 **Foundations of QM, gauge theory and symmetry**
US\$30,000 (COL\$50,000,000 MEX\$50,000) Institute for Nuclear Physics, ICN, research project, with Miguel Socolovsky, National Autonomous University of Mexico, UNAM Mexico City. To study the geometrization of quantum field theories, from the point of view of High Energy Physics. Invited and supported partially, by grant CONACYT code number PA-PIIT IN 103505. Coincides with my sabbatical year 2006.

2002 – 2005 **Combinatoria y cohomología de nudos**
US\$13,250(COL\$26,500,000) Colciencias-National University of Colombia research grand, code number 1101-05-11445. In this project the two participating Master level students visited the University of California at Davis, to discuss their theses results with Mikhail Khovanov. This project was finished in June 2005.

1999 – 2004 **Efecto Unruh sobre variedades curvas**
US\$5,000 (COL\$10,000,000) National Division for Research, DINAIN, 2000.
The participating student visited Professor Robert Wald at the University of Chicago, for the fall-spring academic year 2002. This project was finished on March 31 2004.

1999 – 2002 **Representaciones adjuntas y categorías**
US\$8,000 (\$16,000,000) Colciencias-National University of Colombia,
code number 1101-05-10065. This project was finished on April 30 2002.

PHD THESIS DIRECTED

2005 – 2009 **The Jones polynomial and the Planar Algebra of Alternating Links**
by Hernando Burgos Soto, National University of Colombia, evaluators
Dror Bar Natan and Morwen Thistlethwaite. Bogotá, February 18 2009.

MASTER'S THESES DIRECTED

2007 – 2009 **Finite Group Deformations**
by Manuel Medina, National University of Colombia,
Bogotá to be presented in December 2009. Directed along with César
Neyit Galindo.

2006 – 2009 **Einstein metrics and 4-manifolds**
by Alexander Rincon, National University of Colombia,
November 2009, Bogotá.

2007 – 2009 **Extended (1+1)-OC-TQFT**
by Lara Suarez Lopez, National University of Colombia,
Bogotá, March 17, 2009. Lara started her PhD program at the University
of Montreal in September 2009, with full scholarship, and due to my strong
encouragement.

2005 – 2007 **Khovanov type Homologies and Frobenius Algebras of Higher Rank**
by Jorge Enrique Monsegry, National University of Colombia
Bogotá, September 23 2007. Jorge is an important researcher (due to
my introducing him to my collaborators) at the Petroleum Institute of
Colombia, since August 2006.

2005 – 2007 **Study of the Control Theory from the point of view of the Differential Geometry and the Differential Algebra**
by John Alexander Cortes, National University of Colombia
Bogotá, March 19 2007. Due to my encouragement and letters of rec-
ommendation Alexander was admitted to the PhD program in Control
Theory at Cinvestav Mexico, starting in September 2007, and supported
by an OEA (Organization of American States) fellowship.

2002 – 2003 **Group of motions of a Hilbert space and unitary representations of gauge groups**
by Clara Lucia Aldana Dominguez, Andes University,
Bogotá, September 4 2003. Clara was admitted to the PhD program in
mathematics at the University of Bonn, Germany. She obtained her PhD
degree in August 2009. Currently, Clara is an Assistant Professor at the
Andes University, in Bogotá, Colombia

- 2002 – 2003 **Estudio de la cohomología de Khovanov como invariante topológico de nudos**
 by Carlos Wilson Rodríguez Cárdenas, National University of Colombia, August 4 2003. Currently, Carlos Wilson is an Assistant professor at the Industrial University in Santander, UIS, Bucaramanga, Colombia.
- 2002 – 2003 **Estudio de la p-torsión en los grupos de cohomología de Khovanov,**
 by Jairo Alonso Ayala Molina, Nacional University of Colombia, February 4, 2003. Currently, Jairo is an Assistant professor at the National University of Colombia at Manizales, Caldas, Colombia.

UNDERGRADUATE RESEARCH PROJECTS DIRECTED

- 2008 – 2009 **Clifford Algebras and Spin structures**
 By Daniel Maya, National University of Colombia, June 16, 2009. Currently, Daniel is a Master's student at the National University of Colombia, Bogotá
- 2008 – 2009 **Seiberg-Witten Floer Homologies**
 By, Oscar Parra, National University of Colombia, June 11, 2009. Currently, Oscar is Master's student at the National University of Colombia, Bogotá.
- 2008 – 2008 **On how Jones obtained his polynomial**
 By Edwin Pacheco, National University of Colombia, December 9 2008. Due to this work, Edwin was awarded a full PhD Research Fellowship at the University of Córdoba in Córdoba, Argentina. He will start his PhD in January 2010.
- 2007 – 2008 **Promeasures and their corresponding spaces of functions**
 By Pablo Diaz, National University of Colombia, July 29, 2008. Currently Pablo is a Master's student at the National University of Colombia, Bogotá.
- 2004 – 2005 **Study of some 4-Manifold Invariants**
 By Alexander Caviedes Castro, National University of Colombia, May 2005. Currently, Alexander is a PhD candidate at the University of Toronto, Canada.
- 2004 – 2005 **Orbifolds and the symmetry breaking of the dynamic gauge on $\mathbf{T}^2/\mathbf{Z}^2$**
 By Francisco Meneses, National University of Colombia, March 2005.
- 2004 – 2005 **Knot Theory and the Quantum Group $U_q\mathfrak{sl}_2(\mathbf{C})$**
 By César Neyit Galindo, National University of Colombia, Due to this work César was awarded a complete PhD Research Fellowship at the University in Córdoba, Argentina, in December 2004. He started his PhD in April 2005 and he finished in August 2009. César is currently an Assistant professor at Universidad Javeriana in Bogotá, Colombia. This thesis was presented on March 18 2005.

2004 – 2005 **Introduction to topological invariants of group type and characteristic classes**
By Weimar Muñoz Villate, National University of Colombia,
February 18 2005.

1999 – 2000 **El estudio del espacio de Fock asociado a un oscilador armónico cuántico y su generalización a un número finito de osciladores**
By Clara Lucia Aldana, National University of Colombia,
August 11th 2000.

PUBLICATIONS

1. R. Huerfano, A. Lopez, M. Sokolovsky *Geometry of the Aharonov-Bohm effect* International Journal of Theoretical Physics Vol 46, Issue 11, 2961-2966, arXiv:math-ph/0701050v2(2007).
2. R. Huerfano, S. Sahu, M. Sokolovsky *Quantum Mechanics and the Weak Equivalence Principle*, journal reference to follow, can be viewed at <http://arxiv.org/abs/quant-ph/060617> (2006).
3. R. Huerfano, H. Burgos *Khovanov Type Homologies and Frobenius Extensions* Lecturas Matemáticas, Vol.27, 57-83(2006).
4. R. Huerfano, M. Khovanov *A Category for the second level Representations of sl_2* . Journal of Knot Theory and its Ramifications, Vol 15, Nro 6, 695-713, August 2006.
5. R. Huerfano, H. Burgos *Khovanov Type Homologies and Frobenius Extensions* Lecturas Matemáticas, Vol.27, 57-83(2006).
6. R. Huerfano, M. Khovanov *A Category for the Adjoint Representation* Journal of Algebra 246, 514-542 (2001).
7. R. Huerfano *Class Notes on Differential Geometry*, presented to the 4th National Congress of Mathematics Students, Medellin, Sept. 29th to Oct 3th 1997.
8. R. Huerfano, C. Cartagena *El polinomio de Jones: Ventajas y desventajas* Vialtopo, Univ. Pedagógica, June 1997, Bogotá.
9. R. Huerfano, C. Cartagena *Geometrización de 3-variedades y Física*, Vialtopo, Univ. Pedagógica, June 1997, Bogotá.
10. R. Huerfano, *Unitary Representations of gauge groups*, ERM, Escuela Regional de Matemáticas. EAFIT, Medellin, Dec 3-6th, 1996.
11. R. Huerfano, *Duality on Some Spaces of Analytic Functions of Exponential Type*, Revista Colombiana de Matematicas, Vol XXII pages 129-149, Bogotá, 1988

AWARDS

National University of Colombia & Interamerican Bank of Development Fellowship, similar to a NSF research award, highly competitive, only four were granted in 1985-1987.

INVITED TALKS / MEETINGS

1. Invited to deliver two lectures at *Dror Bar Natan's Graduate Seminar* at the University of Toronto, Canada, November 17 and 19, 2009.

2. Invited to take part of the *Workshop on Computational Differential Geometry, Topology and Dynamics*. At the Fields Institute, Toronto, Canada, November 16–21, 2009.
3. Invited to take part of the *Advanced School and Conference on Knot Theory and its Applications to Physics and Biology* that was held at the Abdus Salam, International Center for Theoretical Physics, May 11–29, 2009.
4. With Lara Suarez delivered the lecture *Extended Topological Quantum Field Theories* at the University of George Washington in Washington D.C, February 11, 2009.
5. Invited to take part of *Knots in Washington* at the University of George Washington in Washington D.C., January 8–12 2009.
6. I delivered the lecture *Frobenius Algebras and Open-Closed Topological Quantum Field Theories (OC-TQFT)* at the “VI North East Congress in Mathematics”. Industrial University of Santander, Bucaramanga, Colombia, December 9–14, 2007.
7. I delivered the lecture *Topological Quantum Field Theories (TQFT) and its applications* in the “Weekly Mathematics PhD student’s seminar” at Cinvestav, México City, September 21, 2007.
8. Delivered the lecture *Topology and the Aharonov-Bohm effect* with M. Sokolovsky and Brenda Caravallo at the “UNAM High Energy Physics Department Annual Meeting”. Botanical Garden, Autonomous University of Mexico, UNAM, January 20–22, 2007.
9. I was invited to the *Workshop on String Topology* at the “Institute of Mathematics”, Cuernavaca Mexico, October 16–18, 2006.
10. I delivered the lecture *Frobenius Algebras Khovanov’s homology and POS-TFT (Planar Open String Topological Quantum Field Theory)* with the PhD student Hernando Burgos Soto, at the “Weekly Seminar”, High Energy Physics Department, Institute of Nuclear Science, ICN, National Autonomous University of Mexico, UNAM, September 13, 2006
11. I delivered the lecture *Extensiones de Frobenius y Homologías de Khovanov* with the PhD student Hernando Burgos Soto, at the “XV Congreso Nacional de Matemáticas”, August 9, 2005.
12. I delivered the lecture *Homología de enlaces y extensiones de Frobenius* with the PhD student Hernando Burgos Soto, at the “XI Encuentro de la Escuela Regional de Matemáticas”, June 27, 2005.
13. I delivered the lecture *Cálculo de los grupos de homología de Khovanov* with the Master’s student Jorge Monsegny, at the “XI Encuentro de la Escuela Regional de Matemáticas”, June 27, 2005.
14. I delivered the lecture *Clases características y espacio proyectivo* with the undergraduate student Weimar Muñoz, at the “XI Encuentro de la Escuela Regional de Matemáticas”, June 28, 2005.
15. I delivered the lecture *Estructuras spin y clasificación de 4-variedades* with the undergraduate student Alexander Caviades Castro, at the “XI Encuentro de la Escuela Regional de Matemáticas”, June 29, 2005.

16. I delivered the lecture *Introducción a los Orbifolds* with the undergraduate student, Francisco Meneses, at the “XVI Encuentro de Geometría y sus aplicaciones y en el IV Encuentro de aritmética”, Universidad Pedagógica Nacional Bogotá, June 24, 2005.
17. I delivered the lecture *Estudio gráfico de la homología de Khovanov* with the PhD student Hernando Burgos Soto, at the “XVI Encuentro de Geometría y sus aplicaciones y en el IV Encuentro de aritmética”, Universidad Pedagógica Nacional Bogotá, June 24, 2005.
18. I delivered the lecture *El grupo spin de $SO(n)$* with the undergraduate student Alexander Caviedes Castro, at the “XVI Encuentro de Geometría y sus aplicaciones y en el IV Encuentro de aritmética”. Universidad Pedagógica Nacional Bogotá, June 24, 2005.
19. I delivered the lecture *Grupos de homología de DeRham* with the undergraduate student Weimar Muñoz, at the “XVI Encuentro de Geometría y sus aplicaciones y en el IV Encuentro de aritmética”. Universidad Pedagógica Nacional Bogotá, June 24, 2005.
20. I delivered the lecture *Elementos básicos de geometría de Riemann* with the Master’s students Alvaro Ruiz y Alexander Rincon, at the “XVI Encuentro de Geometría y sus aplicaciones y en el IV Encuentro de aritmética”. Universidad Pedagógica Nacional Bogotá, June 23–25, 2005.
21. I delivered the lecture *El conjunto de homomorfismos de Z_m en Z_n* with the professor of the Universidad Distrital Sara Garavito at the “XVI Encuentro de Geometría y sus aplicaciones y en el IV Encuentro de aritmética”. Universidad Pedagógica Nacional Bogotá, June 25, 2005.
22. I delivered the lecture *Combinatoria y Cohomología de Nudos* at the Mathematics Weekly Seminar Universidad del Valle, Cali, Colombia, March 15, 2002.
23. I delivered the lecture *Calculus, Differential Geometry and Physics* to the VII meeting of Colombian Mathematics Students. Florencia, Caqueta, Colombia. October 9–13, 2000.
24. Delivered the lecture *An introduction to Quivers* XIV Congress of Mathematics, U. Javeriana, Bogotá, August 17, 2000.
25. Invited to take part of the *Geometry and Physics* summer school, ITP, Institute for Theoretical Physics, University of California, Santa Barbara, July 25 to August 13, 1999.
26. Delivered the lecture *Autosimilaridad y Dimensión Fractal*, Third regional meeting in Mathematics, U. Pamplona, May 31st to June 4th, 1999.
27. Took part of the Conference *Andre Weil, his work and his influence* Institute of Advanced Studies, Princeton, Jan 8-9, 1999.
28. Delivered a *Brief Course in Curves and Surfaces* at the V meeting of Colombian students in Mathematics. Sincelejo, Colombia, October 5–9, 1998.

29. Delivered a *Brief Course in Differential Geometry* at the IV meeting of Colombian students in Mathematics. Medellin, Colombia, September 29 to October 3, 1997.
30. Delivered two lectures on 3-Manifolds and Knots at the VII National meeting in Topology and Geometry. Bogotá, Colombia, June 22–25, 1997
31. Presented a series of three lectures at the IV Regional Meeting of Mathematicians entitled: *Unitary Representations of Gauge Groups* Medellin, Colombia, December 3–6, 1996.
32. Invited to and attended *Calderon's Symposium* University of Chicago, Feb 19–21, 1996.
33. Presented a lecture in the Orlando Meeting of the AMS, entitled: *Unitary Representations of Gauge Groups* Orlando Fla, January 10–13, 1996.
34. Invited to and attended *The Legacy of Norbert Wiener: A Centennial Symposium* MIT, October 8–11, 1994.
35. Presented a lecture in a Graduate Study Group, entitled: *Sheaf Cohomology and DeRham Theorem* November, 1993.
36. Invited as young researcher, and attended the conference *Analysis On the eve of the XXI century* Rutgers University, October 24–27, 1993.
37. Presented a lecture in the Graduate Student Seminar, University of Massachusetts at Amherst, entitled: *About the Existence of Haar Measures*, May 1993.
38. Presented a lecture in the Graduate Student Seminar, University of Massachusetts at Amherst, entitled: *Three Littlewood Principles*, Nov 1991.
39. Presented a lecture at the 1987 Colombian Mathematical Congress entitled: *On Some Spaces of Analytic Functions of Exponential Type* Bogotá, Colombia, August 1987.

SKILLS

Spanish-English Bilingual.
 Knowledge of Pascal & C.
 Familiarity with Mathematica, Maple, Geometer's Sketchpad.
 Skilled using LaTeX and AMS-TeX.

OTHER EXP.

School of Science Professor Representative: Appointed to represent all 450 professors of the School of Science in the “Colegiatura de Sede Bogotá ” to discuss the “Global Plan of Development 2010-2012”, for the National University of Colombia at large. August 27 – September 11, 2009.

Departmental Professor Representative: Appointed to represent the Mathematics Department professors in the “Claustros de Facultad de Ciencias” to discuss the “Global Plan of Development 2010-2012”, for the National University of Colombia at large, This Plan determines completely the budget for all eight campuses of the National University of Colombia for the period 2010-2012. August 10–12, 2009.

Tutoring Experiment: Appointed to tutor new graduate students in the Mathematics PhD program to prepare for their qualifying exams. Winter 1995

Teaching with Graphic Calculators: Attended a seminar to learn how to use and to teach using the graphic calculator TI-85, Summer 1994, Mathematics Department University of Massachusetts.

Mentoring Program: Appointed to and took part in a Committee to improve the quality of communication and the teaching among teaching assistants, their faculty and their students. Fall 1993

Foreign Student Staff: Hired to welcome new foreign students. Foreign Student Office, University of Massachusetts. Summer 1993

REFERENCES

Professor Hans Fischer
University of Massachusetts, Amherst, retired.
Mathematics Department

Professor Mikhail Khovanov
Columbia University, New York N.Y.
Mathematics Department