

Calin Lazaroiu

Education

PhD (*with Distinction*) from **Columbia University, New York**, May 2000

Thesis advisor: Prof. **Brian R. Greene**. Awarded by joint Physics/Mathematics committee, presided by Profs. **Eric Weinberg** (physics) and **John Morgan** (mathematics). Thesis: "*Quantum effects in D-brane geometry*". Focused on algebro-geometric approaches to Calabi-Yau superstring compactifications in the presence of D-branes and their physical applications.

MS from **Columbia University, New York**

Diploma (*Magna cum Laudae*) from University of Bucharest, Romania.

Chief of promotion. Thesis: *Adiabatic vacua in quantum field theories on curved space-times*, supervised by Prof. **G. Nenciu**. Focused on rigorous functional-analytic results on the existence of adiabatic vacua for quantum field theories in nonstationary space-times.

Research experience

2004 Research associate, **Institute for Advanced Study, Princeton, NJ** (supervisor: Edward Witten)

2003 -2004 Research Associate, **Univ. of Wisconsin at Madison** (the group of Prof. A. Klemm)

2002-2003 Post-doctoral research associate, Institute for Physics, **Humboldt University**, Berlin, Germany. Work on matrix models, the Dijkgraaf-Vafa conjecture and Calabi-Yau compactifications.

2000-2002 Post-doctoral research associate, **C.N.Yang Institute for Theoretical Physics**, State University of New York at Stony Brook. Work on manifolds of G2 holonomy, topological field theories and the relation between string field theory, strong homotopy associative structures and triangulated categories.

1997-2000 Research Assistant, **Columbia University**, New York. Work on Calabi-Yau compactifications with D-branes, (0,2) sigma models and F-theory. Supervised by Prof. **Brian R. Greene**.

Other research experience and skills

Research in functional-analytic aspects of field theory (supervised by **R. Purice** and **G. Nenciu**, the Mathematics Institute of the Romanian Academy).

Symbolic (Macaulay), linear (polytopes/toric geometry) and numerical modeling. Knowledge of Unix/Linux at administrator level. Proficient in several programming languages (especially C and Common Lisp).

Extensive background (undergraduate and graduate coursework and research) in Mathematics, with double focus on Geometry (Differential, Algebraic and Simplicial) and Functional Analysis (Locally convex and seminormed spaces, Operator Theory, Functional Calculus).

Formal Teaching Experience and Training

Teaching Assistant at Columbia University. Participated in the University's Honors Physics Program and held a full Summer Teaching position.

While an undergraduate student, acted as substitute Lecturer in Group Theory and Linear Algebra at Univ of Bucharest at the invitation of Prof. D. Stefanescu.

Coursework in Psychology and Pedagogy, Univ. of Bucharest. Held physics lectures for high-school students.

Informal teaching experience

1996-1997 Physics tutor for Columbia University Pre-Med students.

Academic honors

Pfister Fellowship, 1997--1999.

Special Award from the the Romanian Ministry of Education (awarded yearly to one student in natural sciences at the national level), 1994

Invited reviews

C. I. Lazaroiu, *D-brane categories*, **Int.J.Mod.Phys. A18 (2003) 5299-5335**

L. Anguelova, C.I. Lazaroiu, *Enhanced gauge symmetry from "toric" G_2 cones*, **Fortsch. Phys. 51(2003)543-550**.

Publications(journal articles only)

1. C. I. Lazaroiu, *Non-commutative moduli spaces of topological D-branes*, hep-th/0511049, to appear in Fortschritte Physik.
2. C. I. Lazaroiu, *On the non-commutative geometry of topological D-branes*, **JHEP 0511 (2005) 032**
3. M. Herbst, C. I. Lazaroiu, W. Lerche, *D-brane effective action and tachyon condensation in topological minimal models*, **JHEP 0503 (2005) 078**
4. M. Herbst, C. I. Lazaroiu, *Localization and traces in open-closed topological Landau-Ginzburg models*, **JHEP 0505 (2005) 044**
5. M. Herbst, C.I.Lazaroiu, W. Lerche, *Superpotentials, A-infinity Relations and WDVV Equations for Open Topological Strings*, **JHEP 0502 (2005) 071**
6. C. I. Lazaroiu, *On the boundary coupling of topological Landau-Ginzburg models*, **JHEP 0505 (2005) 037**
7. K. Landsteiner, C.I.Lazaroiu, R. Tatar, *Puzzles for Matrix Models of Chiral Field Theories*, **Fortsch.Phys. 52 (2004) 590-595**
8. K. Landsteiner, C. I. Lazaroiu, *On $Sp(0)$ factors and orientifolds*, **Phys.Lett. B588 (2004) 210-216**
9. K. Landsteiner, C. I. Lazaroiu, R. Tatar, *Chiral field theories, Konishi anomalies and matrix models*, **JHEP 0402 (2004) 044**.
10. K. Landsteiner, C. I. Lazaroiu, R. Tatar, *(Anti)symmetric matter and superpotentials from IIB orientifolds*, **JHEP 0311 (2003) 044**
11. C. I. Lazaroiu, *D-brane categories*, **Int.J.Mod.Phys. A18 (2003) 5299-5335**,
12. K. Landsteiner, C. I. Lazaroiu, *Geometric regularizations and dual conifold transitions*, **JHEP 0304(2003)028**
13. A. Klemm, K. Landsteiner, C. I. Lazaroiu, I. Runkel, *Constructing gauge theory geometries from matrix models*, **JHEP 0305(2003) 066**

14. C. I. Lazaroiu, *Holomorphic matrix models*, **JHEP 0305(2003)044**
15. L. Anguelova, C.I. Lazaroiu, *Enhanced gauge symmetry from “toric” G_2 cones*, **Fortsch. Phys. 51(2003)543-550**
16. L. Anguelova, C.I. Lazaroiu, *Domain walls of $N=2$ supergravity in five dimensions from hypermultiplet moduli spaces*, **JHEP09(2002)053**
17. L. Anguelova, C.I. Lazaroiu, *M-theory on “toric” G_2 cones and its type II reduction*, **JHEP 0210(2002)038**
18. L. Anguelova, C. I. Lazaroiu, *M-theory compactifications on certain “toric” cones of G_2 holonomy*, **JHEP 0301(2003)066**
19. C. I. Lazaroiu, R. Roiban, *Gauge-fixing, semiclassical approximation and potentials for graded Chern-Simons theories*, **JHEP 0203 (2002) 022**
20. C. I. Lazaroiu, *An analytic torsion for graded D-branes*, **JHEP09(2002)023**
21. C. I. Lazaroiu, R. Roiban, *Holomorphic potentials for graded D-branes*, **JHEP 0202 (2002)038**
22. C.I. Lazaroiu, *String field theory and brane superpotentials*, **JHEP10(2001)018**, hep-th/0107162
23. C. I. Lazaroiu, R. Roiban, D. Vaman, *Graded Chern-Simons field theory and graded topological D-branes*, **JHEP 0204(2002)023**
24. C. I. Lazaroiu, *Graded Lagrangians, exotic topological D-branes and enhanced triangulated categories*, **JHEP 0106(2001)064**
25. C. I. Lazaroiu, *Unitarity, D-brane dynamics and D-brane categories*, **JHEP 0112 (2001)031**
26. C. I. Lazaroiu, *Generalized complexes and string field theory*, **JHEP 06(2001)052**
27. C. I. Lazaroiu, *On the structure of open-closed topological field theory in two dimensions*, **Nucl.Phys. B603(2001)497-530**
28. C. I. Lazaroiu, *Collapsing D-branes in one-parameter models and small/large radius duality*, **Nucl.Phys. B605(2001)159-191**
29. Brian R. Greene, C. I. Lazaroiu, *Collapsing D-Branes in Calabi-Yau Moduli Space*, **Nucl. Phys. B604 (2001)181-255**
30. Chris Beasley, Brian R. Greene, C. I. Lazaroiu, M. R. Plesser, *D3-branes on partial resolutions of abelian quotient singularities of Calabi-Yau threefolds*, **Nucl. Phys. B566(2000) 599-640**
31. Brian R. Greene, C. I. Lazaroiu, Mark Raugas, *D-branes on Nonabelian Threefold Quotient Singularities*, **Nucl. Phys. B553(1999)711-749**
32. Brian R. Greene, C. I. Lazaroiu, Piljin Yi, *D-particles on T^4/Z_n orbifolds and their resolutions*, **Nucl. Phys. B539(1999)135-165**
33. M. Bershadsky, T. M. Chiang, Brian R. Greene, A. Johansen, C. I. Lazaroiu, *F-theory and linear sigma models*, **Nucl. Phys. B527(1998)531-570**

Invited talks and visits

- “String Theory in Greater Paris” (seminar series), Feb 22, 2006, at **Institute de Hautes Etudes Scientifiques (IHES)**, Bois sur Ivette, Paris, France
- Workshop on Convex and Algebraic Geometry, organized by **Mathematisches Forschungsinstitut Oberwolfach**, Jan 29-Feb 4, 2006, invited participant
- invited speaker, Antwerp Miniworkshop on Noncommutative Geometry, University of Antwerp, Jan 18-20, 2006, organized by **University of Antwerp, Belgium**
- invited speaker, Miniworkshop on Heterotic Strings, Derived Categories and Stacks, organized by **Mathematisches Forschungsinstitut Oberwolfach**, Nov 13-19, 2005
- invited speaker, Conference on Constituents, Fundamental Forces and Symmetries of the Universe, Corfu, Sept 20-26, 2005, organized by the **Corfu Summer Institute of Elementary particle Physics**
- invited talk, The Durham Symposium on “Geometry, Conformal Field Theory and String Theory”, Durham University, July 22-Aug 1, 2005, organized by the **London Mathematical Society**
- Nov 2004, the **Institute for Advanced Study**, Princeton, NJ. Talk on *The boundary coupling of Landau-Ginzburg models*
- April 2004, invited speaker, the Noncommutative Geometry Workshop, **Mittag Leffler**

- Institute**, Swedish Royal Academy. Talk on *Generalized WDVV equations for open-closed topological strings*.
- Sept 2003, invited short term visitor, **CERN, Geneva**. Talk on *Operads, homotopy algebras and open string field theory*.
 - July 2003, invited talk, **Simons workshop**, C. N. Yang Institute for Theoretical Physics, Stony Brook. *Chiral field theories, Konishi anomalies and matrix models*.
 - June 2003, invited participant, **miniprogram on 'Geometry, Topology and Strings'**, Kavli Institute, Santa Barbara
 - June 2003, invited talk, *(Anti)symmetric matter, matrix models and superpotentials*, **Univ. of California at Berkeley**
 - June 2003, invited talk, *Matrix models for (anti)symmetric matter*, **Univ. of Illinois at Urbana-Champaign**
 - April 2003, invited talk, *M-theory on toric G2 cones*, Institute for Theoretical Physics, **Autonomous University of Madrid**
 - April 2003, invited speaker, *M-theory and G2 cones*, **Leipzig worksop** on Mathematics and String theory
 - March 2003, invited talk, *Holomorphic matrix models*, **C.N. Yang Institute**, SUNY at Stony Brook.
 - March 2003, invited speaker, **Banff conference** on 'Recent Developments in String Theory'.
 - Jan 2003, invited Phys/ Math talk at **Toronto University**, *Generalized analytic torsion and graded topological D-branes*.
 - May 2002, invited visitor, **CERN, Geneva**. Two talks: *A-infinity categories, extended deformations and open string field theory* and *M-theory on toric G2 cones*.
 - May 2002, invited speaker, **Physics/Mathematics Conference**, Physikzentrum Bad Honnef, Germany. Talk on *M-theory, G2 cones and toric hyperkahler geometry*.
 - April 2002, invited talk, *M-theory compactification on cones on G2 holonomy*, joint Seminar of **Duke University/Univ of Southern California**
 - Feb 2002, invited visitor, **Caltech-USC workshop on Geometric Transitions**. Talks at USC (*Chiral field theories from toric G2 cones*) and Caltech (*Extended deformations and graded topological D-branes*)
 - Feb 2002, invited talk, *Open string field theory and graded topological Dbranes*, the **Institute of Advanced Study, Princeton**
 - Jan 2002, invited math/physics talk, *Topological D-branes and Enhanced triangulated categories*, at **Univ. of Washington, Seattle**
 - Jan 2002, invited talk, *Calabi-Yau D-brane composites and superpotentials*, in the combined physics/math seminar, **Univ. of Toronto**.
 - Sept. 2001, invited talk, *Topological D-brane composites in Calabi-Yau compactifications*, **New York University**
 - Sept. 2001, invited visitor, **Rutgers University**
 - Jul. 2001, invited participant, **Park City Mathematics Institute**, Park City, Utah
 - Apr. 2001, invited talk, *Associative homotopy algebras and string field theory*, **University of Texas at Austin**
 - Sept. 2000, invited minilecture, *Homological mirror symmetry and string field theory*, the **Mathematics Department, SUNY at Stony Brook**
 - Mar. 2000, invited talk, *D-branes and arithmetic*, **SUNY at Stony Brook**
 - Oct 1998, Feb 1999 and Feb 2000: invited talks and minilectures in the **New York area Geometry and Physics Seminar (NYU/Columbia/Cornell)**. Subjects: *D-branes and toric resolutions, Massless D-branes in Calabi-Yau compactifications, D branes and boundary states*.