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Dept. of Physics, Texas Southern University, Houston, Texas. 77004, USA.
Center for Theoretical Studies of Physical Systems, Clark Atlanta University Atlanta, Georgia 30314, USA.

Resumé

Goals:
Continuing Research in the Extended Relativity Theory in Clifford spaces developed by the author; Gravity, Strings and Membranes; Grand-Unification; Fractals, Quantum Field Theory, Mathematical Physics, Noncommutative Geometry and Number Theory

Education:
Ph.D. in Physics University of Texas, Austin, Texas, 1991 with a 3.93 Grade Point Average out of 4.0. Prof. Yuval Ne'eman advisor
B.S. in Physics MIT, 1980, undergraduate thesis supervised by Prof. Phillip Morrison.

Experience:
Research Affiliate of the NSF Center for Theoretical Studies of Physical Systems. Clark Atlanta University. Atlanta. GA. 30314.

Research 1995-present; Birla Science Center, Hyderabad, India (2003) ; Inst. of Mathematical Sciences of Chennai (Madras) India (2003) ; International Center for Theoretical Physics, Trieste, Italy; July-Nov 1998 and June-Nov 2000. Asian Pacific Center for Theoretical Physics. Seoul, Korea (1998) . Instituto de Fisica, Guanajuato, Mexico. (1995). Instituto de Fisica Matematica, Sao Paulo, Brazil. Centro de Investigacion y Estudios Avanzados del IPN ; Mexico City (1997) .World Laboratory Fellow: Prof. G. Sudarshan advisor. University of Texas, Austin. (1996)

Research Assistant and Teaching Assistant (Fall, 1984 -May 1991), University of Texas, Austin, Texas.

Sept, 1982 joined the University of Chicago and passed the Ph. D Candidacy Examination and worked with the Relativity Group until Spring 83.

Studied Aeronautical Eng. at the Polytechnic of Madrid, Spain. Before arriving in the US.

Fluent in Spanish, English and French.

Professional References

Prof.Yuval Ne′eman

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Prof.Luis Boya

Dept.of Physics & Theory Division Facultad de Ciencias, Universidad de Zaragoza, Spain

Publications and Preprints

1-Carlos Castro :" A Supersymmetric Lagrangian for Poincare Gauge Theories of Gravity ". Progress of Theoretical Physics **Vol 82**, no. 3; (Sept.89); pp.616-630.

2- Carlos Castro: " Non-Linear Corrections to the Schrodinger Equation Derived from Geometric Quantum Mechanics ". Journal of Math. Physics. vol.**31** no.11 (1990) 2633-2636.

3-Carlos Castro :"Nonlinear Quantum Mechanics as the Weyl Geometry of a Classical Statistical Ensemble ". Found. Physics Letters, **vol.4** no.1 (1991) 81.

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7-Carlos Castro : "The Spinning Membrane, super SU(∞) Gauge Theories and Moyal Brackets " Int. J. of Mod. Phy. **A vol.7** no.3, (1992) 535-561.

8-Carlos Castro : "The Lightcone Spinning Membrane".

9-Carlos Castro: The Self Dual Supermembrane and the Super Toda Molecule. Physics Letters **B vol 288** (1992) 291-296.

10-Carlos Castro :" $SU(\infty)$ (super) Gauge Theories and Self Dual (super) Gravity " Journal of Mathematical Physics **34** no.2 (1993) 681.

11-Carlos Castro : "The N=2 SWZNW model valued in the Area Preserving (Super) Diffeomorphisms Group is Self Dual Supergravity in (2+2) 3+1 Dimensions" Journal of Mathematical Physics **35** no.2 (1994) 920.

12- Carlos Castro : " The KP equation from Plebanski" **incorporated** with the article below in the J. Math. Physics.

13- Carlos Castro : " On W gravity, N=2 Strings and D=2+2 $SU^*(\infty)$ Yang-Mills instantons " Jour. Math. Physics **35** no. 6 (1994) 3013.

14- Carlos Castro :" A Universal W_∞ algebra and Quantization of Integrable Deformations of Self Dual Gravity" incorporated with publication no. 15 .

15- Carlos Castro : " Nonlinear W_∞ Algebras from Nonlinear Integrable Deformations of Self Dual Gravity " Physics Letters **B 353** (1995) 201.

16- Carlos Castro : " D=11 Supermembrane Instantons, W_∞ Strings and the Super Toda Molecule " special issue of the Journal of Chaos, Solitons and Fractals : "Quantum Mechanics in Rigged Spacetimes". **vol 7** no.5 (1996) 711-724.

17- Carlos Castro : " String Theory, Scale Relativity and the Generalized Uncertainty Principle " Foundations of Physics Letters **10** (3) (1997) 273

18- Carlos Castro : "p-branes as Composite Antisymmetric Tensor Field Theories " Int. Jour. Mod. Phys.**A 13** (6) (1998) 1263-1292. hep-th/9603117.

19- Carlos Castro : " On the Exact Integrability Aspects of the Self Dual Membrane " ; hep-th/9612241.

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22- Carlos Castro : " Remarks on Spinning Membrane Actions " , hep-th/0007031.

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24- Carlos Castro, Jerzy Plebanski : " The Generalized Moyal Nahm and Continuous Moyal Toda Equations " Journal of Mathematical Physics **vol. 40 (8)** (1999) 3738-3760

25- Carlos Castro,: " $\mathcal{W}$-Geometry from Fedosov's Deformation Quantization " hep-th/9802023. Journal of Geometry and Physics **33** (2000) 173-190

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30- Carlos Castro " Conformally Invariant Sigma Models on Anti de Sitter Spaces, Chern-Simons p-Branes and W Geometry" **submitted** to the Journal of Mathematical Physics ; hep-th/9906176

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32- Carlos Castro " Hints of a New Relativity Principle from p-brane Quantum Mechanics " Jour. Chaos, Solitons and Fractals **11** (11) (2000) 1721-1737 ; hep-th/9912113

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tal Spacetime and the Fine Structure Constant " physics/0010072 " Jour. Chaos, Solitons and Fractals **13** (2002) 203-207.

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65- Carlos Castro : " The Programs of the Extended Relativity Theory in C-spaces, towards the physical foundations of String theory ", invited Talk at the NATO advanced workshop in Tatranska Lomnica, Slovakia, 2002 on "The Nature of Time, Geometry, Physics and Perception" (2003) 175-185, Kluwer Academic Press

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84-Carlos Castro, "On the Riemann Hypothesis and Tachyons in Dual String Scattering Amplitudes" International Journal of Geometric Methods in Modern Physics **vol 3** , no.2 (2006) 187-199; http://www.maths.ex.ac.uk/ mwatkins/zeta

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87- Carlos Castro, "On Geometric Probability, Holography, Shilov Boundaries and the Four Physical Coupling Constants of Nature" Progress in Physics vol. **2** (2005) 30-36

88-Carlos Castro, "Noncommutative (super) p-branes and Moyal-Yang Star Products with a lower and upper scales" Phys. Letts **B 626** (2005) 209

89- Carlos Castro, "On Generalized Yang-Mills Theories and Extensions of the Standard Model in Clifford (Tensorial) Spaces" Annals of Physics **vol. 321** , no.4 (2006) 813-839

90- Carlos Castro, " On the large N limit of Exceptional Jordan Matrix Models, Chern-Simons Foliations and M, F Theory" **submitted** to Class and Quantum Gravity , July 2005.

91- Carlos Castro, "On Area Coordinates and QM in Yang's Noncommutative Spacetime with a lower and upper scale" Progress in Physics **vol. 2** April (2006) 86-92

92- Carlos Castro, "On the Coupling Constants, Geometric Probability and Complex Homogeneous Domains " Progress in Physics **vol. 2** April (2006) 46-53

93- Carlos Castro, " Chern-Simons (Super) Gravity and E_8 Yang-Mills from Clifford Algebra Gauge Theories" **submitted** to Jour. Math. Phys , January 2006.

94- Carlos Castro, "The large N limit of Exceptional Jordan Matrix Models and M, F Theory" Journal of Geometry and Physics, **57** (2007) 1941-1949

95- Carlos Castro, "On Modified Weyl-Heisenberg Algebras, Noncommutativity, Matrix-valued Planck Constant and QM in Clifford Spaces " Journal of Physics **A** : Math. Gen **39** (2006) 14205-14229

97-Carlos Castro, "Novel Remarks on Static Spherically Symmetric Solutions of Einstein's equations and the Cosmological Constant Problem " **submitted** to the Int. Jou. Mod. Phys. **D** , May , 2006

98-Carlos Castro, " On two strategies towards the Riemann Hypothesis : A Fractal Supersymmetric Model for the Riemann zeta zeros and Trace formulae" Int. Jour. of Geom. Methods of Modern Physics, **4**, no. 5 (2007) 881-895.

99-Carlos Castro, "Important Remarks on (Anti) de Sitter Spaces and the Cosmological Constant " Mod. Phys. Lett **A 21** , no. 35 (2006) 2685-2701

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Polyvector valued Gauge Theories in Clifford Spaces" J. Math. Phys, **47** , 112301 (2006) .

101-Carlos Castro, "On Dark Energy, Weyl Geometry, Different Derivations of the Vacuum Energy Density and the Pioneer Anomaly" Foundations of Physics **37**, no. 3 (2007) 366.

102-Carlos Castro, "How Weyl Geometry solves the Riddle of Dark Energy " *Quantization Astrophysics, Brownian Motion and Supersymmetry* pp. 88-96 (eds F. Smarandache and V. Christianato, Math. Tiger, Chennai, India 2007)

103-Carlos Castro and J. Antonio Nieto, "2 + 2 Dimensional Spacetime, Strings and Black Holes" Int. J. Mod. Phys. **A 22**, no. 11 (2007) 2021.

104-Carlos Castro, J.F Gonzalez and J. Antonio Nieto, "Running Newtonian Coupling and Horizonless solutions in Quantum Einstein Gravity " *Quantization in Astrophysics, Brownian Motion and Supersymmetry* pp 178-200 (eds F. Smarandache and V. Christianato, Math. Tiger Press , Chennai, India 2007)

105-Carlos Castro, " Exact solutions of Einstein's equations associated with delta function point mass sources " Advanced Studies of Theoretical Physics, **1**, no. 3 (2007) 119-141

106-Carlos Castro, "The Euclidean Gravitational Action as Black Hole Entropy, Singularities and Spacetime Voids" Journal of Mathematical Physics, **49** 042501 (2008)

107-Carlos Castro, "The Riemann Hypothesis is a consequence of $\mathcal{CT}$-invariant Quantum Mechanics " Int. Jour. of Geom. Methods of Modern Physics, **5**, no. 1 February 2008

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117-Carlos Castro, J. A. Nieto, L. Ruiz and J. Silvas " On Time dependent Black Holes and Cosmological Models from a Kaluza-Klein mechanism " International Journal of Modern Physics **A 24**, no. 7 (2009) 1383 - 1415

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119-Carlos Castro, "Gauge theories of Kac-Moody extensions of W_∞ algebras as effective field theories of colored W_∞ strings" Advanced Studies in Theoretical Physics, **2**, no. 17, (2008) 825 - 835.

120-Carlos Castro,"The Exceptional E_8 Geometry of Clifford (16) Super-

space and Conformal Gravity-Yang-Mills Grand Unification" IJGMMP vol **6**, No. 3 (2009) pp. 1-33

121-Carlos Castro," On Born's Deformed Reciprocal Complex Gravitational Theory and Noncommutative Gravity " Phys Letts **B 668** (2008) 442-446

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123-Carlos Castro,"On Dark Energy, Weyl Geometry and Brans-Dicke-Jordan Scalar Field " Journal of Global Science and Technology, **1**, no. 1 (2009) 1-8.

124-Carlos Castro,"On the Riemann Hypothesis, Area Quantization, Dirac Operators, Modularity and Renormalization Group " **to appear** in the Int Jour of Geom Meth in Mod Phys (IJGMMP) , **7** , no. 1, February, 2010

125-Carlos Castro, "The Cosmological Constant and Pioneer Anomaly from Weyl Spacetimes and Mach's Principle " Phys Letts **B 675**, (2009) 226-230

126-Carlos Castro, "Conformal Gravity, Maxwell and Yang-Mills Unification in 4D from a Clifford Gauge Field Theory" **submitted** to Phys Letts B , March, 2009

127-Carlos Castro, " The Clifford Space Geometry of Conformal Gravity and $U(4) \times U(4)$ Yang-Mills Unification " **submitted** to the Int J. Mod. Phys **A**, April, 2009

128-Carlos Castro, " The Clifford Space Geometry behind the Pioneer and Flyby Anomalies " **submitted** to the Int J. Mod. Phys **A**, June , 2009

In Preparation/Revision

129-Carlos Castro, "Clifford Superspaces, Generalized Twistors and Higher Spin Theories"

Books/Editorials

Co-Editor with Martin Lopez-Corredoira of the book "Against the Tide : a critical review by scientists of how Physics and Astronomy get done "

Universal Publishers, Boca Raton, Florida, March 2008

Guest Editor of the special issue of the Journal of Chaos, Solitons and Fractals **10** (2-3) (1999) Elsevier Publisher on "Strings, M and F Theory"

Awards/Nominations

2000; Nominated for the Peter Gruber Foundation Awards for the development of the Extended Relativity Theory in Clifford Spaces

Proceedings

Talk at the Dept of Physics at Texas Southern University in Houston, Texas, February 17, 2008, on "The Riemann Hypothesis is a consequence of CT-invariant Quantum Mechanics

Talk at the American Mathematical Society Sectional Western Meeting at San Francisco State University, April 29-30, 2006, " A Fractal Supersymmetric Model for the Riemann zeta zeros

Talk at the Dept. of Physics, Universita de La Sapienza, Roma, Italy, October 2005 on "The Extended Relativity Theory in Clifford Spaces"

Talk at the Inst. of Physics, Belgrade, Serbia, September 2005 on "The Riemann Hypothesis and Tachyons in Dual String Scattering Amplitudes"

Talk at the 2nd International Conference on p-adic methods in Mathematics and Physics, held in Belgrade, Yugoslavia, Sept 15-21, 2005 "On Geometric Probability, Holography, Shilov Boundaries and the Four Physical Coupling Constants of Nature"

Talk at the LPMO Institute in Besancon, France on " Final Steps towards a proof of the Riemann Conjecture " April, 2003

Talk at the Institute for Mathematical Sciences in Madras, India on " Final Steps towards a proof of the Riemann Conjecture " February 2003

Talk at the Institute for Mathematical Sciences in Madras, India on " A variable fine structure constant, strings and Maximal acceleration phase space Relativity " February 2003

Talk at the workshop of Mathematical Modeling of Real Systems on " The Mathematical and Physical applications of the Golden Mean " at the Birla Science Center in Hyderabad, India, February 2003

Talk at the 5-th International Conference of Frontiers in Fundamental Physics at the Birla Science Center in Hyderbad, India on " A variable fine structure constant, strings and Maximal acceleration phase space Relativity " January 2003

Talk at the department of Theoretical Physics , University of Zaragoza, Spain. July 3, 2002 on "
The Extended Relativity in C-spaces as Physical Foundations of String Theory "

Invited Talk at the NATO Advanced Research Workshop on the Nature of Time, Geometry, Physics and Perception " Tatranska Lomnica, Slovakia, May 21-24, 2002 on " The Programs of the Extended Relativity Theory in C-spaces : towards the physical foundations of String theory "

Talk at the Phys. Dept at the University of California, Los Angeles on " The Extended Relativity Theory in C-spaces as the physical foundations of String theory " . May 2002

Two talks at the Josef Institute in Ljubljana, Slovenia, October 2001 on Steps towards a proof of the Riemann Conjecture and p-branes from Moyal Deformation quantization of Generalized Yang-Mills Theories

Talk at the Mistelbach (Austria) minisymposium on Fractals in Biology and Physics on September 2001 on the Extended Relativity Theory.

Two Talks on the QCD Membrane and the Extended Relativity Theory at the Institute of Physics, University of Antioquia, Medellin, Colombia, July 2001

Talk on Steps towards a proof of the Riemann Conjecture at the Dept.of Mathematics, Universidad Nacional, Bogota, Colombia, August 2001

Talk on the Logarithmic Corrections to the Black Hole Area Entropy relation from the Extended Relativity Theory " Physics Dept, University of California, San Diego, May 2001.

Talk at Jozef Stefan Institute of Physics. Ljubljana, Slovenia , October 2000 on the Derivation of the Logarithmic corrections to the Black Hole Entropy

Talk at Jozef Stefan Institute of Physics. Ljubljana, Slovenia , October 2000 on Chern-Simons Hadronic Bags from Quenched Large N QCD

Invited to the International Conference on " Frontiers in Physics " B.M. Birla Science Center , Hydebarad, India. December 2000, on the New Relativity Theory as an extension of String and M theory

Invited to the Prof. O. Rossler conference celebration. Karlsruhe University, Germany, May 20, 2000 , on the New Relativity Theory

Talk at the the Quantum Relativity Meeting , Dept. of Physics, Georgia Institute of Technology, March 2000 , on the New Relativity

Talk at the Center for Theoretical Studies , March 2000, on " M Theory, Quantum Paradoxes and the New Relativity

Talk at the Dept.of Physics of the University of la Habana, Cuba. February 2000 : " The Need for a New Theory of Relativity "

Talk at the Instituto de Cibernetica, Fisica y Matematica. La Habana, Cuba. February 2000 " M Theory, Quantum Paradoxes and the New Relativity "

Talk at the Dept. of Physics of the University of Santiago de Chile, September 99 on publication no. 31

Talk at the Dept. of Physics of the Santamaria Technical University of Valparaiso, Chile , August 99 on publication no. 31

Talk at the Center for Scientific Studies of Santiago de Chile, Chile, August 99 on publication no 30

Talk at the Instituto de Astronomia y Fisica del Espacio at the University of Buenos Aires, Argentina, August 99 on Branes from Moyal Deformation of Generalized Yang Mills

Talk at the Institute of Mathematical Physics, University of Sao Paulo, Sao Paulo, Brazil. June 1999 in reference to publications nos. 18, 28

Talk at the Physics Dept. University Federal of Minas Gerais, Belo Horizonte, Brazil . May 1999 : " Status of Superstring Theories "

Talk at the Physics Dept. University of the Pacific, Stockton, California, USA . Feb. 1999 in reference to publication no. 29

Talk at the Asian Pacific Center for Theoretical Physics , Seoul , Korea, November 1998 reference to publications nos. 18

Talk at the Asian Pacific Center for Theoretical Physics , Seoul , Korea, December 1998 reference to publications no. 28

Talk at Dept. of Physics, Sejong University , Seoul , Korea, December 1998 on " W Geometry from Fedosov Deformation Quantization "

Talk at the Instituto de Fisica, Universidad de Guanajuato, Mexico, October, 1997 in reference to publication no. 23.

Talk at the CINVESTAV, Mexico City, Mexico, Sept, 1997 in reference to publication no. 23.

Talk at Vanderbilt University, Nashville, TN. Nov. 1996 in reference to publication no. 17.

Talk at Clark Atlanta University, Georgia, in Nov. 1996 in reference to publication no. 17.

Talk at the University of Barcelona, Spain, pertaining publication no. 18. June 1996.

Two Talks at the Institute of Physics in the University of Guanajuato; Leon, Mexico; June 1995, pertaining to publication nos. 4 , 19.

Talk at the University of Zaragoza, Spain referent to publication no. 14. April, 12, 1994.

Talk at the Consejo Superior de Investigaciones Cientificas in Madrid, Spain referent to publication no. 13; April, 19, 1994.

Invited to the Zihuatanejo, Mexico, International Conference on Differential Geometrical Methods in Physics, September 25-30, 1993.

Attended SUNY at Stony Brook Conference on Super Strings and W-Gravity.

Invited to the Trieste Conference on SuperMembranes and Physics in 2+1 Dimensions, 1989.

Participant in the International Conference of Mathematical Physics ; Nato Advanced Workshop on Physics and Geometry ; Lake Tahoe, USA, 1989.