

## Publications 2005

Research groups of the Director and of the Deputy-Director

1. R. Auzzi, S. Bolognesi, J. Evslin – *Monopoles Can be Confined by 0, 1 or 2 Vortices* – JHEP 0502:046, 2005 - [hep-th/0411074].
2. G. Barnich, N. Bouatta, M. Grigoriev – *Surface Charges and Dynamical Killing Tensors for Higher Spin Gauge Fields in constant Curvature Spaces* – JHEP 0510:010, 2005 – [hep-th/0507138].
3. G. Barnich, G. Compère – *Generalized Smarr relation for Kerr AdS Black holes from improved conservation laws* – Phys. Rev. D71: 044016, 2005 – [gr-qc/0412029].
4. G. Barnich, G. Compère – *Conserved Charges and Thermodynamics of the Spinning Gödel Black Hole* – Phys. Rev. Lett. 95: 031302, 2005 – [hep-th/0501102].
5. G. Barnich, M. Grigoriev – *Hamiltonian BRST and Batalin-Vilkovisky formalisms for second quantization of gauge theories* – Commun. Math. 254, 581-601, 2005 - [hep-th/0310083].
6. G. Barnich, M. Grigoriev, A. Semikhatov, I. Tipunin – *Parent field theory and unfolding in BRST first quantized terms* – Commun. Math. 260, 147-181, 2005 - [hep-th/0406192].
7. X. Bekaert, N. Boulanger, S. Cnockaert - *No Self-Interaction for two-column massless fields.* – JMP 46: 012303, 2005 – [hep-th/0407102].

8. S. Cnockaert, M. Henneaux – *Lovelock Terms and BRST Cohomology* – *Class. Quant. Grav.* 22: 2797-2810, 2005 – [hep-th/0504169].
9. S. Colin, J. Corbett, T. Durt, D. Gross – *About SIC POVM's and discrete Wigner distributions* – *J. Opt. B, Quantum Semiclass. Opt.* (2005) 7, 5778-5785.
10. R. Conte, M. Musette and C. Verhoeven – *Explicit integration of Hénon-Heiles Hamiltonians* – *J. Nonlinear Math. Phys.* (2005) 12, 212-227.
11. R. Conte, M. Musette and C. Verhoeven – *Completeness of the cubic and quartic Hénon-Heiles Hamiltonian* – *Theor. Math. Phys.* (2005) 144, 888-858.
12. R. Conte, M. Musette and C. Verhoeven – *Hamiltonians with two degrees of freedom admitting a singlevalued general solution* – *Analysis in Theory and Applic.* (2005) 21, 188-200.
13. T. Damour, M. Henneaux, H. Nicolai – *Billiard Dynamics of Einstein-Mater Systems Near a Spacelike Singularity* – *Proceedings of « School on Quantum Gravity »* (Valdivia, Chile, Jan. 2002) – A. Gomberoff et D. Marolf eds, Springer (New York: 2005).
14. S. de Buyl, L. Houart, N. Tabti – *Dualities and Signatures of G++ Invariant Theories* – *JHEP* 0506 : 084, 2005 – [hep-th/0505199].
15. S. de Buyl, M. Henneaux, L. Paulot – *Hidden Symmetries and Dirac Fermions* – *Class. Quant. Grav.* 22: 3595-3622, 2005 – [hep-th/0506009].

16. T. Durt, J. Fiurasek and N. Cerf – *Economical quantum cloning in any dimension* – Phys. Rev. A (2005) 72, 052322-052340.
17. T. Durt – *A new expression for mutually unbiased bases in prime power dimensions* – J. Phys. A (2005) 38, 5267-5283.
18. F. Englert - *Broken Symmetry and Yang-Mills theory, Contribution to 'Fifty years of Yang Mills theory'*, editor G.'t Hooft, World Scientific (2005) - [hep-th/0406162].
19. F. Englert, M. Henneaux and L. Houart – *From Very-Extended to Overextended Gravity And M-Theories* – JHEP 0502: 070, 2005 - [hep-th/0412184].
20. J. Evslin – *A Correction to the RR Tadpole Cancellation Condition* – Prepared for the II Southeastern European Workshop, Challenges Beyond the Standard Model – BW2005 Workshop:36, 2005.
21. J. Evslin and H. Sati – *M-Theory, Type II String Theory and Refinements of Twisted K-Theory* – Prepared for the Miniworkshop: Gerbes, Twisted K-Theory and Conformal Field Theory – Mathematisches Forschungsinstitut Oberwolfach Report No. 38/2005:7, 2005.
22. F. Ferrari – *Super Yang-Mills, Matrix Models and Geometric Transitions* – Comptes Rendus de l'Académie des Sciences de Paris (Physique) 6 : 219-230, 2005 – [hep-th/0410169].
23. A. Fuster, M. Henneaux, A. Maas – *BRST-Antifield Quantization : A Short Review* – Int. J. Geom. Meth. Mod. Phys. 2, 939-963, 2005 – [hep-th/0506098].

24. A. Gomberoff, M. Henneaux, C. Teitelboim – *Decay of the Cosmological Constant : Equivalence of Quantum Tunneling and Thermal Activation in Two spacetime Dimensions* – Phys. Rev. D71:063509, 2005 – [hep-th/0501152].
25. B. Grammaticos, A. Ramani, J. Satsuma, R. Willox and A.S. Carstea – *Reductions of integrable lattices* – J. Nonlinear Math. Phys. (2005) 12, Sup. 1, 363-371.
26. M. Henneaux – *Le mystère de l'énergie sombre de l'Univers* – Bull. Cl. Sc. Acad. Roy. Belg., 6e série Tome XV, 305-317, 2005 (publié en 2005).
27. M. Henneaux, C. Teitelboim – *Duality in Linearized Gravity* – Phys. Rev. D71: 024018, 2005 – [gr-qc/0408101].
28. Jiangfeng Du, T. Durt, Ping Zou, Hui Li, L. Kwek, C.H. Lo and A. Ekert – *Experimental quantum cloning with prior partial information* – Phys. Rev. Lett. (2005) 94, 040505.
29. A. Keurentjes, P. Koerber, S. Nevens, A. Sevrin, A. Wijns - *Towards an Effective Action for D-Branes* - Fortschritte der Physik 53, 599, 2005.
30. F. Lambert, J. Springael – “*From soliton equations to their zero-curvature formulation*” in *Bilinear Integrable Systems : from Classical to Quantum, Continuous to Discrete* - Eds L. Faddeev, P. van Moerbeke and F. Lambert, Nato Science Series II (2005) 201, Springer -Verlag.
31. F. Lambert – “*Albert Einstein*” - Nouvelle Biographie Nationale extrait du tome 8, Bruxelles 2005, Académie Royale de Belgique.

32. L. Paulot – *Selfduality of D=2 Reduction of Gravity Coupled to a Sigma-Model* – Phys. Lett. B609, 367-371, 2005 – [hep-th/0412157].
33. A. Ramani, R. Willox, B. Grammaticos, A.S. Carstea and J. Satsuma – *Limits and degeneracies of discrete Painlevé equations : a sequel* – Physica A (2005) 347, 1-16.
34. A. Sevrin – *Prospects from Strings and Branes* - in the proceedings of the 39th Rencontres de Moriond on Electroweak Interactions and Unified Theories, 2005.
35. C. Verhoeven, M. Musette, R. Conte – *On reduction of some KdV-type systems and their link to the quartic Hénon-Heiles Hamiltonian, in Bilinear Integrable Systems : from Classical to Quantum, Continuous to Discrete* – Eds L. Faddeev, P. van Moerbeke and F. Lambert, Nato Science Series II (2005) 201, Springer - Verlag.
36. A. Volkov – *Noncommutative Hypergeometry* – Commun. Math. Phys. (2005) 258, 257-273.
37. R. Willox, B. Grammaticos and A. Ramani – *A study of the antisymmetric QRT mappings* – J. Phys. A (2005) 38, 5227-5236.
38. R. Willox – *On a generalized Tzitzeica equation* – Glasgow Math Journal (2005) 47 A, 221-231.
39. R. Willox – *Special function solutions for integrable non linear PDE's* – Proceedings of the 5th East Asia PDE Conference, Gakkotosho – Int Series – Math. Sciences and Appl. (2005) 22, 91-106.

40. R. Willox, J. Satsuma – *Discrete integrable systems* – Proceedings of the 2003 CIMPA Winterschool on Discrete Integrable Systems, Pondicherry (India) - Springer Lecture Notes in Physics (2005) 644.
41. R. Willox and J. Hietarinta – *On the bilinear forms of Painlevé's 4th equation in Bilinear Integrable Systems : from Classical to Quantum, Continuous to Discrete* – Eds. L. Faddeev, P. van Moerbeke and F. Lambert, Nato Science Series II (2005) 201, Springer-Verlag.
42. F. Lambert – *De banden tussen Albert Einstein en België* – Nederlands Tijdschrift v. Natuurkunde (2005) 11, pp 350-353.

## Preprints

43. M. Abou-Zeid, C. Hull - *A chiral perturbation expansion* – e-Print Archive: hep-th/0511189.
44. M. Banados, G. Barnich, G. Compère, A. Gomberoff – *Three Dimensional Origin of Goedel Spacetimes and Black holes* – e-Print Archive: hep-th/0512105.
45. G. Barnich, G. Bonelli, M. Grigoriev – *From BRST to Light-Cone Description of Higher Spin Gauge Fields* – e-Print Archive: hep-th/0502232.
46. G. Barnich, M. Grigoriev – *BRST Extension of the Non-Linear Unfolded Formalism* – e-Print Archive: hep-th/0504119.
47. X. Bekaert, S. Cnockaert, C. Iazeolla, M.A. Vasiliev – *Nonlinear Higher Spin Theories in Various Dimensions* – e-Print Archive: hep-th/0503128.
48. X. Bekaert, N. Boulanger, S. Cnockaert – *Spin Three Gauge Theory Revisited* – e-Print Archive : hep-th/0508048.
49. S. Bolognesi, J. Evslin – *Stable Versus Unstable Vortices in SQCD* – e-Print Archive : hep-th/0506174.
50. N. Boulanger, S. Cnockaert, S. Leclercq – *Parity Violating Vertices For Spin-3 Gauge Fields* – e-Print archive : hep-th/0509118.

51. P. Bouwknegt, J. Evslin, B. Jurco, V. Mathai, H. Sati – *Flux Compactifications of Projective Spaces and the S-Duality Puzzle* – e-Print archive : hep-th/0501110.
52. R. Brout – *From Inflation to Dark Energy* – e-Print archive: gr-qc/0508019.
53. S. de Buyl, M. Henneaux, L. Paulot – *Extended E8 Invariance of 11-Dimensional Supergravity* – e-Print archive : hep-th/05012292.
54. J. Evslin, M. Fairbairn – *Photon Mixing in Domain Walls and the Cosmic Coincidence Problem* – e-Print archive: hep-ph/0507020.
55. J. Evslin – *Killing Horizons* – e-Print archive: hep-th/0512160.
56. L. Houart – *Kac-Moody Algebras in Gravity and M-theories* – e-Print archive: hep-th/0511009.
57. A. Keurentjes - *Poincare-duality and G+++ algebras* – e-Print archive : hep-th/0510212.
58. F. Lambert, S. Colin, J. Springael and R. Willox – *An elementary method for the construction of hierarchies of soliton equations* – VUB preprint 2005.

## Invited Talks at conferences, seminars.

- 1) January 5- 14, 2005 : **Glenn Barnich**, “*Introduction to higher spin gauge theories*” – CECS Summer Workshop 2005, Valdivia, Chile.
- 2) January 9-23, 2005 : **Marc Henneaux**, “*Non Linear Realizations of  $E(10)$  and 11-Dimensional Supergravity*” – CECS Summer Workshop 2005, Valdivia, Chile.
- 3) January 2005 : **R. Willox**, “*Special function solutions for integrable nonlinear PDE’s*” – invited contribution to the 5th East Asia PDE Conference, Osaka, Japan.
- 4) January 2005 : **T. Durt**, “*Applications of the generalized Pauli group in prime, prime power and non-prime dimensions*” – 3rd Asia-Pacific Workshop on Quantum Information Science, Singapore.
- 5) January 14- 21, 2005 : **Glenn Barnich**, “*Introduction to higher spin gauge theories*” – Universidad Catholica de Santiago, Chile.
- 6) February 17, 2005 : **Marc Henneaux**, “*Le mystère de l’énergie sombre de l’univers, le plus grand défi de la théorie d’Einstein*” – Public lecture given to the “Cercle d’Astronomie de Belgique”, Uccle, Belgium.
- 7) February 19, 2005 : **Marc Henneaux**, “*Théorie de la Gravitation, de Newton à Einstein*” – Public lecture given at Altaïr, ULB, Belgium.

- 8) February 2005 : **C. Verhoeven**, “*Exotic collisions of solitons in 1 and 2 space dimensions* “ - International workshop « Solitons, boomerons and isochronous solutions to nonlinear systems » organized for Francesco Calogero’s 70th birthday, Roma, Italy.
- 9) February 2005 : **T. Durt**, “*A new solution for the Mean King’s problem*” – Seminar Université de Paris VII, France.
- 10) March 2005 : **T. Durt**, “*Galois fields and quantum information*” – Seminar at Macquarie University, Sydney, Australia.
- 11) March 8, 2005 : **Marc Henneaux** , “*Cosmological Billiards and Hidden Symmetries of Supergravities*” – XIIIe Rencontres “Strings in Argentina”, IAFE, Buenos Aires, Argentina.
- 12) March 10, 2005 : **Frank Ferrari**, “*Three aspects of strongly coupled gauge theories*” – Workshop on Nonperturbative Gauge Dynamics, SISSA, Trieste, Italy.
- 13) March 17, 2005 : **Laurent Houart**, “*Kac-Moody algebras in M-theories*” – Universidad Autonoma de Madrid, Spain.
- 14) March 18, 2005 : **Laurent Houart**, “*Kac-Moody algebras in M-theories*” – Universidad de Oviedo, Spain.
- 15) March 19, 2005 : **Laurent Houart**, “*Kac-Moody algebras in M-theories*” – Universidad de Barcelona, Spain.
- 16) April 11-16, 2005 : **François Englert**, “*Extended Gravity and M-Theories*” – International Conference on Theoretical Physics, Lebedev Institute, Moscow, Russia.

- 17) April 17-22, 2005 : **Glenn Barnich**, “*Conserved charges and thermodynamics for higher dimensional black holes in non trivial backgrounds*” and “*Introduction to free higher spin gauge fields from the BRST point of view*” – Università di Milano, Italy.
- 18) May 2005 : **F. Lambert**, “*Albert Einstein et la Belgique*” – Association Royale des ingénieurs de Belgique, Bruxelles.
- 19) May 11, 2005 : **Marc Henneaux**, “*From Platonic Solids to infinite Coxeter group and Lorentzian Kac-Moody Algebras : the Road to uncover the symmetries of gravity ?*” – Universiteit Utrecht, the Netherlands.
- 20) May 12, 2005 : **Frank Ferrari**, “*A review of some aspects of the gauge theory /matrix model correspondence*” – University of Swansea, Swansea, United Kingdom.
- 21) May 30, 2005: **Alexander Sevrin**, “*Effective Actions for D-branes*” - Conference “Gravity, Strings and Branes”, KULeuven, Belgium.
- 22) May 31, 2005 : **Marc Henneaux**, “*Non linear realizations of  $E(10)$  and M-theory : a progress report*” – Conference “Gravity, Strings and Branes”, KULeuven, Belgium.
- 23) May 2005 : **T. Durt**, “*Applications of the generalized Pauli group in prime, prime power and non-prime dimensions*” – ICSSUR Conference, Université de Besançon, Besançon, France.
- 24) July 18-22, 2005 : **Marc Henneaux**, “*Hidden Symmetries of Gravitational Theories*” – Conference “Le Siècle d’Albert Einstein” – Paris, Palais de l’UNESCO.

- 25) August 15, 2005 : **Jarah Evslin**, "*Charges in M-theory*"- Mini-Workshop : Gerbes, Twisted K-Theory and Conformal Field Theory, Oberwolfach-Walke, Germany.
- 26) August 16, 2005 : **Jarah Evslin**, "*Geometric Models of dimensional Reduction*"- Mini-Workshop : Gerbes, Twisted K-Theory and Conformal Field Theory, Oberwolfach-Walke, Germany.
- 27) August 26, 2005 : **Marc Henneaux**, "*Duality and Higher Spin Gauge Fields*" – Conference on “ Supersymmetry, Gauge Theories and Quantum Gravity”, U.N.A.M., Mexico City, Mexico.
- 28) September 22, 2005 : **Marc Henneaux**, "*Relativité, cent ans après : à l'aube d'une nouvelle révolution ?* » - l'Europe de la Science au XVIIIe siècle et aujourd'hui, Seneffe, Belgium.
- 29) October 20, 2005 : **Glenn Barnich**, "*Qu'est-ce que la relativité générale ?*" - Cercle astronomique de Bruxelles, Belgium.
- 30) October 26, 2005 : **Ben Craps**, "*The big bang: a string theory perspective*" – Universiteit van Amsterdam, the Netherlands.
- 31) October 2005 : **I. Loris**, "*Empirical mode decompositions*" – Applied Math. Seminar of Princeton University, U.S.A.
- 32) November 4, 2005 : **Arjan Keurentjes**, "*Time-like T-duality and triple extended algebra's*" - University of Chicago, U.S.A.

- 33) November 7-9, 2005 : **Ben Craps**, "*The big bang: a string theory perspective*" - Niels Bohr Institutet, Denmark.
- 34) November 10, 2005 : **Mohad Abou Zeid**, "*Twistor Strings and Supergravity*" - Universidad de Granada, Spain.
- 35) November 10, 2005: **C. Joachain, Marc Henneaux and P. Gaspard**, "*1905: Annus Mirabilis*" d'Einstein - public lectures given at the SIIIE, ULB, Belgium.
- 36) November 10, 2005: **Arjan Keurentjes**, "*Time-like T-duality and triple extended algebra's*" - University of Berkeley, U.S.A.
- 37) November 17, 2005: **Mohab Abou Zeid**, "*Twistor Strings and Supergravity*" - KULeuven, Belgium.
- 38) November 21-24, 2005: **Ben Craps**, "*The big bang: a string theory perspective*" - ETH, Zurich, Switzerland.
- 39) November 2005 : **T. Durt**, "*Applications of the generalized Pauli group in prime and prime power*" – TQMFA 2005 Conference "New trends in quantum mechanics : fundamental aspects and applications", Palermo, Italy.
- 40) November 2005 : **S. Colin**, "*Superselection rules in Bohm-Bell theories*" – TQMFA Conference "New trends in quantum mechanics : fundamental aspects and applications", Palermo, Italy.

- 41) December 7, 2005 : **A. Sevrin**, "*De Quantumeigenschappen van Ruimte en Tijd*" – Koninklijke Vlaamse Academie van Wetenschappen en Kunsten, Centrum voor Europese Cultuur, Belgium.
- 42) December 2005 : **T. Durt**, "*Applications of the generalized Pauli group in prime and prime power*" – CATS 2005 Conference on Advances in Theoretical Sciences, Putrajaya, Malaysia.
- 43) December 2005 : **T. Durt**, "*Four qubit Wigner tomography*" Seminar at the National University of Singapore, Singapore.
- 44) December 2005 : **C. Verhoeven**, "*Soliton resonances for the KP and CKP equations*" – Seminar at the Math. Dept of the University of Kent at Canterbury, United Kingdom.