Curriculum Vitae Dr. Luzi Bergamin

Personal Data

Date of birth	January 27, 1973
Place of birth	Bern, Switzerland
Nationality	Swiss
Present address	European Space Agency, The Advanced Concepts Team ESTEC, DG-PI Keplerlaan 1 NL-2201 AZ Noordwijk, The Netherlands E-mail: `Luzi.Bergamin@esa.int`

Expertise

PhD in physics; diploma (MSc) in physics, mathematics and astronomy.

My main research activities focus on various aspects of the theory of gravitation (general relativity, dilaton gravity, analogue gravity), supergravity, supersymmetry and high-energy physics. Besides these topics I led or assisted scientific work in various other fields such as dynamics of large structures in space, photovoltaics or system awareness.

In 2007 I started together with Dr. José Llorens Montolio an interdisciplinary project on transformation media. Thanks to a collaboration with TKK Helsinki (Prof. S. Tretyakov, Dr. C. Simovski and Dr. I.S. Nevedov) and KTH Stockholm (Prof. Min Qiu, Dr. Min Yan) I got a deeper insight into this field and started my own research activities in this direction. In particular I derived an extension of the standard transformation optics approach which covers a wider class of media than the original proposal.

I was initiator and technical director of further scientific studies in the fields of general relativity, micro- and nanotechnology.

Postdoctoral Research Experience

2005-present	European Space Agency, The Advanced Concepts Team
2001-2005	Technische Universität Wien, Institut für theoretische Physik

Education

1998-2001	PhD in theoretical physics on "*Geometry and Symmetry Breaking in Supersymmetric Yang-Mills Theories*," supervisor: Prof. P. Minkowski (University of Bern)
1993-1998	Diploma (MSc) in physics, mathematics and astronomy at the University of Bern.

List of publications

Eprints of all papers with eprint numbers [arXiv:...] are available at http://xxx.lanl.gov/.

Peer-reviewed publications

1. L. Bergamin, "Dynamical symmetry breaking in SYM theories as a non-semiclassical effect," Eur. Phys. J. C **26** (2002) 91; [arXiv:hep-th/0102005].

2. L. Bergamin and W. Kummer, "Graded Poisson sigma models and dilaton-deformed 2d supergravity algebra," JHEP **0305** (2003) 074; [arXiv:hep-th/0209209].

3. L. Bergamin and W. Kummer, "The complete solution of 2D superfield supergravity from graded Poisson-Sigma models and the super pointparticle," Phys. Rev. D **68** (2003) 104005; [arXiv:hep-th/0306217].

4. L. Bergamin, D. Grumiller and W. Kummer, "Supersymmetric black holes in 2-D dilaton supergravity: baldness and extremality," J. Phys. A **37** (2004) 3881; [arXiv:hep-th/0310006].

5. L. Bergamin, D. Grumiller and W. Kummer, "Quantization of 2D dilaton supergravity with matter," JHEP **0405** (2004) 060; [arXiv:hep-th/0404004].

6. L. Bergamin and W. Kummer, "Two-dimensional N = (2,2) dilaton supergravity from graded Poisson-sigma models. I: Complete actions and their symmetries.," Eur. Phys. J. C **39** (2005) S41; [arXiv:hep-th/0402138].

7. L. Bergamin and W. Kummer, "Two-dimensional N = (2,2) dilaton supergravity from graded Poisson-sigma models. II: Analytic solution and BPS states," Eur. Phys. J. C **39** (2005) S53; [arXiv:hep-th/0411204].

8. L. Bergamin, D. Grumiller, A. Iorio and C. Nunez, "Chemistry of Chern-Simons supergravity: Reduction to a BPS kink, oxidation to M-theory and thermodynamical aspects," JHEP **0411** (2004) 021; [arXiv:hep-th/0409273].

9. L. Bergamin, "Generalized complex geometry and the Poisson sigma model," Mod. Phys. Lett. A **20** (2005) 985; [arXiv:hep-th/0409283].

10. L. Bergamin, D. Grumiller, W. Kummer and D. V. Vassilevich, "Classical and quantum integrability of 2D dilaton gravities in Euclidean space," Class. Quant. Grav. **22** (2005) 1361; [arXiv:hep-th/0412007].

11. L. Bergamin, D. Grumiller, W. Kummer and D. V. Vassilevich, "Physics-to-gauge conversion at black hole horizons," Class. Quant. Grav. **23** (2006) 3075; [arXiv:hep-th/0512230].

12. L. Bergamin and D. Grumiller, "Killing horizons kill horizon degrees," Int. J. Mod. Phys. D **15** (2006) 2279; [arXiv:gr-qc/0605148].

13. L. Bergamin, D. Grumiller, R. McNees and R. Meyer, "Black Hole Thermodynamics and Hamilton-Jacobi Counterterm," J. Phys. A **41** (2008) 164068; [arXiv:0710.4140 [hep-th]].

14. L. Bergamin, "Generalized transformation optics from triple spacetime metamaterials," Phys. Rev. A **78** (2008) 043825; [arXiv:0807.0186 [physics.optics]].

Submitted papers

15. L. Bergamin and D. Izzo, "Deployment and control of multi-tethered systems assisted by Lorentz forces," submitted to Aerospace Science and Technology.

16. L. Bergamin and R. Meyer, "Wolfgang Kummer and the Vienna School of dilaton (super-)gravity," invited review, to appear in "Fundamental Interactions: a memorial volume for Wolfgang Kummer," World Scientific, [arXiv:0711.3595 [hep-th]].

Conference proceedings

1. L. Bergamin and P. Minkowski, "Spontaneous SUSY breaking in N = 2 super Yang-Mills theories," in *Proceedings of ICHEP2000, Osaka, July 27 - August 2, 2000*, [arXiv:hep-ph/0011041].

2. L. Bergamin, "Dynamics of glue-balls in N = 1 SYM theory," in *Proceedings to the Euroconference on Symmetries Beyond the Standard Model*, N. M. Borštnik, H. B. Nielsen, C. D. Froggat, D. Lukman, eds, Bled Workshops in Physics **4**, No. 2-3, p. 247; [arXiv:hep-th/0310050].

3. L. Bergamin, "Quantum dilaton supergravity in 2D with non-minimally coupled matter," in *Gravity, Astrophysics, and Strings @ the Black Sea*, P. P. Fiziev and M. D. Todorov, eds, p. 17. St. Kliment Ohridsk University Press, Sofia, 2005; [arXiv:hep-th/0408229].

4. L. Bergamin, "Constant dilaton vacua and kinks in 2D (super-)gravity," in *Gravity, Astrophysics, and Strings @ the Black Sea*, P. P. Fiziev and M. D. Todorov, eds, p. 37. St. Kliment Ohridski University Press, Sofia, 2006; [arXiv:hep-th/0509183].

5. D. Girimonte, D. Izzo and L. Bergamin, "Reasoning under an uncertain thermal state," *Proceedings of the 57th International Astronautical Congress*, 2006.

6. L. Bergamin and D. Grumiller, "Black holes as boundaries in 2D dilaton supergravity," in *The eleventh Marcel Grossman Meeting*, H. Kleinert, R.T. Jantzen and R. Ruffini, eds, p. 2686. World Scientific, Singapore, 2008; [arXiv:hep-th/0701196].

7. P. Ben-Abdallah, J. M. Llorens, L. Bergamin and T. Vinko, "Reverse Engineering Design of Directional Microstructured Radiators," *6^{th} ESA Round Table on Micro & Nano Technologies for Space Applications*, Noordwijk, The Netherlands, 2007.

8. L. Bergamin and R. Meyer, "Two-Dimensional Quantum Gravity with Boundary," to appear in *Gravity, Astrophysics, and Strings @ the Black Sea*, P. P. Fiziev and M. D. Todorov, eds, St. Kliment Ohridski University Press, Sofia, 2008; [arXiv:0711.3595 [hep-th]].

9. L. Bergamin, "Triple-spacetime metamaterials," in *Metamaterials' 2008*, p. 800, 2008.

10. L. Bergamin, "A coordinate transformation approach to indefinite materials and their perfect lenses," in *Metamaterials' 2008*, p. 591, 2008.