Curriculum Vitae

Name: Ugo Moschella.

Birthplace: Furci Siculo (Italy).

Birthdate: March 31, 1962.

Marital status: Married to Candida Vannini, father of Giovanni ed Agnese.

Professional address: DiSAT, Università dell'Insubria,
  Via Valleggio 11, 22100 Como.
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Position: Associate Professor of Theoretical Physics

Education

1980–1985: University of Bologna. Laurea in Physics. Advisor: Giorgio Velo

1985–1986: University of Bologna. Master in Physics.

1986–1990: Sissa-ISAS Trieste. Ph D in Mathematical Physics. Advisor: Franco Strocchi.

Post-doctoral employment

1990–1992: Université Catholique de Louvain–la–Neuve (UCL). Institut de Physique Théorique: FDS grant.

1992–1993: Commissariat à l'Energie Atomique (CEA)–Saclay. Service de Physique Théorique (SPhT): Post-doctoral grant.

1993–1994: Université de Paris 7–Denis Diderot. Laboratoire de Physique Thèorique et Mathematique: Maître de Conferences Associé.

1994–1996: Commissariat à l'Energie Atomique (CEA)–Saclay. Service de Physique Théorique: Marie Curie Fellow.

1996–1996: Institut des Hautes Etudes Scientifiques (IHES), Post doctoral grant.

1996–2001: University of Milan. Research position (permanent).

2001– : University of Insubria at Como. Fisiche e Naturali di Como: Associate professor of Theoretical Physics (permanent)

Short term visits. In the last 18 years I have frequently visited the Institut de Physique Theorique of the CEA-Saclay and the IHES. I have visited several times also the Erwin Schrodinger Institute in Vienna and the Perimeter Institute for Theoretical Physics.

Publications

[1] U. Moschella,
"Classical limit of a quantum particle in an external Yang–Mills field,"
Ann. Poincaré Phys. Theor. **51** (1989) 351.

[2] U. Moschella,
"Infrared singularities and breaking of the Poincaré group: the massless dipole field,"
J. Math. Phys. **31** (1990) 2480.

[3] U. Moschella and F. Strocchi,
"The Dipole field model,"
Lett. Math. Phys. **19** (1990) 143.

[4] U. Moschella,
"Infrared structures and symmetry breaking in simple gauge-like quantum field models,"
Ph. D. Thesis, ISAS, Trieste (1991).

[5] U. Moschella,
"A Note on gauge symmetry breaking,"
Lett. Math. Phys. **24** (1992) 155.

[6] U. Moschella and F. Strocchi,
"The Choice of test functions in gauge quantum field theories,"
Lett. Math. Phys. **24** (1992) 103.

[7] J.P. Antoine and U. Moschella,
"Massless Poincaré coherent states and wavelets".
In: Classical and Quantum Systems. Foundations and Symmetries. H.D. Doebner,
F.Schroeck and W.Scherer eds., World Scientific, Singapore (1992).

[8] M. Traini, L. Conci and U. Moschella,
"Deep inelastic parton distributions and the constituent quark model,"
Nucl. Phys. **A544** (1992) 731.

[9] U. Moschella,
"The Wick ordered exponential of the dipole field as a field of type S,"
J. Math. Phys. **34** (1993) 535.

[10] J.-P. Antoine and U. Moschella,
"Poincaré coherent states: The two-dimensional massless case,"
J. Phys. A: Math. Gen. **26** (1994) 591.

[11] J. Bros, U. Moschella and J. P. Gazeau,
"Quantum field theory in the de Sitter universe,"
Phys. Rev. Lett. **73** (1994) 1746.

[12] U. Moschella,
"Quantization, curvature and Temperature: the de Sitter space-time" .

In: Quantization and Infinite Quantum Systems. S.T.Ali and al. eds., Plenum Press, New York (1994).

[13] G. Goldin and U. Moschella,
"Diffeomorphism groups, quasi-invariant measures and infinite quantum systems"
In: Symmetry in Science VIII. B. Gruber ed., Plenum Press, New York (1994).

[14] U. Moschella,
"New results on de Sitter quantum field theory,"
Ann. Poincaré Phys. Theor. **63** (1995) 411.

[15] G. Goldin and U. Moschella,
"Diffeomorphism group representation and quantum phase transitions in one dimension".
In: XIth International Congress in Mathematical Physics. Unesco–Sorbonne–Paris. D. Iagolnitzer ed., International Press, Cambridge (1995).

[16] G. A. Goldin and U. Moschella,
"Quantum Phase Transitions from a New Class of Representations of Diff(R),"
J. Phys. A: Math. Gen. **28** (1995) L475.

[17] J. Bros and U. Moschella,
"Two point functions and quantum fields in the de Sitter universe,"
Rev. Math. Phys. **8** (1996) 327 [gr-qc/9511019].

[18] R. Schaeffer, U. Moschella, M. Bertola and V. Gorini,
"Generation of primordial fluctuations in curved spaces,"
Grav. Cosmol. **4** (1998) 121.

[19] J. Bros, H. Epstein and U. Moschella,
"Analyticity properties and thermal effects for general quantum field theory on de Sitter space-time,"
Commun. Math. Phys. **196** (1998) 535 [gr-qc/9801099].

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"Quantum fluctuations in the open universe,"
Phys. Rev. **D57** (1998) 2147 [gr-qc/9707007].

[21] R. Schaeffer and U. Moschella,
"Quantum fluctuations in curved space,"
Acta Phys. Polon. **B29** (1998) 1927.

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The physics of black holes (an overview). In: Fr P., Gorini V., Magli G., Moschella U.. Classical and Quantum Black Holes. p. 1-15, BRISTOL:Institute of Physics Publishing, ISBN: 0750306270

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"Correspondence between Minkowski and de Sitter quantum field theory,"
Phys. Lett. **B 462**, (1999) 249 [hep-th/9906035].

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"Decomposing quantum fields on branes,"
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"Chaplygin-like gas and branes in black hole bulks,"
Phys. Lett. **B487** (2000) 7 [gr-qc/0005011].

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"A general construction of conformal field theories from scalar anti-de Sitter quantum field theories,"
Nucl. Phys. **B587** (2000) 619 [hep-th/9908140].

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"Random Cantor sets supporting measures quasi-invariant for diffeomrphisms of the circle," *Warsaw University Publications* (2000).

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"Generalized Configuration Spaces for Quantum Systems".
In: "Stochastic Processes, Physics and Geometry: New Interplays. A volume in honor of Sergio Albeverio". CMS Conference Series. Vol. 29, p. 243 (2000).

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"An alternative to quintessence,"
Phys. Lett. B **511** (2001) 265 [arXiv:gr-qc/0103004].

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"Dirac Fields And Thermal Effects In The De Sitter Universe,"
Class. Quant. Grav. **18** (2001) 4373.

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"The asymptotic symmetry of de Sitter spacetime,"
Phys. Rev. D **65** (2002) 084012 [arXiv:hep-th/0107091].

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"Towards a general theory of quantized fields on the anti-de Sitter space-time,"
Commun. Math. Phys. **231**, 481 (2002) [arXiv:hep-th/0111255].

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[34] J. Bros, U. Moschella,
Fourier analysis and holomorphic decomposition on the one-sheeted hyperboloid (arXiv:math-ph/0311052). In: F. Norguet, S. Ofman et J.-J. Szczeciniarz. Gomtrie complexe II. Aspects contemporains dans les mathmatiques et la physique.. vol. II, p. 100-145, Paris:Hermann (2003). ISBN: 2705664971

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[65] M. Gaudin and U. Moschella, "Doubly elliptic strings on the (anti) de Sitter manifold," Int. J. Geom. Meth. Mod. Phys. **12**, no. 03, 1550032 (2015) [arXiv:1303.3137 [hep-th]].

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[67] H. Epstein and U. Moschella, "se Sitter symmetry of Neveu Schwarz spinors " JHEP (2016) In press.

[68] U. Moschella. "Infrared surprises in the de Sitter universe." Int Jour. Mod Phys. D (2016) (in press).

[69] H. Epstein and U. Moschella, "The Thirring model on the de Sitter universe" In preparation.

Books

[70] Fré P., Gorini V., Magli G., Moschella U. (1999). Classical and Quantum Black Holes. Bristol: Institute of Physics Publishing, ISBN: 9780750306270

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[74] Colpi M., Gorini V., Haardt F., Moschella U. (2006). Joint evolution of black holes and galaxies. New York:T aylor & Francis. ISBN: 9780750309998

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[78] D. Faccio, F. Belgiorno, S. Cacciatori, V. Gorini, S. Liberati and U. Moschella, "Analogue Gravity Phenomenology," Lect. Notes Phys. **870** (2013).

[79] R. Peron, V. Gorini, S. and U. Moschella, "Gravity where do we stand?," Lect. Notes Phys. (2014 - in press).

Selected Invited Talks and Lectures

Massless Poincaré coherent states and wavelets.
    Second International Wigner Symposium. Goslar, 1991.

Quantization Curvature et Temperature.
    XII$^{\text{th}}$ Workshop on Geometric Methods in Physics. Bialowieza, 1993.

Diffeomorphism group representation and quantum phase transitions in one dimension.
    XI$^{\text{th}}$ International Congress of Mathematical Physics. Paris, 1994.

Quantum field theory on de Sitter space-time.
    New problems in the general theory of quantized fields. La Sorbonne, Paris, 1994 (plenary).

Diffeomorphism groups, quasi-invariant measures and infinite quantum systems
    Symmetry in Science VIII. Bregenz, 1994.

Théorie des champs quantiques dans l'espace temps de de Sitter.
>**Colloque du CEA**. Seillac, 1994

Quantum fluctuations in the open universe
>**Local Quantum Physics**. Erwin Schrödinger Institut, Vienna, 1997

Anti-de Sitter quantum field theory and the AdS/CFT correspondence
>**Intas school**, Villa Olmo, Como 1999.

Anti-de Sitter quantum field theory and the AdS/CFT correspondence
>**Sigrav 2000 conference**, Genova 2000 (plenary).

Teoria quantistica sugli universi di de Sitter ed applicazioni
>**Problemi attuali di fisica teorica**, Vietri sul mare, 2001

Théorie quantique des chemps sur les universes de de Sitter avec applications
>**Espace et Physique** Cargese, 2002.

Fields and particles on the de Sitter Universe
>**TH-2002** Paris, 2002.

Particles on the de Sitter Universe
>**Geometrical Methods in Physics XIV Bialoweza**, 2003

Particles on the de Sitter Universe
>**Marcel Grossmann Meeting IX** Rio de Janeiro, 2003.

The Chaplygin Gas as a model for dark energy
>**IV Alexander Friedmann Seminar** Cargese 2004.

Lifetime of a de Sitter particle
>**Marcel Grossmann Meeting IX** Berlin, July 2005.
>**Sigrav 2006 Conference** Torino September, 4, 2006
>**XII Brazilian School of Cosmology**. Mangaratiba, September, 10-23, 2006
>**Sistemi classici quantistici e stocastici** Roma la Sapienza, October 6, 2006.

Quantum fields on curved spacetimes
>Five lectures at the **XIII Brazilian School of Cosmology**. Mangaratiba, July 20 - August 3, 2008
>Four lectures given at **Verao Quantico** Ubu (Brazil) - February 15-20, 2009.

Particle Decay in the de Sitter universe
>**IR divergences and loops in the de Sitter Universe**. Perimeter Institute, October 29, 2010
>**SW 2010, Cargese, May 2010**
>**Sigrav, Scuola Normale Pisa, September 26, 2010**
>**XIV Brazilian School of Cosmology**. Mangaratiba, August 19-September 1, 2012

de Sitter Tachyons.
>**SW 2012** - Cargese, May 2012

Quantum fields on curved spacetimes
>**Perimeter Institute** - a series of lectures; available at their website PIRSA - 2013

Classical Anti de Sitter Strings and the AdS-CFT correspondence
>**SW 2014** - Cargese, May 2014

Organization of school and conferences

1. **Curvature and quantization.**
   Jussieu–Paris 7, September 25, 1993. Workshop.

2. **The Physics of Black Holes.**
   Como, Villa Olmo, April 20-24 1998. International Doctoral School.

3. **Gravitational Waves in Astrophysics, Cosmology and String Theory**
   Como Villa Olmo, April 19-24 1999. International Doctoral School.

4. **Relativistic Cosmology: Theory and Observations**
   Como Villa Olmo, May 8-13, 2000. International Doctoral School.

5. **Geometry and Physics of Branes**. Villa Olmo, 20-24 Maggio 2001. International Doctoral School.

6. **Joint Evolution of Black Holes and Galaxies**. Como Villa Olmo, May 2003. International Doctoral School.

7. **Rigorous Quantum Field Theory**. Saclay, July 19-21, 2004. International conference.

8. **A Century from Einstein relativity: probing gravity theories in binary systems**
   Como Villa Olmo, May 17-21, 2005. International Doctoral School.

9. **The dark side of the Universe**
   Como Villa Olmo, May 14-18, 2007. International Doctoral School.

10. **Gravity: where do we stand**
    Como Villa Olmo, May 11-15, 2009. International Doctoral School.

11. **Analogue gravity**
    Como Villa Olmo, May 16-21, 2011. International Doctoral School.

12. **Astrophysical Black Holes** Como Villa Olmo, May 20-26, 2012. International Doctoral School.

13. **Gravity and the Quantum** Como Villa del Grumello, June 1-6 , 2014. International Doctoral School.

Grants

1. *New problems in the general theory of quantized fields* (Marie Curie fellowship) European Union - France

2. *PRIN: Ricerche teoriche e sperimentali in fisica ed astrofisica relativistica.* MIUR (Italy).

3. *PRIN: Sistemi classici, quantistici, stocastici.*
   MIUR (Italy)

4. *INFN: Bologna 11 Gravity.*

5. *INFN: Flag collaboration.*

Thesis direction

1. Marco Bertola
   Effetti termici della quantizzazione in uno spazio tempo curvo
   Tesi di Laurea, Università di Milano, 1995 (con V. Gorini).

2. Mohammad Vahid Takook
   Theorie quantique des champs pour des systemes elementaires massifs et a masse nulle sur l'espace-temps de de Sitter..
   Ph D thesis, Ecole Normale–Università di Parigi 7, 1996 (con J.-P. Gazeau).

3. Francesco Corbetta
   Teorie di campo di massa nulla sullo spazio-tempo di de Sitter.
   Tesi di Laurea, Università di Milano, 1999.

4. Paolo Bartesaghi
   Teorie delle perturbazioni gravitoniche ed instabilità della curvatura dello spazio tempo di de Sitter.
   Tesi di Laurea, Università di Milano, 1999.

5. Oliver Piattella
   Cosmology and unified dark matter.
   Ph D Thesis. Università dell' Insubria. Como 2010

Teaching duties

1. University of Paris 7. (1992-93) Classical mechanics.

2. University of Paris 7. (1992-93) Optics.

3. University of Paris 7. (1992-93) Oscillations and Waves.

4. University of Milano. (1996-1999) Classical mechanics.

5. University of Milano. (1996-1999) General Relativity.

6. University of Insubria. (2001-2004) Matematical Methods for physicists.

7. University of Insubria. (2007-2010) Group theory .

8. University of Insubria. (2011-2013) Oscillations and Waves.

9. University of Waterloo (CA) (2013) Quantum field theory on curved space times.

10. University of Insubria. (2013-2015) Quantum theory of scattering.

11. University of Insubria. (1999-2015) General Relativity.

Other

- Diploma in pianoforte. Conservatory G. B. Martini Bologna. July 1986.