

UNIVERSITA' DEGLI STUDI DI MILANO

Procedura di selezione per la chiamata a professore di II fascia da ricoprire ai sensi dell'art. 18, comma 1, della Legge n. 240/2010 per il settore concorsuale 02/A2 - Fisica Teorica delle Interazioni Fondamentali, (settore scientifico-disciplinare FIS/02 - Fisica Teorica Modelli e Metodi Matematici) presso il Dipartimento di FISICA, (avviso bando pubblicato sulla G.U. n. 91 del 28/11/2017) - Codice concorso 3662

Curriculum Vitæ

Name and Surname : Alessio MARRANI

Place and Date of Birth : Roma (Italy), August 27th, 1977

Nationality : Italian

Education :

2002-05 : Ph.D. in Theoretical Physics at the University of Rome "Roma Tre", Rome, Italy.

Date: March 3, 2005.

Title of Ph.D. Thesis:

"Symmetry and Dynamics:

Mathematical Topics in 5-Dimensional Deformed Relativity".

Supervisor: Prof. R. Mignani.

1996-2001 : Laurea Degree in Theoretical Physics at the University of Rome "Roma Tre", Rome, Italy. Date: October 31, 2001.

Final mark: 110/110 *cum laude*.

Title of Laurea Thesis: *"Killing Symmetries of Generalized Minkowski Spaces"*.

Supervisor: Prof. R. Mignani.

1991-96 : Maturità Scientifica Degree.

Scientific Lyceum F. Enriques, Ostia Lido, Rome, Italy.

Final mark: 60/60 *with Honors*.

Short Thesis on Relativity, Big Bang and Black Holes.

Scientific Visiting Periods :

2017 (1 visiting period) : Mathematical Institute, Oxford, UK.

2017 (Sep. - Dec.) : Jimenez de la Espada Fellow, Theoretical Physics Group, University of Murcia, Spain.

2017 (1 visiting period) : Department of Applied Mathematics and Theoretical Physics (DAMTP), University of Cambridge, UK.

2017 (1 visiting period) : Theoretical Physics Group, PUCV, Valparaiso, Chile.

2016 - 2017 (2 visiting periods) : Theoretical Physics Group, Dublin Institute for Advanced Studies (DIAS), Dublin, Ireland.

2015 - 2016 (6 visiting periods) : Mathematics Dept., University of Bologna, Bologna, Italy.

2016 - 2009 (6 visiting periods) : Physics Dept. of State University, Milano, Italy.

2015 - 2009 (3 visiting periods) : IPhT - CEA, Saclay (Paris), France.

2015 - 2009 (7 visiting periods) : Physics Dept., Imperial College, London, UK.

2015 -2013 (2 visiting periods) : IFT, UAM - CSIC, Madrid, Spain.

2016 - 2012 (several visiting periods) : DISAT, Insubria University, Como, Italy; DISIT, Piemonte Orientale University, Alessandria, Italy; Theoretical Physics Dept., Torino University, Italy; Physics Dept., Ferrara University, Italy; Physics Dept., Genova Univ., Italy.

2011 -2012 (2 visiting periods) : Physics Dept., UCB, Berkeley, CA, USA.

2016 - 2006 (16 visiting periods) : Physics Dept., Theory Division, CERN, Switzerland.

2016 - 2009 (6 visiting periods) : Mathematics Dept. of State University, Milano, Italy.

2013 - 2009 (3 visiting periods) : Physics Dept., Polytechnic of Torino, Italy.

2010 - 2009 (2 visiting periods) : Mathematics Dept., King's College, London, UK.

2007, 2009-2012 (6 visiting periods) : Department of Physics and Astronomy, UCLA, Los Angeles, CA, USA.

Research Directions : [in inverse chronological order]

- 1.** Study of the phase transitions in asymptotically non-flat extremal black holes, non-linearly coupled to Stueckelberg scalar fields, with applications to the AdS/CFT and AdS/CMT correspondences.
(with O. Miskovic, P. Quezada Leon).
- 2.** Study of the quantum circuits and quantum gates in the context of the black-hole/qubit correspondence, with particular emphasis on orbit transmutation and entanglement generation by means of suitable symplectic transformations
(with T. Prudencio, D. J. Cirilo-Lombardo).
- 3.** Study of the double-copy structure of (super) gravity in various dimensions, with particular emphasis on the origin of gravitational symmetries and electric-magnetic dualities from the gauge groups of (super)Yang-Mills theories
(with A. Anastasiou, L. Borsten, M. J. Duff, M. J. Hughes, S. Nagy, M. Zoccali).
- 4.** Study of spinor and semispinor irreducible representation of the Spin Lie algebra in various signatures and dimensions, with particular emphasis on the use of division or split algebras in the classification of the corresponding orbit stratification. Application to the maximally supersymmetric supergravity theories in 11 dimensions, beyond M-theory (namely, M'-theory and M*-theory)
(with A. Santi).
- 5.** Study, characterization and classification of Jordan and Kantor triple systems, especially

- in relation to the generalization of Jordan algebras and Freudenthal triple systems. Investigation of the relation with Lie algebras through the Tits-Koecher-Kantor procedure, and with homogeneous and/or symmetric manifolds and their geometric properties (with N. Cantarini, E. Latini, A. Ricciardo, A. Santi).
- 6.** Study and classification of maximal parabolic subalgebras of exceptional Lie algebras, and their interpretation in terms of symmetries of Jordan algebras and (extended) Freudenthal triple systems (with V. Dobrev).
- 7.** Study of the extended Vogel plane, and its relation to Jordan algebras, Freudenthal triple systems, and their symmetries (with B. W. Westbury).
- 8.** Definition and study of lower-dimensional super-Calabi-Yau manifolds, and formulation of generalized mirror symmetry (also in relation to the peculiar sub-class of rigid Calabi-Yau's) (with S. L. Cacciatori, F. Dalla Piazza, S. Noja, R. Re).
- 9.** Study of superspaces and their quantization in various signatures and dimensions, and of their relations with split algebras and Jordan algebras, also by means of quantum group theoretical techniques (with R. Fioresi, E. Latini).
- 10.** Study of non-linear symmetries in theories of gravity, with application to asymptotically AdS black holes, their geometry, physics and attractor dynamics in gauged supergravity theories, and to their relevance within AdS/CFT correspondence (with D. Klemm, T. Mandal, N. Petri, M. Rabbiosi, C. Santoli, P.K. Tripathy).
- 11.** Study of *symplectic deformations* of gauged supergravity theories, and analysis of the properties of the resulting vacua, by exploiting group-theoretical methods in flux compactifications of superstring theory (with G. Dall'Agata and G. Inverso).
- 12.** Study of exceptional Lie algebras by focussing on their inner Jordan pair structure, also in relation to applications in physics, especially in cosmology and particle physics (with M. Rios and P. Truini).
- 13.** Study of *fermionic wiggling* (through anti-Killing spinor techniques) of solutions of supergravity theories in various dimensions, with particular attention to possible modifications of the attractor mechanism (with L. G. C. Gentile, P. A. Grassi, A. Mezzalana, W. A. Sabra).
- 14.** Study of non-linear, non-associative structures in gauge theories, in particular related to division algebras, Jordan and Freudenthal triple systems, and investigation of their interplay with global or local supersymmetry and conformal symmetry (with L. Borsten, M.J. Duff, J. J. Fernandez-Melgarejo, S. Ferrara, C. Furey, C.-X. Qiu, S.-Y. D. Shih, A. Tagliaferro, E. Torrente-Lujan, B. Zumino).
- 15.** Study of standard and non-standard p -branes in gravity with (maximal and non-maximal) local supersymmetry in every dimension, with particular emphasis on their symmetries and on the structure of the corresponding *wrapping rules*, also in relation to “magic” non-supersymmetric theories in various dimensions (with E. A. Bergshoeff, G. Pradisi, F. Riccioni, L. Romano).
- 16.** Study of the correspondence between the mathematics of stringy black holes and the quantum entanglement, with applications to Quantum Information Theory (with M.J. Duff, L. Borsten, D. Dahanayake and W. Rubens).
- 17.** Application of entropy function formalism in flux compactifications of superstring theo-

ries, in order to classify the critical points of the effective gauge potential, and their supersymmetry breaking properties

(with D. Cassani, S. Ferrara, F. Morales, H. Samtleben).

18. Study of exceptional groups and their applications to supergravity, multi-center black hole physics and supersymmetry

(with S. L. Cacciatori, B. L. Cerchiai, S. Ferrara, E. Orazi, F. Riccioni, B. van Geemen).

19. Study of non-minimal curvature couplings, their embedding in Superconformal Supergravity, and applications to cosmological inflationary models within (and beyond) $(N)MSSM$, both in Jordan and Einstein frames

(with S. Ferrara, R. Kallosh, A. Linde, A. Van Proeyen).

20. Study of the Attractor Mechanism in single-center and multi-center space-time singularities, in Supergravity and Superstring theories in various dimensions

(with L. Andrianopoli, P. Aschieri, S. Bellucci, L. Borsten, S. Cacciatori, B. L. Cerchiai, A. Ceresole, R. D'Auria, D. Dahanayake, M. J. Duff, S. Ferrara, A. Gnechi, M. Günaydin, R. Kallosh, F. Morales, E. Orazi, W. Rubens, H. Samtleben, A. Shcherbakov, R. Stora, M. Trigiante, A. Yeranyan, B. Zumino).

21. Non-linear realizations of $\mathcal{N} = 8$ superconformal algebras, and related study of $\mathcal{N} = 8$ Superconformal Mechanics, also in the (bi-)harmonic superspace formulation

(with S. Bellucci, S. Krivonos, E. Orazi).

22. Study of Fayet-Ilioupoulos terms in $\mathcal{N} = 4$ Superconformal Mechanics, and search for “root actions” by bosonic dimensional reduction procedures

(with S. Bellucci, S. Krivonos, E. Orazi).

23. Study of spin-chain and integrability techniques in $\mathcal{N} = 4$ super-Yang-Mills gauge theory, within the framework of the AdS/CFT correspondence

(with S. Bellucci, P.-Y. Casteill, J. F. Morales, C. Sochichiu).

Post-Doctoral Fellowships :

Jan. 2015 - Dec. 2016 : 5th Post-Doctoral Fellowship : *Senior Research Grant* supported by the Physics Museum and Research Center “*Enrico Fermi*”, Roma, Italy (Prof. L. Cifarelli President).

Dec. 2012 - Nov. 2014 : 4th Post-Doctoral Fellowship : *Post-Doctoral Fellow* of the Institute for Theoretical Physics of KUL Leuven, Belgium.

Dec. 2010 - Nov. 2012 : 3rd Post-Doctoral Fellowship : *Fellow* of the Physics Theory Division of CERN, Geneva, Switzerland.

Nov. 2008- Nov. 2010 : 2nd Post-Doctoral Fellowship : INFN Research Fellowship for Theoretical Physicists, Foreign Research Center : *Stanford Institute for Theoretical Physics*, Physics Department, Stanford, CA, USA. (Supervisor : Prof. R. Kallosh).

Jan. 2006 - Nov. 2008 : 1st Post-Doctoral Fellowship : *Junior Research Grant* supported by the Physics Museum and Research Center “*Enrico Fermi*”, Roma, Italy (Prof. A. Zichichi President).

Appointments and Awards

2017 : Jimenez de la Espada Fellow

Theoretical Physics Group, University of Murcia, Spain, September - December.

- 2016 : Visiting Scientist**
CERN Theory Division, September - October 2016.
- 2013 : Abilitazione**
II Fascia, settore concorsuale 02/A2, s.s.d. FIS/02.
- 2013 : Julian Schwinger Diploma**,
 at the International School of Subnuclear Physics, 51st Course:
Reflections on the Next Step for LHC,
 “Ettore Majorana” Foundation and Centre for Scientific Culture (EMFCSC),
 June 24 - July 3, Erice, Italy.
- 2006 : Young Graduate Student Award** by the Italian Physics Society, Turin, Italy,
 September 18, 2006.
- 2005 : The Best Student Award**
 at the International School of Subnuclear Physics, 43rd Course:
Towards New Milestones in our Quest to go Beyond the Standard Model,
 “Ettore Majorana” Foundation and Centre for Scientific Culture (EMFCSC),
 Erice, Italy, August 29 - September 7, 2005.
- 2002-2004 : Research Grant** supported by *Italian Catholic University Centre (CUC)*.
- 2002 : Mentioned with Honors** in the International Award “*Ostia Mare di Roma*”, Roma,
 Italy.
- 2000 : “Enrico Persico” Fellowship** by Accademia Nazionale dei Lincei, Roma, Italy.

Teaching Duties :

- Nov. 2013 : Tutoring Bachelor Project** [2 students] “*Classical Spin : an Intrinsic Property of Extended Media*”, KU Leuven, Belgium.
- 2012-13 : Exercise Tutoring** in the course “*Electroweak and Strong Interactions*”
 (Prof. A.Sevrin) [Graduate level, 15 students], KU Leuven, Belgium.
- 2004-05 : Teaching assistant** in the course “*Theory of General Relativity*”(Prof. R.Mignani)
 [Graduate level, 13 students],
 University of Rome “Roma Tre”, “*Edoardo Amaldi*” Physics Dept., Italy.
- 2004-05 : Teaching assistant** in the course “*Classical Electrodynamics and Special Relativity*”
 (Prof. R.Mignani) [Graduate level, 22 students]:
 lectures on “*Paradoxes in Special Relativity*”,
 University of Rome “Roma Tre”, “*Edoardo Amaldi*” Physics Dept., Italy.
- 2002-03 : Teaching assistant** in the course “*Physics of NonLinear Systems*” (Prof. O.Ragnisco)
 [Ph.D. level, 5 students]:
 lectures on “*Classical Solitons in Field Theory*”,
 University of Rome “Roma Tre”, “*Edoardo Amaldi*” Physics Dept., Italy.

Research Papers and Contributions to Proceedings

At December 27, 2017 : total number of citeable papers (on INSPIRES HEP) : **105** (**2233** citations), h-index : **28**.

Research Papers

1. *Extremal Black Holes, Stueckelberg Scalars and Phase Transitions*, A. Marrani, O. Miskovic, P. Quezada Leon, [arXiv:1712.01425 \[hep-th\]](#).
2. *Are all Supergravity Theories Yang-Mills Squared?*, A. Anastasiou, L. Borsten, M.J. Duff, A. Marrani, S. Nagy, M. Zoccali, [arXiv:1707.03234 \[hep-th\]](#).
3. *A Kind of Magic*, L. Borsten, A. Marrani, *Class. Quant. Grav.* **34** 235014 (2017), [arXiv:1707.02072 \[hep-th\]](#), DOI: 10.1088/1361-6382/aa8fe2.
4. *Quantum Klein Space and Superspace*, R. Fiorese, E. Latini, A. Marrani, [arXiv:1705.01755 \[hep-th\]](#).
5. *Supersymmetric Black Holes and Freudenthal Duality*, T. Mandal, A. Marrani, P. K. Tripathy, *Int. J. Mod. Phys. A* **32** (2017) 1750114, [arXiv:1703.08669 \[hep-th\]](#), DOI: 10.1142/S0217751X17501147.
6. *Nonlinear symmetries of black hole entropy in gauged supergravity*, D. Klemm, A. Marrani, N. Petri, M. Rabbiosi, *JHEP* **1704** (2017) 013, [arXiv:1701.08536 \[hep-th\]](#), DOI: 10.1007/JHEP04(2017)013.
7. *Non-Supersymmetric Magic Theories and Ehlers Truncations*, A. Marrani, G. Pradisi, F. Riccioni, L. Romano, *Int. J. Mod. Phys. A* **32** (2017) 1750120, [arXiv:1701.03031 \[hep-th\]](#), DOI: 10.1142/S0217751X17501202.
8. *Peccei-Quinn Transformations and Black Holes : Orbit Transmutations and Entanglement Generation*, T. Prudencio, A. Marrani, D. J. Cirilo-Lombardo, *Universe* **3** (2017) 12, [arXiv:1612.00344 \[hep-th\]](#), DOI:10.3390/universe3010012.
9. *$D = 3$ Unification of Curious Supergravities*, M. J. Duff, S. Ferrara, A. Marrani, *JHEP* **1701** (2017) 023, [arXiv:1610.08800 \[hep-th\]](#), DOI: 10.1007/JHEP01(2017)023.
10. *Twin Supergravities from Yang-Mills Squared*, A. Anastasiou, L. Borsten, M. J. Duff, M. J. Hughes, A. Marrani, S. Nagy, M. Zoccali, *Phys.Rev. D* **96** (2017) no.2, 026013, [arXiv:1610.07192 \[hep-th\]](#), DOI : 10.1103/PhysRevD.96.026013.
11. *One-Dimensional Super Calabi-Yau Manifolds and their Mirrors*, S. Noja, S. L. Cacciatori, F. Dalla Piazza, A. Marrani, R. Re, *JHEP* **1704** (2017) 094, [arXiv:1609.03801 \[hep-th\]](#), DOI:10.1007/JHEP04(2017)094.
12. *Klein and Conformal Superspaces, Split Algebras and Spinor Orbits*, R. Fiorese, E. Latini, A. Marrani, *Rev. Math. Phys.* **29**, 1750011 (2017), [arXiv:1603.09063 \[hep-th\]](#), DOI: <http://dx.doi.org/10.1142/S0129055X17500118>.
13. *BPS Black Holes in a Non-Homogeneous Deformation of the stu model of $\mathcal{N} = 2$, $D = 4$ Gauged Supergravity*, D. Klemm, A. Marrani, N. Petri, C. Santoli, *JHEP* **1509** (2015) 205, [arXiv:1507.05553 \[hep-th\]](#), DOI: 10.1007/JHEP09(2015)205.

14. *Sextonions, Zorn Matrices, and $e_{71/2}$* , A. Marrani, P. Truini, Lett. Math. Phys. **107** (2017) 1859, [arXiv:1506.04604 \[math.RA\]](#), DOI: 10.1007/s11005-017-0966-7.
15. *Real weights, bound states and duality orbits*, A. Marrani, F. Riccioni, L. Romano, Int. J. Mod. Phys. **A31**, 1550218 (2016), [arXiv:1501.06895 \[hep-th\]](#), DOI: 10.1142/S0217751X15502188.
16. *Symplectic Deformations of Gauged Maximal Supergravity*, G. Dall'Agata, G. Inverso, A. Marrani, JHEP **1407** (2014) 133, [arXiv:1405.2437 \[hep-th\]](#), DOI: 10.1007/JHEP07(2014)133.
17. *Exceptional Lie Algebras, $SU(3)$ and Jordan Pairs Part 2: Zorn-type Representations*, A. Marrani, P. Truini, J.Phys. **A47** (2014) 265202, [arXiv:1403.5120 \[math-ph\]](#), DOI: 10.1088/1751-8113/47/26/265202.
18. *No Fermionic Wigs for BPS Attractors in 5 Dimensions*, G. L. C. Gentile, P. A. Grassi, A. Marrani, A. Mezzalira, W. A. Sabra, Phys. Lett. **B735** (2014) 231, [arXiv:1403.5097 \[hep-th\]](#), DOI: 10.1016/j.physletb.2014.06.026.
19. *Iwasawa nilpotency degree of non compact symmetric cosets in \mathcal{N} -extended Supergravity*, S. L. Cacciatori, B. L. Cerchiai, S. Ferrara, A. Marrani, Fortsch.Phys. **62** (2014) 350, [arXiv:1402.5063 \[hep-th\]](#), DOI: 10.1002/prop.201400010.
20. *Fermions, Wigs, and Attractors*, G. L. C. Gentile, P. A. Grassi, A. Marrani, A. Mezzalira, Phys. Lett. **B732**, 263 (2014), [arXiv:1309.0821 \[hep-th\]](#), DOI: 10.1016/j.physletb.2014.03.046.
21. *Dualities Near the Horizon*, S. Ferrara, A. Marrani, E. Orazi, M. Trigiante, JHEP **1311**, 056 (2013), [arXiv:1305.2057 \[hep-th\]](#), DOI: 10.1007/JHEP11(2013)056.
22. *Freudenthal Dual Lagrangians*, L. Borsten, M. J. Duff, S. Ferrara, A. Marrani, Class. Quant. Grav **30**, 235003 (2013), [arXiv:1212.3254 \[hep-th\]](#), DOI: 10.1088/0264-9381/30/23/235003.
23. *Multi-Centered Invariants, Plethysm and Grassmannians*, S. L. Cacciatori, A. Marrani, B. van Geemen, JHEP **1302**, 049 (2013), [arXiv:1211.3432 \[math-ph\]](#), DOI: 10.1007/JHEP02(2013)049.
24. *Multi-Centered First Order Formalism*, S. Ferrara, A. Marrani, A. Shcherbakov, A. Yeranyan, JHEP **1305**, 127 (2013), [arXiv:1211.3262 \[hep-th\]](#), DOI: 10.1007/JHEP05(2013)127.
25. *d-Geometries Revisited*, A. Ceresole, S. Ferrara, A. Gnechi, A. Marrani, JHEP **1302**, 059 (2013), [arXiv:1210.5983 \[hep-th\]](#), DOI: 10.1007/JHEP02(2013)059.
26. *Squaring the Magic*, S. L. Cacciatori, B. L. Cerchiai, A. Marrani, Adv. Theor. Math. Phys. vol. **19**, no. 5, 923 (2015), [arXiv:1208.6153 \[math-ph\]](#), DOI: <http://dx.doi.org/10.4310/ATMP.2015.v19.n5.a1>.
27. *Jordan Pairs, E_6 and U-Duality in Five Dimensions*, S. Ferrara, A. Marrani, B. Zumino, J. Phys. **A42**, 065402 (2013), [arXiv:1208.0347 \[math-ph\]](#), DOI: 10.1088/1751-8113/46/6/065402.
28. *Freudenthal Gauge Theory*, A. Marrani, C.-X. Qiu, S.-Y. D. Shih, A. Tagliaferro, B. Zumino, JHEP **1303**, 132 (2013), [arXiv:1208.0013 \[hep-th\]](#), DOI: 10.1007/JHEP03(2013)132.
29. *Super-Ehlers in Any Dimension*, S. Ferrara, A. Marrani, M. Trigiante, JHEP **1211** (2012) 068, [arXiv:1206.1255 \[hep-th\]](#), DOI: 10.1007/JHEP11(2012)068.

30. *Degeneration of Groups of Type E_7 and Minimal Coupling in Supergravity*, S. Ferrara, R. Kallosh, A. Marrani, JHEP **1206**, 074 (2012), [arXiv:1202.1290 \[hep-th\]](#), DOI: 10.1007/JHEP06(2012)074.
31. *Magic Coset Decompositions*, S. L. Cacciatori, B. L. Cerchiai, A. Marrani, Adv. Theor. Math. Phys. vol. **17**, no. 5, 1077 (2013), [arXiv:1201.6314 \[hep-th\]](#), DOI: <http://dx.doi.org/10.4310/ATMP.2013.v17.n5.a4>.
32. *Brane Orbits*, E. A. Bergshoeff, A. Marrani, F. Riccioni, Nucl. Phys. **B861**, 104 (2012), [arXiv:1201.5819 \[hep-th\]](#), DOI: 10.1016/j.nuclphysb.2012.03.014.
33. *On Invariant Structures of Black Hole Charges*, S. Ferrara, A. Marrani, A. Yeranyan, JHEP **1202**, 071 (2012), [arXiv:1110.4004 \[hep-th\]](#), DOI: 10.1007/JHEP02(2012)071.
34. *Generalized Mirror Symmetry and Quantum Black Hole Entropy*, S. Ferrara, A. Marrani, Phys. Lett. **B707**, 173 (2012), [arXiv:1109.0444 \[hep-th\]](#), DOI: 10.1016/j.physletb.2011.12.005.
35. *Explicit Orbit Classification of Reducible Jordan Algebras and Freudenthal Triple Systems*, L. Borsten, M. J. Duff, S. Ferrara, A. Marrani, W. Rubens, Commun. Math. Phys. **325**, 17 (2014), [arXiv:1108.0908 \[math.RA\]](#), DOI: 10.1007/s00220-013-1846-3.
36. *Small Orbits*, L. Borsten, M. J. Duff, S. Ferrara, A. Marrani, W. Rubens, Phys. Rev. **D85**, 086002 (2012), [arXiv:1108.0424 \[hep-th\]](#), DOI: 10.1103/PhysRevD.85.086002.
37. *Small Black Hole Constituents and Horizontal Symmetry*, A. Ceresole, S. Ferrara, A. Marrani, A. Yeranyan, JHEP **1106**, 078 (2011), [arXiv:1104.4652 \[hep-th\]](#), DOI: 10.1007/JHEP06(2011)078.
38. *Freudenthal Duality and Generalized Special Geometry*, S. Ferrara, A. Marrani, A. Yeranyan, Phys. Lett. **B701**, 640 (2011), [arXiv:1102.4857 \[hep-th\]](#), DOI: 10.1016/j.physletb.2011.06.031.
39. *On the Black-Hole/Qubit Correspondence*, L. Borsten, M. J. Duff, A. Marrani, W. Rubens, Eur. Phys. J. Plus **126**, 37 (2011), [arXiv:1101.3559 \[hep-th\]](#), DOI: 10.1140/epjp/i2011-11037-5.
40. *Two-Centered Magical Charge Orbits*, L. Andrianopoli, R. D'Auria, S. Ferrara, A. Marrani, M. Trigiante, JHEP **1104**, 041 (2011), [arXiv:1101.3496 \[hep-th\]](#), DOI: 10.1007/JHEP04(2011)041.
41. *Exceptional Reductions*, A. Marrani, E. Orazi, F. Riccioni, J. Phys. **A44**, 155207 (2011), [arXiv:1012.5797 \[hep-th\]](#), DOI: 10.1088/1751-8113/44/15/155207.
42. *Two-Center Black Holes Duality-Invariants for stu Model and its Lower-Rank Descendants*, S. Ferrara, A. Marrani, E. Orazi, R. Stora, A. Yeranyan, J. Math. Phys. **52**, 062302 (2011), [arXiv:1011.5864 \[hep-th\]](#), DOI: 10.1063/1.3589319.
43. *Topics in Cubic Special Geometry*, S. Bellucci, A. Marrani, R. Roychowdhury, J. Math. Phys. **52**, 082302 (2011), [arXiv:1011.0705 \[hep-th\]](#), DOI: 10.1063/1.3622851.
44. *Split Attractor Flow in $\mathcal{N} = 2$ Minimally Coupled Supergravity*, S. Ferrara, A. Marrani, E. Orazi, Nucl. Phys. **B846**, 512 (2011), [arXiv:1010.2280 \[hep-th\]](#), DOI: 10.1016/j.nuclphysb.2011.01.015.

45. *Matrix Norms, BPS Bounds and Marginal Stability in $\mathcal{N} = 8$ Supergravity*, S. Ferrara, A. Marrani, JHEP **1012**, 038 (2010), [arXiv:1009.3251 \[hep-th\]](#), DOI: 10.1007/JHEP12(2010)038.
46. *Superconformal Symmetry, NMSSM, and Inflation*, S. Ferrara, R. Kallosh, A. Linde, A. Marrani, A. Van Proeyen, Phys. Rev. **D83**, 025008 (2011), [arXiv:1008.2942 \[hep-th\]](#), DOI: 10.1103/PhysRevD.83.025008.
47. *Charge Orbits of Extremal Black Holes in Five Dimensional Supergravity*, B. L. Cerchiai, S. Ferrara, A. Marrani, B. Zumino, Phys. Rev. **D82**, 085010 (2010), [arXiv:1006.3101 \[hep-th\]](#), DOI: 10.1103/PhysRevD.82.085010.
48. *Small $\mathcal{N} = 2$ Extremal Black Holes in Special Geometry*, A. Ceresole, S. Ferrara, A. Marrani, Phys. Lett. **B693**, 366 (2010), [arXiv:1006.2007 \[hep-th\]](#), DOI: 10.1016/j.physletb.2010.08.053.
49. *Geodesics of deformed relativity in five dimensions*, F. Cardone, A. Marrani and R. Mignani, Electron. J. Theor. Phys. **7** 23, 281 (2010).
50. *Four-qubit entanglement classification from string theory*, L. Borsten, D. Dahanayake, M. J. Duff, A. Marrani, W. Rubens, Phys. Rev. Lett. **105**, 100507 (2010), [arXiv:1005.4915 \[hep-th\]](#), DOI: 10.1103/PhysRevLett.105.100507.
51. *Iwasawa $\mathcal{N} = 8$ Attractors*, S. L. Cacciatori, B. L. Cerchiai, A. Marrani, J. Math. Phys. **51**, 102502 (2010), [arXiv:1005.2231 \[hep-th\]](#), DOI: 10.1063/1.3501024.
52. *Jordan Frame Supergravity and Inflation in NMSSM*, S. Ferrara, R. Kallosh, A. Linde, A. Marrani, A. Van Proeyen, Phys. Rev. **D82**, 045003 (2010), [arXiv:1004.0712 \[hep-th\]](#), DOI: 10.1103/PhysRevD.82.045003.
53. *Observations on Integral and Continuous U-duality Orbits in $\mathcal{N} = 8$ Supergravity*, L. Borsten, D. Dahanayake, M.J. Duff, S. Ferrara, A. Marrani, W. Rubens, Class. Quant. Grav. **27**, 185003 (2010), [arXiv:1002.4223 \[hep-th\]](#), DOI: 10.1088/0264-9381/27/18/185003.
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2. *The Magic Star of Exceptional Periodicity*, P. Truini, M. Rios, A. Marrani,
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3. *Freudenthal duality and black holes : from groups of type E_7 to pre-homogeneous spaces*, A. Marrani,
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4. *Majorana Fermions, Supersymmetry Breaking, and Born-Infeld Theory* , S. Ferrara, A. Marrani, A. Yeranyan,
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and Celebration of the Triumph of Ettore Majorana,
Erice, 24 June-3 July 2015,
Subnucl. Ser. **53** (2017) 123-156, [arXiv:1510.01658 \[hep-th\]](#), DOI: 10.1142/9789813208292_0003.
5. *Freudenthal Duality in Gravity: from Groups of Type E_7 to Pre-Homogeneous Spaces* ,
A. Marrani, [arXiv:1509.01031 \[hep-th\]](#),
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6. *Exceptional Lie Algebras at the very Foundations of Space and Time*, A. Marrani, P. Truini, [arXiv:1506.08576 \[hep-th\]](#),
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nucl. Ser. **51**, 91 (2015),
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8. *Adams-Iwasawa $\mathcal{N} = 8$ Black Holes*, S. L. Cacciatori, B. L. Cerchiai, A. Marrani, Int. J.
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XVII European Workshop on String Theory,
Padua, Italy, September 5-9, 2011.
11. *Quantum Gravity needs Supersymmetry*, S. Ferrara, A. Marrani, [arXiv:1201.4328 \[hep-th\]](#),
Subnucl.Ser. **49** (2013) 53-67, DOI: 10.1142/9789814522519_0003,
International School of Subnuclear Physics,
49th Course: *Searching for the Unexpected at LHC and Status of Our Knowledge*,
Erice, Italy, June 24 July 3, 2011.
12. *Black Holes and Groups of Type E_7* , S. Ferrara, A. Marrani, Pramana **78**, 893 (2012),
[arXiv:1112.2664 \[hep-th\]](#), DOI: 10.1007/s12043-012-0315-4,

Conference in Honor of Raymond Storas 80th Birthday,
LAPTh, Annecy, July 8, 2011.

13. *Perturbative and Non-Perturbative Aspects of $\mathcal{N} = 8$ Supergravity*, S. Ferrara, A. Marrani, Subnucl.Ser. **48**, 67 (2013), [arXiv:1103.5138 \[hep-th\]](#), International School of Subnuclear Physics, 48th Course: *What is Known and Unexpected at LHC*, Erice, Italy, 29 August – 7 September 2010, DOI: 10.1142/9789814522489_0004.
14. *Charge Orbits and Moduli Spaces of Black Hole Attractors*, A. Marrani, Lect. Notes Math. **2027**, 155 (2011), [arXiv:1012.3559 \[hep-th\]](#), DOI: 10.1007/978-3-642-21744-9_8, Workshop *Supersymmetry in Mathematics and Physics*, UCLA Mathematics Department, Los Angeles, CA, USA, February 67 2010.
15. *SAM Lectures on Extremal Black Holes in $d=4$ Extended Supergravity*, S. Bellucci, S. Ferrara, M. Günaydin, A. Marrani, Springer Proc. in Physics **134**, 1 (2010), [arXiv:0905.3739](#), DOI: 10.1007/978-3-642-10736-8_1, "School on Attractor Mechanism" 2007 (SAM2007), INFN-LNF, Frascati, Italy, June 18-22, 2007.
16. *Status of Supersymmetry : Foundations and Applications*, S. Ferrara, A. Marrani, in: "Predicted and Totally Unexpected in the Energy Frontier Opened by LHC", A. Zichichi (Ed.), Subnucl. Ser. **46** (2011) 277, World Scientific (Singapore, 2011), DOI: 10.1142/9789814340212_0010.
17. *Symmetric Spaces in Supergravity*, S. Ferrara and A. Marrani, in: "Symmetry in Mathematics and Physics" (D. Babbitt, V. Vyjayanthi and R. Fioresi Eds.), Contemporary Mathematics **490**, American Mathematical Society, Providence 2009, [arXiv:0808.3567](#).
18. *Lectures on Attractors and Black Holes*, S. Ferrara, K. Hayakawa and A. Marrani, *Fortsch. Phys.* **56**, 993 (2008), [arXiv:0805.2498](#), DOI: 10.1002/prop.200810569, International School of Subnuclear Physics, 45th Course: "Search for the Totally Unexpected in the LHC era", Erice, Italy, 29 August – 7 September 2007.
19. *Attractors in Black*, S. Bellucci, S. Ferrara and A. Marrani, *Fortsch. Phys.* **56**, 761 (2008), [arXiv:0805.1310](#), DOI: 10.1002/prop.200810566, 3rd RTN Workshop *Constituents, Fundamental Forces and Symmetries of the Universe*, 15 October 2007, Valencia, Spain.
20. *Extremal Black Hole and Flux Vacua Attractors*, S. Bellucci, S. Ferrara, R. Kallosh and A. Marrani, *Lect. Notes Phys.* **755**, 115 (2008), [arXiv:0711.4547](#), "Winter School on Attractor Mechanism" 2006 (SAM2006), INFN-LNF, Frascati, Italy, 20-24 March 2006.
21. *Black Hole Attractors in Extended Supergravity*, S. Ferrara and A. Marrani, *AIP Conf. Proc.* **957**, 58 (2007), [arXiv:0708.1268](#), DOI: 10.1063/1.2823828, *PASCOS 2007*, 13th International Symposium on Particles, Strings and Cosmology, Imperial College, London, UK, 27 July 2007.
22. *Attractor Horizon Geometries of Extremal Black Holes*, S. Bellucci, S. Ferrara and A. Marrani, [hep-th/0702019](#), 17th SIGRAV Conference, Turin, Italy, 4-7 Sep 2006.

23. *Spin-Bits and $\mathcal{N} = 4$ SYM*, A. Marrani, in: “*Towards New Milestones in Our Quest To Go Beyond the Standard Model*”, A. Zichichi (Ed.), Subnucl.Ser. **43**, 345 (2007), World Scientific (Singapore), hep-th/0604174, DOI: 10.1142/9789812779120_0015.

Books :

1. *Supersymmetric Mechanics.*
Vol.2: The Attractor Mechanism and Space-Time Singularities,
S. Bellucci, S. Ferrara and A. Marrani,
Lecture Notes in Physics vol. **701**, Springer-Verlag, Heidelberg (2006), DOI: 10.1007/b11749356.

Thesis Supervised :

1. Ph.D. student: R. Roychowdhury, University of Naples, Italy.
Thesis Title: “*Selected Topics in Quantum Gravity : a Maiden Voyage*”
Date: Jan. 2011. Mark: *Ottimo*.

PhD Committee :

1. Ph.D. student: C. S. Shabhazi, IFT, UAM - CSIC, Madrid, Spain.
Thesis Title: “*Black Holes in Supergravity with Applications to String Theory*”
Date: June 2013. Mark: *Excellent*.

Schools, Conferences and Workshops :

- | | |
|---------------------------------|--|
| 2017, October, 13 | : <i>Member of the Organizing Committee</i>
<i>A Lie Day in Bologna</i> ,
Univ. of Bologna, Mathematics Dept., Bologna, Italy. |
| 2017, September, 11 - 15 | : <i>103rd National Congress of SIF (Italian Physics Society)</i> ,
University of Trento, Trento, Italy. |
| 2017, July, 5 - 12 | : <i>EPS Conference on High Energy Physics</i> ,
Venice, Italy. |
| 2017, June, 14 - 23 | : <i>International School of Subnuclear Physics, 55th Course:</i>
<i>Highlights from LHC and the other Frontiers in Physics</i> ,
“Ettore Majorana” Foundation and Centre for Scientific Cul-
ture (EMFCSC),
Erice, Italy. |
| 2017, May, 22 - 26 | : <i>Invited Speaker</i>
<i>Symposium on Quantum Gravity</i> ,
Quantum Gravity Research headquarters, Los Angeles, CA
USA. |
| 2017, May 18 - 19 | : <i>Supergravity 2017</i>
University of Padova, Physics and Astronomy Dept., Padova,
Italy. |

- 2017, April, 24 - 28** : *Invited Speaker*
Geometry, Gravity and Supersymmetry,
Mainz Institute for Theoretical Physics, Johannes Gutenberg
University, Mainz, Germany.
- 2016, December, 10 - 18** : *Invited Speaker*
Advances in Quantum Gravity III (AQG III) 2016,
Pacific Science Institute (PSI), Maui, HI, USA.
- 2016, December, 5 - 9** : *QCD Meets Gravity*,
Bhaumik Institute for Theoretical Physics, UCLA, USA.
- 2016, September, 26 - 30** : *102nd National Congress of SIF (Italian Physics Society)*,
University of Padova, Padova, Italy.
- 2016, July, 8 - 16** : *Invited Speaker*
Advances in Quantum Gravity (AQG) 2016,
Topos House, San Francisco, CA, USA.
- 2016, June, 29 - 30** : *Invited Scientist*
Two Days in Quantum Mechanics,
University of Genova, Physics Dept., Genova, Italy.
- 2016, June, 14 - 23** : *International School of Subnuclear Physics, 54th Course:*
The New Physics Frontiers in the LHC-2 Era,
“Ettore Majorana” Foundation and Centre for Scientific Cul-
ture (EMFCSC),
Erice, Italy.
- 2016, May, 1 - 7** : *Invited Speaker*
Superstring Solutions, Supersymmetry and Geometry 2016,
Centro de Ciencias de Benasque “Pedro Pascual”, Benasque,
Spain.
- 2016, January, 20 - 22** : *Invited Scientist*
Workshop of Algebraic Geometry and Physics 2016,
Villa del Grumello, Como, Italy.
- 2015, November, 23 - 24** : *Invited Speaker*
Advances in Quantum Gravity (AQG) 2015,
Los Angeles, CA, USA.
- 2015, October, 1** : *Invited Speaker*
A Lie Day in Bologna,
Univ. of Bologna, Mathematics Dept., Bologna, Italy.
- 2015, July, 12 - 18** : *14th Marcel Grossmann Meeting*
University of Roma “La Sapienza”, Physics Dept., Roma, Italy.
- 2015, June, 24 - July, 3** : *International School of Subnuclear Physics, 53rd Course:*
The Future of Our Physics, Including New Frontier,
“Ettore Majorana” Foundation and Centre for Scientific Cul-
ture (EMFCSC),
Erice, Italy.

- 2015, April, 27 - 28** : *Invited Speaker*
Bruno Zumino Memorial Meeting 2015,
Main Auditorium, CERN, Geneva, Switzerland.
- 2014, November 7 - 9** : *Invited Speaker,*
Group Theory, Probability, and the Structure of Spacetime
A Conference on the occasion of Professor Varadarajan's re-
irement,
Department of Mathematics, University of California, Los Angeles, USA.
- 2014, September, 8 - 12** : *International Conference*
Conceptual and Technical Challenges for Quantum Gravity
2014,
Univ. of Roma "La Sapienza", Physics Dept., Roma, Italy.
- 2014, June, 24 - July, 3** : *International School of Subnuclear Physics, 52nd Course:*
Status of Theoretical Understanding and of Experimental Power
for LHC Physics and Beyond,
"Ettore Majorana" Foundation and Centre for Scientific Cul-
ture (EMFCSC),
Erice, Italy.
- 2013, June, 24 - July, 3** : *Julian Schwinger Diploma,*
International School of Subnuclear Physics, 51st Course:
Reflections on the Next Step for LHC,
"Ettore Majorana" Foundation and Centre for Scientific Cul-
ture (EMFCSC),
Erice, Italy.
- 2012, June 23 - July 2** : *International School of Subnuclear Physics, 50th Course:*
What We Would Like LHC To Give Us,
"Ettore Majorana" Foundation and Center for Scientific Cul-
ture (EMFCSC), Erice, Italy.
- 2011, November, 15 - 17** : *The supersymmetric, the extremal*
and the ugly - solutions in string theory,
IPHT CEA Saclay, Paris, France.
- 2011, June 24 - July 3** : *Invited Scientist,*
International School of Subnuclear Physics, 49th Course:
Searching for the Unexpected at LHC
and Status of our Knowledge,
"Ettore Majorana" Foundation and Center for Scientific Cul-
ture (EMFCSC), Erice, Italy.
- 2011, May, 9-13** : *Invited Speaker,*
Black Objects in Supergravity School (BOSS 2011),
INFN - Frascati National Laboratories (LNF), Rome, Italy.
- 2011, January, 24 - 28** : *CERN Winter School on Supergravity, Strings*
and Gauge Theory,
CERN, Switzerland.

- 2010, August, 29 - Sept., 7 :** *International School of Subnuclear Physics, 48th Course: What is known and unexpected at LHC , “Ettore Majorana” Foundation and Center for Scientific Culture (EMFCSC), Erice, Italy.*
- 2010, February, 6 - 7 :** *Supersymmetry in Mathematics and Physics, Mathematics Dept., UCLA, USA.*
- 2009, August, 29 - Sept., 7 :** *International School of Subnuclear Physics, 47th Course: The Most Unexpected at LHC and the Status of High Energy Frontier, “Ettore Majorana” Foundation and Center for Scientific Culture (EMFCSC), Erice, Italy.*
- 2009, June, 29 - July, 3 :** *School on attractor Mechanism (SAM) 2009, INFN - Frascati National Laboratories, Rome, Italy.*
- 2009, June, 22-26 :** *Strings 2009, Rome, Italy.*
- 2009, June, 15-19 :** *“New Perspectives in String Theory” School, GGI Institute, Florence, Italy.*
- 2008, August, 29 - Sept., 7 :** *International School of Subnuclear Physics, 46th Course: Homage to Sidney Coleman : Predicted and Totally Unexpected in the Energy Frontier opened by LHC, “Ettore Majorana” Foundation and Center for Scientific Culture (EMFCSC), Erice, Italy.*
- 2008, August, 18-23 :** *Strings 2008, CERN, Switzerland.*
- 2008, June, 26-28 :** *Theories of Fundamental Interactions, Villa Mondragone, Frascati, Italy.*
- 2008, January, 21-25 :** *RTN Winter School on Strings, Supergravity and Gauge Theories, CERN, Geneva, Switzerland.*
- 2007, October, 1-6 :** *“Constituents, Fundamental Forces and Symmetries of the Universe” RTN 3rd Workshop, Valencia, Spain.*
- 2007, August, 29 - Sept., 7 :** *International School of Subnuclear Physics, 45th Course: Search for the “Totally Unexpected” in the LHC Era , “Ettore Majorana” Foundation and Center for Scientific Culture (EMFCSC), Erice, Italy.*
- 2007, June, 18-22 :** *Member of the Organizing Committee, School on Attractor Mechanism, INFN - Frascati National Laboratories (LNF), Rome, Italy.*

- 2007, June, 4-8** : “*String Phenomenology 2007*”,
INFN - Frascati National Laboratories (LNF), Rome, Italy.
- 2006, October, 9-13** : “*Constituents, Fundamental Forces and Symmetries of the Universe*”
RTN 2nd Workshop and Midterm Meeting ,
Napoli, Italy.
- 2006, September, 18-23** : *XCII National Congress of the Italian Physics Society*,
Torino, Italy.
- 2006, August, 29 - Sept., 7** : ***Invited Scientist***,
International School of Subnuclear Physics, 44th Course:
The Logic of Nature, Complexity and New Physics:
From Quark-Gluon Plasma to Superstrings, Quantum Gravity
and Beyond,
“Ettore Majorana” Foundation and Center for Scientific Cul-
ture (EMFCSC),
Erice, Italy.
- 2006, March, 20-24** : *Winter School on Attractor Mechanism*,
INFN - Frascati National Laboratories (LNF), Rome, Italy.
- 2006, January, 16-20** : *RTN Winter School*
on Strings, Supergravity and Gauge Theories,
CERN, Geneva, Switzerland.
- 2005, August, 29 - Sept., 7** : ***The Best Student***,
International School of Subnuclear Physics, 43rd Course:
Towards New Milestones in our Quest to go Beyond
the Standard Model,
“Ettore Majorana” Foundation and Centre for Scientific Cul-
ture (EMFCSC),
Erice, Italy.
- 2005, June, 6-8** : *The Legacy of Supergravity*,
Conference in honour of Sergio Ferrara, awarded with an Hon-
orary Degree in Physics by University of Rome “Tor Vergata”,
Villa Mondragone, Monte Porzio Catone (Rome), Italy.
- 2005, March, 14-22** : *Spring School on Superstring Theory and Related Topics*,
The Abdus Salam International Center for Theoretical Physics
(ICTP), Trieste, Italy.
- 2005, March, 7-12** : *Winter School*
on Modern Trends in Supersymmetric Mechanics,
INFN - Frascati National Laboratories (LNF), Rome, Italy.
- 2005, March, 1-4** : *Conference on Higher Dimensional Quantum Hall Effect, Chern-
Simons Theory and Non-Commutative Geometry in Condensed
Matter Physics and Field Theory*, ICTP, Trieste, Italy.
- 2005, January, 31 - February, 4** : *RTN Winter School*
on Strings, Supergravity and Gauge Theories,

Scuola Internazionale Superiore di Studi Avanzati (SISSA),
Trieste, Italy.

2002, September, 6-10 : *Villa Mondragone International School
of Gravitation and Cosmology,*
Società Italiana Relatività e Gravitazione (SIGRAV),
Monte Porzio Catone (Rome), Italy.

Seminars and Talks :

2017, September, 28 : *U-Duality and F-Duality. Linear and Non-Linear Symmetries of Black Hole Entropy.*

University of Trento, TIFPA, Dept. of Physics, Trento, Italy.

2017, September, 13 : *A Black Hole Mystery.*

University of Trento, Dept. of Physics, Trento, Italy.

2017, July, 8

: *Non-Linear Invariance of Black Hole Entropy.*

Palazzo del Casinó, Venice, Italy.

2017, June, 1

: *A Mystery of Black Hole Entropy.*

UB, Dept. of Physics, Barcelona, Spain.

2017, May, 22

: *Exceptional Periodicity and the Magic Star.*

Quantum Gravity Research headquarters, Los Angeles, CA USA.

2017, April, 28

: *Non-linear anti-involutive symmetries of black hole entropy.*

Mainz Institute for Theoretical Physics, Johannes Gutenberg University, Mainz, Germany.

2017, Jan, 12

: *Bekenstein and Hawking meet Jordan and Freudenthal : Non-Linear Symmetries of Black Hole Entropy.*

PUCV, Institute of Physics, Valparaiso, Chile.

2016, September, 26 : *Bekenstein and Hawking meet Jordan and Freudenthal : Non-Linear Symmetries of Black Hole Entropy.*

University of Padova, Phys. Dept., Padova, Italy.

2016, May, 11

: *Jordan and Freudenthal meet Bekenstein and Hawking : Non-Linear Symmetries of Black Hole Entropy.*

University of Ferrara, Dept. of Physics, Ferrara, Italy.

2016, May, 10

: *Bekenstein and Hawking meet Jordan and Freudenthal : Non-Linear Symmetries of Black Hole Entropy.*

University of Bologna, Dept. of Physics, Bologna, Italy.

2016, May, 5

: *Almost-Complex Structures for Symplectic Spaces and Non-Linear Symmetries of Black Hole Entropy.*

Centro de Ciencias de Benasque “Pedro Pascual”, Benasque, Spain.

2016, April, 11

: *Anti-Involutive Maps for Electromagnetic Fluxes and Non-Linear Symmetries of Black Hole Entropy.*

DIAS, Dublin, Ireland.

- 2016, March, 30** : *Almost-Complex Structures for Electromagnetic Fluxes and Non-Linear Symmetries of Black Hole Entropy.*
University of Genova, Phys. Dept., Genova, Italy.
- 2016, March, 16** : *Almost-Complex Structures for Symplectic Spaces and Non-Linear Symmetries of Black Hole Entropy.*
DISAT, University of Insubria, Como, Italy.
- 2016, February, 23** : *Freudenthal and Exceptional : Symmetries of Gravity and Black Hole Entropy.*
“Statale” Univ. of Milan, Phys. Dept., Milan, Italy.
- 2016, January, 25** : *Quantum Gravity : from Black Holes to Quantum Entanglement.*
“Enrico Fermi” Center, Roma, Italy.
- 2015, December, 1** : *Freudenthal Symmetries and U-Orbits : from Groups of Type E_7 to Pre-Homogeneous Vector Spaces.*
IPhT, CEA, Saclay (Paris), France.
- 2015, November, 24** : *Freudenthal Symmetries and U-Orbits : from Groups of Type E_7 to Pre-Homogeneous Vector Spaces.*
Los Angeles, CA, USA.
- 2015, October, 1** : *Freudenthal Duality, Lie Groups of Type E_7 , and Pre-Homogeneous Vector Spaces.*
Univ. of Bologna, Mathematics Dept., Bologna, Italy.
- 2015, July, 13** : *Freudenthal Duality and Black Holes : from Groups of type E_7 to Pre-Homogeneous Spaces.*
Univ. of Roma “La Sapienza”, Physics Dept., Roma, Italy.
- 2015, April, 28** : *Black Hole Attractors, Charge Orbits and Moduli Spaces.*
CERN, Geneva, Switzerland.
- 2015, March, 5** : *Gravity, Supersymmetry and Attractors.*
“Statale” Univ. of Milan, Phys. Dept., Milan, Italy.
- 2014, November, 7** : *Freudenthal Duality in Gravity: from Groups of Type E_7 to Pre-Homogeneous Spaces.*
IPAM, UCLA, Los Angeles, CA, USA.
- 2014, September, 17** : *The Role of Freudenthal Duality in Gravity: from Groups of Type E_7 to Pre-Homogeneous Spaces.*
Univ. of Genova, Physics Dept., Genova, Italy.
- 2014, September, 9** : *Global Symmetries in (Super)Gravity: Freudenthal Duality, Groups of Type E_7 and Pre-Homogeneous Spaces.*
Univ. of Roma “La Sapienza”, Physics Dept., Roma, Italy.
- 2013, October, 25** : *Groups of Type E_7 in (Super)Gravity: from Freudenthal Duality to Pre-Homogeneous Spaces.*
Univ. of Genova, Physics Dept., Genova, Italy.
- 2013, October 23** : *Dualities Near the Horizon.*
Univ. of Ferrara, Physics Dept., Ferrara, Italy.

- 2013, October 15** : *Freudenthal Duality, Groups of Type E_7 , and Pre-Homogeneous Spaces.*
Univ. of Turin, Theoretical Physics Dept., Turin, Italy.
- 2013, June, 5** : *Dualities Near the Horizon.*
CSIC, Piemonte Orientale Univ., Alessandria, Italy.
- 2013, April, 24** : *Dualities Near the Horizon.*
ITF, KUL, Leuven, Belgium.
- 2013, January, 9** : *Attractive Dynamics and Local Supersymmetry.*
Univ. of Ferrara, Physics Dept., Ferrara, Italy.
- 2012, November, 6** : *Freudenthal Gauge Theory.*
Univ. of Insubria, Como, Italy.
- 2011, November, 17** : *Multi-Centered Black Hole Structures and Groups of Type E_7 .*
IPHT CEA Saclay, Paris, France.
- 2011, November, 11** : *Invariant Structures of Multi-Centered Black Holes.*
“Statale” Univ. of Milan, Phys. Dept., Milan, Italy.
- 2011, June, 1** : *Horizontal Invariants in Multi-Centered Black Holes.*
UCB, Physics Dept., Berkeley, CA, USA.
- 2011, May, 24** : *Multi-Centered Black Holes and Horizontal Symmetry.*
UCLA, Physics and Astronomy Dept., Los Angeles, CA, USA.
- 2010, January, 21** : *Black Attractors.*
“Statale” Univ. of Milan, Phys. Dept., Milan, Italy.
- 2010, January, 12** : *Attractors in Black.*
Univ. of Turin, Theoretical Physics Dept., Turin, Italy.
- 2009, December, 1** : *On the Attractor Mechanism.*
Imperial College, Physics Dept., London, UK.
- 2009, November, 25** : *Attractors in Supergravity.*
King’s College, Mathematics Dept., London, UK.
- 2009, March, 19** : *Moduli Spaces, Charge Orbits and Space-Time.*
Univ. of Minnesota, Fine Theoretical Physics Inst.,
Minneapolis, MN USA.
- 2008, December, 8** : *Attractor Mechanism and Space-Time Singularities.*
Univ. of Cincinnati, Physics Dept., Cincinnati, OH USA.
- 2008, October, 24** : *The Attractor Mechanism in Extremal Black Holes.*
Foundations and Recent Developments.
Univ. of Rome “Tor Vergata”, Physics Dept., Roma, Italy.
- 2006, September, 20** : *Attractors and Black Holes in Supergravity.*
Univ. of Turin, Theoretical Physics Dept., Turin, Italy.
- 2006, February, 27** : *The Attractor Mechanism and Black Holes.*
INFN - Frascati National Laboratories (LNF), Rome, Italy.

- 2002, October, 22** : *CPT Theorem. CPT Violation in Neutral Meson Systems.*
Univ. of Rome “Roma Tre”, “Edoardo Amaldi” Physics Dept.
- 2002, October, 6** : *Elements of Gauge Theories. Physical Consistence of Gauge Group.*
Univ. of Rome “Roma Tre”, “Edoardo Amaldi” Physics Dept.
- 2002, October, 14** : *Elements of Theory of Algebras. From Poincar-Birkhoff-Witt Theorem to Baker-Campbell-Hausdorff formula.*
Univ. of Rome “Roma Tre”, “Edoardo Amaldi” Physics Dept.
- 2002, August, 31** : *Hamilton’s Quaternionic R-algebra and the Rotations in R^3 .*
Univ. of Rome “Roma Tre”, “Edoardo Amaldi” Physics Dept.

Refereeing :

1. Physics Letters B (*The Best Reviewer 2011*);
2. Classical and Quantum Gravity;
3. Letters in Mathematical Physics;
4. European Physics Journal Plus;
5. Il Nuovo Cimento;
6. Journal of High Energy Physics;
7. Nuclear Physics B;
8. SIGMA (Symmetry, Integrability and Geometry : Methods and Applications);
9. Journal of Geometry and Symmetry in Physics;
10. Journal of Physics A;
11. International Journal of Geometric Methods in Modern Physics;
12. Mathematical Reviews (AMS).

Relevant Scientific Techniques and Skills :

Area of research : Attractor Mechanism;
 “Black Objects”;
 Supergravity;
 Supersymmetry;
 Flux Compactifications;
 Spin Chains and AdS/CFT Correspondence;
 Supersymmetric Inflationary Cosmology;
 Field Theory and Gravity on Symmetric and Homogeneous Spaces;
 Exceptional Lie Algebras and Applications in Physics;
 Jordan, Freudenthal and Kantor Triple Systems, and Gauge and Gravity Theories;
 Magic Squares of Lie Algebras;
 Quantum Space-Times;
 Quantum Information Theory.

- Computing** : Expert in :
Word;
Powerpoint;
WinEdit;
Maple;
Mathematica;
Scientific Workplace;
Scientific Word;
LaTeX.
- Languages** : Italian as mother tongue;
English fluent in speaking and writing;
French bases.

Data : 27/12/2017

Luogo : Roma