

Theory Group

@ INFN – National Laboratories, Frascati (LNF)



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Outline

➤ **People @ LNF**

➤ **Resources and Collaborations**

➤ **Main Research Activities 2006-2007**

➤ **Publications 2006-2007** (Proceedings excluded)

People @ LNF

Professor Sergio FERRARA

Professor Fabrizio PALUMBO

INFN First Researcher Stefano BELLUCCI

ER RTN Post-Doc Fellow Cornelius SOCHICHIU

“Enrico Fermi” Grantist Alessio MARRANI

INFN Post-Doc Fellow Armen YERANYAN

ESR RTN Fellow Andrey SHCHERBAKOV

Resources

INFN – LNF : MI12 Project

EU - RTN

INTAS Grant (coordinated by LNF)

Collaborations

- ✓ ITALY : Polytechnic and University, Turin; INFN, Genoa; Milan Univ.
- ✓ USA : Stanford Univ., CA; UC Berkeley, CA; Penn State Univ., PA; CUNY, NY; Maryland Univ., MD
- ✓ SPAIN : Univ. of Valencia; Univ. of Zaragoza
- ✓ UK : Imperial College, London
- ✓ RUSSIA : JINR, Dubna, Russia
- ✓ ARMENIA : Yerevan State Univ.; Artsakh State Univ.

Main Research Activities 2006 - 2007

Attractor Mechanism

Bellucci, Ferrara, Marrani,
Shcherbakov, Yeranyan

Special Geometry, Supergravity

Bellucci, Ferrara

Quantum Information and Extremal BHs

Ferrara

**Non-Perturbative formulation
of Gauge Theories**

Palumbo

AdS/CFT Correspondence

Bellucci, Sochichiu

Supersymmetric Mechanics

Bellucci, Marrani,
Shcherbakov, Yeranyan

Publications 2006 – 2007 (Proceedings excluded)

Attractor Mechanism (1/2)

SB, SF, AM *On some properties of the attractor equations*
PLB635:172,2006, hep-th/0602161

SF, R.Kallosh *On $N=8$ attractors*, PRD73:125005,2006, hep-th/0603247

SF, M. Gunaydin *Orbits and Attractors for $N=2$ Maxwell-Einstein Supergravity Theories in Five Dimensions*, NPB759:1,2006, hep-th/0606108

SB, SF, M. Gunaydin, AM *Charge orbits of symmetric special geometries and attractors*, IJMPA21:5043,2006, hep-th/0606209

SF, E.G.Gimon, R.Kallosh *Magic supergravities, $N=8$ and black hole composites*
PRD74:125018,2006, hep-th/0606211

SB, SF, AM, AY *Mirror Fermat Calabi-Yau Threefolds and Landau-Ginzburg Black Hole Attractors*, Riv.Nuovo Cim.029:1,2006, hep-th/0608091

L.Andrianopoli, R.D'Auria, SF, M.Trigiante *Extremal black holes in supergravity*
hep-th/0611345

Attractor Mechanism (2/2)

R.D'Auria, SF, M.Trigiante Critical points of the Black-Hole potential for homogeneous special geometries, JHEP 0703:097, 2007, hep-th/0701090

L.Andrianopoli, R.D'Auria, SF, M.Trigiante, Black-hole attractors in N=1 supergravity, JHEP 0707:019, 2007, hep-th/0703178

SF, AM N=8 non-BPS Attractors, Fixed Scalars and Magic Supergravities NPB
2007, in press, arXiv:0705.3866

SF, AM On the Moduli Space of non-BPS Attractors for N=2 Symmetric Manifolds
PLB652:111,2007, arXiv:0706.1667

A.Ceresole, SF, AM 4d/5d Correspondence for the Black Hole Potential and its Critical Points, CQG 2007, in press, arXiv:0707.0964

SB, AM, E.Orazi, AS Attractors with Vanishing Central Charge, arXiv:0707.2730

L.Andrianopoli, SF, AM, M.Trigiante Non-BPS Attractors in 5d and 6d Extended Supergravity, arXiv:0709.3488

BOOK : SB, SF, AM
Supersymmetric mechanics. Vol. 2
The attractor mechanism and space time singularities
LNP701:1,2006

Special Geometry, Supergravity

SF, O.Macia *Observations on the Darboux coordinates for rigid special geometry*
JHEP 0605:008,2006, hep-th/0602262

SB, D.O'Reilly *Non-minimal string corrections and supergravity*
Phys.Rev.D73:065009,2006, hep-th/0603033

SF, O.Macia *Real symplectic formulation of local special geometry*
PLB637:102,2006, hep-th/0603111

R.D'Auria, SF, M.Trigiante *On the supergravity formulation of mirror symmetry in generalized Calabi-Yau manifolds*, NPB780:28,2007, hep-th/0701247

Quantum Information and Extremal BHs

M.J.Duff, SF *E(7) and the tripartite entanglement of seven qubits*
PRD76:025018,2007, quant-ph/0609227

M.J.Duff, SF *Black hole entropy and quantum information*, hep-th/0612036

M.J.Duff, SF *E(6) and the bipartite entanglement of three qutrits*, arXiv:0704.0507

Non-Pert. Formulation of Gauge Theories

M.B.Barbaro, R.Cenni, S.Chiacchiera, A.Molinari, FP

Multilevel pairing Hamiltonian versus the degenerate case, [nucl-th/0602070](#) The

S.Caracciolo, V.Laliena, FP

Composite boson dominance in relativistic field theories,

JHEP 0702:034,2007, [hep-lat/0611012](#)

FP *A Semi-variational approach to QCD at finite temperature and baryon density*

[hep-lat/0702001](#)

AdS/CFT Correspondence

SB, P.Y.Castell *Sigma model from $SU(1,1|2)$ spin chain*,

NPB741:297,2006, [hep-th/0602007](#)

CS *On dilatation operator for a renormalizable theory*, [arXiv:0707.3517](#)

Supersymmetric Mechanics (1/2)

SB, L.Mardoyan, A.Nersessian *Hyperboloid, instanton, oscillator*
PLB636:137,2006, hep-th/0602231

SB, S.Krivonos, AS *Hyper-Kahler geometry and dualization*
PRD73:085014,2006, hep-th/0604056

SB, S.Krivonos, AS *Universal superfield action for $N=8 \rightarrow N=4$ partial breaking of global supersymmetry in $D=1$* , PLB638:526,2006, hep-th/0604215

SB, S.Krivonos, AM *A New $N = 8$ nonlinear supermultiplet* PRD74:045005,2006,
hep-th/0605165

SB, S.Krivonos, AS *$N=4, d=3$ nonlinear electrodynamics*
PRD74:065016,2006, hep-th/0606052

SB, A.Nersessian, AY *Hamiltonian reduction and supersymmetric mechanics with Dirac monopole*, PRD74:065022,2006, hep-th/0606152

SB, S.Krivonos *Geometry of $N=4, d=1$ nonlinear supermultiplet*
PRD74:125024,2006, hep-th/0611104

SB, S.Krivonos, AS *Generic $N=4$ supersymmetric hyper-Kahler sigma models in $D=1$* , PLB645:299,2007, hep-th/0611248

Supersymmetric Mechanics (2/2)

SB, S.Krivonos, V.Ohanyan *N=4 supersymmetric MICZ-Kepler systems on S^{*3}*
arXiv:0706.1469

SB, S.Krivonos, A.Sutulin
*Towards N=8 supersymmetric mechanics on the sphere S^{*3}* , arXiv:0706.3466

SB, S.Krivonos, AS *Universal superfield action for N=8 ---> N=4 partial breaking of global supersymmetry in D=1*, PLB638:526,2006, hep-th/0604215

BOOK : SB (Ed.)
Supersymmetric mechanics. Vol. 1
Supersymmetry, noncommutativity and matrix models
LNP698:1,2006

The background is a complex, abstract fractal pattern. It features a dense network of fine, overlapping lines and swirls. The color palette is primarily green, ranging from light lime to deep forest green, with prominent streaks of purple and blue. The overall effect is one of organic, fluid motion, reminiscent of marbled paper or a microscopic view of a liquid crystal. The patterns are most concentrated in the center and right side, with a slight darkening towards the left edge.

Thank You!