SUPERSYMMETRY, QUANTUM GRAVITY AND GAUGE FIELDS

Fact Sheet

Project Information

SUPERFIELDS

Grant agreement ID: 226455

Project closed

Start date
1 June 2009

End date
31 December 2014

Funded under
Specific programme: "Ideas" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Total cost
€ 1 700 000,00

EU contribution
€ 1 700 000,00

Coordinated by
ORGANISATION EUROPEENNE POUR LA RECHERCHE NUCLEAIRE
Switzerland

Objective

This project aims at investigating some crucial issues in globally supersymmetric and Supergravity theories. Firstly, it focuses on perturbative and non-perturbative sources of Supersymmetry Breaking in the low-energy effective Supergravity description of Superstrings and M-theory. These include Gaugings and Fluxes in compactifications from higher dimensions, Gaugino Condensation and other non-

perturbative effects generated by (unoriented) D-brane instantons. Secondly, it explores the physics of extremal Black Holes by means of the Attractor Mechanism, that relates their Entropy to the extrema of an Effective Potential. The tantalizing analogy with moduli stabilization in flux compactifications is considered in detail. Moreover, the deep connection between the Entropy-Formula and certain topological string partition functions is exploited to improve the connection between macroscopic and microscopic interpretations. The holographic (AdS/CFT) correspondence conjectured by Maldacena between (super)conformal Yang-Mills theories and certain (super)gravity theories in Anti De Sitter spaces is analyzed in view of the attractive nature of universal horizon geometries and in relation to Higher-Spin Symmetries, that may be associated with bulk duals of certain gauge-invariant composite operators on the boundary. The project also addresses the possible link between higher-spin theories and an unbroken phase of Superstring or M-theory. The project will be carried out through the abilities and the skills of the PI and of the team members, with their complementary expertise on different but interrelated topics in the holographic approach to modern theories of quantum gravity. Supersymmetry and gauge principles will serve as basic tools for their research.

Fields of science (EuroSciVoc)

natural sciences > physical sciences > astronomy > astrophysics > **black holes**

natural sciences > mathematics > pure mathematics > **geometry**

natural sciences > physical sciences > **theoretical physics**

Keywords

black hole attractors | branes | extra dimensions | high spin fields | supergravity

Programme(s)

FP7-IDEAS-ERC - Specific programme: "Ideas" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Topic(s)

ERC-AG-PE2 - ERC Advanced Grant - Fundamental constituents of matter

Call for proposal

ERC-2008-AdG
See other projects for this call

Funding Scheme

ERC-AG - ERC Advanced Grant

Host institution

ORGANISATION EUROPEENNE POUR LA RECHERCHE NUCLEAIRE

EU contribution

€ 689 400,00

Total cost

No data

Address

ESPLANADE DES PARTICULES 1 PARCELLE 11482 DE MEYRIN BATIMENT CADASTRAL 1046
1211 Meyrin
Switzerland

Region

Schweiz/Suisse/Svizzera > Région lémanique > Genève

Activity type

Research Organisations

Principal investigator

Sergio Ferrara (Prof.)

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Beneficiaries (2)

ORGANISATION EUROPEENNE POUR LA RECHERCHE NUCLEAIRE

Switzerland

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Total cost

No data

ISTITUTO NAZIONALE DI FISICA NUCLEARE

Italy

EU contribution

€ 1 010 600,00

Address

Via Enrico Fermi 54
00044 Frascati

Region

Centro (IT) > Lazio > Roma

Activity type

Research Organisations

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Total cost

No data

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