

Cianfrani Francesco



Position: Postdoctoral Research Fellow (Della Riccia grant)

Period covered: January- December 2008

I Scientific Work

Investigation on the semi-classical limit of the Dirac field on a curved space-time;

Extension of Loop Quantum Gravity formulation to a generic Lorentz frame

Study of phenomenological aspects of Kaluza-Klein theories and on the role of spinors in such models.

II Conferences and educational activities

Conferences:

3rd Stueckelberg Workshop on Relativistic Field Theories, Pescara (Italy), July 8-18, 2008.

III 2007-2008 List of Publications

Boost invariance of the gravitational field dynamics: quantization without time gauge, F. Cianfrani, G. Montani, *Class. Quant. Grav.*, 24, (2007)4161.

Dixon-Souriau equations from a 5-dimensional spinning particle in a Kaluza-Klein framework, F. Cianfrani, I. Milillo, G. Montani, *Phys. Lett. A*, 366, (2007)7

Spinning particles in General Relativity, F. Cianfrani, G. Montani, *Proceedings of the I Stueckelberg Workshop, Nuovo Cimento B*, 122, (2007)173

The Electro-Weak model as low-energy sector of 8-dimensional General Relativity, F. Cianfrani, G. Montani, *Proceedings of the I Stueckelberg Workshop, Nuovo Cimento B*, 122, (2007)213

E.C.G. Stueckelberg: A Forerunner of modern physics., F. Cianfrani, O.M. Lecian, *Proceedings of the I Stueckelberg Workshop, Nuovo Cimento B*, 122, (2007)123

The electro-weak model as a phenomenological issue of multidimensions, F. Cianfrani, G. Montani, *Proceedings of the XI Marcel Grossmann meeting on Recent Developments in Theoretical and*

Experimental General Relativity, Gravitation, and Relativistic Field Theories, Berlin, Germany, 23-29 Jul 2006.

On the geometrization of the electro-magnetic interaction for a spinning particle, F. Cianfrani, I. Milillo, G. Montani, Proceedings of the XI Marcel Grossmann meeting on Recent Developments in Theoretical and Experimental General Relativity, Gravitation, and Relativistic Field Theories, Berlin, Germany, 23-29 Jul 2006.

Geometrization of the electro-weak model bosonic component, F. Cianfrani, G. Montani, Int. J. Theor. Phys., 46, (2007)471

Dirac equation in curved space-time versus Papapetrou spinning particles, F. Cianfrani, G. Montani, Europhys. Lett., in press.

Particles and fields within a unification scheme, F. Cianfrani, V. Lacquaniti, G. Montani, Proceedings of the X Italian-Korean Symposium on Relativistic Astrophysics, held in Pescara (Italy) on June 25-30 2007

The role of the time gauge in the 2nd order formalism, F. Cianfrani, G. Montani, Proceedings of the II Stueckelberg Workshop, Int. J. Mod. Phys. A, 23 (Issue 8), (2008)1214

Curvature-spin coupling from the semi-classical limit of the Dirac equation, F. Cianfrani, G. Montani, Proceedings of the II Stueckelberg Workshop, Int. J. Mod. Phys. A, 23, No: 8, (2008)1274

Elementary particle interaction from a Kaluza-Klein scheme, F. Cianfrani, G. Montani, Proceedings of the II Stueckelberg workshop, Int. J. Mod. Phys. A, 23 No: 8, (2008)1182

Synchronous Quantum Gravity, F. Cianfrani, G. Montani, Proceedings of the II Stueckelberg workshop, Int. J. Mod. Phys. A, 23, No: 8, (2008)1105

E.C.G. Stueckelberg: A Forerunner of modern physics II., F. Cianfrani, O.M. Lecian, Proceedings of the II Stueckelberg Workshop, Int. J. Mod. Phys. A, 23, No: 8, (2008)1112

General Relativity as Classical Limit of Evolutionary Quantum Gravity, G. Montani, F. Cianfrani, Class. Quant. Grav., 25, (2008)065007

Boost symmetry in the Quantum Gravity sector, F. Cianfrani, G. Montani, Proceedings of the "4th Italian-Sino Workshop on Relativistic Astrophysics", AIP Conf. Proc., 966, (2008)249.

Low-energy sector of 8-dimensional General Relativity: Electro-Weak model and neutrino mass, F. Cianfrani, G. Montani, Int. J. Mod. Phys. D, 17, No 5, (2008)785

Francesco Cianfrani was born in Isernia on January 1st 1982. He got a Master Degree in Physics at University of Roma "Sapienza" with a thesis on "Kaluza-Klein theories" under the supervision of Prof. Remo Ruffni and Dr. Giovanni Montani. Then he became an IRAP-PhD student and he focused his scientific research on unification geometrical theories and on quantum gravity. On April 2008 he got the Irap-PhD with the thesis "Classical and quantum fields coupling with geometry viewed in a unification picture". Then he won a post-doctoral fellowship (funded by "Fondazione Angelo Della Riccia" and University of Roma "Sapienza") for spending a period of six months at Queen Mary, University of London. There he participated at the activities of the group on gravitation and cosmology, supervised by Malcom MacCallum. He collaborated with several researchers within the Physics Department of Roma "Sapienza" and scientists of ICRANet. He participated at international meetings and workshops. He is the author of twenty scientific papers published on international journals. He is also a member of ICRA, ICRANet, SIF (Societ Italiana di Fisica) and APS (American Physics Society).