

## Rueda Hernández Jorge Armando

Position: PhD Student-University of Rome "La Sapienza"

Period covered: 2006-2009



### I Scientific Work

- **Relativistic Astrophysics:** The general properties of Neutron Stars as mass and radius are studied on the light of general relativity. Particular attention is devoted to the electromagnetic properties and their influence on these properties and eventually on the gravitational collapse to a black hole. Also the most external part of neutron stars, the crust, is studied and its connection with the Fireshell model of GRBs is established.
- **Critical Fields in Massive Cores:** The existence of electric fields of the order of the critical field of Sauter-Heisenberg-Euler-Schwinger for electron-positron pair production in massive cores within the Thomas-Fermi model is studied. We have extended the treatment to the General Relativistic case.
- **Vacuum polarization processes:** It is studied the effect of critical fields for pair creation on the geometry and energetics of compact objects like black holes.

### II Conferences and educational activities

#### Conferences and Other External Scientific Work

- First Cesare Lattes Meeting on Gamma Ray Bursts, Black Holes and Supernovae, Mangaratiba (Brazil), February 25 - March 3, 2007
- Tenth Italian-Korean Symposium on Relativistic Astrophysics, Pescara (Italy), June 25 - 30, 2007
- Fourth Italian-Sino Workshop on Relativistic Astrophysics, Pescara (Italy), July 20 - 30, 2007
- April Meeting of the American Physical Society, St. Louis (Missouri - USA), April 12-15, 2008
- Third Stueckelberg Workshop on Relativistic Field Theories, Pescara (Italy), July 8 - 18, 2008

### III 2007-2008 List of Publications

General Relativistic Radiant Shock Waves in the Post-Quasistatic Approximation, Jorge A. Rueda H. and L. A. Nuñez, Journal of Physics: Conf. Series 66 012042

On the "Dyadotorus" of the Kerr-Newman Spacetime, Christian Cherubini, Andrea Geralico, J. A. Rueda H. and Remo Ruffini, AIP Conf. Proceedings 966 pp. 123-126

The Electrodynamics of the Core and the Crust components in Neutron Stars, B. Patricelli, M. Rotondo, J. A. Rueda H. and R. Ruffini, AIP Conf. Proceedings 1059 pp. 68-71

On Gamma Ray Bursts, Remo Ruffini et al., To appear on the Proceedings of the Eleventh Marcel Grossmann Meeting, Berlin (Germany), arXiv:0804.2837