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The physics of GRBs

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The fundamental role of recent astrophysical observations pertaining to GRBs are shown to promote a revival of fundamental issues in GRBs, in black hole physics and in relativistic quantum field theory. The possibility to observe for the first time the process of vacuum polarization at the energy scale of 10^{54} ergs is presented. The profound consequences of the results on the physics of neutron stars and on black hole electrodynamics are presented and discussed. Some new perspectives in relativistic quantum field theory are as well outlined. In collaboration with Maria Grazia Bernardini, Carlo Luciano Bianco, Donato Bini, Letizia Caito, Pascal Chardonnet, Maria Giovanna Dainotti, Federico Fraschetti, Andrea Geralico, Roberto Guida, Michael Rotondo, Gregory Vereshchagin, and She-Sheng Xue, ICRA, ICRANet and Dipartimento di Fisica - Università di Roma “La Sapienza”.