

Bini Donato



Position: Reasercher at Istituto per le Applicazioni del Calcolo, "M. Picone"
CNR Viale Manzoni, 30 I-00185 Roma
Period covered: 1995 -today.

I Scientific Work

The main topic of my interest is General Relativity with special attention to several classical aspects, like the analysis and the interpretation of exact solutions of Einstein's field equations.

In particular, I'm interested in spacetime splitting techniques, measurement process and the role of the observer in General Relativity, particle dynamics in certain fixed gravitational backgrounds (either test particles with scalar structure: the mass or particles with internal structure: spinning test particles and particles with quadrupolar structure), gravitational perturbations, gravitational waves.

I'm an expert user of MAPLE™ tensor calculus package.

II Conferences and educational activities

Conferences and Other External Scientific Work

Since 1988 I have participated in all the international meetings of the Marcel Grossmann series as well as all the conferences of the ICRA- ICRANet series.

Diploma thesis supervision

I've been supervisor of the Diploma thesis of many students at the University of Rome "La Sapienza", since 1995:

G. Spoliti, A. Merloni, C. Germani, C. Cherubini, G. Miniutti, G. Cruciani, A. Geralico, A. Lunari, M. De Mattia.

Ph.D thesis supervision

Dr. V. Montaquila, Physics departments of the University of Naples "Federico II."

Other Teaching Duties

I'm Contract Professor of Physics since 2004 at the faculty of Medicine of the University Campus Biomedico, in Rome. From 2007-2009 I have also been Contract Professor of Physics at the Nursery School of the same university.

Work With Postdocs

A Geralico, post-doc student at the University of Rome "La Sapienza."

III Service activities

Scientific collaboration with:

Prof. R. Ruffini (University of Rome, Italy and ICRANet);

Prof. R.T. Jantzen (Villanova Univesity, USA and ICRANet);

Prof. S. Filippi (University Campus Biomedico, Rome, Italy and ICRANet).

Dr. C. Cherubini (University Campus Biomedico, Rome, Italy and ICRANet).

Outside ICRANet

Scientific collaboration with:

Prof. F. de Felice (University of Padova, Italy);

Prof. L. Lusanna (INFN Florence, Italy);
Prof. P. Fortini (University of Ferrara);
Dr. A. Ortolan (INFN Legnaro, Padova);
Prof. O. Semerak (University of Prague);

Other

I'm currently doing referee activity for a large number of international journals in the field of General Relativity and I'm a reviewer for Mathreview.

For the years 2002-2004 I have been the leader of a collaboration project between the Italian Research Council (CNR) and the analogous institution in Venezuela. Title of the project: Construction of 3d numerical models for the study of magnetohydrodynamics in gravitational physics and astrophysics.

For the years 2007-2008 I have been the leader of young researchers projects of INDAM (Istituto Nazionale di Alta Matematica). Title of the project: Light coordinates and spacetime topography.

For the years 2008-2009 I have been the leader of young researchers projects of INDAM (Istituto Nazionale di Alta Matematica). Title of the project: Sistemi di Posizionamento Globale relativistici

2010 List of Publications

Published papers

Bini D., C. Cherubini, S. Filippi, A. Gizzi and P. E. Ricci
On the universality of spiral waves
Communications in Computational Physics (CiCP), vol. 8, pp. 610-622, 2010

Bini D., Geralico A., Kerr R.P.
The Kerr-Schild ansatz revised
International Journal of Geometric Methods in Modern Physics (IJGMMP)
vol.7, 693-703, 2010

Bini D., Geralico A.
Spinning bodies and the Poynting-Robertson effect in the Schwarzschild spacetime
Classical and Quantum Gravity, vol. 27, 185014, 2010.

Bini D., C. Cherubini, S. Filippi, Geralico A.
Effective geometry of the $n=1$ uniformly rotating self-gravitating polytrope
Physical Review D, vol. 82, 044005 2010

Bini D., Geralico A., Jantzen R. T.
Spin-geodesic deviations in the Schwarzschild spacetime
General Relativity and Gravitation, to appear, 2010

De Felice F., Bini D.
Classical Measurements in Curved Space-Times
Series: Cambridge Monographs on Mathematical Physics, Cambridge, UK, 2010

Bini D., Geralico A., Jantzen R.T.
Fermi coordinates in Schwarzschild spacetime: closed form expressions
General Relativity and Gravitation, submitted, 2010.

Gizzi A., Bernaschi M., Bini D., Cherubini C., Filippi S., Melchionna S., Succi S.
Three-band decomposition analysis of wall shear stress in pulsatile flows
Physical Review E, submitted, 2010.

Bini D., Geralico A., Jantzen R. T., Semerak O. and Stella L.

The general relativistic Poynting-Robertson effect II: A photon flux with nonzero angular momentum
Classical and Quantum Gravity, submitted, 2010.