

Bini Donato

Position: Reasercher at

Istituto per le Applicazioni del Calcolo, CNR

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 MAPLETM 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

I'm a co-tutor of Dr. V. Montaquila, a Ph.D. student at the 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

I'm continuously working with 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 University, USA and ICRANet);
Prof. B. Mashhoon (University of Missouri-Columbia 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. A. Tartaglia (Politecnico of Turin, Italy)
Prof. P. Fortini (university of Ferrara)
Dr. A. Ortolan (INFN Legnaro, Padova)

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'm 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'm leader of young researchers projects of INDAM (Istituto Nazionale di Alta Matematica). Title of the project: *Sistemi di Posizionamento Globale relativistici*

2009 List of publications

Bini D., Cherubini, C., Geralico, A., Ortolan, A.
Dixon's extended bodies and weak gravitational waves
General Relativity and Gravitation, vol. 41, 105, 2009.

Bini D., Capozziello S., Esposito G.
Gravitational waves about curved backgrounds: a consistency analysis in De Sitter spacetime,
International Journal of Geometric Methods in Modern Physics,
Vol. 5, No. 7 1069–1083, 2008.

Bini D., Esposito G., Montaquila R.V.,
The vector wave equation in de Sitter space-time
General Relativity and Gravitation, 2009, in corso di stampa.

Bini D., Cherubini C., Filippi S.
On vortices heating biological excitable media,
Chaos, Solitons and Fractals vol. 42, 2057–2066, 2009.

Bini D., Cherubini C., Geralico A., Jantzen R. T.
Electrocardiogram of the Mixmaster Universe,
Classical and Quantum Gravity, vol. 26, 025012, 2009.

Bini D., Jantzen R. T., Stella L.
The general relativistic Poynting-Robertson effect
Classical and Quantum Gravity, vol. 26, 055009, 2009.

Bini D., Cherubini C., Filippi S., Geralico A.
*Extended bodies with quadrupole moment interacting with gravitational monopoles:
reciprocity relations*
General Relativity and Gravitation, 2009, in corso di stampa.

Bini D., Geralico A., Luongo O., Quevedo H.
*Kerr spacetime with an arbitrary mass quadrupole moment: geometric properties vs particle
motion*,
Classical and Quantum Gravity, vol. 26, 225006 (23pp), 2009.

Bini D., Geralico A., Jantzen R.T.
“Exact” Fermi coordinates in the Schwarzschild spacetime,
Classical and Quantum Gravity, submitted, 2009.