

## Cherubini Christian



Position: University Researcher (Fis/02) in Theoretical Physics

Integrated Center for Research

Biomedical Engineering Faculty

University "Campus Bio-medico"

Period covered: 1st November 2007-present

### I Scientific Work

- Astrophysics of self-gravitating fluids.
- General relativistic perturbation theory.
- Cosmology.
- Numerical Relativity.
- Acoustic black holes.
- Theoretical biophysics focused on pathological physiology of cardiac and neural tissues and on cancer growth modelling.

### II Conferences and educational activities

#### Conferences and Other External Scientific Work

1999 -Second ICRA Network Workshop "Chaotic Universe" Rome-Pescara (ITALY).

-Third ICRA Network Workshop "Electrodynamics and Magnetohydrodynamics around Black Holes" Rome-Pescara (ITALY).

2000 -9th Marcel Grossmann a Roma (ITALIA).

2001 -Royal Astronomical Society meeting on Cosmological Models, London, (GREAT BRITAIN).

2002 -Wheeler Symposium, Princeton NJ (USA).

2003 -10th Marcel Grossmann in Rio de Janeiro (BRASIL).

-8th Italian-Korean Symposium on Relativistic Astrophysics in Pescara (ITALY).

-Inaugural Meeting of the Center for Gravitational Wave Astronomy,  
Brownsville, TX (USA)

2004 -Elba Meeting in Honour of Y. Choquet-Bruhat “Analysis, Manifolds  
And Geometric Structures in Physics”, Isola d’Elba (ITALY).

2005 - Russian-Italian Lifshitz-Zeldovich Meeting on Relativistic Astrophysics, Pescara  
(ITALY)

-9th Italian-Korean Symposium on Relativistic Astrophysics, Seoul (SOUTH  
KOREA) and Mt.Kumgang (NORTH KOREA).

-COMSOL Italian Multiphysics Meeting, Milan (ITALY).

2006 -Bego scientific Rencontres, Nice (FRANCE).

-Eleventh Marcel Grossmann Meeting on General Relativity, Berlin  
(GERMANY).

-COMSOL Users Conference, Milan (ITALY).

2007 -Cardiac MEF and Arrhythmias Conference, Oxford (GREAT BRITAIN).

-10th Italian-Korean Symposium on Relativistic Astrophysics in Pescara (ITALY).

-4th Italian-Sino Workshop on Relativistic Astrophysics in Pescara (ITALY).

-APS Meeting in Jacksonville (USA)

2008 - Experimental Chaos Conference in Catania (Italy)

### **Teaching Duties**

2003/04 Assistant “General Physics I”

(Engineering Faculty, University Campus Bio-Medico)

2004/05 Assistant “General Physics I” and “Dynamics of Complex Physiological Systems”

(Engineering Faculty, University Campus Bio-Medico)

2005/06 Assistant “General Physics I” and “Dynamics of Complex Physiological Systems”

(Engineering Faculty, University Campus Bio-Medico)

2006/07 Assistant “General Physics I” and “Dynamics of Complex Physiological Systems”

(Engineering Faculty, University Campus Bio-Medico)

2007/08 Lecturer "Physics" (Alimentation and Human Nutrition Sciences, Medicine Faculty, University Campus Bio-Medico) and Assistant "General Physics I" and "Dynamics of Complex Physiological Systems" (Engineering Faculty, University Campus Bio-Medico)

2008/09 Lecturer "Physics" (Alimentation and Human Nutrition Sciences, Medicine Faculty, University Campus Bio-Medico) and Assistant "General Physics I" and "Dynamics of Complex Physiological Systems" (Engineering Faculty, University Campus Bio-Medico)

### **Work With Postdocs**

The main collaboration of Dr Cherubini with ICRANET postdocs has been with Dr Andrea Geralico, in relation with perturbation theory in General Relativity and quasilocal energy definitions in charged and rotating black hole spacetimes (Dyadotorii). Moreover in this context a collaboration with a doctoral student, Mr Jorge Rueda, has been established.

### **III Service activities**

#### **Within ICRANet**

Organization of conference activities in the ICRA center of Pescara (3rd ICRA Network workshop and Sixth Italo-Korean Meeting 1999) as well as in the organization of the 9<sup>th</sup> Marcel Grossmann in Rome (2000).

#### **Other**

Dr Cherubini has a longstanding collaboration with other ICRANET scientists. In particular in collaboration with Dr Donato Bini, Prof. Robert T Jantzen and Prof. Remo Ruffini he has written plenty articles in various areas of General Relativity. In collaboration with Dr Giovanni Montani he has studied some problems of cosmology while with Prof. Simonetta Filippi he is involved in research activities in the fields of Stellar and Galactic Structures and Complex Systems in Nature.

### **IV 2007-2008 List of Publications**

Bini D., Cherubini C. and Jantzen R.T, "The speciality index and the Lifshitz-Khalatnikov Kasner index parametrization" Class.Quantum. Grav. vol. 24, p. 5627 (2007).

Bini D., Cherubini C., Geralico A. and Jantzen R.T, "Circular Motion in Accelerating Black Hole spacetimes" *Int.J.Mod.Phys.D* 6, p.1813 (2007).

Bini D., Cherubini C., Geralico A. and Jantzen R.T, "Physical frames along circular orbits in stationary axisymmetric spacetimes" *Gen. Rel. and Grav.*, vol 40, p.985 (2008).

Cherubini C., Filippi S., Nardinocchi P. and Teresi L., "An electromechanical model of cardiac tissue: Constitutive issues and electrophysiological effects", *Progress in biophysics and molecular biology*, 97: 562 (2008).

D. Bini, Cherubini and S. Filippi, "Effective geometries in self-gravitating polytropes", *Phys. Rev. D* 78, 064024 (2008).

Bini D., Cherubini C., Geralico A. "Massless field perturbations of the spinning C metric" , *J. Math. Phys.* 49, 062502 (2008)

Bini D., Cherubini C., Chicone C. and Mashhoon M. "Gravitational induction" , *Class.Quantum. Grav.* vol. 25, in press (2008).

Bini D., Cherubini C., Geralico A. and Ortolan A., "Dixon's extended bodies and weak gravitational waves" *Gen. Rel. and Grav.*, in press (2008).

Cherubini C., Geralico A., Rueda J.H. and Ruffini R., "On the "Dyadotorus" of the Kerr-Newman Spacetime" *AIP Conf. Proc*, Volume 966, pp. 123 (2008).