

## **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-today

### **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)
- 2009 - 2nd Italian-Pakistani Workshop Relativistic Astrophysics in Pescara (ITALY)

### **Other 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 “Mechanics and Thermodynamics” and “Dynamics of Complex Physiological Systems” (Engineering Faculty, University Campus Bio-Medico)

2009/10 Lecturer “Physics” (Alimentation and Human Nutrition Sciences, Medicine Faculty, University Campus Bio-Medico) and Assistant “Mechanics and Thermodynamics” and “Dynamics of Complex 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 quasi-local 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, Effective Geometries and Complex Systems in Nature.

## 2009 List of Publications

Cherubini C., Geralico A, Rueda J.A.H and R. Ruffini R “e<sup>-</sup>-e<sup>+</sup> pair creation by vacuum polarization around electromagnetic black holes”. Phys Rev D ,79; p. 124002-1 (2009).

Cherubini C. and Filippi S “Lagrangian field theory of reaction-diffusion”. Phys Rev E, 80; 046117 (2009).

Bini D, Cherubini C., Geralico A, Ortolan A “Dixon’s extended bodies and weak gravitational waves”. Gen. Rel. and Grav, 41; 105 (2009).

Bini D, Cherubini C., Geralico A and Jantzen R.T “Electrocardiogram of the Mixmaster universe”. Class. Quantum Grav, 26; 025012 (2009)

Bini D, Cherubini C. and Filippi S. ”On vortices heating biological excitable media”. Chaos, Solit. and Fract., 42; 2057 (2009)