

# Carlos Palenzuela Luque

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## CONTACT INFORMATION

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## EDUCATION

**Universitat de les Illes Balears (UIB)**, Palma de Mallorca, Balears, SPAIN

Graduated in Physics, June 2000

Ph.D. Physics, September 2004

- Thesis Title: “Formalisms and Tools for Numerical Relativity: from general covariance to Black Hole simulations”
- Advisor: Carles Bona and Joan Masso

## ACADEMIC EXPERIENCE

**Louisiana State University**, Baton Rouge, Louisiana USA

*Postdoctorate Researcher*

*Horace Hearne Jr. Institute for Theoretical Physics*

**September, 2004 - present**

Investigations include gauge conditions, black hole evolutions and boson stars.

**Universitat de les Illes Balears**, Palma de Mallorca, Balears SPAIN

*Fellowship from the Govern de les Illes Balears*

**September, 2001 - 2004**

*Teacher assistant*

**September, 2000 - 2001**

Formulations of Einstein Equations and High Resolution Shock Capturing methods.

## PUBLICATIONS

*Coherence Resonance in Chaotic Systems*, C. Palenzuela, R. Toral, C. Mirasso, O. Calvo and J. Gunton, *Europhysics Letters* **56**, 347 (2001).

*The Gravitational Radiation degrees of freedom in Hyperbolic Systems for Numerical Relativity*, C. Bona and C. Palenzuela, *Phys. Rev. D* **66**, 064020 (2002).

*A 3+1 covariant suite of Numerical Relativity Evolution Systems*, C. Bona, T. Ledvinka and C. Palenzuela, *Phys. Rev. D* **66**, 084013 (2002).

*General-covariant constraint-free evolution system for Numerical Relativity*, C. Bona, T. Ledvinka, C. Palenzuela and M. Zacek, *Phys. Rev. D* **67**, 104005 (2003).

*Symmetry-breaking mechanism for the  $Z_4$  general-covariant evolution system*, C. Bona, T. Ledvinka, C. Palenzuela and M. Zacek, *Phys. Rev. D* **69**, 064036 (2004).

*Dynamical shift conditions for the  $Z_4$  and BSSN hyperbolic formalisms*, C. Bona and C. Palenzuela, *Phys. Rev. D* **69** 104003 (2004).

*Constraint-preserving boundary conditions in the  $Z_4$  Numerical Relativity formalism*, C. Bona, T. Ledvinka, C. Palenzuela and M. Zacek, *Class. Quant. Grav.* **22**, 2615-2634 (2005).

*Geometrically motivated hyperbolic coordinate conditions for numerical relativity: Analysis, issues and implementations*, C. Bona, L. Lehner and C. Palenzuela, *Phys. Rev. D* **72** , 104009 (2005).

*Almost-stationary motions and gauge conditions in General Relativity*, C. Bona, J. Carot and C. Palenzuela, Phys. Rev. D **72** , 124010 (2005).

PAPERS SUBMITTED FOR PUBLICATION *Head-on collision of boson stars*, C. Palenzuela, I. Olabarrieta, L. Lehner and S. Liebling, submitted to Phys. Rev. D, available at gr-qc/0612067 .

*How far away is far enough for extracting numerical waveforms, and how much do they depend on the extraction method?*, E. N. Dorband, C. Palenzuela, E. Pazos, E. Schnetter and M. Tiglio, submitted to Class. Quant. Grav.

BOOKS Chapter in *Flux-limiter methods in 3D numerical relativity*, C. Bona and C. Palenzuela, in "Current Trends in Relativistic Astrophysics", Lect. Notes Phys. **617** 130-139 (2003).

Co-author in *Elements of Numerical Relativity From Einstein's Equations to Black Hole Simulations Series*, Lecture Notes in Physics, Vol. 673 (2004)  
C. Bona, C. Palenzuela Luque, Hardcover ISBN: 3-540-25779-9

CONFERENCE PRESENTATIONS September 4-8, 2006: XIX Spanish Relativity Meeting in Palma de Mallorca (SPAIN).

July 17-21, 2006: "New Frontiers in Numerical Relativity" in Potsdam, Berlin (GERMANY).

September 6-10, 2005: XXVIII Spanish Relativity Meeting in Oviedo (SPAIN).

December 1-12, 2003: Second "Apples-with-Apples" workshop in Mexico City (MEXICO).

September 18-21, 2001: XXIV Spanish Relativity Meeting in Madrid (SPAIN).