Personal Information

Name:	**George Pappas**
Nationality:	Greek
Date of Birth:	02 January 1978
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Spoken Languages:	Greek (mother tongue), English (first certificate)
Computer skills:	Basic programming in Fortran and BASIC. Advanced programming in Mathematica.

Academic Record

PhD: Physics Department, University of Athens, Greece
PhD by Research in Astrophysics, Astronomy and Mechanics, June 2012
PhD Thesis title: *Applications of the theory of General Relativity: the space-time around compact objects*
Supervisor: Theocharis A. Apostolatos

MSc: Physics Department, University of Athens, Greece
MSc by Research in Astrophysics, Astronomy and Mechanics, Feb. 2005
MSc Thesis title: *Methods for generating solutions of the Einstein field equations*
Supervisor: Theocharis A. Apostolatos

Undergraduate: Physics Department, University of Athens, Greece
Degree in Physics, Oct. 2001
Degree Thesis title: *Relativistic gravitational collapse of spherically symmetric stars*
Supervisor: Theocharis A. Apostolatos

Membership in Scientific Communities

- Junior Member of the "Hellenic Society on Relativity, Gravitation and Cosmology" (HSRGC).

Funding-Grants

- "PYTHAGORAS I" Research funding program, Grant No 70/3/7396 (April 2004 - December 2007).
- IKY-DAAD funding program (for the years 2010-2011)
- DAAD scholarship (DAAD-Stipendium, for the period, Sep 2012 - Feb 2013)

Academic Career

Sep 2012 - Feb 2013:	Postdoc for the Theoretical Astrophysics group, Eberhard-Karls University of Tubingen.
Nov 2005 - Jun 2012:	PhD student in Section of Astrophysics, Astronomy and Mechanics, Physics Department, University of Athens, Greece.
Dec 2001 - Feb 2005:	Graduate (MSc) student in Section of Astrophysics, Astronomy and Mechanics, Physics Department, University of Athens, Greece.
Oct 1996 - Oct 2001:	Undergraduate student, Physics Department, University of Athens, Greece.

Teaching Experience

Supervisor at laboratory courses Physics I (Mechanics, 1st semester), Physics II (Thermodynamics, 2nd semester) and Physics IV (Waves-Optics, 4th semester)[2001-2005, Department of Physics, University of Athens, Greece]. It included teaching, supervision and guidance in conducting experiments, correction and grading of the students' assignments.

Short Record

I was born in Athens in 1978. In 1995 I graduated from high school and took Panhellenic Exams in 1996, to enter the Physics Department of the University of Athens, Greece. During my studies, my interests turned to Astrophysics and particularly Astrophysical applications of the General Theory of Relativity. My degree thesis was supervised by Ass. Prof. T. Apostolatos and its title was "Relativistic gravitational collapse of spherically symmetric stars". I graduated in Octomber, 2001 (grade: 7.24/10) and in December, 2001, I enrolled for a Masters Degree in Astrophysics at the same Department. I was awarded a Master's degree in Astrophysics in February 2005. I worked under the supervision of Ass. Prof. Apostolatos on my Master's thesis in General Relativity and more specifically on methods for generating axially symmetric solutions of Einstein field equations. Since November, 2005 I have been working on a PhD thesis under the supervision of Ass. Prof. Apostolatos. In August of 2009, I interrupted my research in order to serve my military service (which is obligatory). I was discharged in April 2010 from the army having the rank of *corporal* and resumed my PhD. I concluded my PhD research by defending my thesis in June 2012 which was on the subject of using analytic solutions of the Einstein field equations to describe the spacetime around compact objects and study astrophysical processes. At the moment I am continuing my research with the Group of Theoretical Astrophysics at Tübingen under a DAAD scholarship.

Research Interests

Compact objects: Equilibrium, stability and radial pulsations in full relativity. Issues concerning the equation of state and the maximum mass of neutron stars.

Multipole moments in General Relativity: Geroch-Hansen-Fodor moments. Their application in the construction of analytic spacetimes suitable for astrophysical applications and their use as probing tools for astrophysical systems such as XRBs.

Stationary axisymmetric spacetimes in GR: Methods for generating solutions of the Einstein field equations in vacuum, ie., the Ernst formulation, the Geroch transformation and the method of generating asymptotically flat vacuum spacetimes developed by Sibgatullin and Manko. Applications:

• Relate the Ernst potential to Astrophysical problems through the correlation of the multipole moments of the spacetime to the multipole moments of the matter distribution.

• Construct analytic metrics suitable for describing the exterior of compact objects and consider their application to astrophysical problems such as rotating neutron stars, accretion disks and QPOs.

• Probe issues concerning the nature of compact objects and their deviation from classical GR solutions like Schwarzschild and Kerr.

Rotating spacetimes beyond GR: Rotating spacetimes in alternative theories of gravity, i.e., their properties and their astrophysical signatures. Testing GR and alternative theories by means of astrophysical observations.

Seminars and Conferences

• NEB IX "Recent Developments in Gravity", September 2000, Ioannina, Greece.
• 2nd Hellenic Cosmology Meeting, 19-20 April 2001, National Observatory of Athens, Penteli.
• NEB X "Recent Developments in Gravity", 31 May - 3 June 2002, Chalkidiki, Greece. • SOLMAG 2002, Euroconference and IAU Colloquium 188 "Magnetic Coupling of the Solar Atmosphere", Santorini, Greece, 11-15 June 2002 (Poster presentation).
• NEB XI "Recent Developments in Gravity", 2-5 June 2004, Lesvos island, Greece.
Talk title: "On the Multipole Moments of Axially Symmetric Spacetime".
• University of Athens, March 11th 2005, Athens, Greece.
Talk title: "Maximum masses of white dwarfs and neutron stars".
• University of Athens, January 13th 2006, Athens, Greece.
Talk title: "The concept of acoustic analogues of black holes".
• 42nd Karpacz Winter School of Theoretical Physics, "Current Mathematical Topics in Gravitation and Cosmology", Ladek, Poland, 6-11 February 2006.
• NEB XII "Recent Developments in Gravity", 29 June - 2 July 2006, Nafplio, Greece.
• 4th Aegean Summer School, "Black Holes", Mytilene, Island of Lesvos, Greece, 17-22 September 2007.
• NEB XIII "Recent Developments in Gravity", 3-6 June 2008, Thessaloniki, Greece.
Talk title: "Matching of Analytical and Numerical Solutions for Neutron Stars of Arbitrary Rotation".
• 2008 Onassis Lectures in Physics, "COSMOLOGY: AN ASTROPHYSICAL PERSPECTIVE", June 30 - July 4, Heraklion, Greece.
• University of Tübingen, Institut für Astronomie & Astrophysik, November 24th 2010, Tübingen, Germany.
Talk title: "The spacetime exterior to rotating neutron stars and the possibility of constraining the equation of state from QPOs".
• University of Athens, November 4th 2011, Athens, Greece.
Talk title: "On the recent measurement of the distance, the mass and the spin of Cygnus X-1".
• NEB XV "Recent Developments in Gravity", 20-23 June 2012, Chania, Greece.
Talk title: "Revising the Multipole Moments of numerical spacetimes".

Publications

Theses

1. Master Thesis: "Methods for generating solutions of the Einstein field equations"
G. Pappas, University of Athens, 2005
2. PhD Thesis: "Applications of the theory of General Relativity: the spacetime around compact objects"
G. Pappas, University of Athens, 2012

Papers in Refereed Journals

3. "Faithful transformation of quasi-isotropic to Weyl-Papapetrou coordinates: A prerequisite to compare metrics."
G. Pappas, T. A. Apostolatos, 2008 Class. Quant. Grav. 25, 228002 , (arXiv:0803.0602 [gr-qc]).
4. "What can QPOs tell us about the structure of the corresponding compact objects?"
George Pappas, 2012 MNRAS, 422, 2581-2589 (arXiv:1201.6071 [astro-ph.HE])
5."Revising the multipole moments of numerical spacetimes, and its consequences."
G. Pappas and T. A. Apostolatos, 2012 Phys. Rev. Lett. 108, 231104 (arXiv:1201.6067 [gr-qc])

Papers in Refereed Conference Proceedings

6. "Extending Sibgatullin's ansatz for the Ernst potential to generate a richer family of axially symmetric solutions of Einstein's equations."
T. P. Sotiriou and G. Pappas, 2005 J. Phys. Conf. Ser. 8, 23 (arXiv:gr-qc/0504122),
Talk given (by G. P.) at the 11th Conference on Recent Developments in Gravity (NEB XI), Mytilene, Lesbos, Greece, 2-6 Jun 2004.

7. "Matching of analytical and numerical solutions for neutron stars of arbitrary rotation."
George Pappas, 2009 J. Phys. Conf. Ser. 189, 012028 (arXiv:1201.6055 [gr-qc])
Talk given at the 13th Conference on Recent Developments in Gravity (NEB XIII), Thessaloniki, Greece, 4-6 June 2008.

Papers in Conference Proceedings

8. "Ephemeral periodicities in the solar activity."
J. Polygiannakis, P. Preka-Papadema, B. Petropoulos, G. Pothitakis, X. Moussas, G. Pappas, A. Hillaris, Proceedings of the Magnetic Coupling of the Solar Atmosphere Euroconference and IAU Colloquium 188, 11 - 15 June 2002, Santorini, Greece.

Papers on the arXiv

9. "An all-purpose metric for the exterior of any kind of rotating neutron star"
G. Pappas, T. A. Apostolatos, *Preprint:* arXiv:1209.6148 [gr-qc] (submitted to MNRAS).

Papers in Preparation

10. "Comment on the possibility of constraining the maximum value of the spin parameter of the super-massive objects in galactic nuclei."
G. Pappas, T. A. Apostolatos, submission expected, end of 2012

11. "An insightful newtonian analogue of the Kerr metric."
C. Hatzioannou, T. A. Apostolatos, G. Pappas, submission expected, end of 2012

Tuebingen
September 28, 2012

George Pappas