Adamantios Stavridis - curriculum vitae - 10/24/2008

Personal data

Name:	**Adamantios Stavridis**
Bithplace and date:	Thessaloniki, Greece, 8/22/1973
Marital status :	Married with Chrysanthi Topaloglou, one child
Citizenship:	Greek
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Current address:	4475 West Pine Blvd, 63108, St. Louis, (USA)
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Military service:	From May 2005 to February 2006 at the Greek Air Forces
Languages:	Greek (native), English (fluent), Italian (fluent), German (basic)

References

Kostas D. Kokkotas
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Current Position

Starting 8/1/2007	**Post-doctoral Fellow**, McDonnell Center for the Space Sciences Department of Physics Washington University, 63130, St Louis, (USA).

Previous Positions

October 2005–June 2007	**Post-doctoral Fellow** Department of Physics Aristotle University, Thessaloniki, 54124, Greece. (Prof. Kostas Kokkotas)
January 2005–April 2005	**Post-doctoral position**, Physics Department Eberhard Karls Universität Tübingen Auf der Morgenstelle 14, D-72076 Tübingen, Germany (Prof. Hanns Ruder and Prof. Wilhelm Kley)
June 2002–June 2004	**Post-doctoral position** University of Rome, La Sapienza (local coordinator: Prof. Valeria Ferrari) within the European Network on *Gravitational Wave Astronomy*. Among other activities, I attended the Advanced EU Network School *Sources of Gravitational Waves* in Trieste, Italy (9/15/2003–9/26/2003).

Education

December 2004	**PhD in Astrophysics** Aristotle University of Thessaloniki. Supervisor: Prof. Kostas D. Kokkotas.
December 1998	**M.Sc. in Theoretical Physics** Aristotle University of Thessaloniki, Excellent.
November 1996	**B.Sc in Physics** Aristotle University of Thessaloniki, Very good (8.13/10).

Awards

1991	Hellenic National Scholarship Foundation, (IKY), for high ranking in grades
1996-1999	Doctoral Hellenic National Scholarship Foundation, (IKY) (after nationwide examination procedure)
2007	Post-doctoral Hellenic National Scholarship Foundation, (IKY)

Societies

1996	Hellenic Astronomical Society (HELAS)
2004	Hellenic Physical Society
2007	Americal Physical Society (APS)

Computing Knowledge

Programming languages:	Fortran, C, C++, HTML
Scientific software:	Maple, Mathematica, MATLAB, Gnuplot, XMGrace, Origin, IDL (among others)
Operating systems:	UNIX, Linux, Windows, Mac OS X

Teaching Experience, Students

Four-year teaching experience at University level
Lecturer for the course of General Theory of Relativity
at the Physics Department of Aristotle University of Thessaloniki with Prof. Kostas Kokkotas.
Three-year teaching experience at University level
Lecturer for the course of Numerical Analysis
at the Physics Department of Aristotle University of Thessaloniki with Prof. Kostas Kokkotas.

Undergraduate students (co-supervised)
Asimina Maniopoulou, (student with Kostas Kokkotas at the Aristotle University of Thessaloniki, Greece)
Christian Casalvieri, (student with Prof. Valeria Ferrari at the University of Rome La Sapienza, Italy)
PhD students (co-supervised)
Miltos Vavoulidis, (with Prof. Kostas Kokkotas, Thessaloniki, Greece)

Research interests

I am mainly interested in the modelling of compact objects, and astrophysical sources of gravitational waves. Over the years I have been working on perturbation theory of stars and post-Newtonian theory.

Perturbation theory of stars

I have considerable experience on perturbation theory of stars and black holes. I derived analytically and integrated numerically using different numerical methods, the perturbed Einstein equations for rotating stars, both uniformly and differentially, using different formalisms (metric-based, 3 plus 1) and gauges. Most of the work was done mainly for polytropic equations of state (EOS), but I plan in the future to incorporate in the codes, routines for realistic EOS, which are more relevant for hot newly born differentially rotating neutron stars. I have used both the frequency and time domain approaches. Perturbation theory can be applied to many other astrophysical scenarios involving gravitational-wave emission. For example, it is a key tool to study the properties of extreme-mass ratio inspirals, which are one of the target sources of the planned space-based interferometer LISA.

Gravitational waves from binary inspiral and tests of alternative theories of gravity

During my stay at Washington University in St. Louis, I have initiated studying post-Newtonian methods describing binary inspirals and signal analysis methods for estimating parameters that are astrophysically important for such binaries, like masses, luminocity distances, source location on the sky, spins etc. Inspiraling binary systems are the main target source group for the planed LISA mission. Since it's expected that they will be easily detected they can give us a lot of insight about those sources. I plan to invest more on this direction in the future and finish a code, that I have already started writting that takes into account the spin precession effects on bounding the mass of the massive graviton.

Cosmology and the merger history of massive black holes with LISA

LISA will detect the inspiral of massive black-hole binaries with large signal-to-noise ratio out to cosmological distances. Massive black holes are observed in the bulges of almost all local galaxies. Since massive black-hole binaries are considered to be "clean" emitters of gravitational waves, they can be thought of as standard candles (or "standard sirens"), and their observation in gravitational waves can be used to study structure formation in the early universe. If measurements of the luminosity distance and source location are accurate enough, these observations could be used to place constraints on cosmological scenarios and/or on alternative theories of gravity.

I am interested in broadening my knowledge and experience in general relativity, numerical relativity and relativistic astrophysics. I would like to work on astrophysical applications of general relativity and/or numerical relativity. I would prefer to work on problems in relativity that are subject to experimental tests, mainly (though not only) through gravitational-wave detectors. However, I would also be very keen on extenting my knowledge beyond the above fields of interest, torwards cosmology, quantum gravity or string theory, if I have the opportunity. I have long experience on writting symbolic codes in Maple and Mathematica, or in Fortran and C, for simulating numerically solutions of physical problems.

Publications

Refereed Journals

A1. J. Ruoff, A. Stavridis, K.D. Kokkotas, *Evolution equations for the perturbations of slowly rotating relativistic stars*, Mon. Not. R. Astron. Soc. **332**, 676 (2002).
A2. J. Ruoff, A. Stavridis, K.D. Kokkotas, *Inertial modes of slowly rotating relativistic stars in the Cowling approximation*, Mon. Not. R. Astron. Soc. **339**, 1170 (2003).
A3. A. Stavridis, K.D. Kokkotas, *Evolution equations for slowly rotating stars*, Int. J. of Mod. Phys. D **14**, n. 5, 543 (2005).
A4. V. Ferrari, L. Gualtieri, J. Pons, A. Stavridis, *Rotational effects on the oscillation frequencies of newly born proto neutron stars*, Mon. Not. R. Astron. Soc. **350**, 763 (2004)
A5. C. Casalvieri, V. Ferrari, A. Stavridis, *Gravitational signals due to tidal interactions between white dwarfs and black holes*, Mon. Not. R. Astron. Soc. **365**, 929 (2006)
A6. M. Vavoulidis, A. Stavridis, K.D. Kokkotas, H. Beyer, *Torsional oscillations of rotating relativistic stars*, Mon. Not. R. Astron. Soc. **377**, 1553 (2007)
A7. A. Stavridis, A. Passamonti, K.D. Kokkotas, *Non-radial oscillations of slowly and differentially rotating compact stars*, Phys. Rev. D **75**, 064019 (2007)
A8. A. Passamonti, A. Stavridis, K.D. Kokkotas, *Non axisymmetric oscillations of differentially rotating relativistic stars*, Phys. Rev. D **77**, 024029 (2008).
A9. M. Vavoulidis, K.D. Kokkotas, A. Stavridis, *Crustal oscillations of slowly rotating stars*, Mon. Not. R. Astron. Soc. **384**, 1711 (2008)

Conference Proceedings (those marked by a * were refereed)

B1. A. Stavridis, J. Ruoff, K.D. Kokkotas, *A new gauge for the polar perturbations of slowly relativistic stars* in *Conference on Applied Differential Geometry, Lie Algebra and General Relativity*, 27 June -1 July 2001, Thessaloniki, Greece.
B2.* A. Stavridis, J. Ruoff, K.D. Kokkotas, *Perturbations of slowly rotating relativistic stars*, in *Panhellenic Conference New Developments in Gravity 10*, May 30-June 3 2002, Thessaloniki, Hellas. Published in Conference procceding volume by Springer-Verlah.
B3.* V. Ferrari, L. Gualtieri, J. Pons, A. Stavridis, *Perturbations of slowly rotating relativistic stars* Proceedings of the 5th Edoardo Amaldi Conference on Gravitational Waves, Tirrenia Pisa, Italy, 6-11 Jul 2003, Published in Class.Quant.Grav.21:S515-S519,2004
B4. A. Stavridis, C. Casalvieri, V. Ferrari, *Gravitational Waves from black holes and neutron stars* Prepared for Cosmology and Gravitational Physics meeting during the Year of Physics and Einstein's celebration of the Aristotle University of Thessaloniki.
B5.* Isabel Rica-Mendez, A. Stavridis, *Perturbations of slowly rotating relativistic stars* Prepared for the conference, A century of Relatistic Physics: ERE 2005; XXVIII Spanish Relativity Meeting, published by AIP Conference proccedings.

Theses

T1. *Sources and detection of gravitational waves.* Diploma thesis, in English, November 1996. Online at `http://www.astro.auth.gr/documents/diplomas/Stavridis_diplomatiki.pdf` (PDF)
T2. *Non Radial Oscillations of Slowly Rotating Relativistic Stars.* PhD thesis, in Greek, October 2004. Online at `http://www.astro.auth.gr/documents/diplomas_PhD/Stavridis_phd.pdf` (PDF)

Other activities

Conference organizer

- *JENAM - 97*
  Kallithea, Halkidiki, July 2-5 1997, Greece.
- *2nd European Network meeting on sources of gravitational radiation*
  6-10 June 2001, Thessaloniki, Greece

Referee

Classical and Quantum Gravity, *General Relativity and Gravitation*,

Invited talks

• *Differentially rotating neutron stars: A perturbative study*
November 2007, Departament d'Astronomia i Astrofisica Facultat de Fisica, Universitat de Valencia, C/ Dr. Moliner, 50, 46100 Burjassot, Spain.
• *Differentiallly rotating neutron stars and instabilities*
December 2007, Albert Einstein Institute, Potsdam, Germany.

Participation in Conferences and Schools (those marked by a * was with presentation)

- *2nd Hellenic Astronomical Conference*, July 1995, Peraia, Thessaloniki, Greece (*).
- *JENAM - 97*, July 2-5 1997, Kallithea, Halkidiki, Greece (*).
- *An International seminar on Current Issues of Astronomical and Planetary Environmental Concern*, April 1998, Thessaloniki, Greece (*).
- *NEB-8, New developments in Gravity*, August 26-29 1998, Samos, Greece (*).
- *2nd Samos Meeting on Cosmology Geometry and Relativity*, August 31 - Semptember 4 1998, Samos, Greece.
- *The third Euro-Conference on Parallel and Distributed Computing for Computational Mechanics*, 20-25 March 1999, Weimar, Germany.
- *The Neutron Star, Black Hole Connection*, 7-18 June 1999, Elounta, Creta, Greece.
- *12th EADN predoctoral school, Selected topics on binary stars, Observations and physical processes*, 6-17 Semptember 1999, La Laguna, Tenerife, Canary Islands, Spain.
- *2nd E.U network meeting*, 6-10 June 2001, Thessaloniki, Greece (*).
- *Conference on Applied Differential Geometry - Lie Algebra, General Relativity*, 27 June -1 July 2001, Thessaloniki, Greece (*).
- *5th Hellenic Astronomical Conference*, Herakleion, 20-22 Semptember 2001, Crete, Greece (*).
- *NEB-10, New developments in Gravity*, May 30-June 3 2002, Thessaloniki, Greece (*).
- 4^{th} *E.U. network meeting*, 26-28 Semptember 2002, Palma de Mallorka, Spain.
- *Joint BURST 2003/*5^{th} *E.U. Network Meeting*, 19-22 May 2003, Paris, France (*).
- *Advanced School and Conference on Sources of Gravitational Waves*, 15-26 Semptember 2003, Trieste Italy.
- *Problemi Attuali di Fisica Teorica*, 2-7 April 2004, Vietri sul Mare, Italy.
- *Union of German Physical Society*, 4-9 March 2005, Berlin, Germany (*).
- *NEB XII, New developments in Gravity*, 29 June-2 July 2006, Nafplio, Greece.
- *3rd Annual ILIAS meeting*, 11-14 December 2006, Paris, France (*).
- *Hellenic Astronomical Society Conference*, 13-15 Semptember 2007, Island of Thasos, Greece (*).
- *April 2008, American Physical Society meeting*, 12-15 April 2008, St. Louis, MO, USA (*).