

Georgios Antoniou

Curriculum Vitae

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🏛 School of Mathematical Sciences
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Links

Inspire     

Personal information

INTERESTS: strong gravity, gravitational waves, quasinormal modes, modified gravity, compact objects, black-hole shadows, gravitational lensing, initial value problem, well-posedness

NATIONALITY: Greek

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Education

26/09/2019 - Present	PhD in Mathematics , University of Nottingham, Nottingham, UK <i>Thesis:</i> “Strong Gravity Phase Transitions and Gravitational Waves” <i>Advisor:</i> Prof. Thomas Sotiriou (Thomas.Sotiriou@nottingham.ac.uk)
05/10/2017 - 31/05/2019	MSc in Physics , University of Minnesota Twin Cities, Minneapolis, USA <i>Grade:</i> Distinction (highest grade in the graduate exams in my year) <i>Thesis:</i> “Five-dimensional Gravity and the Weak Gravity Conjecture” <i>Advisor:</i> Prof. Tony Gherghetta (tgher@umn.edu)
01/10/2012 - 19/07/2016	BSc in Physics , University of Ioannina, Ioannina, Greece <i>Grade:</i> 9.77/10.00 (highest grade in school's history) <i>Thesis:</i> “Black Hole and Wormhole Solutions in General Relativity and Beyond” <i>Advisor:</i> Prof. Panagiota Kanti (pkanti@cc.uoi.gr)

Employment

01/2020 - 12/2022	Teaching Assistant , University of Nottingham, Nottingham, UK.
09/2019 - 02/2023	Doctoral Candidate , University of Nottingham, Nottingham, UK.
09/2018 - 05/2019	Teaching Assistant , University of Minnesota Twin Cities, Minneapolis, USA.

Awards, Funding and Distinctions

1. EuCAPT exchange programme visit to GSSI, (**Fr. 1,000**) 2022
2. Onassis Foundation Scholarship for PhD studies (3 years), Greece (**£18,300**) 2019-2022
3. Post Graduate Studentship and Vice-Chancellor's Scholarship for Research Excellence (EU), 2019, University of Nottingham, UK (**~£15,500+tuition/year**)
4. COST CA16104 - GWverse meeting at Lisbon, Portugal (**€1,375.06**) 2021
5. College of Science and Engineering Graduate Fellowship (2 years), 2017-2019
University of Minnesota Twin Cities, USA (**\$48,000+tuition**)
6. Onassis Foundation Scholarship for MS studies (2 years), Greece (**\$10,000**) 2017-2019
7. Summer Fellowship, School of Physics and Astronomy, 2018
University of Minnesota Twin Cities, USA (**\$6,357**)
8. **Top graduate** in the history of the Physics Department, University of Ioannina, Greece 2016
9. Xristodoulos Efthimiou Foundation Undergraduate Scholarship 2012-2016
(4 years), Greece (**~ €4,500**)
10. Honorary Scholarship, State Scholarships Foundation (IKY), Greece (**~ €1,400**). 2014

Talks-presentations

1. *“Quasinormal modes of black holes in spontaneous scalarization”*, Talk at the 11th Aegean Summer School *“Recent developments in theory and observations in gravity and cosmology”*, Syros, Greece, 5-15 September 2022.
2. *“Cosmology and Scalarized Compact Objects”*, Talk at *“Cosmology from Home 2022”*, 4-15 July 2022.
3. **Invited seminar**: *“A viable scalarization mechanism in black holes”*, Talk at *“Nottingham Centre of Gravity (NCoG) workshop”*, 20 May 2022.
4. *“Towards a viable compact-object scalarization model”*, Talk at *“Atlantic General Relativity 2022”*, Memorial University of Newfoundland and Labrador, 16-19 May 2022.
5. *“Stable spontaneously-scalarized black holes in generalized scalar-tensor theories”*, Talk at *“BritGrav22”*, Institute for Gravitational Research, University of Glasgow, UK, 4-5 April 2022 
6. *“Black holes, scalar fields and their phenomenology”*, Talk at *“Maths retreat”*, Sutton Bonington UK, 10 February 2022.
7. **Invited seminar**: *“Scalar hair and compact objects”*, Talk at *“London-Oldenburg Relativity Seminar”*, 20 December 2021.
8. *“Spontaneous scalarization of compact objects with Ricci and Gauss-Bonnet couplings”*, Talk at *“NEB-19 Recent Developments in Gravity”*, Athens, Greece, 21 September 2021 

9. *“Black-hole and neutron-star scalarization with Ricci and Gauss-Bonnet couplings”*, Talk at the 4th meeting of the GWVerse COST action *“Gravitational Waves, Black Holes and Fundamental Physics”*, Lisbon, Portugal, 4 September 2021.
10. *“Scalarization of compact objects with general relativity as a cosmological attractor”*, Talk at *“BritGrav21”*, University College Dublin, UK, 12-16 April 2021.
11. *“Compact object scalarization with general relativity as a cosmic attractor”*, Talk at *“Mathematical Physics 2nd year talks”*, University of Nottingham, UK, 10 February 2021.
12. *“Scalar fields around black holes and their phenomenological implications”*, Poster Presentation at *“Third EPS (European Physical Society) Conference on Gravitation”*, 23 May 2022
13. *“The importance of a Ricci-scalar coupling in black hole scalarization”*, Poster Presentation at the conference *“Black Holes Inside and Out”*, 27 September 2021
14. *“Novel Wormhole Solutions in Einstein-Scalar-Gauss-Bonnet Theories”*, Poster Presentation at the 3rd meeting of the GWVerse COST action *“Gravitational Waves, Black Holes and Fundamental Physics”*, Trieste, Italy, 16 January 2020.

Teaching

1. Teaching Assistant, University of Nottingham, Nottingham, UK.

- **“Introduction to Mathematical Physics”**,
 - MATH2013 UNUK (FYR1 22-23): 26/09/2022 - 16/12/2022, Autumn term
 - MATH2013 UNUK (FYR1 21-22): 15/02/2022 - 08/04/2022, Spring term
- **“Vector Calculus”**,
 - MATH2005 UNUK (AUT1 22-23): 26/09/2022 - 16/12/2022, Autumn term
 - MATH2005 UNUK (AUT1 21-22): 04/10/2021 - 17/12/2021, Autumn term
- **“Probability Models and Methods”**,
 - MATH2010 UNUK (AUT1 22-23): 26/09/2022 - 16/12/2022, Autumn term
- **“Foundation Mathematics”**,
 - MTHSF001 UNUK (AUT1 22-23): 26/09/2022 - 16/12/2022, Autumn term.
 - MTHSF004 UNUK (SUM1 20-21): 26/04/2021 - 31/08/2021, Summer term.
 - MTHSF003 UNUK (SPR1 20-21): 11/01/2021 - 25/04/2021, Spring term.
- **“Modelling with Differential Equations”**,
 - MATH2012 UNUK (FYR1 21-22): 04/10/2021 - 17/12/2021, 03/02/2022 - 05/05/2022, Autumn/Spring term.
- **“Differential Equations and Fourier Analysis”**,
 - MATH2008 UNUK (FYR1 21-22): 17/02/2022 - 14/05/2022, Spring term.
- **“Complex Functions”**,
 - MATH 2007 UNUK (SPR1 20-21): 11/01/2021 - 25/04/2021, Spring term.
- **“Advanced Mathematical Methods for Civil Engineering”**,

- MTHS2005 UNUK (SPR1 20-21): 11/01/2020 - 25/04/2020, Spring term.
- “Advanced Mathematics and Statistics for Mechanical Engineers”,
 - MTHS2007 UNUK (AUT1 20-21): 21/09/2020 - 18/12/2020, Autumn term.
- “Fluid Dynamics”,
 - MATH3017 UNUK (SPR1 19-20): 11/01/2020 - 25/04/2020, Spring term.
- “Computerised Mathematical Methods in Engineering”,
 - MTHS3001 UNUK (SPR1 19-20): 11/01/2020 - 25/04/2020, Spring term.

2. Teaching Assistant, University of Minnesota Twin Cities, Minneapolis, USA.

- “Quantum Physics”,
 - PHYS 2601: 22/01/2019 - 15/05/2019
- “Introductory Physics for Science and Engineering I”,
 - PHYS 1301W: 04/09/2018 - 20/12/2018

Workshops, Schools, Conferences

1. “*11th Aegean Summer School: Recent developments in theory and observations in gravity and cosmology*”, Syros, Greece, 5-15 September 2022.
2. “*Cosmology from Home 2022*”, 4-15 July 2022.
3. “*Gravity: Current challenges in black hole physics and cosmology*”, Kyoto, Japan, 20 June-1 July 2022.
4. “*Third EPS (European Physical Society) Conference on Gravitation*”, Nice, France, 23-25 May 2022.
5. “*Atlantic General Relativity 2022*”, Memorial University of Newfoundland and Labrador, 16-19 May 2022.
6. “*Gravity - The Next Generation*”, Yukawa Institute for Theoretical Physics, Kyoto University, 14-18 February 2022.
7. “*A Discussion on the Cosmological Principle*”, 25-28 October 2021.
8. “*Black Holes Inside and Out*”, 27 September - 1 October 2021.
9. “*NEB-19 Recent Developments in Gravity*”, Athens, Greece, 20-23 September 2021.
10. “*Spanish-Portuguese Relativity Meeting EREP2021*”, Aveiro, Portugal, 13-16 September 2021.
11. “*Global meeting of the GWVerse COST action*”, Lisbon, Portugal, 30 August-4 September 2021.
12. “*North American Einstein Toolkit School 2021*”, University of Illinois Urbana Champaign, 26 July 2021-30 July 2021.
13. “*Cosmological Frontiers in Fundamental Physics Triangular Conference: APC - Perimeter - Solvay 2021*”, 25-28 May 2021.

14. *“LISA Canada Workshop”*, Canada, 27-29 April, 2021.
15. *“Current challenges in gravitational physics WORKSHOP”*, 21-28 April 2021.
16. *“BritGrav21”*, University College Dublin, UK, 12-16 April 2021.
17. *“Black Hole Perturbation Toolkit Spring 2020 Workshop”*, Prague, Czechia, 25-27 May 2020.
18. *“Gravitational Waves, Black Holes and Fundamental Physics”*, Trieste, Italy, 13-16 January 2020.
19. *“Holographic Quantum Matter Workshop”*, William I. Fine Theoretical Physics Institute, University of Minnesota Twin Cities, Minneapolis, MN, USA 4-6 May 2018.
20. *“PLANCK 2015: From the Planck Scale to the Electroweak Scale”*, Ioannina, Greece, 25-29 May 2015.
21. *“TAMVAKIS FEST 2015: Beyond the standard models oh physics and cosmology”*, Ioannina Greece, 24 May 2015.
22. *“Black Holes at all scales”*, summer school, Ioannina, Greece, 16-19 September 2013.

Computer Skills

OS: WINDOWS, LINUX, MAC
 PROGRAMMING: MATHEMATICA, PYTHON, C, R, MATLAB, L^AT_EX.
 GRAPHICS: BLENDER, PREMIER PRO, PHOTOSHOP, LIGHTROOM
 PACKAGES: EinsteinPy, Einstein Toolkit, BHPToolkit, Xact, GREATER2, GR

List of Publications

Citations overview according to [INSPIRE](#) 

(Updated: January 10, 2023)

No. of Papers : 11 (+1)

Total citations : 680

Papers

- [1] **“Black hole minimum size and scalar charge in shift-symmetric theories”**
 F. Thaalba, **G. Antoniou**, T. P. Sotiriou
[arXiv:2211.05099 \[gr-qc\]](#) (submitted to *Class. Quant. Grav.*).
- [2] **“Constraining modified gravity theories with scalar fields using black-hole images”**
G. Antoniou, A. Papageorgiou, P. Kanti
Universe **9** (2023) 3, 147, [arXiv:2210.17533 \[gr-qc\]](#)
- [3] **“Stable spontaneously-scalarized black holes in generalized scalar-tensor theories”**
G. Antoniou, C. F. B. Macedo, R. McManus, T. P. Sotiriou
Phys. Rev. D **106** (2022) 2, 024029, [arXiv:2204.01684 \[gr-qc\]](#).

- [4] “Neutron star scalarization with Gauss-Bonnet and Ricci scalar couplings”
G. Ventagli, **G. Antoniou**, A. Lehébel, T. P. Sotiriou
Phys. Rev. D **104** (2021) 12, 124078, [arXiv:2111.03644 \[gr-qc\]](#).
- [5] “Black hole scalarization with Gauss-Bonnet and Ricci scalar couplings”
G. Antoniou, A. Lehébel, G. Ventagli, T. P. Sotiriou
Phys. Rev. D **104** (2021) 4, 044002, [arXiv:2105.04479 \[gr-qc\]](#).
- [6] “Compact object scalarization with general relativity as a cosmic attractor”
G. Antoniou, L. Bordin, T. P. Sotiriou
Phys. Rev. D **103** (2021), 024012, [arXiv:2004.14985 \[gr-qc\]](#).
- [7] “Novel Einstein-Scalar-Gauss-Bonnet Wormholes without Exotic Matter”
G. Antoniou, A. Bakopoulos, P. Kanti, B. Kleihaus, J. Kunz
Phys. Rev. D **101** (2020) 2, 024033, [arXiv:1904.13091 \[hep-th\]](#).
- [8] “Novel black hole solutions with scalar hair in Einstein-scalar-Gauss-Bonnet theories”
A. Bakopoulos, **G. Antoniou**, P. Kanti
AIP Conf. Proc. **2075** (2019) 1, 040003.
- [9] “Novel black-hole solutions in Einstein-scalar-Gauss-Bonnet theories with a cosmological constant”
A. Bakopoulos, **G. Antoniou**, P. Kanti
Phys. Rev. D **99** (2019) 6, 064003, [arXiv:1812.06941 \[hep-th\]](#).
- [10] “Black-hole solutions with scalar hair in Einstein-scalar-Gauss-Bonnet theories”
G. Antoniou, A. Bakopoulos, P. Kanti
Phys. Rev. D **97** (2018) 8, 084037, [arXiv:1711.07431 \[hep-th\]](#).
- [11] “Evasion of No-Hair Theorems and Novel Black-Hole Solutions in Gauss-Bonnet Theories”
G. Antoniou, A. Bakopoulos, P. Kanti
Phys. Rev. Lett. **120** (2018) 13, 131102, [arXiv:1711.03390 \[hep-th\]](#).
- [12] “Cosmology with a subdominant scalar field”
G. Antoniou
(near completion).

Theses

- [1] “Five-dimensional Gravity and the Weak Gravity Conjecture”
G. Antoniou
Retrieved from the University of Minnesota Digital Conservancy,
<https://hdl.handle.net/11299/206199>.
- [2] “Black holes and wormholes in general relativity and beyond”
G. Antoniou
Undergraduate thesis, University of Ioannina