Georgios Antoniou

Curriculum Vitae

georgios.antoniou@nottingham.ac.uk
georgiosanton00@gmail.com (personal)
+44 07525062091
School of Mathematical Sciences
The University of Nottingham
NG7 2RD

Links

Inspire Orcid Google Scholar ArXiv ResearchGate

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
Phone:	+44 07525062091
email:	georgios.antoniou@nottingham.ac.uk georgiosanton00@gmail.com (personal)
Address:	School of Mathematical Sciences, The University of Nottingham, NG7 2RD, UK

Education

26/09/2019 - Present
PhD in Mathematics, University of Nottingham, Nottingham, UK
Thesis: "Strong Gravity Phase Transitions and Gravitational Waves"
Advisor: Prof. Thomas Sotiriou (Thomas.Sotiriou@nottingham.ac.uk)

05/10/2017 - 31/05/2019
MSc in Physics, University of Minnesota Twin Cities, Minneapolis, USA
Grade: Distinction (**highest grade in the graduate exams in my year**)
Thesis: "Five-dimensional Gravity and the Weak Gravity Conjecture"
Advisor: Prof. Tony Gherghetta (tgher@umn.edu)

01/10/2012 - 19/07/2016
BSc in Physics, University of Ioannina, Ioannina, Greece
Grade: 9.77/10.00 (**highest grade in school's history**)
Thesis: "Black Hole and Wormhole Solutions in General Relativity and Beyond"
Advisor: 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, Unversity 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 Decemeber 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, LaTeX.
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] (to be submitted to Class. Quant. Grav.).

[2] **"Constraining modified gravity theories with scalar fields using black-hole images"**
G. Antoniou, A. Papageorgiou, P. Kanti
arXiv:2210.17533 [gr-qc] (submitted to Phys. Rev. D).

[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] **"Rectifying cosmological instabilities in Horndeski gravity"**
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