

Ludovic Ducobu

PhD in Science

Rue Jacques Prévert, 9 bte. 2.4
7000 Mons
Belgium

+32(0) 473/59.21.66

✉ ludovic.ducobu@umons.ac.be

📄 UMONS staff page



Born on October 05 1993 in Boussu (Belgium)

Formation

- 2005–2011 **Highschool**, *Collège Sainte-Marie de Saint-Ghislain*
Orientation : Math-Sciences + Math. reinforcement
- 2011–2014 **Bachelor in Physics**, *University of Mons (Belgium)*, *Successful completion during 1st session with Great Distinction*
Distinction for cycle : Great Distinction
- 2014–2016 **Master in Physics**, *University of Mons (Belgium)*, *Successful completion during 1st session with the Greatest Distinction*
Distinction for cycle : the Greatest Distinction
- June 22 2022 **Awarded of the title of PhD in Science**, *University of Mons (Belgium)*

Professional experience

- From 2016/02/15 to 2016/03/25 **Teaching assistant (1/5th time)**, *University of Mons - Faculty of Sciences*
Supervision of exercise sessions for lectures in electromagnetism (BaB2 Physics and Mathematics)
- From 2016/04/11 to 2016/05/13 **Teaching assistant (1/5th time)**, *University of Mons - Faculty of Sciences*
Supervision of exercise sessions for lectures in electromagnetism (BaB2 Physics and Mathematics)
- From 2016/09/15 to 2022/09/14 **PhD student & Teaching assistant (full time)**, *University of Mons - Faculty of Sciences*
PhD thesis in theoretical physics (modified theories of gravity)
&
Supervision of exercise sessions for bachelor courses in Physics (Mathematical Analysis, Electromagnetism, Tensor Calculus, Special Relativity, Newtonian Mechanics, Quantum Mechanics) and supervision of laboratories and exercise sessions in Physics in the Faculty of Medicine and Pharmacy
- From 2022/09/15 to 2022/10/28 **Postdoctoral researcher (1/2 time)**, *University of Mons - Faculty of Sciences*
Research on compact objects in modified theories of gravity. Postdoctoral Grant awarded by COMPLEXYS (UMONS institute for complex systems)
- From 2022/09/15 to 2022/10/28 **Teaching assistant (1/2 time)**, *University of Mons - Faculty of Engineering*
Supervision of exercise sessions for bachelor courses in Engineering (Linear Algebra, Mathematical Analysis, Analytical methods for ODEs [Banach Fixed-Point Theorem, Cauchy-Lipschitz/Picard-Lindelöf Theorem, Laplace & Fourier Transform, Fourier Series])
- From 2022/11/01 to 2023/10/31 **Postdoctoral researcher (full time)**, *Transilvania University of Brasov - Department of Mathematics and Computer Science*
Research on compact objects in modified theories of gravity. Postdoctoral Grant awarded by the Transilvania Fellowship Program

Fields of expertise (research)

◆ Mathematical Physics ◆ Gravitation ◆ Astrophysics ◆ Numerical methods for ODEs ◆

Scientific publications

8 papers published in peer reviewed journals : **3 in Q1** and **2 in Q2** journals, 1 in Q3 and 2 in Q4 journals according to Clarivate Analytics. List of publications annexed below.

Languages

French	Native language	Level \approx C2
English	Advanced knowledge of written and spoken language	Level \approx C1
Dutch	Intermediate knowledge of written and spoken language	Level \approx A2

Computer skills

◆ Operating systems	Windows [+++], Linux [+]	◆ Programming	Python [+++], FORTRAN [+], Mathematica [++]
◆ Word processing softwares	L ^A T _E X [+++] (article, beamer, creation of package, ...), Word [++], Powerpoint [++], Excel [+]	◆ Pedagogical tools	GeoGebra [software for dynamical geometry visualisation] [+], X-mind [Mind map] [++], ActivInspire [Interactive Whiteboard] [±]

+++ : advanced skills, ++ : intermediate skills, + : mastery of basic tasks, ± : ongoing learning.

Scientific popularisation (in French)

- ◆ Participation to the “Printemps des sciences” [Cycle of scientific popularisation (in French)] : ■ Popularisation workshop «*Lumière sur les Trous Noirs*» (March 2016) ■ Conference «*Sciences... Vous avez dit Science ?*» (March 2018) ■ Conference «*Pas si élémentaire... mon cher Watson*» (March 2019) ■
- ◆ Hosting highschool students for internships of introduction to university life (2017–2019)
- ◆ Guide to the exhibition «*Histoire d’ondes*» [Exhibition around the concept of wave (university of Mons)] (2019)
- ◆ “Séminaire sandwich” [Physics department] : «*Le(s) concept(s) d’éther ou l’art de combler le vide*» (2020)
- ◆ Scientific popularisation in highschools (conferences) : ■ «*Le concept d’inertie “la première des unifications”*» ■ «*Pas si élémentaire... mon cher Watson (investigation au cœur des paradoxes)*» ■

Miscellaneous

- ◆ Dispensing private lessons in mathematics (2012–2016)
- ◆ Member (consultant) of the SoφHa [philosophical society of Hainaut] since its creation (2018–today)
- ◆ Chairing a session for the 2021 edition of the congress of the Belgian Society of Philosophy of Science
- ◆ Voluntary contributions : Introductory courses and «*Franchir le cap*» activities for new Bachelor students in Physics at the University of Mons (2012–2016)
- ◆ Theatre :
 - Drama courses [academy of music and performing arts of Saint-Ghislain (Belgium)] (2004–2022)
 - Member of the amateur theatre group *Le théâtre du Kiosque*. I have participated in the following plays : ● «*James*» by Jean-Philippe Decrème (2015) ● «*Impair et père*» by Ray Cooney (2016) ● «*Ainsi soient elles*» by Eric Beauvillain (2017) ● «*Du Rififi chez la comtesse*» by Jean-Claude Martineau (2018) ●
- ◆ Autodidact guitar player

Life project

To pursue a professional career in academia to share my passion for Science – in the general sense – with as many people as possible while continuing to learn and discover new horizons.



Publications and communications of Ludovic DUCOBU

Articles accepted in peer reviewed journals

1. Bahamonde, S., *Ducobu, L.*, & Pfeifer, C. (11 April 2022). Scalarized Black Holes in Teleparallel Gravity. **Journal of Cosmology and Astroparticle Physics**, Volume 2022 (April 2022).
Quartile (according to Clarivate Analytics) : **Q1**
2. Brihaye, Y., *Ducobu, L.*, & Hartmann, B. (11 April 2020). Boson and neutron stars with increased density. **Physics Letters B**, 811, 135906.
Quartile (according to Clarivate Analytics) : **Q2**
3. Brihaye, Y., & *Ducobu, L.* (11 June 2019). Hairy black holes, boson stars and non-minimal coupling to curvature invariants. **Physics Letters B**, 795, 135-146.
Quartile (according to Clarivate Analytics) : **Q2**
4. Brihaye, Y., Brandelet, A., *Ducobu, L.*, & Delsate, T. (22 November 2018). Nutty black holes in galileon scalar-tensor gravity. *International Journal of Modern Physics A*, 33 (32), 1850189.
Quartile (according to Clarivate Analytics) : Q4
5. Brihaye, Y., & *Ducobu, L.* (17 September 2018). Spinning-charged-hairy black holes in 5D Einstein gravity. **Physical Review. D**.
Quartile (according to Clarivate Analytics) : **Q1**
6. Semay, C., & *Ducobu, L.* (16 May 2016). Quantum and classical probability distributions for arbitrary Hamiltonians. *European Journal of Physics*, 37.
Quartile (according to Clarivate Analytics) : Q4
7. Cisterna, A., Delsate, T., *Ducobu, L.*, & Rinaldi, M. (26 April 2016). Slowly rotating neutron stars in the non-minimal derivative coupling sector of Horndeski gravity. **Physical Review. D**, Particles, Fields, Gravitation, and Cosmology.
Quartile (according to Clarivate Analytics) : **Q1**
8. Brihaye, Y., & *Ducobu, L.* (18 April 2016). Black holes with scalar hair in Einstein-Gauss-Bonnet gravity. *International Journal of Modern Physics. D*.
Quartile (according to Clarivate Analytics) : Q3

Articles submitted in peer reviewed journals

1. Bahamonde, S., Doneva, Daniela D., *Ducobu, L.*, Pfeifer, C., & Yazadjiev, Stoytcho S. (TBA). Spontaneous Scalarization of Black Holes in Gauss-Bonnet Teleparallel Gravity. **Physical Review. D**, submitted on 25 December 2022 (currently under peer reviewing).
Quartile (according to Clarivate Analytics) : **Q1**

Scientific talks in universities or research centers

1. *Ducobu, L.* (02 June 2022). hairy black holes, boson stars and non-minimal couplings from Einstein to teleparallel gravity.
Talk presented at Exact solutions in classical field theory : Solitons, black holes and bosons stars.
2. *Ducobu, L.* (10 March 2022). Scalarized black holes in Horndeski gravity : an overview.
Talk presented at The 1st International Conference of Holography and its Applications, Damghan, Iran.

3. *Ducobu, L.* (23 August 2021). A walk through scalar tensor gravity.
Talk presented at Space Science at Drop Tower Seminar, Bremen, Germany.
4. *Ducobu, L.* (27 September 2019). Hairy Black Holes & Boson Stars : From shift-symmetry to spontaneous scalarization.
Talk presented at RTG Autumn Workshop, Oldenburg, Germany.
5. *Ducobu, L.* (11 October 2017). Slowly rotating neutron stars in Horndeski gravity.
Talk presented at RTG Autumn Workshop, Oldenburg, Germany.

Talks in Summer schools

1. *Ducobu, L.* (26 July 2020). The concept(s) of æther or The physicist's habit of carpeting.
Talk presented at L'Agape, Summer School in Theoretical Physics (fourth edition), Mézeryrac, France.
2. *Ducobu, L.* (27 July 2019). The place of space.
Talk presented at L'agape, summer school of theoretical physics (third edition), Mézeryrac, France.

Scientific popularisation (in French)

Every talk listed below has been presented in Belgian high schools and in dedicated popularisation events.

1. *Ducobu, L., & Gamrath, S.* (2021). Pas si élémentaire mon cher Watson - Investigation au coeur de paradoxes.
Popularisation talk about the scientific method illustrated using historical paradoxes.
2. *Ducobu, L.* (2021). Le(s) concept(s) d'æther ou l'art de combler le vide.
Popularisation talk about the history of the concept of æther.
3. Brandelet, A., *Ducobu, L., & Gamrath, S.* (2019). Pas si élémentaire... Mon cher Watson.
Popularisation talk about the scientific method illustrated using historical paradoxes.
4. Brandelet, A., & *Ducobu, L.* (2018). Sciences... Vous avez dit sciences ?
Popularisation talk about the scientific method.
5. *Ducobu, L.* (2017). Le concept d'inertie : 'La première des unifications'.
Popularisation talk about the history of the principle of inertia.

Poster sessions

1. *Ducobu, L.* (05 March 2019). Hairy Black Holes : Is Dark Matter a scalar field ?
Poster session presented at Mardi des Chercheurs 2019 (MdC2019), Mons, Belgium.