

Guillaume Rollin

Ph.D. in Physics, Master's degree in Epistemology

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Education

- 2018 – **Master's degree in epistemology**, Université de Lorraine, Nancy, France
- 2015 – **Ph.D. in theoretical physics**, Université de Franche-Comté, Besançon, France
- 2012 – **Master's degree in physics**, Université de Franche-Comté, Besançon, France
- 2009 – **Bachelor in physics**, Université Henri Poincaré, Nancy 1, France
- 2006 – **High school diploma (scientific)**, Lycée Louis Lapicque, Epinal, France

Research experience

- Oct 2020 – Today : researches on *the dynamics of complex systems* and on *complex networks*, Graduate assistant, Employer : University of Franche-Comté, Besançon, France.
- Oct 2018 – Sept 2020 : *Google matrix analysis of real complex networks* (GNETWORKS project), Post-Doctoral position, Supervisor : J. Lages, Institut UTINAM, CNRS Besançon, France.
- Oct 2017 – Sept 2018 : *Physical analysis of complex networks* (APEX project), Statistics engineer, Supervisor : J. Lages, Institut UTINAM, CNRS Besançon, France.
- Sept 2017 – Sept 2018 : *Free Will in Contemporary Sciences*, Master's degree thesis (epistemology), Supervisor : V. Giardino, Archives Poincaré, CNRS Nancy, France.
- Oct 2012 – Nov 2015 : *Dynamical chaos in the restricted three body problem*, Ph.D. thesis (Theory/Numerical simulations), Supervisors : J. Lages et E. de Prunelé, Institut UTINAM, CNRS Besançon, France.
- Janv-Jun 2012 : *Transfer of vibrational qubit in confined molecular network*, Master's degree thesis (Theory/Numerical simulations), Supervisor : V. Pouthier, Institut UTINAM, CNRS Besançon, France.
- Jan-Mar 2011 : *Photo-luminescence excitation spectroscopy applied on doped thin film*, free teaching unit (Experimental), Supervisors : H. Rinnert et E. Steveler, Institut Jean Lamour, CNRS, Nancy, France.
- May-Jun 2010 : *Easy magnetization directions in some compound TRFe₂*, first year MSc thesis (Numerical calculation), Supervisor : C. Dufour, Institut Jean Lamour, CNRS, Nancy, France.

Teaching

- From 2020 – today : Newtonian Mechanics (Lectures/Tutorials), Optics (Lectures/Tutorials/Practical works), Waves and Oscillators (Tutorials), Physics for Chemistry (Tutorials), Special Relativity (Tutorials), Philosophy and History of Sciences (Tutorials), Mathematics (Lectures/Tutorials), Informatics (Tutorials/Practical works), Chemistry (Practical works).
- 2013/2014 : Newtonian Physics (Practical works), Biophysics (Tutorials)

Student supervision

- 2020 : Supervision of a Bachelor internship *Analyse physique des réseaux complexes : une approche markovienne*, Salomé Gentili
- 2014 : Co-supervision of a Master internship *Détermination de l'application symplectique régissant la*

dynamique de la comète de Halley, Pierre Haag

- 2013 : Co-supervision of a Bachelor internship *Etude de la dynamique de la comète de Halley*, Antoine Patt et Saad Yalouz

Publication

Publication in refereed journals

- [10] **G. Rollin**, I. I. Shevchenko, J. Lages, *Dynamical environments of MU69 and similar objects*, *Icarus*, **357**, 114178 (2021)
arXiv : <https://arxiv.org/abs/2012.02814>
- [9] I. I. Shevchenko, **G. Rollin**, A. V. Melnikov, J. Lages, *Massive evaluation and analysis of Poincaré recurrences on grids of initial data: A tool to map chaotic diffusion* *Computer Physics Communications*, **246**, 106868 (2020)
arXiv : <https://arxiv.org/abs/1908.09683>
- [8] **G. Rollin**, J. Lages, T. S. Serebriyskaya, D. L. Shepelyansky, *Interactions of pharmaceutical companies with world countries, cancers and rare diseases from Wikipedia network analysis* *PLOS ONE* **14(12)**: e0225500 (2019)
bioRxiv : <https://www.biorxiv.org/content/10.1101/614016v2>
- [7] **G. Rollin**, J. Lages, D. L. Shepelyansky, *Wikipedia network analysis of cancer interactions and world influence* *PLOS ONE* **14(9)**: e0222508 (2019)
bioRxiv : <https://www.biorxiv.org/content/10.1101/527879v2>
- [6] I. I. Shevchenko, **G. Rollin**, J. Lages, *Dynamical environments of relativistic binaries: The phenomenon of resonance shifting* *Phys. Rev. D*, **100**, 064016 (2019)
arXiv : <https://arxiv.org/abs/1909.00648>
- [5] **G. Rollin**, J. Lages, D. L. Shepelyansky, *World Influence of Infectious Diseases from Wikipedia Network Analysis* *IEEE Access*, **7**, 26073-26087 (2019)
bioRxiv : <https://www.biorxiv.org/content/10.1101/424465v1>
- [4] J. Lages, I. Shevchenko, **G. Rollin**, *Chaotic dynamics around cometary nuclei* *Icarus*, **307**, 391-399 (2018)
arXiv : <https://arxiv.org/abs/1710.10110>
- [3] **G. Rollin**, J. Lages, D. L. Shepelyansky, *Fractal structures for the Jacobi Hamiltonian of restricted three-body problem* *New Astron.* **47**, 97–104 (2016)
arXiv : <http://arxiv.org/abs/1509.07638>
- [2] **G. Rollin**, P. Haag, J. Lages, *Symplectic map description of Halley's comet dynamics* *Phys. Lett. A*, **379**, 1017-1022 (2015)
arXiv : <http://arxiv.org/abs/1410.3727>
- [1] **G. Rollin**, J. Lages, D. L. Shepelyansky, *Chaotic enhancement of dark matter density in binary systems* *Astron. Astrophys.*, **576**, A40 (2015)
arXiv : <http://arxiv.org/abs/1403.0254>

Thesis

- [3] **G. Rollin**, *Libre Arbitre à l'ère des Sciences Contemporaines* *MSc thesis (epistemology)* (2018)
pdf : https://g-rollin.hebfree.org/FR_pages/M22.pdf
- [2] **G. Rollin**, *Chaos dynamique dans le problème à trois corps restreint* *PhD thesis (physics)* (2015)
HAL : <https://hal.archives-ouvertes.fr/tel-01344435>
- [1] **G. Rollin**, *Transfert d'un qubit vibrationnel dans un réseau moléculaire confiné* *MSc thesis (physics)* (2012)
pdf : https://g-rollin.hebfree.org/FR_pages/M21.pdf

Administrative duties

- 2014 – 2015 : Member of Institut UTINAM council as Ph.D. student 2014-2015.

Skills

- Languages : French, English
- OS : Linux, Windows
- Programming languages : Fortran (77/90), Python, Bash, HTML, LaTeX
- Computing cluster : Sun Grid Engine
- Graphics softwares : Gnuplot, Grace
- Infographics softwares : Blender (3D modelisation), Gimp, Inkscape

Seminars and Workshops

- 2020 – Virtual Sunbelt, Paris (remote presentation), *Cultural analysis of philosophers' position within the Wikipedia articles networks*.
- 2017 – APEX project kick-off meeting at UTINAM Institut, Besançon, France, *Chaos and philosophy*.
- 2016 – School for advanced sciences, Luchon, France, *Chaos and fractal structures in the planar restricted three-body problem*.
- 2015 – Seminar at Lagrange laboratory, Nice, France, *From comet dynamics to dark matter dynamics*.
- 2014 – School for advanced sciences, Luchon, France, *Chaotic enhancement of dark matter density in binary systems*.
- 2013 – Doctoral school, Dijon, France, *The Kepler-Petrosky map* (Poster).

Other interests

- Philosophy
- Poetry
- 3D Modeling/animation

Referees

- J. Lages, Ph.D. Supervisor, UTINAM, Besançon, France.
Email : jose.lages@utinam.cnrs.fr
- D. L. Shepelyansky, Co-author, Laboratoire de Physique Théorique, CNRS, Toulouse, France.
Email : dima@irsamc.ups-tlse.fr
- I. I. Shevchenko, referee of my Ph.D. thesis, Pulkovo Observatory, St. Petersburg, Russia.
Email : iis@gao.spb.ru