

# Lucas Gautheron

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## Education

- 2022-2025 **PhD student**, *University of Wuppertal*, Wuppertal (Allemagne), Dynamics of a research program in high-energy physics: the case of supersymmetry (Research Training Group 2696, “Transformations of science and technology since 1800: topics, processes, institutions ”) [*on-going*]
- 2021-2022 **M.A**, *Université de Paris*, Paris, History and Philosophy of Science [Class rank: 1st] Thesis : “Too beautiful to be false, or too beautiful to be true? Searching supersymmetry at the *Large Hadron Collider*”. Supervisors: Olivier Darrigol, Elisa Omodei.
- 2014-2018 **Master 1**, *Ecole Normale Supérieure de Cachan*, Cachan, Fundamental Physics Full scholarship. Experimental and theoretical physics, mathematics. Options: Symmetries and path integrals; Astrophysics and Cosmology.
- 2012-2014 **PCSI/PC\***, *Lycée Berthollet*, Annecy  
“Classe préparatoire aux grandes écoles”

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## Research

- September 2020 to November 2021 **Engineer**, *Laboratoire de Sciences Cognitives et Psycholinguistique (LSCP - DEC - École Normale Supérieure)*, Paris  
Study of language acquisition across cultures through naturalistic long-form audio recordings. Supervised by Alejandrina Cristia.
  - Creation of a python package for the management, storage and analysis of large datasets ( $\mathcal{O}(10^4)$  hours of audio)
  - Signal processing on long-form audio
  - Statistical analysis (bayesian inference)
  - CNRS Training “Basics of Machine Learning and Deep Learning” (28h)
- October 2016 – January 2017 **Research Internship**, *Laboratoire Univers et Théories (LUTH - INSU - CNRS)*, Paris Meudon  
Influence of the nuclei distribution on the electron capture rates and neutrino scattering in core-collapse supernovae. Supervised by Micaela Oertel.
  - Implementation of electron capture rates and neutrino scattering cross-sections calculations in a core-collapse supernova simulation code (Fortran, C++).
- May 2016 – July 2016 **Research Internship**, *Laboratoire de Physique Nucléaire et des Hautes Énergies (LPNHE - IN2P3 - CNRS)*, Paris  
Diphoton analysis and phenomenology for the ATLAS experiment. Supervised by Lydia Roos.
  - New parameterization of the diphoton invariant mass distribution for a spin-2 decaying particle signal (Pythia, ROOT, RooFit, C++, Python, FeynRules, CalcHEP)
  - NLO corrections for the spin-2 signal (MadGraph5\_aMC\_atNLO)
  - Signal-background interferences
- October 2015 – January 2016 **Research Internship**, *Laboratoire d’Annecy-Le-Vieux de Physique Théorique (LAPth - IN2P3 - CNRS)*, Annecy-Le-Vieux  
Cosmology. Supervised par Richard Taillet.
  - Creation of an Internet website for students about the history of modern cosmology (<http://cosmology.education/>)
  - Development of several simulations in C++ to illustrate the website.

May 2015 – **Research Internship**, *Laboratoire d'Annecy-Le-Vieux des Particules (LAPP - IN2P3*  
July 2015 - *CNRS*), Annecy-Le-Vieux

Particle physics for the ATLAS experiment. Supervised by Stéphane Jézéquel.

- Diphoton events analysis and local/global significance calculations with ROOT.
- Analysis of the performance of a new tracker prototype for HL-LHC, using MC simulations
- Development of a simulation to assess the impact of thermal radiation over the temperature of parts of the tracker, as part of the design of a cooling system upgrade
- Development of a simulation to calculate the intersections of charged particles with the sensors of a tracker prototype

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## Publications

- [3] **L. Gautheron**, N. Rochat, and A. Cristia. “Managing, storing, and sharing long-form recordings and their annotations”. In: *Language Resources and Evaluation* (Feb. 2022). DOI: 10.1007/s10579-022-09579-3. URL: <https://link.springer.com/10.1007/s10579-022-09579-3>.
- [4] M. Lavechin, M. de Seyssel, **L. Gautheron**, E. Dupoux, and A. Cristia. “Reverse Engineering Language Acquisition with Child-Centered Long-Form Recordings”. In: *Annual Review of Linguistics* 8.1 (Jan. 2022), pp. 389–407. DOI: 10.1146/annurev-linguistics-031120-122120. URL: <https://www.annualreviews.org/doi/full/10.1146/annurev-linguistics-031120-122120>.
- [5] **L. Gautheron**, M. Lavechin, R. Riad, C. Scaff, and A. Cristia. “Longform recordings : Opportunities and challenges”. In: *LIFT 2020 - 2èmes journées scientifiques du Groupement de Recherche "Linguistique informatique, formelle et de terrain"*. Ed. by T. Poibeau, Y. Parmentier, and E. Schang. Montrouge / Virtual, France: CNRS, Dec. 2020, pp. 64–71. URL: <https://hal.archives-ouvertes.fr/hal-03047153>.

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## Talks

- [1] **L. Gautheron**. “The many faces of supersymmetry: Supersymmetry across subcultures of High-Energy Physics, 1971–2019”. 2022 History of Science Society Annual Meeting: group session on Historical Epistemology of Particle Physics and Quantum Gravity, Chicago, IL, United States. Nov. 2022.
- [2] **L. Gautheron**. “Who trusts supersymmetry? Probing quantitative methods for investigating research orientations in High-Energy Physics”. 4th International Spring School of the Epistemology of the Large Hadron Collider: The History, Philosophy and Sociology of Large Scale Experiments, Wuppertal, Germany. Mar. 2022.

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## Journalism

December 2019 **President**, *Société de Production Le Média*, Montreuil  
to November 2020 Management of a production company with more than 12 full-time equivalent workers. Publication Manager. Marketing procedures optimization, development of revenue forecasting models and audience data analysis.  
Septemter 2018 to September 2020 **Journalist**, *Le Média*, Montreuil  
Specializing in data journalism and book reviews [https://www.lemediatv.fr/auteurs/lucas-gautheron-9DAnWoo5TlavitrWgg\\_Qlw/articles](https://www.lemediatv.fr/auteurs/lucas-gautheron-9DAnWoo5TlavitrWgg_Qlw/articles).

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## Development

Juillet 2013 **Developer**, *Électricité réseau Distribution de France (ErDF)*, Annecy  
○ Design of an archive database and search system (PHP/MySQL)  
○ Automated retrieval of large amounts of data from other company-wide applications.  
Mars 2011 à 2014 **Developer**, *AssaultCube*  
Development of a C++ 3D video game as part of an international team of volunteers

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## Skills

### Computer

Programming Python, C, C++, Fortran

Scientific software    numpy, scipy, scikit-learn, MadGraph5\_aMC\_@NLO, Pythia, ROOT/RooFit, stan

    Data    Pandas, MySQL, HDF

    Web    PHP, HTML, JS, CSS

    Video    Adobe Premiere Pro

#### [Languages](#)

English    Toefl IBT: 104

French    Native

Spanish    Beginner