

SALOMON GUINCHARD

<https://salomon73.github.io> | Up to November 29, 2023

PERSONAL INFORMATIONS

Full name: Salomon Jacques Jean Guinchard

Date and place of birth: December 12, 1999, Besançon (France)

Citizenship: French

Address: 110 Route des Bartelins, 73100 Pugny-chaenod (France)

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Spoken languages: French (Mother tongue) - English (Fluent) - Spanish (Conversational) - German (Basics) - Russian (Basics)

EDUCATION

Princeton University - Princeton Plasma Physics Laboratory
Visiting researcher

Feb 2023 - Aug 2023

Ecole Polytechnique fédérale de Lausanne
Master of Science in theoretical physics

2021 - 2023

Ecole Polytechnique fédérale de Lausanne
Bachelor of Science in physics

2017 - 2021

Lycée Saint-Ambroise Chambéry
Baccalauréat scientifique
Grade: 17.31/20 (With honor)

2014 - 2017

EXPERIENCE

Ecole Polytechnique Fédérale de Lausanne
Thermodynamics Notebook programmer

Sept. 2021 - Jul. 2022
Lausanne (Switzerland)

- **Aim:** provide additional resources for physics courses at EPFL.

Ecole Polytechnique Fédérale de Lausanne
Teaching Assistant - Physique avancée I

Sept. 2021 - Jan. 2023
Lausanne (Switzerland)

- Help first year of Physics Bachelor students solve their physics exercises.
- Help deepen their understanding of the subject during Q&A sessions.

Ecole Polytechnique Fédérale de Lausanne
Teaching Assistant - Physique avancée II

Jan. 2021 - July 2021
Lausanne (Switzerland)

- Help first year of Physics Bachelor students solve their thermodynamics exercises.
- Help deepen their understanding of the subject, and improve their intuition.

Ecole Polytechnique Fédérale de Lausanne
Partial differential equations Notebook Programmer

Jan. 2021 - July 2021
Lausanne (Switzerland)

- Programming of a Jupyter Notebook implementing partial differential equations.
- Visual modelisation of heat diffusion in different physical systems.
- Visual modelisation of Turing Patterns arising from Reaction-Diffusion models.
- **Aim:** provide additional resources for physics courses.

Ecole Polytechnique Fédérale de Lausanne
Teaching Assistant - Analyse avancée I

Sept. 2019 - Jan. 2020
Lausanne (Switzerland)

- Help first year of Physics Bachelor students solve their mathematical analysis exercises.
- Help deepen their understanding of the subject during Q&A sessions.

PUBLICATIONS

S. Guinchard, W. Sengupta, S. Hudson, *Application of Lagrangian techniques for calculating the on-axis rotational transform*, To be submitted on ArXiv, Dec. 2023.

G. Le Bars, S. Guinchard, P. Kaminski, et al., *Fennecs: A novel particle-in-cell code for simulating the formation of magnetized non-neutral plasmas trapped by electrodes of complex geometries*, Computer Physics Communications, Aug. 2023, Submitted

UNPUBLISHED WORKS RELATED TO MY STUDIES

Effect of magnetic axis torsion and magnetic surfaces ellipticity on the rotational transform and the magnetic shear - Jan. 2022 - Supervised by A. Baillod and J. Loizu

Dependence of quasi-helical symmetry and quasi-axisymmetry on magnetic axis torsion and magnetic surfaces ellipticity - June 2022 - Supervised by A. Baillod and J. Loizu

Numerical study of the effect of secondary electron emission on the dynamics of electron clouds in gyrotron guns - Jan. 2023 - Supervised by G. Le Bars and J. Loizu

Stellarator design and optimization: A novel approach based on variational principles - Aug. 2023 - Master's thesis - Supervised by S. Hudson, J. Loizu and J.P. Hogge - GPA 6.0/6.0

CONFERENCES

S. Guinchard, W. Sengupta, S. R. Hudson, *Application of Lagrangian techniques for calculating the on-axis rotational transform*, To be presented at the 50th EPS conference on Plasma Physics, Jul. 2024.

S. Guinchard, W. Sengupta, S. R. Hudson, *Application of Floquet theory to on-axis rotational transform computation*, SPECTaculars meetings, online invited talk, Nov. 08, 2023.

S. Guinchard, S. R. Hudson, W. Sengupta, E. J. Paul, *Lagrangian techniques and on axis rotational transform - Vacuum field energy for coil design*, Seminar given at Columbia University, Aug. 01, 2023.

A. Baillod, S. Guinchard, J. Loizu, J. P. Graves, *Equilibrium β -limit in a quasi-axisymmetric stellarator with self-consistent bootstrap current*, Simons Collaboration on Hidden Symmetries and Fusion Energy Meeting, Princeton (NJ), USA, 2023.

S. Hudson, S. Guinchard, E. Paul, W. Sengupta, C. Aderson, *Minimizing the magnetic energy with prescribed on-axis rotational transform*, SPECtaculars meetings, online talk, May 24, 2023.

G. Le Bars, S. Guinchard, J.-P. Hogge, et al., *FENNECS: A flexible code to simulate non-neutral plasmas trapped in penning-like annular potential wells*, in 49th EPS Conference on Plasma Physics, EPS 2023, Publisher: European Physical Society (EPS), Bordeaux, France, 2023.

SKILLS

Analytics and synthesis skills	Strong abilities to analyse and synthetise results (as a former EPFL student).
Physical fields	Plasma physics, quantum physics, astrophysics.
Mathematical fields	Real & complex analysis, optimal transport, topology, group theory.
Typesetting Document	LaTeX, Beamer LaTeX, Office.
Programming	C++, FORTRAN, Python, Bash, Matlab and Mathematica.
Plasma physics related codes	SPEC, Simsopt, BoozXforms.
Tools	MPI, OpenMP, SLURM, Git.

EXTRACURRICULAR ACTIVITIES

Ecole de Musique de Lausanne - EML	2019 - 2023
<i>Pianist student</i>	<i>Lausanne (Switzerland)</i>

- I attended the Music School of Lausanne as a pianist (second cycle), in the class of Galina Lagresle.
- In 2020, I passed the first-cycle exam with distinction (Très bien) and am currently preparing the second-cycle exam.

SSA EPFL	Jan. - July 2021
<i>Team member</i>	<i>Lausanne (Switzerland)</i>

- Part of the conception of a portative camera tracking satellites and polluting spatial debris

AI4 Mars - JPL (NASA)	March - May 2020
<i>Photo/data analyst</i>	

- Photo/data analysis from the rover Curiosity for Hiro Ono - NASA Jet Propulsion Laboratory, in order to apply machine learning to the rover Perseverance

Aix-Savoie Triathlon	2015 - 2017
<i>Member of the local triathlon club</i>	<i>Aix les Bains (France)</i>

- Participated in competitions

OTHER INTERESTS

Music	Classical and Jazz music enthusiast.
Endurance sports	Cycling, Triathlon, Swimming, Ski-Touring and Trail.
Promote environmental awareness	
Reading	Jack London and Boris Vian's works particularly speak to me.
Physics and Mathematics	Nuclear fusion, Quantum physics, Astrophysics, High critical-temperature superconductors, Fractals Optimal transport.

OTHER PROFESSIONAL EXPERIENCES

Chantier Marée Haute <i>Stratifier for a shipyard</i>	Oct. 2023 <i>Concarneau (France)</i>
· Sanding and stratification of the hull of fishing trawlers for a shipyard.	
Atelier Alter-Ego <i>Market research for a real estate development company</i>	July 2018 - August 2018 <i>Aix-les-Bains (France)</i>
· Real estate market research in Aix les Bains and Chambéry areas.	
Atelier Alter-Ego <i>Painter</i>	July 2017 <i>Aix-les-Bains (France)</i>
· Painting of the outsides and facades of a renovated 19th century mansion.	
ABM TP <i>Demolition worker</i>	July 2016 <i>Aix-les-Bains (France)</i>
· Dismantling of all interiors of a 19th century mansion.	
Charpente Contemporaine <i>Carpentry worker</i>	June 2015 <i>Grenoble (France)</i>
· 2 weeks summer internship in a carpentry company.	
· Building wooden houses frames and working on construction sites.	
Restaurant Atmosphère <i>Commis chef</i>	January 2014 <i>Le Bourget du Lac (France)</i>
· 2 weeks internship as a commis chef in a 1 Michelin star restaurant.	