SALOMON GUINCHARD

https://salomon73.github.io | Up to May 21, 2024

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-chatenod (France)
Telephone: +33 6 84 38 40 11
E-mail: salomon.guinchard@orange.fr
Spoken languages: French (Mother tongue) - English (Fluent) - Spanish (Conversational) - German (Basics) - Russian (Basics)

EDUCATION

Princeton University - Princeton Plasma Physics Laboratory *Feb 2023 - Aug 2023*
Visiting researcher

Ecole Polytechnique fédérale de Lausanne *2021 - 2023*
Master of Science in theoretical physics

Ecole Polytechnique fédérale de Lausanne *2017 - 2021*
Bachelor of Science in physics

Lycée Saint-Ambroise Chambery *2014 - 2017*
Baccalauréat scientifique
Grade: 17.31/20 (With honor)

EXPERIENCE

Ecole Polytechnique Fédérale de Lausanne Sept. 2021 - Jul. 2022
Thermodynamics Notebook programmer *Lausanne (Switzerland)*

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

Ecole Polytechnique Fédérale de Lausanne Sept. 2021 - Jan. 2023
Teaching Assistant - Physique avancée I *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 Jan. 2021 - July 2021
Teaching Assistant - Physique avancée II *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 Jan. 2021 - July 2021
Partial differential equations Notebook Programmer *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 Sept. 2019 - Jan. 2020
Teaching Assistant - Analyse avancée I *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, S. R. Hudson, E. J. Paul, *Reducing the intercoil forces by minimizing the vacuum field energy*, Journal of Plasma Physics, In preparation.

S. R. Hudson, S. Guinchard, W. Sengupta, *Sensitivity of the magnetic axis to variations in the magnetic field*, Physics of Plasma, May 2024, Submitted.

S. Guinchard, W. Sengupta, S. R. Hudson, *Application of Lagrangian techniques for calculating the on-axis rotational transform*, Journal of Plasma Physics, April 2024, Submitted. Available on arXiv.

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.

G. Le Bars, J. Loizu, J.-P. Hogge, S. Guinchard, et al., *FENNECS: A flexible code to simulate non-neutral plas- mas trapped in penning-like annular potential wells*, poster presented at the Computational Challenges and Optimization in Kinetic Plasma Physics Poster Session, Publisher: Institute for Mathematical and Statistical Innovation (IMSI), Chicago IL, USA, Feb. 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 prescribded 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.

PRIZES AND AWARDS

Gilbert Haussmann award Sept. 2024
Nominated - pending result *EPFL (Lausanne)*

· Meant to award a deserving graduate or PhD. student in the field of physics. Pending result, nominated in Oct. 2023 for 2024.

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
Pianist student *Lausanne (Switzerland)*

· 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
Team member *Lausanne (Switzerland)*

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

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

· 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
Member of the local triathlon club *Aix les Bains (France)*

· 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 Oct. 2023
Stratifier for a shipyard *Concarneau (France)*

· Sanding and stratification of the hull of fishing trawlers for a shipyard.

Atelier Alter-Ego July 2018 - August 2018
Market research for a real estate development company *Aix-les-Bains (France)*

· Real estate market research in Aix les Bains and Chambery areas.

Atelier Alter-Ego July 2017
Painter *Aix-les-Bains (France)*

· Painting of the outsides and facades of a renovated 19th century mansion.

ABM TP July 2016
Demolition worker *Aix-les-Bains (France)*

· Dismantling of all interiors of a 19th century mansion.

Charpente Contemporaine June 2015
Carpentry worker *Grenoble (France)*

· 2 weeks summer internship in a carpentry company.
· Building wooden houses frames and working on construction sites.

Restaurant Atmosphère January 2014
Commis chef *Le Bourget du Lac (France)*

· 2 weeks internship as a commis chef in a 1 Michelin star restaurant.