Skander Charfi

Personal Data

Place and Date of Birth:	Sfax, Tunisia | 22 February 1996
Address:	Institut de Mathématiques de Jussieu-Paris Rive Gauche Campus Pierre et Marie Curie 4, place Jussieu – Boite Courrier 247 75252 Paris Cedex 05
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Spoken Languages

Arabic:	Mother-tongue
French:	Fluent
English:	Fluent
Japanese:	Beginner
German:	Beginner

Formation

Currently 2021 - 2024 | **PhD in Mathematics,** *Université Paris-Cité*
On the Recurrence of Lagrangians and Viscosity Solutions under Symplectic Actions that deviate the Vertical Line,
under the supervision of Marie-Claude Arnaud and Jacques Féjoz.

2020 - 2021 | **Long Research Project,** *ENS de Lyon*
- First Research Internship on KAM Theory.
- Second Research Internship on Weak KAM Theory.
- Followed Courses :
Dynamical Systems II, by Frédéric LE ROUX, Sorbonne Université
Introduction to Symplectic Topology I and II, by Claude VITERBO, ENS

2019 - 2020 | **Master 2 of Mathematics,** *ENS de Lyon*
- First Term Courses: h-Principle and Convex Integration, Riemannian Geometry and Isometric Immersions, Variational principle and Elliptic PDEs, Evolution Equations, Representation Theory of GLn(C)
- Second Term Courses: Effective Geometry : Linear Embeddings and Optimal Transport, Besse and Zoll Manifolds, Mathematical methods for the Navier-Stokes equations, Analysis of PDE models for biology

2018 - 2019 | **Master 1 of Mathematics,** *ENS de Lyon*
- First Term Courses: Advanced Algebra, Functional Analysis, Advanced Geometry, Advanced Probability, Measurable Dynamical Systems
- Second Term Courses: Partial Differential Equations, Elementary Algebraic Geometry, Riemannian Geometry, Riemann Surfaces, Stochastic Process
- Physics Courses: Fluid Mechanics, Dynamical Systems And Chaos, Advanced Quantum Mechanics, Advanced Thermodynamics

2017 - 2018 | **Licentiate 3 (Bachelor) of Mathematics,** *ENS de Lyon*
- Courses: Algebra 1 (Groups theory), Algebra 2 (Galois Theory), Complex Analysis, Measure Theory, Topology, Differential Calculus, Probability, Introduction to Dynamical Systems, Fundamental Groups and Coverings, P-adic Numbers, Logic.
- Physics Courses: Quantum Mechanics, Analytical Mechanics, Atoms and Chemical Bonds, Quantum Information Science, Electromagnetism, Statistical Physics.
- Working Group: Lie Algebra Representation Theory.

2015 - 2017 | **Higher School Preparatory Classes,** *Maths-Physics MPSI-MP*, Esprit-Prépa, Tunis, Tunisia*
Result: Admission to Ecole Normale Supérieure de Lyon

Diplomas

2021 | **ENS de Lyon Diploma,** *ENSL, Lyon*

2020 | **Master of Mathematics and Applications,** *ENSL, Lyon*

2018 | **Licentiate (Bachelor) of Mathematics,** *ENSL, Lyon*

2014 | **Baccalauréat in Mathématics,** *15 Novembre 1955 Highschool, Sfax, Tunisia.*

RESEARCH INTERNSHIPS

SPRING 2021 | **Master 2 Internship (4 Months),** *Supervised by Ludovic Rifford, Université Côte d'Azur, Nice, France*
- Subject: Regularity of Weak KAM Solutions.
- Description: Analysis of the dynamic properties of Green bundles and use of the results to demonstrate a better regularity of weak KAM solutions in low dimension. Use of these ideas added to the closure lemma in order to solve particular cases of Mañé's conjecture.

WINTER 2021 | **Master 2 Internship (4 Months),** *Supervised by Jacques Féjoz, Université Paris Dauphine-PSL, Paris, France*
- Subject: KAM Theory and Paradifferential Calculus.
- Description: Study of different versions of the KAM theorem and several proof methods. Refining results using para-differential calculus.

SUMMER 2020 | **Master 2 Internship (4 Months),** *Supervised by Jean-Claude Sikorav and Marie-Claude Arnaud, ENS de Lyon, Lyon, France*
- Subject: Weak KAM Solutions for the Hamilton-Jacobi Equation.
- Description: Study of weak KAM theory and properties of weak solutions for the stationary Hamilton-Jacobi equation. Study of the characteristic sets of these weak solutions given by the Mather, Aubry and Mañé sets. Study of the link between weak KAM solutions and viscosity solutions.
- Parallel Work: Study of twist maps and generating functions. Construction in dimension 2 of a correspondence between twists close to the standards and a family of Tonelli Hamiltonians in order to relate discrete and continuous weak KAM solutions.

SUMMER 2019 | **Master 1 Internship (3 Months),** *Supervised by Inou Hiroyuki, Kyoto University, Kyoto, Japan*
- Subject: Julia sets in small copies of the Mandelbrot set.
- Description: Study of the forms of the Julia sets corresponding to the small copies of the Mandelbrot set located inside itself. Construction of a straightening map from small copies to the entire Mandelbrot set, and construction of an inverse map using quasiconformal surgery on the associated Julia sets.

SUMMER 2017 | **Bachelor Internship (6 Weeks),** *Supervised by Dietrich Häfner, Fourier Institute, Grenoble, France*
- Subject: Oppenheimer-Snyder Model.
- Description: Modeling the Collapse of a star and the formation of a Black Hole by gluing two different solutions to Einstein's Equations and studying the regularity at the glued surface.

Teaching

2022-2023	**Office and Internet Tools,** *Université Paris-Cité* L1 Students
	Elementary Analysis 2, *Université Paris-Cité* L1 Students
	Algebra 3, *Université Paris-Cité* L2 Students
	Math Oral Tests, *Université Paris-Cité* L1 Students
2021-2022	**Analysis 2,** *Université Paris-Cité* L1 Students
	Math Oral Tests, *Université Paris-Cité* L1 Students

Research Talks

8 June 2023	*Various solutions for the Hamilton-Jacobi Equation,* Séminaire des thésards, Institut de Mathématiques de Jussieu-Paris Rive Gauche - site Sophie Germain - Université Paris Cité (IMJ-PRG), Paris, France
8 December 2022	*Pendulum and Variational Principal,* Pampers seminar for young researchers in geometry, Institut de recherche mathématique de Rennes (IRMAR), Rennes, France

Diffusion

7 Février 2019	*Meeting with Researchers, MathαLyon ,* Honoré de Balzac Middleschool, Vénissieux, France
7 Mai 2017	*Kakeya Needle Problem ,* Diffusion Talk , ENS de Lyon, France

ATTENDED CONFERENCES AND WORKSHOPS

20 - 22 September 2023	*1923-2023, the centenary of the birth of René Thom,* Institut des hautes études scientifiques (IHÉS), France
11 - 15 September 2023	*French-Japanese Workshop at Jussieu,* Sorbonne Université, Paris, France
22 - 26 May 2023	*Symplectic Dynamics - INdAM Meeting - Incontro INdAM,* Istituto Nazionale di Alta Matematica "Francesco Severi", Rome, Italy
8 - 12 May 2023	*School on conformal symplectic dynamics and related fields,* Centre International de Rencontres Mathématiques (CIRM), Marseille, France
23 - 28 April 2023	*Beyond Uniform Hyperbolicity,* Bedlewo, Poland
28 - 30 September 2022	*Dynamics 2022 at the IMJ-PRG,* Université Paris-Cité, Paris, France
04 - 08 July 2022	*Convexity in Contact and Symplectic Topology,* Institut Henri Poincaré, Paris, France
27 June - 01 July 2022	*18th School on Interactions between Dynamical Systems and Partial Differential Equations (JISD2022),* Centre de Recerca Matemàtica (CRM), Barcelona, Spain
30 May - 3 June 2022	*Weak-KAM Theory XXV+1 Years Later,* Avignon Université, Avignon, France
7 - 8 October 2021	*Dynamics 2021 at the IMJ-PRG,* Université Paris-Cité, Paris, France
7 - 10 June 2021	*International conference in Hamiltonian Dynamical Systems in honor of Jean-Pierre Marco ,* teleconference, Observatoire de Paris, Paris, France
7 ; 13 ; 20 ; 28 February 2020	*Solving ill posed problems in fluid mechanics ,* by Eduard Feireisl, Institut Camille Jordan, Lyon, France
6 - 8 December 2019	*Introduction to quantum differential calculus and ideas of noncommutative geometry ,* by Alain Connes, Mathematical Week-end at Goutelas Castles, ENS de Lyon, France
3 - 7 June 2019	*Dynamical Systems -Toward New Theory and Application ,* Kyoto University, Kyoto, Japan
15 - 17 April 2019	*Three days'workshop in mathematical general relativity ,* Institut Camille Jordan, Lyon, France
14 - 17 December 2018	*Random Geometry,* by Nalini Anantharaman, Mathematical Week-end at Goutelas Castle, ENS de Lyon, France
1 - 3 December 2017	*Démontrer. — Pourquoi, comment, jusqu'où ?,* by Antoine Chambert-Loir, Mathematical Week-end at Goutelas Castle, ENS de Lyon, France
17 - 27 July 2017	*Topology from the differential point of View, Fuchsian Groups ,* Mathcamp 5, Oran, Algeria
14 - 17 December 2018	*Random Geometry ,* by Nalini Anantharaman, Mathematical Week-end at Goutelas Castle, ENS de Lyon, France