SOFÍA ANGRIMAN

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I am a physicist with a strong background in Fluid Dynamics, especially in turbulence. During my PhD I conducted experiments focused on **particle dynamics in turbulent flows**, and also carried out Direct Numerical Simulations of particle-laden turbulent flows to compare with the experiments. Currently I am a postdoctoral researcher at the Physics of Fluids group at the University of Twente, in the Netherlands, working in collaboration with Sander G. Huisman and Detlef Lohse. My current research involves the study of **melting of ice under different flow conditions**, performing numerical simulations of idealised configurations to understand the underlying physics involved in the melting process.

Professional experience

01/05/2023 – present	**Postdoctoral researcher** – Physics of Fluids Group, University of Twente (The Netherlands)

Education

01/04/2019 – 18/04/2023	**Ph.D** in Physics – University of Buenos Aires, Faculty of Exact and Natural Sciences (Argentina) Thesis: "Turbulence in multiphase flows". Advisors: P. J. Cobelli and P. D. Mininni. Defence date: 18/04/2023. Qualification: Outstanding (highest qualification).
01/03/2014 – 26/03/2019	*Licenciatura* in Physical Sciences – Equivalent to a **Bachelor + M. Sc. in Physi Sciences**. University of Buenos Aires, Faculty of Exact and Natural Sciences (Argentina). Overall grade: 9.3/10 (average from 2018-2022: 8.86/10). Thesis: "Particle dynamics in turbulent flows", advisors: P. J. Cobelli and P. D. Mininni, Grade: 10/10.

Journal Publications (peer reviewed)

9. **S. Angriman**, S. E. Smith, P. Clark di Leoni, P. J. Cobelli, P. D. Mininni & M. Obligado. *Active grid turbulence anomalies through the lens of physics informed neural networks*. Results in Engineering 24, 103265 (2024)
8. F. Zapata, **S. Angriman**, A. Ferran, P. J. Cobelli, M. Obligado & P. D. Mininni. *Turbulence Unsteadiness Drives Extreme Clustering*. Phys. Rev. Lett. 132, 104005 (2024)

7. **S. Angriman**, P. J. Cobelli, P. D. Mininni, M. Obligado & P. Clark di Leoni. *Assimilation of statistical data into turbulent flows using physics-informed neural networks*. Eur. Phys. J. E 46, 13 (2023)

6. N. Philipp, **S. Angriman**, S. Burne et al. *Physico-chemical elucidation of the mechanism involved in optical lithography: Micro-fabrication of 2D and 3D platforms*. J. Appl. Phys., 132, 183104 (2022).

5. **S. Angriman**, A. Ferran, F. Zapata, P. J. Cobelli, M. Obligado & P. D. Mininni. *Clustering in laboratory and numerical turbulent swirling flows*. J. Fluid Mech., Volume 948, A30 (2022)

4. **S. Angriman**, P. D. Mininni & P.J. Cobelli. *Multitime structure functions and the Lagrangian scaling of turbulence*. Phys. Rev. Fluids 7, 064603 (2022)

3. A. Ferran, **S. Angriman**, P. D. Mininni & M. Obligado. Characterising single and two-phase homogeneous isotropic turbulence with stagnation points. Dynamics 2022, 2(2), 63-72

2. **S. Angriman**, P. J. Cobelli, M. Bourgoin, S. G. Huisman, R. Volk & P. D. Mininni. *Broken mirror symmetry of tracer's trajectories in turbulence*. Phys. Rev. Lett. 127, 254502 (2021)

1. **S. Angriman**, P. D. Mininni & P. J. Cobelli. *Velocity and acceleration statistics in particle-laden turbulent swirling flows*. Phys. Rev. Fluids 5, 064605 (2020)

Conference & meeting contributions and invited seminars

7. December 2024, Buenos Aires, Argentina	Dynamic Days Latin America and the Caribbean. Semi-plenary talk. *Collective effects of ice objects melting in fresh water*. **S Angriman**, D. Lohse, R. Verzicco & S.G. Huisman.
6. September 2024, Aachen, Germany	1st European Fluid Dynamics Conference. Talk. *Icebergs melting side by side: numerical study of collective effects*. **S. Angriman**, R. Verzicco, D. Lohse & S. G. Huisman.
5. November 2023, Washington DC, USA	American Physical Society - Division of Fluid Dynamics - 76th annual meeting Talk. *Melting dynamics of an ice surface in a turbulent shear flow.* **S. Angriman**, R. Yang, C. Howland, R. Verzicco, D. Lohse & S. G. Huisman.
4. July 2021 (Online)	"Wavecomplexity International Networking Event" - Online conference organised by the Université Côte d'Azur (Nice, France) Poster. *Lagrangian and inertial particles' dynamics in anisotropic turbulence: experiments and simulations*. **S. Angriman**, P. D. Mininni & P. J. Cobelli.

3.	January 2020, Santa Fe, NM, USA	3rd Physics Informed Machine Learning Talk and poster. *Effective parameter calibration for a simple model of a particle-laden turbulent flow using laboratory data*. **S. Angriman**, P. D. Mininni & P. J. Cobelli.
2.	October 2019, Buenos Aires, Argentina	"IRP IVMF KickOff meeting" - Initial meeting in a joint collaboration between France and Argentina, in topics in fluid mechanics. Talk. *Dynamics of particle-laden turbulent flows*.
1.	July 2019, Buenos Aires, Argentina	StatPhys 27 - IUPAP International Conference on Statistical Physics Poster. *Lagrangian particle dynamics in anisotropic turbulence*. **S. Angriman**, P. D. Mininni & P. J. Cobelli.

I have also presented several times in the Argentinian Physics Society annual meeting, and in the meeting of the Argentinian Division of Fluid Mechanics.

Invited seminars

3. 15 Feb. 2024 – *Exploring particle dynamics in anisotropic and inhomogeneous turbulent flows*.
   Laboratoire de Méchanique des Fluides de Lille (LMFL), Lille, France

2. 13 Sept. 2023 – *Particle dynamics in turbulent swirling flows*.
   Physics of Fluids Group, University of Twente, The Netherlands

1. 31 Mar. 2022 – *Mirror, mirror on the wall: helicity and the knottedness of tracers' trajectories in turbulence*.
   Laboratoire des Ecoulements Geophysiques et Industriels (LEGI), Grenoble, France

Fellowships

2019 – 2024	**Ph.D fellowship** – Ph.D fellowship granted by the National Scientific and Technical Research Council (CONICET, Argentina). Research subject: *Dispersion of Lagrangian and inertial particles in turbulent flows for the generation and validation of climate parameterisations*. Advisors: P. J. Cobelli & P. D. Mininni.
2017 – 2018	**Undergraduate research fellowship** – Fellowship for undergraduate students to work in a research project for one year. Granted by the National Inter-university Board (CIN, Argentina). The research took place at the Physics Department of the Faculty of Exact and Natural Sciences, University of Buenos Aires, Argentina. Research subject: *Two-photon absorption optical microlithography*. Advisor: L. C. Estrada. The experimental work that I carried out during this fellowship resulted in the publication of one paper (publication #6, see above).

Teaching Experience

2020 – 2023	**Graduate teaching assistant** – Physics Department, Faculty of Exact a Natural Sciences, University of Buenos Aires (Argentina). Courses include: Dynamics of Geophysical Flows, Fluid Mechanics, Mechar Laboratory, Electricity and Magnetism Laboratory, Introduction to Optics a Electrodynamics (course aimed for Biology and Geology students). Teaching load: 10 hours/week. Each course spans 16 weeks.
2018 – 2020	**Undergraduate teaching assistant** – Physics Department, Faculty of Exact a Natural Sciences, University of Buenos Aires (Argentina). Courses include: Mechanics Laboratory, Optics Laboratory and Fluid Mechan Teaching load: 10 hours/week. Each course spans 16 weeks.

To hold these positions I had to go through an official (yearly) selection process with a committee, that entailed presenting a written exam and going through an interview, competing with other candidates. The activities involved solving exercises, part of the tutorials related to the lectures, on the board in front of students, answer questions, and prepare and grade exams. The laboratory courses entailed supervision and guidance of students in completing the weekly assignments, and grading their reports.

Supervision of Bachelor students' final assignment for the "Fluid Physics" course at the University of Twente (the Netherlands) during June 2024. The supervision consisted in meeting two groups of students weekly to discuss the implementation of an experiment, measurements, analysis, and presentation.

Outreach activities

- Feb. 2024 – I was featured in the Twitter initiative of "AeroWomen", which aims at raising visibility of women in Aerodynamics and Fluid Dynamics (link here).
- Apr. 2021 – Interview discussing my publication "*Broken mirror symmetry of tracer's trajectories in turbulence*" in the science outreach magazine of the Faculty of Exact and Natural Sciences of the University of Buenos Aires, Argentina (link, in Spanish).
- Oct. 2020 – Discussion with the National Network of Scientific Journalists (RAdPC, Argentina) about the Nobel Prize in Physics, an outreach activity organised by the Physics Department of the University of Buenos Aires (one of the published articles, in one of the major newspapers in Argentina, in Spanish, here).
- Jun. 2019 – Talk in science popularisation event "Counter-possible, science and fiction talks" (*Contraposible, charlas de ciencia y ficción*). Event with around 500 attendees of all ages, aiming at discussing physics concepts appearing in popular science fiction content, in a plain language for a non-scientific audience, hosted at the "Popular Science Centre" (*Centro Cultural de la Ciencia*, Buenos Aires, Argentina).
- Sept. 2017 and Sept. 2019 – Participation in events at the Faculty of Exact and Natural Sciences, University of Buenos Aires (Argentina), on different science popularisation stands, aimed at a general audience of all ages, in the context of the Buenos Aires "Museums Night".

- Jun. 2017 and Jun. 2018 – "Physics Week" popularisation event, organised by the Physics Department of the University of Buenos Aires. The aim of this event is to show high school students and their teachers what studying physics entails, and the research that is carried out in the Department.

Other relevant information

- Reviewed publications for *Journal of Fluid Mechanics* and *Physical Review Fluids* (see Publons profile)
- I'm always interested in having an active participation in the life of the Institution which I'm part of, not just from the research viewpoint. During 2021 and 2022, as a PhD student, I participated in the Physics PhD program advisory board of the Faculty, as an overseer representing graduate students.