# Víctor Navarro-Fernández

*Institut für Analysis und Numerik*
*Orléans-Ring 10, 48149 Münster*
✉ *victor.navarro@uni-muenster.de*
*sites.google.com/view/navarrofernandez*

## Research Interests

Transport and advection-diffusion equations | Mathematical fluid dynamics
Mixing of passive scalars | Convergence of numerical schemes

## Positions

since 09.2020 **Research Assistant (PhD Position)**, *DFG Project: Transport Equations, Mixing and Fluid Dynamics*, Universität Münster, PI Prof. Christian Seis.

## Education

since 09.2020 **PhD in Mathematics**,
*Universität Münster*, Mathematics Münster Graduate School (MMGS), Cluster of Excellence.
Thesis supervised by Prof. Christian Seis

2019–2020 **Master's Degree in Advanced Mathematics**,
*Universidad Complutense de Madrid (UCM)*, 60 ECTS.

2014–2019 **Bachelor's Degree in Mathematics**,
*Universidad Complutense de Madrid*, 240 ECTS.

2014–2019 **Bachelor's Degree in Physics**,
*Universidad Complutense de Madrid*, 240 ECTS.

## Fellowships and Research Stays

10.2022 **Max-Planck-Institute (MPI) for Mathematics in the Sciences**, *Leipzig, Germany*.
Visitor in the Research Group of Prof. Felix Otto, 1 week.

06.–10.2018 **Instituto de Ciencias Matemáticas (ICMAT)**, *Madrid, Spain*.
JAE Intro Severo Ochoa Fellowship 2018. Project on pseudo-spectral methods for computational fluid dynamics and applications to Rayleigh-Bénard and Taylor-Couette, supervised by Prof. Jezabel Curbelo.

2017–2018 **Rijksuniversiteit Groningen**, *Groningen, The Netherlands*.
Erasmus+ Exchange, 72 ECTS, 10 months.

## Honors and Awards

2019 **First Prize in Certamen Universitario Arquímedes**, *Experimental, Environmental and Exact Sciences*, Ministerio de Ciencia, Innovación y Universidades, Spain.
Prize for the Thesis: *Global existence and stability of solutions in predator-prey systems with chemotaxis*.

2019 **UCM Excellence Master Scholarship**,
*Universidad Complutense de Madrid*, Spain.

2014 **Bronze Medal in National Physics Olympiad**,
*Universidade da Coruña*, Spain.

## Talks

10.2022 Arbeitgemeinschaft Applied Analysis, MPI for Mathematics in the Sciences, Leipzig, Germany.
*Optimal stability estimates for the advection-diffusion equation with rough vector fields.*

09.2020 14th Workshop of Young Researchers, Universidad Complutense de Madrid, Spain.
*Existence of solutions and asymptotic behavior of a predator-prey system with chemotaxis.*

11.2019 XVIII Certamen Universitario Arquímedes, Ministerio de Ciencia, Innovación y Universidades, Spain.
*Global existence and stability of solutions of a two-species predator-prey system with diffusion and chemotaxis.*

## Teaching

**Universität Münster**, *Teaching Assistant*.

- Introduction to Mathematical Fluid Dynamics, 100406 — Winter 2022/23

## Seminars

since 09.2020 **Oberseminar Advanced Topics in Analysis and PDEs**, *Universität Münster*.

- Exponential mixing for random dynamical systems
- Lyapunov exponents for random dynamical systems and the Furstenberg-Kesten Theorem
- Invariant measures for continuous random dynamical systems
- Uniqueness for 2D Navier–Stokes with a measure as initial vorticity
- Estimates for the advection-diffusion equation in the DiPerna–Lions setting
- Universal mixers in all dimensions
- Estimates for the advection-diffusion equation in the Ladýzhenskaya–Prodi–Serrin setting

since 02.2022 **Analysis' PhD Students Seminar**, *Universität Münster*.

- Absolutely continuous curves, the Wasserstein distance and the continuity equation
- Subdifferential calculus in the space of probability measures

## Organization of Workshops

08.2023 Stability, Mixing and Fluid Dynamics, Universität Münster.

## Schools and Conferences attended

09.2022 Summerschool on Analysis and Applied Mathematics, Universität Münster.
07.2022 2nd IST Austria Summer School in Analysis and PDEs, IST Austria.
06.2022 Summer School on Fluids and Turbulence, Institut Camille Jordan, Lyon.
02.2022 Hausdorff School: PDEs in Fluid Mechanics, HCM, Universität Bonn.
01.2022 Transport, Fluids and Mixing, Centro De Giorgi, Pisa *(online)*.
11.2021 New Trends in Geometric PDEs, Universität Münster.
05.2021 Oberwolfach Seminar: Introduction to Convex Integration, MFO, Oberwolfach.
02.2021 Winterschool on Analysis and Applied Mathematics, Universität Münster *(online)*.
07.2020 Linear Transport and Incompressible Fluids, SMI Cortona *(online)*.
07.2019 Summer School in Fluid Mechanics, ICMAT, Madrid.
07.2018 JAE School of Mathematics, ICMAT, Madrid.

## Publications and Preprints

[5] V. Navarro-Fernández and A. Schlichting. Error estimates for a finite volume scheme for advection-diffusion equations with rough coefficients, *preprint at* arXiv:2201.10411.

[4] V. Navarro-Fernández, A. Schlichting and C. Seis. Optimal stability estimates and a new uniqueness result for advection-diffusion equations, *Pure and Applied Analysis* 4, 3 (2022), 571–596.

[3] R. Dáger, V. Navarro-Fernández and M. Negreanu. Uniform boundedness of solutions for a predator-prey system with chemotaxis and dormancy of predators, *Quart. Appl. Math.* 79, 2 (2021), 367-382.

[2] R. Dáger, V. Navarro-Fernández, M. Negreanu and A.M. Vargas. Uniform asymptotic behavior of numerical solutionsfor a predator-prey system with diffusion and chemotaxis, *Eng. Anal. Bound. Elem.* 120 (2020), 82-94.

[1] R. Dáger, V. Navarro-Fernández and M. Negreanu. Uniform boundedness of solutions for a predator-prey system with diffusion and chemotaxis, *C. R. Mathématique* 358, 1 (2020), 103-108.

## Service and Skills

Language Spanish (native), English (fluent), German (intermediate), French (intermediate)
Software LaTeX, Matlab, Dedalus, Mathematica, SageMath
Service Students' Representative, Faculty of Physics, Universidad Complutense de Madrid — 09.2016-08.2018