

Pablo Alexei Gazca Orozco

Curriculum Vitae

Academic and Education History

- 2025-present **Faculty Member**, *Faculty of Mathematics and Physics*, Mathematical Institute, Charles University, Prague.
- 2022–2025 **Postdoctoral Researcher**, *Mathematical Institute*, Albert-Ludwigs-Universität Freiburg (in the group of Prof. Michael Růžička).
- 2022 **Postdoctoral Researcher**, *Faculty of Mathematics and Physics*, Mathematical Institute, Charles University, Prague (in the group of Prof. Josef Málek).
- 2020–2021 **Postdoctoral Researcher**, *Chair in Applied Analysis*, FAU Erlangen-Nürnberg, Germany.
- 2016–2020 **DPhil**, *Mathematical Institute, University of Oxford, UK*, Member of the Centre for Doctoral Training in Partial Differential Equations (PDE-CDT).
Thesis: Numerical Analysis of Implicitly Constituted Incompressible Fluids.
Supervisors: Endre Süli and Patrick Farrell.
- 2010–2015 **B.Sc. (Physics)**, *Facultad de Ciencias*, Universidad Nacional Autónoma de México.

Research Funding

- 2025–2028 **Principal Investigator**, *Numerical analysis for non-smooth partial differential equations*, PRIMUS/25/SCI/025, Charles University, 3 000 000 CZK
- 2024–2029 **Junior team member**, *University Centre for Mathematical Modelling, Applied Analysis and Computational Mathematics*, UNCE 24/SCI/005, Charles University, PI Josef Málek

Scientific Interests

- Analysis of finite element discretisations under minimal regularity assumptions.
- Numerical and mathematical analysis of nonlinear partial differential equations arising from fluid and solid mechanics.
- Preconditioning and fast solvers for PDEs describing incompressible fluids.

Experience

Teaching

- 2022–2025 **Lecturer/Tutor**, *Albert-Ludwigs-Universität Freiburg*.
I was the main lecturer for:
- **2023–24** Introductory Numerical Analysis (Numerik I & II).
- I organised and delivered tutorials and/or developed exercise sheets for:
- **WS 2024/25** Analysis I.
 - **SS 2023** Functional analysis, Seminar on Theory and Numerics for Fluids.
 - **WS 2022/23** Practical course on the implementation of finite elements.

- 2019-2020 **Stipendiary Lecturer in Mathematics**, *Wadham College, University of Oxford*.
 In addition to organising and delivering tutorials for several undergraduate courses, I was in charge of setting and marking termly examinations, writing and authorising reports on the students and providing pastoral care and advice. I was also a member of the College's Tutorial Board and was involved in the undergraduate admissions process.
- **Courses taught:** Analysis III, Calculus of Variations, Multivariable Calculus, Numerical Analysis, Integral Transforms, Differential Equations 1, Introductory Calculus.
- 2017-2020 **Class Tutor/Teaching Assistant**, *University of Oxford*.
 The task of the Tutor is to organise the problem classes and perform most of the teaching, as opposed to a Teaching Assistant, who does limited teaching and mostly focuses on marking the problem sheets.
- **Courses taught (incomplete list):** Fixed Point Methods for Nonlinear PDEs (Tutor/Graduate Level), Functional Analytic Methods for PDEs (Tutor/Graduate Level), Linear Algebra for Computer Science & Differential Equations 1, Numerical Analysis and Scientific Computing (Tutor/PDE-CDT course), Applied Partial Differential Equations (TA), Introduction to Functional Analysis (TA/PDE-CDT course).
- 2015-2016 **Teaching Assistant**, *Facultad de Ciencias, UNAM*.
 My task was to deliver tutorials and grade assignments and tests, and occasionally assisted in delivering the lectures.
- **Courses taught:** Calculus of Variations, Calculus IV, Partial Differential Equations, Introduction to Control Theory (ODEs and PDEs)
- Academic Service**
- 2018-present **Reviewer**, *Contributed as anonymous referee for several journals, including IMA J. Numer. Anal., Numer. Math., J. Differential Equations, Math. Models Methods Appl. Sci., Math. Comput. Simulation, Internat. J. Numer. Methods Engrg.*
- 2018-2020 **Seminar Series**, *Co-organiser of the PDE CDT Lunchtime Seminar at the Mathematical Institute, University of Oxford*.

Invited talks (selected)

- Jun 2025 "A Nitsche method for fluid flow with set-valued BCs", Minisymposium "Advancements and applications of solvers for PDE with nonsmooth structures", The 30th Biennial Numerical Analysis Conference, University of Strathclyde, UK.
- Sep 2024 "A priori and a posteriori estimates for vectorial problems via convex duality", Modelling, PDE analysis and computational mathematics in materials science, Prague, Czech Republic.
- Dec 2023 "Numerical computations and thermodynamically complete models for inelastic behaviour in solids", MathLab seminar, SISSA, Italy.
- Sep 2023 "Quasioptimal nonconforming discretisations of the p -Laplace equation", Minisymposium "Nonlinear problems in fluid mechanics and related problems", ENUMATH 2023, Lisbon, Portugal.
- Jul 2023 "Numerical computations and thermodynamically complete models for inelastic behaviour in solids", MATHPHYS Analysis Seminar, ISTA, Austria.
- Jun 2023 "A posteriori analysis for Bingham via equilibrated fluxes", Minisymposium "Recent advances in the approximation of variational inequalities", The 29th Biennial Numerical Analysis Conference, University of Strathclyde, United Kingdom.
- Mar 2023 "On the finite element approximation of incompressible implicitly constituted fluids", Minisymposium "Modelling and computation for Implicitly Constituted Materials: Fluids, Solids, Plasmas and Mixtures", SIAM CSE23, Amsterdam, Netherlands.