

Curriculum Vitae

Personal information

First name: Nicolò

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Date of birth: 10/05/1994

Languages known: Italian, English

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Research activities

01/11/2021-Present: One-year research fellow at the Department of Mathematics, University of Bologna. Title of the project: “Free boundary regularity in problems governed by degenerate operators”. Tutor: Prof. Fausto Ferrari.

25/01/2020-20/03/2020: Visiting fellow at Columbia University in the context of the MSCA funded project GHAIA (GA 777822). Supervisors: Proff. Daniela De Silva and Ovidiu Savin.

26/07/2019-02/09/2019: Visiting fellow at The University of Western Australia in the context of the MSCA funded project GHAIA (GA 777822). Supervisors: Proff. Serena Dipierro and Enrico Valdinoci.

Education

02/12/2021: PhD in Mathematics, University of Bologna. Title of the thesis: “Regularity in degenerate elliptic and parabolic free boundary problems”. Advisor: Prof. Fausto Ferrari.

01/11/2018-31/10/2021: PhD student in Mathematical Analysis, University of Bologna. Research argument: free boundary problems. Advisor: Prof. Fausto Ferrari.

28/09/2018: Master’s degree in Mathematics, University of Bologna. Vote: 110/110 with honors. Title of the thesis: “Free Boundary Regularity of Some Non-Homogeneous Problems”. Advisor: Prof. Fausto Ferrari.

23/09/2016: Bachelor's degree in Mathematics, University of Bologna. Vote: 110/110 with honors. Title of the thesis: "Funzioni BV e disuguaglianze isoperimetriche". Advisor: Prof. Bruno Franchi.

Seminars

11/11/2021: Seminar in the frame of the "Seminario di Problemi Differenziali Non Lineari" at Università di Roma "Sapienza", Dipartimento di Matematica. Website of the seminar: <https://www.mat.uniroma1.it/ricerca/notiziario?notiziario=211108.html>

12/10/2021: Contributed talk in the CIRM conference "Nonlinear Elliptic and Parabolic Partial Differential Equations" at Levico Terme: "Free boundary regularity in the one-phase Stefan problem: a recent perturbative method". Website of the conference: <https://neppde-levico21.fbk.eu/>

07/09/2021: Seminar in the workshop "Regularity Theory for Free Boundary and Geometric Variational Problems" at Levico Terme: "A perturbative estimates approach to the free boundary regularity in the one-phase Stefan problem". Website of the workshop: http://www.velichkov.it/workshop_levico_1.html

10/06/2021: In the frame of the "Seminario di Analisi Matematica Bruno Pini" activities, I have been invited to deliver the seminar "Regularity of the free boundary in the one-phase Stefan problem: a recent approach", available on the website: <https://youtu.be/F46wV9sPRDg>. I have also been invited to submit a written note to Bruno Pini Mathematical Analysis Seminar on the subject discussed in the seminar.

19/08/2019: Seminar at The University of Western Australia: "Free Boundary Problems".

Research funds

I am a member of the following projects:

INDAM-GNAMPA 2020 Project "*Metodi di viscosità e applicazioni a problemi non lineari con debole ellitticità*", P.I.: Prof. Antonio Vitolo;

INDAM-GNAMPA 2019 Project "Proprietà di regolarità delle soluzioni viscosi con applicazioni a problemi di frontiera libera", P.I.: Prof. Fausto Ferrari.

Schools and workshops

10/10/2021-15/10/2021: CIRM conference "Nonlinear Elliptic and Parabolic Partial Differential Equations" at Levico Terme.

01/10/2021: Workshop "One day in PDEs in honor of Sandro Salsa" at Politecnico di Milano.

05/09/2021-10/09/2021: Workshop "Regularity Theory for Free Boundary and Geometric Variational Problems" at Levico Terme.

16/11/2020-20/11/2020: RISM course “Maximum Principle and Detours” (by Italo Capuzzo Dolcetta) at Villa Toeplitz, Varese (virtual mode).

25/11/2019-28/11/2019: Workshop “Recent trends in Geometric analysis and applications” at Centro di Ricerca Matematica Ennio De Giorgi, Pisa.

02/09/2019-06/09/2019: CIME school “Geometric Measure Theory and Applications: From Geometric Analysis to Free Boundary Problems ” at Cetraro.

01/07/2019-05/07/2019: Summer school “Partial differential equations from theory to applications” at Università degli Studi di Milano, Dipartimento di Matematica Federico Enriques.

14/01/2019-16/01/2019: Winter school “Stochastic PDEs and Mean-Field Games” at Alma Mater Studiorum-Università di Bologna, Dipartimento di Matematica.

Courses

-An introduction to free boundary problems, hold by Prof. Ovidiu Savin.

Tutor activities

I have been didactic tutor to the following courses:

-Insegnamento: ANALISI MATEMATICA 3, **Corso di Laurea:** 8010-MATEMATICA, **Docente responsabile:** FAUSTO FERRARI, **Anno Accademico:** 2021-2022;

-Insegnamento: ANALISI MATEMATICA 3, **Corso di Laurea:** 8010-MATEMATICA, **Docente responsabile:** FAUSTO FERRARI, **Anno Accademico:** 2020-2021;

-Insegnamento: ANALISI MATEMATICA T-1, **Corso di Laurea:** 8887-INGEGNERIA CHIMICA E BIOCHIMICA, **Docente responsabile:** BERARDO RUFFINI, **Anno Accademico:** 2020-2021;

-Insegnamento: ANALISI MATEMATICA 2, **Corso di Laurea:** 9244-FISICA, **Docente responsabile:** FAUSTO FERRARI, **Anno Accademico:** 2019-2020;

-Insegnamento: ANALISI MATEMATICA T-1, **Corso di Laurea:** 8887-INGEGNERIA CHIMICA E BIOCHIMICA, **Docente responsabile:** BERARDO RUFFINI, **Anno Accademico:** 2019-2020.

Publications

-D. De Silva, N. Forcillo, O. Savin, *Perturbative estimates for the one-phase Stefan Problem*, Calc. Var. Partial Differential Equations 60 (2021), no.6, Paper No. 219

- N. Forcillo, *Regularity of the free boundary in the one-phase Stefan problem: a recent approach*, Bruno Pini Mathematical Analysis Seminar, Vol. 12, n. 1, Univ. Bologna, Alma Mater Stud., Bologna, 2021, 122-140 (to appear)

-F. Ferrari, N. Forcillo, *About the existence of an Alt-Caffarelli-Friedman monotonicity formula in the Heisenberg group*, *Matemática Aplicada, Computacional e Industrial MACI*, Vol. 8, 2021, 301-304, Proceedings of VIII MACI 2021, La Plata, 3 al 7 de mayo de 2021

-F. Ferrari, N. Forcillo, *A new glance to the Alt-Caffarelli-Friedman monotonicity formula*, *Mathematics in Engineering*, Vol. 2 (2020), n. 4, 657-679. doi: 10.3934/mine.2020030

-S. Dipierro, A. Dzhugan, N. Forcillo, E. Valdinoci, *Enhanced boundary regularity of planar nonlocal minimal graphs, and a butterfly effect*, *Bruno Pini Mathematical Analysis Seminar*, Vol. 11, n. 1, Univ. Bologna, Alma Mater Stud., Bologna, 2020, 44-67

Preprints

-F. Ferrari, N. Forcillo, *Some remarks about the existence of an Alt-Caffarelli-Friedman monotonicity formula in the Heisenberg group*, 2020, arXiv: 2001.04393

- S. Dipierro, F. Ferrari, N. Forcillo, E. Valdinoci, *Regularity properties for p -Laplacian almost minimizers*

PhD thesis

-N. Forcillo, *Regularity in degenerate elliptic and parabolic free boundary problems*, 213 pp., Advisor: Prof. Fausto Ferrari

Master's thesis

-N. Forcillo, *Free Boundary Regularity of Some Non-Homogeneous Problems*, Advisor: Prof. Fausto Ferrari. Available on: <https://amslaurea.unibo.it/16392/>

Papers in progress

- F. Ferrari, N. Forcillo, *A counterexample to the monotonicity formula in the Heisenberg group*