Filippo Francesco Favale

WORK EXPERIENCE

09/2021 – CURRENT Pavia, Italy
RESEARCHER (RTD/A) UNIVERSITÀ DEGLI STUDI DI PAVIA

I'm actually a researcher (RTD/A) in the algebraic geometry group of the math department of the University of Pavia.

01/2014 – CURRENT Cisliano, Italy
SCIENCE COMMUNICATOR CURVILINEA SOCIETÀ COOPERATIVA

Curvilinea is a cooperative company whose aim is the dissemination of Mathematics. I am one of the founding members. My role in the cooperative is to support the organization of exhibitions, workshops, conferences, and events that are organized for the general public or for schools.

31/12/2017 – 29/09/2022 Milano
POST-DOC (ASSEGNISTA DI RICERCA) UNIVERSITÀ DEGLI STUDI DI MILANO-BICOCCA

Post-doc in the Algebraic Geometry group under the supervision of Prof.ssa Sonia Brivio.

30/11/2015 – 29/11/2017 Trento, Italy
POST-DOC (ASSEGNISTA DI RICERCA) UNIVERSITÀ DEGLI STUDI DI TRENTO

Post-doc in the Algebraic Geometry group under the supervision of Prof. Claudio Fontanari.

08/2016 – 12/2016
VISITING POST-DOC IMUB - UNIVERSITY OF BARCELLONA

Guest of IMUB (Institute of Mathematics of the University of Barcelona) under the supervision of Prof. J.C. Naranjo del Val.

30/11/2013 – 29/11/2015 Trento, Italy
CIRM RESEARCHER FONDAZIONE BRUNO KESSLER - CIRM

Collaboration for research activities for CIRM (Centro Internazionale per la Ricerca Matematica) of the FBK foundation (Fondazione Bruno Kessler).

TEACHING - TEACHING LOAD AS A RESEARCHER

2023 – CURRENT
Lecturer for the course "Geometria 2" for the Bachelor's Degree in Mathematics

I am responsible for 3 CFU credits (out of a total of 9) of the course "Geometria 2" for the academic year 2023/2024 in the Bachelor's Degree in Mathematics at the University of Pavia

2023 – CURRENT
Lecturer for the course "Matematica con elementi di Statistica" for the Degree in Pharmacy

I am responsible for 3 CFU credits (out of a total of 6) of the course "Matematica con elementi di Statistica" for the academic year 2023/2024 in the Degree in Pharmacy at the University of Pavia

2022 – 2023
Lecturer for the course "Istituzioni di Algebra" for the Master's Degree in Mathematics

I was responsible for 5 CFU credits (out of 9 CFU credits) of the course "Istituzioni di Algebra" for the academic year 2022/2023 in the Master's Degree in Mathematics at the University of Pavia.

2022 – 2023
Lecturer for the course "Algebra 1" for the Bachelor's Degree in Mathematics

I was responsible, for the academic year 2022/2023, for 1 CFU credit of the "Algebra 1" course for the Bachelor's Degree in Mathematics at the University of Pavia.

2021 – 2022
Lecturer for the course "Geometria 2" for the Bachelor's Degree in Mathematics

I am responsible for 3 CFU credits (out of a total of 9) of the course 'Geometria 2' for the academic year 2021/2022 in the Bachelor's Degree in Mathematics at the University of Pavia.

2021 – 2022
Lecturer for the course "Istituzioni di Algebra" for the Master's Degree in Mathematics

I was responsible for 3 CFU credits (out of 9 CFU credits) of the course "Istituzioni di Algebra" for the academic year 2021/2022 in the Master's Degree in Mathematics at the University of Pavia.

TEACHING - PAST EXPERIENCES

2020 – 2021
Lecturer for a PhD course in Mathematics (joint PhD program of the University of Milano-Bicocca, the University of Pavia, and INdAM)

Lecturer for the course "Introduction to Moduli Spaces of Vector Bundles on Curves." This course was part of the educational activities of the joint PhD program of the University of Milano-Bicocca, the University of Pavia, and INdAM for the academic year 2020/21. More information can be found on the website http://fcubo.altervista.org/didattica/intromodvbonc .

2017 – 2021
Lecturer (docenza a contratto) for the course "Matematica" for the Bachelor's Degree in Medical Biotechnology (University of Milan)

Lecturer (docenza a contratto) for the course "Matematica" (6 CFU out of 6) for the Bachelor's Degree in Medical Biotechnology for the academic years 2018/2019, 2019/2020, and 2020/2021.

2017 – 2021
Tutor and teaching assistant for various university courses (University of Milano-Bicocca)

Lectures, exercises, and assistance during written and oral exams.
Teaching assistant for "Algebra lineare e Geometria" in the Bachelor's Degree courses in Mathematics and Physics for the academic years 2018/2019, 2019/2020, and 2020/2021.
Tutor for the "Geometria II" course in the Bachelor's Degree in Mathematics for the academic years 2019/2020 and 2020/2021.

2018 – 2019
Lecturer (docenza a contratto) for the course "Geometria II" for the Bachelor's Degree in Mathematics (University of Insubria)

Lecturer (docenza a contratto) for the course "Geometria II" (8 CFU out of 8) for the Bachelor's Degree in Mathematics for the academic year 2018/2019.

2012 – 2017
Teaching Assistant for various university courses (University of Trento)

Lectures, exercises, and assistance during written and oral exams in the following university courses:
 • Experimental Mathematics at High School Level (Master's Degree in Mathematics, academic year 2013-2014)
 • Geometria II (Bachelor's Degree in Mathematics, academic years 2013-2014 and 2014-2015)
 • Geometria A (Bachelor's Degree in Mathematics, academic years 2015-2016 and 2016-2017)

2013 – 2014
Instructor for the PAS courses organized by the University of Trento

Lecturer for the teaching module "Geometria e didattica della geometria" of the PAS (Percorsi Abilitanti Speciali) 2014 for the A059 qualification class.

2009 – 2013
Teaching assistant and tutor for various university courses (University of Pavia)

Frontal lectures, exercises, and assistance during written and oral exams in the following university courses:
  • Algebra e Geometria (Bachelor's Degree in Industrial Engineering)
  • Algebra e Geometria (Bachelor's Degree in Engineering-Architecture)
  • Algebra II (Bachelor's Degree in Mathematics)
  • Geometria I (Bachelor's Degree in Mathematics)
Academic years from 2010/2011 to 2012/2013 included.

EDUCATION AND TRAINING

2009 – 2013 Pavia, Italy
DOTTORATO DI RICERCA IN MATEMATICE E STATISTICA (PHD IN MATHEMATICS AND STATISTICS)
Università degli Studi di Pavia

PhD program in Mathematics and Statistics (Cycle XXVI)
PhD thesis on "Quotients of Calabi-Yau threefolds".
Advisor: Prof. Gilberto Bini
Internal Tutor: Prof. Gian Pietro Pirola.
Date of discussion: 20/11/2013

Field of study Mathematics and Statistics **Level in EQF**EQF level 8 **Thesis**Quotients of Calabi-Yau threefolds

2007 – 2010 Milano, Italy
DOTTORE MAGISTRALE IN MATEMATICA (MASTER'S DEGREE IN MATHEMATICS) Università degli Studi di Milano

Master degree in Mathematics
Title of Master thesis: "Threefolds di Calabi-Yau con azioni di gruppi finiti".
Advisor: Prof. Lambertus van Geemen.
Mark: 110/110 cum laude.
Date of discussion: 16/09/2010

Field of study Mathematics **Final grade**110 Cum Laude **Level in EQF**EQF level 7

ThesisThreefolds di Calabi-Yau con azioni di gruppi finiti

2004 – 2008 Milano, Italy
DOTTORE IN MATEMATICA (BACHELOR'S DEGREE IN MATHEMATICS) Università degli Studi di Milano

Bachelor's degree in Mathematics
Title of Bachelor's thesis: "Superfici di Seifert".
Advisor: Prof.ssa Maria Dedò.
Mark: 110/110 cum laude.
Date of discussion: 10/10/2008

Field of study Mathematics **Final grade**110 Cum Laude **Level in EQF**EQF level 6 **Thesis**Superfici di Seifert

1998 – 2005 Abbiategrasso, Italy
HIGH SCHOOL DIPLOMA Liceo scientifico Blaise Pascal

Sezione bilingue: inglese/francese

Level in EQFEQF level 4

NETWORKS & MEMBERSHIPS

Groups and associations

I have been a member of the INdAM group 'GNSAGA' since 2011. I am a member of the Italian Mathematical Union (UMI). Since 2016, I have been a member of the editorial board of the UMI newsletter. I am a reviewer for the American Mathematical Society (AMS). From 2020 to 2021, I was the representative for research fellows at the Department of Mathematics of the University of Milano-Bicocca.

PRIN project 2017

I have been affiliated to the project *PRIN 2017 - Moduli and Lie Theory*.

PRIN project 2022

I am affiliated to the project *PRIN 2022 - Moduli spaces and special varieties*.

PROFESSIONAL SKILLS AND RESPONSIBILITIES

Short description of my scientific activities

I have extensive experience in the field of research in algebraic geometry. I began my research during my doctoral studies, focusing on problems related to the classification of Calabi-Yau varieties and surfaces of general type. I have worked on surface fibrations (specifically, on a case of Xiao's conjecture) and on stability problems of torsion-free sheaves and coherent systems on curves, particularly nodal and reducible curves. As a visiting researcher at IMUB in Barcelona, I also studied problems related to inequalities among invariants of fibred surfaces and problems in curve moduli. Since joining as a RTD/A researcher at the University of Pavia, I have been investigating problems related to Artinian algebras, their Lefschetz properties, and studying associated Hessians varieties, especially cubic hypersurfaces.

I have been involved in university-level teaching for several years, both as a teaching assistant or tutor, and as a lecturer for Mathematics courses (at the University of Insubria) and service courses for the Bachelor's Degree in Medical Biotechnology (at the University of Milan). As a RTD/A researcher, I have taught courses for both undergraduate and graduate Mathematics programs and have been responsible for service courses for other Bachelor's Degree programs. In 2020, I was appointed to teach a doctoral course for the joint PhD program of the Universities of Milano-Bicocca, Pavia, and INdAM. In 2021, I obtained the national scientific qualification (Abilitazione Scientifica Nazionale Settore 01/A2).

I have a longstanding experience as a science communicator, utilizing software, images, videos, and other self-produced materials. This experience has also led me to take on organizational roles in outreach events for various departments and institutions where I have worked.

Organization of workshops and conferences

I have organized the following conferences and workshops:

  • Winter Workshop on Algebraic Geometry (2024)
  • Geometria in Bicocca (2020)
  • Geometria in Bicocca (2019)
  • Jade 2019 - Joint Algebraic & Differential Encounters (2019)
  • Geometria in Bicocca (2018)

Terza missione - recent assignments

In 2022, 2023, and in 2024 (ongoing), on behalf of the Department of Mathematics at the University of Pavia, I have been involved in organizing and managing activities for the European Researchers' Night (Sharper Night).
I have also participated in events organized by the Department of Mathematics at the University of Pavia for high school students during internships and events such as Pi-day.

Terza missione - past assignments

I have been among the organizers and promoters of the following public outreach events aimed at the general public:

  • European Researchers' Night - 2014 - organizer on behalf of the Bruno Kessler Foundation
  • European Researchers' Night - 2017 - organizer for the University of Trento
  • MeetMeTonight - 2019 - organizer for the University of Milano-Bicocca

17/03/2023 – 2024
Principal Investigator for a INdAM-GNSAGA project

Principal Investigator for the INdAM - GNSAGA 2023 - "*Classification Problems in Algebraic Geometry: Lefschetz Properties and Moduli Spaces*"

2023 – CURRENT
Organizers of the seminars of the Algebraic Geometry group

From 2023 onwards, I have been one of the organizers of the weekly seminars for the Algebraic Geometry group at the Department of Mathematics of the University of Pavia.

Advisor for Bachelor's and Master's thesis

I have supervised 3 undergraduate theses in Mathematics (fields: topology, algebraic number theory, algebraic geometry) and 1 master's thesis in Mathematics (algebra).

I am currently supervising 1 undergraduate thesis in Mathematics (topic: geometry).

2022 – CURRENT
Member of the "Commissione paritetica docenti-studenti"

I am a member of the "Commissione Paritetica Docenti-Studenti (CPDS)" for the Bachelor's and Master's Degree in Mathematics of the University of Pavia.

23/05/2021 – CURRENT
Abilitazione scientifica nazionale (seconda fascia)

I was granted the Italian **Abilitazione Scientifica Nazionale** (Seconda Fascia, Settore concorsuale 01/A2 - GEOMETRIA E ALGEBRA).

SEMINARS, CONGRESSES AND WORKSHOPS AS SPEAKER

Selected seminars

- *"Hessian varieties and cubic hypersurfaces"*, Geometria in Bicocca 2024, Milano, September 2024
- "*Jacobian rings of cubics and Lefschetz properties*", Algebraic Geometry in L'Aquila, L'Aquila, July 2023
- "*Lefschetz properties for jacobian rings of cubics and other Artinian algebras*", International Meeting of AMS, EMS and SMF, Grenoble, July 2022
- "*Lefschetz properties for Jacobian rings of cubic hypersurfaces*", University of Milano, July 2022
- "*Lefschetz Properties for jacobian rings of cubic fourfolds and other Artinian Algebras*", University of Insubria, May 2022
- "*A theorem of Gordan and Noether via Gorenstein Rings*", University of Pavia, 2021
- *"Fibrations in planar curves and Xiao's conjecture"*, Young Perspectives in Algebraic Geometry II – University of Bayreuth, April 2019
- *"Relative irregularity of a fibration and a conjecture of Xiao"*, Séminaire Géométrie – Institut Camille Jordan, February 2019
- "*Xiao's conjecture on relative irregularity*", Università degli Studi di Torino, 18 September 2017
- *"Towards a (twisted) bicanonical system with base point"*, IMUB - Universitat de Barcelona, 18 November 2017
- *"A twisted bicanonical system with base point"*, Oberseminar of Hannover University, 10 November 2017
- *"A surface of general type and a parabicanonical system with base point"*, Complex Geometry BiDay, Università di Parma, 25 February 2016
- "*A surface of general type which is birational to a surface of degree 10 of P^3*", September 2015, Levico Terme.
- "*Coppie mirror-simmetriche di threefold di Calabi-Yau con altezza bassa* " Progressi Recenti in Geometria Reale e Complessa – IX, October 2014, Levico Terme.
- *"Coppie ammissibili e quozienti di threefold di Calabi-Yau"*, June 2014, Giornate di Geometria Algebrica ed Argomenti Correlati XII, Torino
- "*Quotients of Calabi-Yau Threefolds*", December 2014, Department of Mathematics, Università degli Studi di Trento.
- "*Calabi–Yau threefolds with free group actions*", Workshop in Algebraic Geometry - Seminari di Natale, December 2013, Department of Mathematics "F. Enriques", Università degli Studi di Milano

SCIENTIFIC PRODUCTION

Publications (last 5 years)

1. S. Brivio, F.F. Favale, *Genus 2 curves and generalized theta divisors,* "Bulletin dés Sciences Mathématiques" (2019)
2. S. Brivio, F.F. Favale, *Coherent systems on curves of compact type, "*J. Geom and Phys*" (2020)*
3. S. Brivio, F.F. Favale, *On kernel bundles over reducible curves with a node, "*Int J Math*" (2020)*
4. C. Gleissner, F.F. Favale, R. Pignatelli, *The pluricanonical systems of a product-quotient variety,* "Galois Covers, Grothendieck-Teichmüller Theory and Dessins d'Enfants" (2020)
5. S. Brivio, F.F. Favale, *On vector bundles over reducible curves with a node, "*Adv in Geom*" (2021)*
6. S. Brivio, F.F. Favale, *Nodal curves and polarizations with good properties*, To appear in "Rev Math Complut" (2021)
7. S. Brivio, F.F. Favale, *Coherent systems and BGN extensions on nodal reducible curves, "*Int J Math*" (2022)*
8. F.F. Favale, G.P. Pirola, *Infinitesimal variation functions for families of smooth varieties*, "Milan J. Math." (2022)
9. I. Biswas, F.F. Favale, G.P. Pirola, S. Torelli, *Quillen connection and the uniformization of Riemann surfaces, "*Ann. di Mat. Pura ed Appl.*" (2022)*
10. D. Bricalli, F.F. Favale, *Lefschetz properties for jacobian rings of cubic fourfolds and other Artinian algebras,* "Collectanea Mathematica" (2022)

11. S. Brivio, F.F. Favale, *Higher-rank Brill-Noether loci on nodal reducible curves*, "Geometriae Dedicata" (2022)
12. F.F. Favale, G.P. Pirola, S. Torelli, *Holomorphic 1-forms on the moduli space of curves, "Geometry and Topology"* (2023)
13. D. Bricalli, F.F. Favale, G.P. Pirola, *A Theorem of Gordan and Noether via Artinian Algebras, "Selecta Mathematica"* (2023)
14. F.F. Favale, J.C. Naranjo, G.P. Pirola, S.Torelli, *Holomorphic 1-forms on some coverings of the Moduli space of curves,* "Pure and Applied Mathematics Quarterly" (2023)
15. D. Bricalli, F.F. Favale, G.P. Pirola, On the Hessian of cubic hypersurfaces, *"International Mathematics Research Notices"* (2023)
16. D. Bricalli, F.F. Favale, SAGAs and Lefschetz properties: a geometric approach. "Prooceedings of AMS-SMF-EMS Joint International Meeting" (2023)

Other publications

1. G. Bini, F.F. Favale, *Groups Acting Freely on Calabi--Yau Threefolds Embedded in a Product of del Pezzo Surfaces,* "Advances in Theoretical and Mathematical Physics" (2012)
2. F.F. Favale, *Quotients of Calabi--Yau threefolds,* "Scientifica Acta" (2013)
3. G. Bini, F.F. Favale, J. Neves, R. Pignatelli, *New examples of Calabi--Yau threefolds and genus zero surfaces,* "Communications in Contemporary Mathematics" (2014)
4. F. F. Favale, *Calabi--Yau quotients with terminal singularities,* "Bollettino dell'Unione Matematica Italiana" (2018)
5. G. Bini, F.F. Favale, *A closer look at mirrors and quotients of Calabi-Yau threefolds,* "Annali della Scuola Normale Superiore di Pisa - Classe di Scienze" (2016)
6. F.F. Favale, R. Pignatelli, *A twisted bicanonical system with base points,* "R. Ann Univ Ferrara" (2017)
7. F. F. Favale, *Rational curves in CICY's in products of two projective spaces,* "Communications in Algebra" (2017)
8. F.F. Favale, G. Bini, *An Unbounded Family of log Calabi-Yau Pairs,* "Rendiconti Lincei: Matematica e Applicazioni" (2016)
9. F.F. Favale, S. Torelli, *Covering of elliptic curves and the kernel of the Prym map,* "Le Matematiche" (2017)
10. F.F. Favale, J.C. Naranjo, G.P. Pirola, *On the Xiao conjecture for plane curves,* "Geom Dedicata" (2018)

Preprint and Work in progress

Preprint
1. F.F. Favale, D. Bricalli, G.P. Pirola, *"On the irreducibility of Hessian varieties of cubic hypersurfaces" (2024)*

Work in progress
1. "*Hessian Loci for nodal cubic hypersurfaces*"
2. In collaboration with D. Bricalli and G. P. Pirola: "*On the conjecture of Ciliberto-Ottaviani for cubic hypersurfaces*".
3. In collaboration with S. Brivio: "*Determinantal map for 1-nodal curves*".
4. In collaboration with S. Brivio and F. Fallucca: "*Vector bundles and torsion-free sheaves on products of curves*".

LANGUAGE SKILLS

Mother tongue(s): **ITALIANO**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH B2		C1	B2	B2	C1
FRENCH B1		B2	B1	B1	B2

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user

DIGITAL SKILLS

Padronanza del Pacchetto Office (Word Excel PowerPoint ecc) | POV-ray | Sistemi Operativi Windows | WebGL | Babylon.js | Matlab | Magma | Maple | Linguaggi web CSS, HTML | C++ | Javascript | Utilizzo base di git (git bash, gitlab, ...)

SCIENCE COMUNICATION

2014 – CURRENT
Curvilinea

Outside the university environment, I am involved in scientific outreach, particularly in mathematics. This passion began during my years of study at the University of Milan, collaborating with the Mathematita Center (where I

continued to collaborate even after graduation). In 2014, together with other colleagues and mathematician friends, I co-founded Curvilinea (www.curvilinea.org), a cooperative dedicated to scientific outreach. The cooperative organizes workshops, presentations, and exhibitions on various mathematical topics directly in schools and at scientific festivals. Curvilinea also won the Culturability grant, a national competition promoted by the Unipolis Foundation to reward startups with innovative entrepreneurial ideas.

The application "Fly Faster Fly Shorter," developed by Curvilinea, received an honorable mention in an international competition for the creation of multimedia exhibits related to the use of mathematics to study the Earth (MPE Competition 2017).

Curvilinea was a partner in the Erasmus+ project "Mathina," funded by the European Union. The project, concluded in May 2021, produced an interactive booklet (available at www.mathina.eu) aimed at promoting mathematics, which was recognized as one of the best projects by the EU.

2009 – 2015
Scientific animation and Junior collaborator of "Centro matematita"

Collaboration as a scientific animator and later as a junior collaborator, curator of exhibitions, and preparation of images for the informal communication of mathematics.

2009 – 2015
Collaborator for the magazine XlaTangente

Creation of interactive animations for the website of the XlaTangente magazine (http://www.xlatangente.it) and images for the magazine using the POV-Ray raytracer.

DECLARATION FOR GPDR

Declaration

I declare that the information provided in this curriculum vitae is true, pursuant to articles 46 and 47 of Italian Legislative Decree no. 445/2000.

Pavia , 30/08/2024