

Pedro Núñez

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Work Experience

National Taiwan University, Postdoctoral Researcher

Taipei, Taiwan

- In the group of Jungkai Alfred Chen.
- Research focused on birational geometry and derived categories of coherent sheaves.
- Participated in and organized various seminars and reading groups.

Sept 2023 – present

Participation in Research Projects

Varieties of general type (NSTC114-2639-M-002-009-ASP)

Taipei, Taiwan

Funded by National Science and Technology Council of Taiwan. PI: Jungkai Alfred Chen.

Sept 2023 – present

GRK 1821: Cohomological Methods in Geometry

Freiburg, Germany

Funded by Deutsche Forschungsgemeinschaft (DFG).

Sept 2019 – Aug 2021

Publications

Extension of adapted differentials on klt orbifolds

2024

Pedro Núñez.

Preprint (arxiv.org/abs/2411.17268).

The Albanese morphism for hyperelliptic varieties

2025

Pieter Belmans, Andreas Demleitner, Pedro Núñez.

Indagationes Mathematicae ([10.1016/j.indag.2025.10.004](https://doi.org/10.1016/j.indag.2025.10.004)).

Adapted differentials as a qfh-sheaf

2023

Pedro Núñez.

Mathematische Zeitschrift 304, 68 ([10.1007/s00209-023-03330-6](https://doi.org/10.1007/s00209-023-03330-6)).

A note on semiorthogonal decompositions for Fano fibrations

2022

Pedro Núñez.

Geometriae Dedicata 216, 20 ([10.1007/s10711-022-00680-z](https://doi.org/10.1007/s10711-022-00680-z)).

Teaching Experience

National Taiwan University, Lecturer

Taipei, Taiwan

- Lecturer for *Calculus 1*, *Calculus 2*, *Calculus 3*, and *Calculus 4* for first-year economics majors.
- Taught theoretical classes, coordinated the course and tutors, and created exam problems.
- Taught in English.

Sept 2024 – July 2025

University of Freiburg, Teaching Assistant

Freiburg, Germany

- Teaching Assistant for *Algebra and Number Theory*, *Elementary Geometry* (twice), and *Riemann Surfaces*.
- Handled question sessions for *Linear Algebra II*.
- Created weekly exercise sheets, coordinated practice classes, offered tutoring, and discussed solutions.
- Taught in German.

Oct 2021 – July 2023

University of Bonn, Tutor

- Tutor for *Linear Algebra for Informatics and Teachers*, and *Introduction to Algebra*.
- Graded weekly homework and discussed solutions in exercise classes.
- Taught in German.

Bonn, Germany

Apr 2018 – July 2019

Education

PhD **University of Freiburg**, PhD in Mathematics

- Thesis: Categorical aspects of Campana orbifolds, supervised by Stefan Kebekus.
- PhD title certified in Spain by the Autonomous University of Madrid.
- Grade: magna cum laude.

Freiburg, Germany

Sept 2019 – July 2023

MSc **University of Bonn**, Master in Mathematics

- Thesis: Derived categories of Fano fibrations.
- Grade: 1.2 in the German system (approx. 9.5/10 in the Spanish system).

Bonn, Germany

Oct 2017 – July 2019

BSc **Complutense University of Madrid**, Bachelor in Mathematics

- Thesis: Blow-ups in algebraic geometry.
- Grade: 8.34/10 in the Spanish system.
- Erasmus exchange at LMU Munich during the course 2016/2017.

Madrid, Spain

Sept 2013 – Aug 2017

Languages

Spanish: Native speaker.**English:** C1 level (IELTS with score 8).**German:** C1 level (Goethe-Zertifikat C1).**Chinese:** B1 level (HSK3 + HSKK Basic).

Invited Talks

Indecomposability of derived categories of hyperelliptic varieties

2026 Higher Dimensional Algebraic Geometry.

Taipei, Taiwan

17 Apr 2026

Campana orbifolds and their morphisms

61st Annual Meeting of the Taiwan Mathematical Society.

Chiayi, Taiwan

22 Jan 2026

Campana orbifolds: between projective and logarithmic geometry

Taipei Postdoc Seminar.

Taipei, Taiwan

5 Nov 2025

Adapted differentials on Campana orbifolds

KIAS Algebraic Geometry Seminar.

Seoul, South Korea

31 Oct 2025

Derived categories and birational geometry

Colloquium talk at National Central University.

Taoyuan, Taiwan

23 Oct 2025

Derived categories of threefolds on the Noether line

SJTU Algebraic Geometry Seminar.

Shanghai, China

10 Oct 2025

Derived categories of threefolds on the Noether line

Fudan University Algebraic Geometry Seminar.

Shanghai, China

8 Oct 2025

Derived categories and birational geometry

Mathematics Seminar at CUNEF University.

Madrid, Spain

22 Sep 2025

Derived categories of hyperelliptic varieties

Algebraic Geometry meets Machine Learning.

Tainan, Taiwan

29 Apr 2025

Indecomposability of derived categories of threefolds on the Noether line Younger Generation of Algebraic Geometry 2025.	Penghu, Taiwan 19 Apr 2025
On the Albanese morphism of hyperelliptic varieties NCTS One-Day Workshop on Arithmetic and Algebraic Geometry.	Taipei, Taiwan 20 Feb 2025
Indecomposability of derived categories of threefolds on the Noether line NCKU Algebraic Geometry Seminar.	Tainan, Taiwan 18 Apr 2024
Indecomposability of derived categories of hyperelliptic manifolds NCTS Seminar in Algebraic Geometry.	Taipei, Taiwan 20 Oct 2023
Adapted differentials on Campana orbifolds Luxembourg Algebraic Geometry Seminar.	Esch-sur-Alzette, Luxembourg 22 Mar 2023
Adapted differentials on Campana orbifolds NCTS Seminar in Algebraic Geometry (online).	Taipei, Taiwan 6 Feb 2023
Categorías derivadas y geometría birracional Red de Doctorandos en Matemáticas UCM (online).	Madrid, Spain 22 Mar 2022

Contributed Talks

Indecomposability of derived categories of hyperelliptic varieties 2025 Summer Research Institute in Algebraic Geometry.	Fort Collins, CO, USA 22 Jul 2025
Adapted differentials as a qfh-sheaf 9th European Congress of Mathematics.	Seville, Spain 15 Jul 2024
Semiorthogonal decompositions on Fano fibrations Géométrie Algébrique en Liberté XXIX.	Orsay, France 24 May 2022
Derived categories of Fano varieties and Mori fibre spaces 2nd BYMAT Conference.	Madrid, Spain 21 May 2019

Academic Visits

Academic visit at Fudan University Shanghai Center for Mathematical Sciences. Hosted by Meng Chen.	Shanghai, China 28 Sep – 11 Oct 2025
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Other Academic Activities

Organization of the international conference Tour de Formosa Organized jointly with Flora Poon. sites.google.com/view/tour-de-formosa	Taiwan's East Coast 12 – 16 Jan 2026
Organization of the NCTS Seminar in Algebraic Geometry Invited external speakers to talk about their research.	Taipei, Taiwan Summer Term 2025
Organization of a seminar on deformation theory Organized jointly with Flora Poon.	Taipei, Taiwan Summer Term 2025
Organization of a seminar on Hodge theory Organized jointly with Hsueh-Yung Lin.	Taipei and Xitou, Taiwan Summer 2025
Organization of a seminar on enumerative geometry Notes for the seminar are available on my homepage.	Freiburg, Germany Winter Term 2020/2021

Organization of a reading group on Grothendieck's EGA

Informal reading group with various other students.

Bonn, Germany

Winter Term 2017/2018

Scholarships & Funding received

2025 Summer Research Institute in Algebraic Geometry

Funded by the NCTS and NSTC to attend the conference.

Fort Collins, CO, USA

12 – 26 Jul 2025

Geometric and Arithmetic Frontiers of Orbifolds II

Funded by IRMA to attend their workshop.

Strasbourg, France

5 – 9 Jun 2023

Oberwolfach Leibniz Graduate Students (OWLG)

Funded by MFO to attend the Komplexe Analysis workshop.

Oberwolfach, Germany

9 – 14 Apr 2023

2nd BYMAT Conference

Funded by ICMAT to attend their conference.

Madrid, Spain

20 – 24 May 2019

Geometry Summer School

Funded by Utrecht University to attend their summer school.

Utrecht, Netherlands

14 – 25 Aug 2017

Erasmus Scholarship

Funded by the European Union to study as an exchange student.

Munich, Germany

Sep 2016 – Jul 2017

Dynamical Systems Summer School

Funded by the Fundação Calouste Gulbenkian to attend their summer school.

Lisbon, Portugal

6 – 10 Jul 2015

Conferences, Workshops and Schools Attended

Mini-Workshop: Algebraic Geometry in Xitou

National Taiwan University / National Science and Technology Council.

sites.google.com/view/mini-workshopalgebraicgeometry/%E9%A6%96%E9%A0%81

Xitou, Taiwan

19 – 21 Jul 2026

10th Pacific Rim Conference on Mathematics

Universidad Complutense de Madrid.

sites.google.com/view/2026pacificrim/home

Madrid, Spain

15 – 19 Jun 2026

Topological and Geometric Deep Learning: Theory, Methods, and Applications

Academia Sinica.

ines.topology.rocks/tgdl-2026

Taipei, Taiwan

11 – 14 May 2026

NCTS Minicourse - Topics on Derived Categories of Coherent Sheaves

National Center for Theoretical Sciences. Lecturer: Yujiro Kawamata.

ncts.ntu.edu.tw/events_3_detail.php?nid=395

Taipei, Taiwan

22, 27, 29 Apr 2026

2026 Higher Dimensional Algebraic Geometry

National Taiwan University.

sites.google.com/ncts.ntu.edu.tw/2026hdag

Taipei, Taiwan

13 – 17 Apr 2026

2026 Higher Dimensional Algebraic Geometry - Minicourses

National Taiwan University.

sites.google.com/ncts.ntu.edu.tw/2026hdag-minicourses

Taipei, Taiwan

4 – 10 Apr 2026

Meet with Prof. Chenyang Xu

National Center for Theoretical Sciences.

ncts.ntu.edu.tw/events_2_detail.php?nid=552

Taipei, Taiwan

2 Apr 2026

61st Annual Meeting of the Taiwan Mathematical Society National Chung Cheng University. 2026tms-en.tms.org.tw	Chiayi, Taiwan 21 – 22 Jan 2026
Tour de Formosa National Taiwan University / National Science and Technology Council. sites.google.com/view/tour-de-formosa	Taiwan's East Coast 12 – 16 Jan 2026
NCTS Minicourse on Gizatullin's problem National Center for Theoretical Sciences. Lecturer: Keiji Oguiso. ncts.ntu.edu.tw/events_3_detail.php?nid=384	Taipei, Taiwan 24, 26 Nov, 1 Dec 2025
2025 Algebraic Geometry in East Asia National Cheng Kung University. sites.google.com/ncts.ntu.edu.tw/2025-algebraic-geometry-in/2025-agea	Tainan, Taiwan 10 – 14 Nov 2025
2025 Summer Research Institute in Algebraic Geometry Colorado State University. sites.google.com/view/2025summerinstitute/home	Fort Collins, CO, USA 14 Jul – 1 Aug 2025
NCTS Minicourse on Deformation Theory National Center for Theoretical Sciences. Lecturer: Yujiro Kawamata. ncts.ntu.edu.tw/events_3_detail.php?nid=369	Taipei, Taiwan 2, 9 May 2025
Algebraic Geometry meets Machine Learning National Cheng Kung University. sites.google.com/view/cjlai-ncku/conferenceworkshop/ag-meets-ml-ncku-2025-4	Tainan, Taiwan 27 – 29 Apr 2025
Younger Generation of Algebraic Geometry 2025 National Taiwan University / National Science and Technology Council. sites.google.com/view/laboratoryofbirationalgeometry/%E9%A6%96%E9%A0%81	Penghu, Taiwan 17 – 19 Apr 2025
NCTS One-Day Workshop on Arithmetic and Algebraic Geometry National Taiwan University. ncts.ntu.edu.tw/events_2_detail.php?nid=492	Taipei, Taiwan 20 Feb 2025
60th Annual Meeting of the Taiwan Mathematical Society National Central University. 2025tms.tms.org.tw	Taoyuan, Taiwan 14 – 15 Jan 2025
Introduction to Nevanlinna Theory, Hyperbolicity and Arithmetic Dynamics Academia Sinica. www.math.sinica.edu.tw/workshop/202501SCV/index.html	Taipei, Taiwan 2 – 3 Jan 2025
Algebraic Geometry in Taipei National Taiwan University. sites.google.com/g.ntu.edu.tw/ag-Taipei/mpbg-2023	Taipei, Taiwan 2 – 6 Dec 2024
Mini-Workshop: Young Perspectives in Algebraic Geometry National Taiwan University. sites.google.com/view/mini-workshop-young-perspectiv/%E9%A6%96%E9%A0%81	Taipei, Taiwan 25 – 26 Nov 2024
Workshop in Hodge Theory National Taiwan University / National Science and Technology Council. sites.google.com/view/laboratoryofbirationalgeometry/%E9%A6%96%E9%A0%81	Xitou, Taiwan 21 – 23 Aug 2024

9th European Congress of Mathematics Universidad de Sevilla. www.ecm2024sevilla.com	Seville, Spain 15 – 19 Jul 2024
Transcendental aspects of algebraic geometry Grand Hotel San Michele. www2.mathematik.hu-berlin.de/~klingleb/Cetraro24/main.html	Cetraro, Italy 1 – 5 Jul 2024
NCTS Minicourse on Non-Commutative Geometry National Center for Theoretical Sciences. Lecturer: Yujiro Kawamata. ncts.ntu.edu.tw/events_3_detail.php?nid=334	Taipei, Taiwan 17, 24, 29 Apr 2024
Mini-Arbeitsgemeinschaft 2024: Severi-Brauer varieties National Taiwan University / National Science and Technology Council. sites.google.com/view/laboratoryofbirationalgeometry/%E9%A6%96%E9%A0%81	Hualien, Taiwan 26 – 29 Jan 2024
59th Annual Meeting of the Taiwan Mathematical Society National Chengchi University. 2024tms.tms.org.tw	Taipei, Taiwan 22 – 23 Jan 2024
NCTS-Kyoto Mathematics Symposium National Center for Theoretical Sciences. ncts.ntu.edu.tw/events_2_detail.php?nid=427	Taipei, Taiwan 9 Dec 2023
Birational Geometry and Algebraic Dynamics University of Tokyo. www.ms.u-tokyo.ac.jp/~stakagi/workshop/oguiso/index.html	Tokyo, Japan 27 Nov – 1 Dec 2023
Algebraic Geometry in East Asia Korea Institute For Advanced Study. events.kias.re.kr/h/AGEA23	Seoul, South Korea 6 – 10 Nov 2023
Geometric and Arithmetic Frontiers of Orbifolds II Institut de recherche mathématique avancée. cirget.uqam.ca/Orbifolds3/en	Strasbourg, France 5 – 9 Jun 2023
Differential and Algebraic methods in Kähler spaces Mathematisches Forschungsinstitut Oberwolfach. www.mfo.de/occasion/2315/www_view	Oberwolfach, Germany 9 – 14 Apr 2023
Crash Course Condensed Mathematics University of Freiburg. math.commelin.net/2023/condensed	Freiburg, Germany 13 – 17 Mar 2023
Abschlusskolloquium of GK "Cohomological Methods in Geometry" University of Freiburg. freidok.uni-freiburg.de/proj/8331	Freiburg, Germany 14 – 15 Jul 2022
Birational Geometry conference École Polytechnique Fédérale de Lausanne. www.epfl.ch/labs/cag/birational-geometry-conference	Lausanne, Switzerland 13 – 17 Jun 2022
Géométrie Algébrique en Liberté XXIX Laboratoire de Mathématiques d'Orsay. lmv.math.cnrs.fr/geometrie-algebrique-en-liberte-gael-xxix	Orsay, France 23 – 27 May 2022

Workshop Higher Algebra Technical University of Darmstadt. crc326gaus.de/workshop-higher-algebra	Darmstadt, Germany 16 – 18 Mar 2022
New Techniques in Resolution of Singularities (online) Mathematisches Forschungsinstitut Oberwolfach. www.mfo.de/www/activity/2143b	Oberwolfach, Germany 24 – 30 Oct 2021
K-theory, algebraic cycles and motivic homotopy theory Isaac Newton Institute for Mathematical Sciences. www.newton.ac.uk/event/kahw01	Cambridge, UK 13 – 17 Jan 2020
o-Minimal Structures in Algebraic Geometry Summer School University of Freiburg. www.math.ens.psl.eu/~odegaay/Freiburg.pdf	Freiburg, Germany 9 – 13 Sep 2019
Moduli and Stability conditions Summer School University of Hannover. sites.google.com/site/moduli2019hannover/home	Hannover, Germany 29 Jul – 2 Aug 2019
2nd BYMAT Conference Instituto de Ciencias Matemáticas. www.icmat.es/congresos/2019/BYMAT/abstracts.pdf	Madrid, Spain 20 – 24 May 2019
Geometry Summer School Utrecht University. www.utrechtsummerschool.nl/courses/science/geometry	Utrecht, Netherlands 14 – 25 Aug 2017
Partial Differential Equations Summer School Fundação Calouste Gulbenkian. www.math.tecnico.ulisboa.pt/~ggranja/Talentos/school2016	Lisbon, Portugal 4 – 8 Jul 2016
Dynamical Systems Summer School Fundação Calouste Gulbenkian. www.math.tecnico.ulisboa.pt/~ggranja/Talentos/school2015	Lisbon, Portugal 6 – 10 Jul 2015
Algebraic Geometry Summer School Fundação Calouste Gulbenkian. www.math.tecnico.ulisboa.pt/~ggranja/Talentos/school2014	Lisbon, Portugal 14 – 18 Jul 2014

Additional Formation

Internship at the WSO-UV space telescope project Time-series analysis from ultraviolet spectroscopy measurements using Matlab.	Madrid, Spain 1 – 31 Jul 2015
International Astronomical Youth Camp 2014 Observational astronomy and climate modeling using Matlab.	Weyer, Austria 20 Jul – 9 Aug 2014
Android application development I, II and III Courses taken at TEIDE Centros de Formación.	Madrid, Spain Jan – Jun 2013