

CURRICULUM VITAE

Óscar Domínguez

Ph.D. in Mathematics

EDUCATION

- 2016: **PhD in Mathematics**: “Approximation Spaces, Limiting Interpolation and Besov spaces”, Universidad Complutense de Madrid, Spain; Advisors: Fernando Cobos, Antón Martínez
- 2012: **Master of Sciences in Mathematics**: “Approximation Spaces”, Universidad Complutense de Madrid, Spain; Supervisor: Fernando Cobos
- 2011: **Bachelor Degree in Mathematics**, Universidad de Santiago de Compostela, Spain

APPOINTMENTS AND FELLOWSHIPS AWARDED

- **Universidad Complutense de Madrid**, Assistant Professor, January 2018—present.
- **Simons Fellow, Centre de Recherches Mathématiques, Montreal**, Canada. October 2022—December 2022.
- **Postdoctoral Fellow LaBex Milyon, Université Lyon 1**, France. September 2021 – August 2022.
- **Del Amo Fellowship, University of California-Irvine**. March 2020 – April 2020.
- **Invited Researcher at the Isaac Newton Institute, University of Cambridge**. January 2019 – June 2019.

- **2018 Juan de la Cierva Fellow, ICMAT-CSIC**, Madrid, Spain. Spanish Economy Ministry (declined).
- **Postdoctoral Fellow BPD, Center for Mathematics of the University of Coimbra (CMUC)**, University of Coimbra, Portugal. May 2017 – December 2017.
- **FPU Fellow, Universidad Complutense de Madrid**, Spanish Ministry of Education. March 2013 – March 2017.
- **PhD Research Stay Fellowship, University of Jena (Germany)**, Spanish Ministry of Education. September 2015 – December 2015.
- **IMI Research Grant, Institute for Interdisciplinary Mathematics (IMI), Universidad Complutense de Madrid**, Spain. October 2011 – December 2011.
- **Xunta de Galicia Collaboration Grant, Universidad de Santiago de Compostela**. Galician Government, Spain. October 2010 – June 2011.

AWARDS AND HONORS

2017: **Prize “Vicent Caselles”**, awarded by the Spanish Royal Mathematical Society. Spanish award to the best young researchers (under 30) in Mathematics.

2017: **Best PhD Dissertation Thesis in Mathematics**, Universidad Complutense de Madrid.

2016: European PhD with the grade “Sobresaliente – Cum Laude”.

2011: **Graduated from Universidad de Santiago de Compostela with distinction.**

2006: Graduated with Honors in High School.

RESEARCH VISITS

11/22-11/22: Department of Mathematics, Duke University, Durham NC, USA

10/22-12/22: Centre de Recherches Mathématiques, Montreal, Canada

05/22-05/22: Laboratoire Jacques-Louis Lions, Sorbonne University, Paris, France

03/22-03/22: Mathematical Institute, Jena, Germany

02/22-02/22: Institut Fourier Grenoble, France

02/22-02/22: Institut de Mathématiques de Toulouse, France

03/20-04/20: Del Amo Visitor, Department of Mathematics, University of California-Irvine, USA

03/19-03/19: Mathematical Institute, University of Oxford, UK

12/17-12/17: Delft University of Technology, Delft, The Netherlands

11/17-11/17: Universidad Complutense de Madrid, Madrid, Spain

07/17-07/17: Centre de Recerca Matemàtica, Barcelona, Spain
02/17-02/17: Laboratoire Jacques-Louis Lions, Université Pierre et Marie Curie,
Paris, France
02/17-02/17: Department of Mathematics, Ohio State University, USA
01/17-02/17: Department of Mathematics, University of South Carolina, USA
06/16-06/16: Centre de Recerca Matemàtica, Barcelona, Spain
11/15-11/15: Institute of Mathematics, University of Leipzig, Germany
09/15-12/15: Mathematical Institute, Jena, Germany
04/14-04/14: Mathematical Institute, Jena, Germany
10/11-12/11: Institute for IMI, Universidad Complutense de Madrid, Madrid, Spain

RESEARCH INTERESTS

My main research fields are

- Function Spaces
- Interpolation Theory
- Approximation Theory
- Harmonic Analysis
- PDE's

PUBLICATIONS

Journal Papers (Accepted)

(1) O. Domínguez, A. Seeger, B. Street, J. Van Schaftingen, P.-L. Yung, *Spaces of Besov—Sobolev type and a problem on non-linear approximation.*

J. Funct. Anal., 284, 50 pp., 2023.

(2) O. Domínguez, M. Milman, *New Brezis-Van Schaftingen-Yung Sobolev type inequalities connected with maximal inequalities and one parameter families of operators.*

Adv. In Math., 411, 76 pp., 2022.

(3) O. Domínguez, M. Milman, *Bourgain—Brezis—Mironescu—Maz'ya—Shaposhnikova limit formulae for fractional Sobolev spaces via interpolation and extrapolation.*

Calc. Var. Partial Differential Equations, 62, 37 pp., 2023.

(4) O. Domínguez, S. Tikhonov, *Function Spaces of Logarithmic Smoothness: Characterizations and Embeddings.*

Mem. Amer. Math. Soc., 282, 180 pp., 2023.

- (5) M. Cao, O. Domínguez, C. Martell, P. Tradacete, *On the A_∞ condition for elliptic operators in 1-sided NTA domains satisfying the capacity density condition*.
Forum Math. Sigma, 10, 57 pp., 2022.
- (6) O. Domínguez, S. Tikhonov, *New estimates for the maximal function and applications*.
Trans. Amer. Math. Soc., 375, 3969—4018, 2022.
- (7) O. Domínguez, M. Milman, *Sparse Brudnyi and John—Nirenberg spaces*.
Comptes Rendus Mathématique, 359, 1059—1069, 2021.
- (8) O. Domínguez, M. Veraar, *Extensions of the vector-valued Hausdorff-Young inequalities*.
Math. Z., 299, 373—425, 2021.
- (9) O. Domínguez, D.D. Haroske, S. Tikhonov, *Embeddings and characterizations of Lipschitz spaces*.
J. Math. Pures Appl., 144, 69—105, 2020.
- (10) F. Cobos, O. Domínguez, T. Kühn, *Approximation and entropy numbers of embeddings between approximation spaces*.
Constr. Approx., 47, 453—486, 2018.
- (11) O. Domínguez, *Sharp estimates of the norms of embeddings between Besov spaces*.
Z. Anal. Anwendungen, 37, 127—149, 2018.
- (12) F. Cobos, O. Domínguez, T. Kühn, *On nuclearity of embeddings between Besov spaces*.
J. Approx. Theory, 225, 209—223, 2018.
- (13) O. Domínguez, *Sharp embeddings of Besov spaces with logarithmic smoothness in sub-critical cases*.
Anal. Math., 43, 219—240, 2017.
- (14) O. Domínguez, *Ulyanov-type inequalities and embeddings between Besov spaces: the case of parameters with limit values*.
Math. Inequal. Appl., 20, 755—772, 2017.
- (15) F. Cobos, O. Domínguez, *On Besov spaces modelled on Zygmund spaces*.
J. Approx. Theory, 211, 61—77, 2016.
- (16) O. Domínguez, *Tractable embeddings of Besov spaces into small Lebesgue spaces*.
Math. Nachr., 289, 1739—1759, 2016.
- (17) F. Cobos, O. Domínguez, *On the relationship between two kinds of Besov spaces with smoothness near zero and some other applications of limiting interpolation*.
J. Fourier Anal. Appl., 22, 1174—1191, 2016.
- (18) F. Cobos, O. Domínguez, H. Triebel, *Characterizations of logarithmic Besov spaces in terms of differences, Fourier-analytical decompositions, wavelets and semi-groups*.

J. Funct. Anal., 270, 4386—4425, 2016.

(19) F. Cobos, O. Domínguez, *On Besov spaces of logarithmic smoothness and Lipschitz spaces.*

J. Math. Anal. Appl., 425, 71—84, 2015.

(20) F. Cobos, O. Domínguez, *Approximation spaces, limiting interpolation and Besov spaces.*

J. Approx. Theory, 189, 43—66, 2015.

(21) F. Cobos, O. Domínguez, *Embeddings of Besov spaces of logarithmic smoothness.*

Studia Math., 223, 193—204, 2014.

(22) F. Cobos, O. Domínguez, A. Martínez, *Compact operators and approximation spaces.*

Colloq. Math., 136, 1—11, 2014.

(23) L. Plociniczak, W. Okrasinski, J. Nieto, O. Domínguez, *On a nonlinear boundary problem modeling corneal shape.*

J. Math. Anal. Appl., 414, 461—471, 2014.

(24) A. Bermúdez, O. Domínguez, D. Gómez, P. Salgado, *Finite element approximation of nonlinear transient magnetic problems involving periodic potential drop excitations.*

Computers & Mathematics with Applications, 65, 1200—1219, 2013.

Journal Papers (submitted)

(DLTY) O. Domínguez, Y. Li, S. Tikhonov, D. Yang, W. Yuan, *A unified approach to self-improving property via K -functionals.* 38 pp. [ArXiv: 2309.02597](https://arxiv.org/abs/2309.02597)

(DLX) O. Domínguez, L. Liu, J. Xiao, *Logarithmic-Lipschitz function spaces, capacities and perimeters-mean curvatures.* 62 pp.

(DM) O. Domínguez, M. Milman, *Uniqueness for 2D Euler and transport equations via extrapolation.* 36 pp. [ArXiv: 2306.08082](https://arxiv.org/abs/2306.08082)

(DoTi) O. Domínguez, S. Tikhonov, *Sobolev embeddings, extrapolations, and related inequalities.* 97 pp. [ArXiv: 1909.12818](https://arxiv.org/abs/1909.12818)

(DoTi2) O. Domínguez, S. Tikhonov, *Truncated smooth function spaces.* 152 pp. [ArXiv: 2211.01529](https://arxiv.org/abs/2211.01529)

Thesis

(The1) O. Domínguez, “Approximation spaces, limiting interpolation and Besov spaces”. Universidad Complutense de Madrid, 2016. PhD Thesis.

(The2) O. Domínguez, “Approximation spaces”. Universidad Complutense de Madrid, 2013. Diploma thesis.

Other Reports

(Rep1) O. Domínguez, “Besov spaces of logarithmic smoothness, characterizations and embeddings”. Oberwolfach Report No. 6, 385 – 387, 2015.

Citation Report (October 2023)

- *Number of citations:* **161** times by **108** authors; MathSciNet.
- *Number of citations:* **370**; Google Scholar.
- h-index: 12

CONFERENCE TALKS

- *2022 CMS Winter Meeting*
Invited talk at special session “Analysis of PDE’s”
Toronto, Canada, December 2022
- *Journées ANR RAGE*
Plenary talk
Nantes, France, January 2022
- *Non-linear Approximation Meeting*
Plenary talk
Universidad Autónoma de Madrid, Spain, January 2022 (postponed)
- *Mathematical Congress of the Americas*
Invited talk at special session “Geometric Potential Analysis”
Online, July 2021
- *Workshop of Young Researchers 2020*
Invited talk.
Universidad Complutense de Madrid, Spain, September 2020.
- *12th International Isaac Congress*
Invited talk at special session “Function Spaces and Applications”.
Aveiro (Portugal), July 2019.
- *Challenges in Optimal Recovery and Hyperbolic Cross Approximation*
Plenary talk.
Isaac Newton Institute, Cambridge (UK), February 2019.
- *7th Iberian Mathematical Meeting*
Invited talk at special session “Harmonic and Complex Analysis”.

Évora (Portugal), October 2018.

- *11th International Conference Nonlinear Analysis, Function Spaces and Applications*
Contributed talk.

Prague (Czech Republic), July 2018.

- *Real Harmonic Analysis and its Applications to Partial Differential Equations and Geometric Measure Theory*

Contributed talk.

ICMAT, Madrid (Spain), May 2018.

- *Function Spaces, Interpolation Theory and Related Topics*

Plenary talk.

Madrid (Spain), November 2017.

- *New Perspectives in the Theory of Function Spaces and their Applications*

Invited talk.

Bedlewo (Poland), September 2017.

- *Follow-up Approximation Theory and Function Spaces*

Plenary talk.

Centre de Recerca Matemàtica, Barcelona (Spain), June 2017.

- *Encuentros de Análisis Real y Complejo*

Plenary talk.

Santa Cruz de Tenerife (Spain), May 2017.

- *International Conference on Function Spaces, Differential Operators and Nonlinear Analysis*

Contributed talk.

Prague (Czech Republic), July 2016.

- *Workshop on Function Spaces and High-Dimensional Approximation*

Contributed talk.

Centre de Recerca Matemàtica, Barcelona (Spain), May 2016.

- *Conference "PDEs, Potential Theory, Function Spaces"*

Contributed talk.

Linköping (Sweden), June 2015.

- *Mini-Workshop: Modern Applications of s -numbers and Operator Ideals*

Plenary talk

Mathematisches Forschungsinstitut Oberwolfach (Germany), February 2015.

- *8th Workshop of Young Researchers in Mathematics*

Plenary talk.

Universidad Complutense de Madrid (Spain), September 2014.

- *School on Nonlinear Analysis, Function Spaces and Applications 10*

Contributed talk.

Trest (Czech Republic), June 2014.

- *Encuentros de Análisis Real y Complejo*

Plenary talk.

Girona (Spain), May 2014.

- *X Encuentro de la Red de Análisis Funcional y Aplicaciones*

Plenary talk.

Sevilla (Spain), March 2014.

- *Function Theory on Infinite Dimensional Spaces XIII*

Contributed talk.

ICMAT, Madrid (Spain), February 2014.

- *Workshop of Young Researchers in Mathematics 2012*

Plenary Talk.

Madrid (Spain), September 2012.

INVITED TALKS AT SEMINARS, COLLOQUIUMS

- *Mischa Cotlar Analysis Seminar*, Instituto Argentino de Matemática, Buenos Aires. 09/2023

Link to the talk:

<https://www.youtube.com/watch?v=VmuwPWSuHeM&t=867s>

- *Duke University. Analysis Seminar*. 11/2022
- *Centre de Recherches Mathématiques, Montreal. Harmonic Analysis Seminar*. 10/2022
- *Nonlinear Analysis and PDE Seminar, Sorbonne Université, Paris VI*. 05/2022
- *International Prague Seminar on Function Spaces, Charles University, Prague*. 04/2022

Link to the talk:

<https://www.youtube.com/watch?v=IR03aCx9LYM>

- *Seminar "Function Spaces", Friedrich-Schiller-Universität Jena. 03/2022*
- *Analysis and Mathematical Physics Seminar, Institut Fourier Grenoble. 02/2022*
- *Analysis Seminar, Institute de Mathématiques de Toulouse. 02/2022*
- *Maynooth Analysis Seminar, Dublin. 11/2021*
- *Nonlinear Analysis Seminar, Okinawa. 10/2021*

Link to the talk:

<https://groups.oist.jp/nonlinearanalysis/fall-2021-nonlinear-analysis-seminar-series->

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- *Séminaire EDP-Analyse, Institut Camille Jordan, Lyon. 09/2021*
- *Corona Seminar. 07/2021*
- *Bilbao Analysis and PDE. Basque Center for Applied Mathematics. 03/2021*

Link to the talk:

<https://drive.google.com/file/d/1ONuTIJ5s71IfA6WgpLPPnLxVd6UaKC-N/view>

- *Probability and Analysis Webinar. 11/2020.*

Link to the talk:

https://www.youtube.com/watch?v=1QDJM6Pejn0&ab_channel=ProbabilityandAnalysisWebinar

- *University of Wisconsin-Madison. Analysis Seminar. 11/2020.*
- *Corona Seminar, 07/2020*

Link to the talk:

<https://drive.google.com/drive/folders/1ixsdVuJ5eh06L95eXZfzF3nKYV2RcOTU>

- *Instituto de Ciencias Matemáticas (ICMAT). Analysis and Applications Seminar. 01/2020.*
- *University of Birmingham. Analysis Seminar. 05/2019.*
- *University of Oxford. 03/2019.*
- *University of Santiago de Compostela. Seminar of Differential Equations and Functional Analysis. 04/2018.*
- *Delft University of Technology. Analysis Seminar. 12/2017.*
- *University of Aveiro. Functional Analysis Seminar. 10/2017.*
- *Centre for Mathematics of the University of Coimbra. Analysis Seminar. 05/2017.*
- *Université Pierre et Marie Curie. Seminar Laboratoire Jacques-Louis Lions. 02/2017.*
- *Ohio State University. Analysis and Operator Theory Seminar. 02/2017.*

- *University of South Carolina*. IMI Seminar. 02/2017.
- *Universidad Complutense de Madrid*. Colloquium Mathematical Analysis. 03/2016.
- *Friedrich-Schiller-Universität Jena*. Seminar "Function Spaces". 12/2015.
- *Friedrich-Schiller-Universität Jena*. PhD Seminar. 12/2015.
- *Universität Leipzig*. Functional Analysis Seminar. 11/2015.
- *TU Chemnitz*. Analysis Seminar. 11/2015.
- *Friedrich-Schiller-Universität Jena*. Seminar Function Spaces. 10/2015.
- *Universidad Autónoma de Madrid*. PhD Seminar. 04/2015.
- *Friedrich-Schiller-Universität Jena*. Seminar "Function Spaces". 04/2014.
- *Universidad Complutense de Madrid*. PhD Seminar. 04/2013.
- *Universidad de Santiago de Compostela*. PhD Seminar. 03/2012.

MINICOURSES

- *Commutator estimates revisited*, Analysis Summer School 2021, Imperial College, London. 16/06/2021--18/06/2021.
<https://sites.google.com/view/analysis-summer-school>
- *New Perspectives in Sobolev inequalities*, X Escuela-Taller de Análisis Funcional, La Laguna, Spain. 02/03/2020-06/03/2020.
<https://www.uv.es/functanalys/encuentros/2020/school-talleres.html>

FUNDING

- Cooperation with Beijing Normal University, 2022 — 2023.
- Labex Milyon, 2021 — 2022.
- Spain-MINECO: MTM2017-84058-P "Interpolación, Espacios de Funciones y Compacidad de Operadores", 2018 — 2022. PI: F. Cobos.
- FCT UID/MAT/00324/2013 Centre of Mathematics of the University of Coimbra (CMUC), 2017 — 2018. PI: M.M. Clementino.
- Spain-MINECO: MTM2013-42220-P "Interpolación, aproximación, entropía y espacios de funciones", 2014 — 2017. PI: F. Cobos.
- Spain-MINECO: MTM2010-15814 "Interpolación, espacios de funciones y aplicaciones", 2013. PI: F. Cobos.

SYNERGISTIC ACTIVITIES

- Referee for several journals, including: Journal of Functional Analysis; Advances in Mathematics; Journal of the European Mathematical Society; Calculus of Variations

and PDE; Revista Matemática Iberoamericana; Journal of Geometric Analysis; Nonlinear Analysis; Comptes Rendus Mathématique; Journal of Approximation Theory; IMA Journal of Numerical Analysis; Mathematische Nachrichten; Revista Matemática Complutense; Journal of Mathematical Analysis and Applications; Acta Math. Hungarica; Analysis Mathematica; Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales; Publicacions Matemàtiques; Journal of Function Spaces and Applications; Journal of Inequalities and Applications; Applied Numerical Mathematics; Indagationes Mathematicae; Pure and Applied Functional Analysis; Boletín de la Sociedad Matemática Mexicana.

- 2014-2021: MathSciNet Reviewer (x15).

ORGANIZING COMMITTEES

- 2022: Coorganizer together with Galia Dafni (Concordia University), Javad Mashreghi (Laval University) and Sergey Tikhonov (CRM-Barcelona) of the session “Harmonic Analysis, Function Spaces and Approximation Theory” at 2022 CMS Winter Meeting, December 2022, Toronto, Canada.
- 2022: Coorganizer together with Galia Dafni (Concordia University), Javad Mashreghi (Laval University) and Sergey Tikhonov (CRM-Barcelona) of the *Harmonic Analysis Seminar* at Centre de Recherches Mathématiques, Montreal.
- 2020--2022: Coorganizer together with Alberto Debernardi (University of Aveiro) and Mario Milman (Florida Atlantic University and Instituto de Matemática Argentino) of the *Corona Seminar*.

<https://coronaseminar.wordpress.com/>

- 2020: Organizer of the session “*Real Analysis*” at V Congreso de Jóvenes Investigadores RSME, January 2020, Castellón, Spain.

<https://jovenesrsme2020.com/analisis-real/>

- 2019: Organizer of the *Approximation, Sampling and Compression in Data Science Seminar*, Isaac Newton Institute, University of Cambridge, UK.

<https://www.newton.ac.uk/event/asc/seminars>

- 2014-2016: Organizer of the *PhD Seminar* at the Universidad Complutense de Madrid.

HABILITATIONS

2023: Acreditación para Profesor Titular, ANECA (Spain)

2016: Acreditación para Profesor Contratado Doctor, ANECA (Spain)

TEACHING

- 09/23-10/23: Basic Mathematics. Dual Degree in Economics and Mathematics-Statistics. Universidad Complutense de Madrid.
- 09/23-12/23: Calculus. Degree in Computer Science Engineering. Universidad Complutense de Madrid.
- 01/23-05/23: Integral Calculus. Degree in Mathematics. Universidad Complutense de Madrid.
- 01/23-05/23: Elements of Ordinary Differential Equations. Universidad Complutense de Madrid.
- 09/22-10/22: Basic Mathematics. Dual Degree in Economics and Mathematics-Statistics. Universidad Complutense de Madrid.
- 09/20-02/21: Analysis I. Degree in Mathematics. Universidad Complutense de Madrid.
- 09/20-02/21: Elements of Mathematics and Applications. Degree in Mathematics. Universidad Complutense de Madrid.
- 09/20-11/20: Basic Mathematics. Degree in Mathematics. Universidad Complutense de Madrid.
- 09/19-12/19: Analysis I. Degree in Mathematics. Universidad Complutense de Madrid.
- 09/19-12/19: Mathematics for Chemistry. Degree in Biochemistry. Universidad Complutense de Madrid.
- 09/19-09/19: Basic Mathematics. Degree in Mathematics. Universidad Complutense de Madrid.
- 09/18-12/18: Analysis I. Degree in Mathematics. Universidad Complutense de Madrid.
- 09/18-09/18: Basic Mathematics. Degree in Mathematics & Statistics. Universidad Complutense de Madrid.
- 01/18-05/18: Functional Analysis. Degree in Mathematics & Physics. Universidad Complutense de Madrid.
- 01/18-05/18: Analysis II. Degree in Mathematics & Physics. Universidad Complutense de Madrid.
- 01/18-05/18: Analysis I. Degree in Mathematics. Universidad Complutense de Madrid.
- 03/16-06/16: Analysis I. Degree in Mathematics. Universidad Complutense de Madrid.
- 03/15-06/15: Analysis I. Degree in Mathematics. Universidad Complutense de Madrid.

SUPERVISION OF BACHELOR THESES

- Nuria Frutos. *Solvability of the Dirichlet Problem for the Laplace Equation*. Universidad Complutense de Madrid, 2021.
- Enrique García. *Analysis on non-smooth domains: harmonic measure, free boundary problems and rectifiability*. Universidad Complutense de Madrid, 2021.

