

# Odysseas Bakas

---

## Contact Information

Department of Mathematics,  
University of Patras, 26504 Patras, Greece

☎ +30 2610997491  
✉ obakas@upatras.gr

## Employment

Department of Mathematics, University of Patras, Patras, Greece  
Assistant Professor

Jul 2023-

## Previous employment

BCAM - Basque Center for Applied Mathematics, Bilbao, Spain  
Juan de la Cierva Postdoctoral Fellow

Jul 2022-Jul 2023

BCAM - Basque Center for Applied Mathematics, Bilbao, Spain  
Postdoctoral Fellow in APDE

Jul 2021-Jun 2022

Lund University, Centre for Mathematical Sciences, Lund, Sweden  
Postdoctoral Fellow in Mathematics

Jul 2019-Jun 2021

Two year postdoctoral position in Professor Sandra Pott's project 'New Focus on Old Problems', financed by the Knut and Alice Wallenberg Foundation.

Stockholm University, Department of Mathematics, Stockholm, Sweden  
Postdoctoral Fellow in Complex and Harmonic Analysis

Sep 2017-Jun 2019

## Education

The University of Edinburgh, Edinburgh, UK  
PhD in Mathematics. Supervisor: Professor James Wright

Sep 2013-Aug 2017

National Technical University of Athens, Athens, Greece  
MSc in Applied Mathematical Sciences

2011-2013

National Technical University of Athens, Athens, Greece  
Diploma in Electrical and Computer Engineering

2006-2011

## Research Interests

My research interests lie in harmonic analysis with an emphasis on problems related to endpoint mapping properties of operators, such as square functions, certain classes of Fourier multiplier operators, paraproducts, and directional operators, when acting on spaces arising in harmonic analysis as well as in its intersection with complex analysis. I am also interested in problems in classical Fourier analysis related to 'thin' spectral sets.

## Publications

### Pure Mathematics

- Bakas, O.; Ciccone, V.; Wright, J. *Walter Rudin meets Elias M. Stein*. To appear in Notices Amer. Math. Soc.
- Bakas, O.; Pott, S.; Rodríguez-López, S.; Sola, A. *Multipliers for Hardy-Orlicz spaces and applications*. Submitted; preprint arXiv:2306.09874.
- Bakas, O.; Xu, Z.; Zhai, Y.; Zhang, H. *Multiplication between elements in Martingale Hardy spaces and their duals*. Submitted; preprint arXiv:2301.08723.
- Bakas, O.; Di Plinio, F.; Parissis, I.; Roncal, L. *Singular integrals along variable codimension one subspaces*. Submitted; preprint arXiv: 2211.13646.
- Bakas, O.; Pott, S.; Rodríguez-López, S.; Sola, A. *Notes on  $H^{\log}$ : structural properties, dyadic variants, and bilinear  $H^1$ -BMO mappings*. Ark. Mat. **60** (2022), no. 2, 231–275.
- Bakas, O. *Sharp asymptotic estimates for a class of Littlewood-Paley operators*. Studia Math. **260** (2021), no. 2, 195–206.
- Bakas, O. *On a Problem of Pichorides*. J. Geom. Anal. **31** (2021), no. 7, 7455–7512; *Correction*. J. Geom. Anal. **31** (2021), no. 12, 12637–12639.
- Bakas, O. *Extrapolation on Hardy spaces and applications*. Pure Appl. Funct. Anal. **6** (2021), no. 3, 531–550.
- Bakas, O. *A variant of Yano’s extrapolation theorem on Hardy spaces*. Arch. der Math. **113** (2019), no. 5, 537–549.
- Bakas, O.; Latorre, E.; Rincón M., D. C.; Wright, J. *A class of multiparameter oscillatory singular integral operators: endpoint Hardy space bounds*. Rev. Mat. Iberoam. **36** (2020), no. 2, 611–639.
- Bakas, O.; Rodríguez-López, S.; Sola, A. *Multi-parameter extensions of a theorem of Pichorides*. Proc. Amer. Math. Soc. **147** (2019), no. 3, 1081–1095.
- Bakas, O. *A multiplier inclusion theorem on product domains*. Proc. Edinb. Math. Soc. **62** (2019), no. 4, 1073–1088.
- Bakas, O. *Variants of the Inequalities of Paley and Zygmund*. J. Fourier Anal. and Appl. **25** (2019), no. 3, 1113–1133.
- Bakas, O. *Endpoint mapping properties of the Littlewood-Paley square function*. Colloq. Math. **157** (2019), no. 1, 1–15.

### Electrical Engineering/Applied Mathematics

- Fikioris, G.; Bakas, O. N.; Zouros, G. P. *Study of Convergence, Divergence, and Oscillations in Method-of-Auxiliary-Sources (MAS) and Extended-Integral-Equation (EIE). Solutions to a Simple Cavity Problem*, IEEE Trans. Microw. Theory Techniques **61** (2013), no. 8, 2773–2782.
- (book) Fikioris, G.; Tastsoglou, I.; Bakas, O. N. *Selected Asymptotic Methods with Applications to Electromagnetics and Antennas (Synthesis Lectures on Computational Electromagnetics)*, Morgan and Claypool Publishers, 2013.

## Research Visits

Lund University, Lund, Sweden	5-16 Dec 2022
Lund University, Lund, Sweden	2-25 May 2022
Université de Franche-Comté, Besançon, France	28 Feb-11 Mar 2022
Stockholm University, Stockholm, Sweden	2-7 Dec 2019
Université de Nantes, Nantes, France	4-9 Dec 2018

## Teaching Experience

### Lecturing

- Harmonic analysis. Advanced course at Lund University, Autumn semester 2020. The syllabus of the course was developed together with Sandra Pott. I prepared and gave all the lectures and I was responsible for the examination of the course. The course was done remotely via ‘Zoom’.
- Fourier Analysis. Advanced level course at Lund University, Spring semester 2020. I was the sole lecturer of the course and responsible for its examination. The course was done remotely via ‘Zoom’.
- Fourier Analysis methods for Partial Differential Equations. PhD course at Stockholm University and KTH, Spring semester 2019. The contents of the course were developed together with Salvador Rodríguez-López. I prepared and gave about half of the lectures and I was responsible for the examination of the course.

### Supervision/Mentoring

- Mentoring, together with Ioannis Parissis, of Valentina Ciccone during her research stay at BCAM - Basque Center for Applied Mathematics. Jan 2023-Apr 2023
- Participation as a mentor in the BATERA mentoring programme at BCAM - Basque Center for Applied Mathematics. Jan 2023-Mar 2023
- Supervision of Joar Melström’s MSc thesis, entitled ‘The Sparse Revolution in Harmonic Analysis’, Lund University, 2021.
- Supervision of Peter Ridemalm’s BSc thesis, entitled ‘Kahane’s Theorem on divergence of Fourier series’, Stockholm University, 2018.

### Examiner/Referee for BSc theses

- Examiner of Francisco Carvalho’s BSc thesis, entitled ‘Waring’s problem and the Hardy-Littlewood circle method’, Lund University, 2021.
- Examiner of Joar Melström’s BSc thesis, entitled ‘Boundedness of the Carleson operator’, Lund University, 2020.
- Referee for Joakim Hag’s BSc thesis, entitled ‘Weyl’s Law for Quantum Graphs’, Stockholm University, 2018.

## Teaching Assistant/Tutorials

- Complex analysis (Teaching Assistant), Stockholm University, 2017-2018 (Spring semester, in-person version of the course), 2018-2019 (Autumn semester, distance version of the course. Spring semester, in-person version of the course).
- Student Library, Stockholm University, 2017-2018 (Autumn and Spring semester).
- Fourier analysis (Tutorials), The University of Edinburgh, 2016-2017.
- Honours analysis (Tutorials), The University of Edinburgh, 2015-2016, 2016-2017.
- Calculus and its Applications (Tutorials), The University of Edinburgh, 2013-2014, 2014-2015, 2015-2016, 2016-2017.
- Mathbase, The University of Edinburgh, 2013-2014, 2014-2015, 2015-2016.
- Introduction to Linear Algebra (Tutorials), The University of Edinburgh, 2013-2014, 2014-2015.

## Talks

### Invited talks at conferences and workshops

- *Codimension one multiplier operators*. Second Congress of Greek Mathematicians SCGM-2022.  
National Technical University of Athens, Athens, Greece 4-8 Jul 2022
- *Multiplier theorems for Hardy-Orlicz spaces*. Miniworkshop on Harmonic Analysis.  
Lund University, Lund, Sweden 13 May 2022
- *Problems related to the endpoint mapping properties of classical Littlewood-Paley operators*. V Congreso de Jóvenes Investigadores de la RSME.  
Castellón, Spain 28 Jan 2020
- *Problems related to interpolation and extrapolation on analytic Hardy spaces*. Summer Meeting of Young Researchers in Mathematics.  
National and Kapodistrian University of Athens, Athens, Greece 16 Jul 2019
- *A question of S. Pichorides*. Analysis Summer Meeting.  
Aristotle University of Thessaloniki, Thessaloniki, Greece 27 Jun 2019
- *Remarks on the endpoint behaviour of some Littlewood-Paley operators: optimal asymptotic estimates and open problems*. Öresundsseminarium.  
Lund University, Lund, Sweden 11 Dec 2019
- *Problems related to lacunary Fourier series*. An Afternoon of Harmonic Analysis.  
Lund University, Lund, Sweden 12 Nov 2019
- *A conjecture of Pichorides on the reverse Littlewood-Paley inequality*. Atelier d'Analyse Harmonique 2017.  
Laboratoire Jean Leray, Université de Nantes, Nantes, France 7 Mar 2017
- *Classical inequalities of Paley and Zygmund: weighted and higher dimensional versions revisited*. Harmonic Analysis/PDEs Workshop.  
University of Bath, Bath, UK 30 Jun 2016

## Contributed talks and presentations at conferences

- *Codimension one directional multipliers*. Short talk at the ‘11th International Conference on Harmonic Analysis and Partial Differential Equations’.  
El Escorial, Spain 7 Jun 2022
- *Asymptotic estimates of the constants in the Littlewood-Paley inequality*. Contributed talk at the conference ‘Harmonic Analysis and PDEs (HAPDE 2019)’.  
University of Helsinki, Finland 5 Jun 2019
- Poster presentation in ‘Geometric Aspects of Harmonic Analysis: a conference on the occasion of Fulvio Ricci’s 70th birthday’.  
Cortona, Italy (25-29 June 2018) 28 Jun 2018

## Seminars talks

- *Products of functions in Hardy spaces and their duals from a dyadic perspective*. Séminaire d’Analyse Fonctionnelle.  
Université de Franche-Comté, France 1 Mar 2022
- *A dyadic approach to products of functions in  $H^1$  and BMO*. Virtual Maxwell Analysis seminar (via zoom).  
The University of Edinburgh and Heriot-Watt University, UK 21 Jan 2022
- *Multiplication between functions in  $H^1$  and BMO*. Analysis and Geometry Seminar (via zoom).  
University of Bristol, UK 2 Dec 2021
- *Notes on the structure of a class of Hardy-Orlicz spaces*. The Analysis Seminar in Thessaloniki (via Zoom).  
Aristotle University of Thessaloniki, Greece 16 Mar 2021
- *Sharp estimates in certain theorems of Marcinkiewicz, Sjögren and Sjölin*. APDE Webinar (via zoom).  
Bilbao, Spain 3 Dec 2020
- *Sharp quantitative estimates for certain classes of Littlewood-Paley operators*. Analysis, Geometry, and PDE seminar (via zoom).  
Lund University, Sweden 20 Oct 2020
- *Remarks on a theorem of Pichorides*. Harmonic Analysis, Operator Algebras, and Representation Theory Seminar.  
Stockholm University, Sweden 4 Dec 2019
- *Extrapolation on analytic Hardy spaces*. Séminaire d’Analyse.  
Laboratoire Jean Leray, Université de Nantes, France 6 Dec 2018
- *A class of thin sets in higher dimensions*. Stockholm Analysis seminar .  
Stockholm University, Sweden 7 Nov 2018
- *Mapping properties of the multi-parameter Littlewood-Paley square function*. Lund Analysis seminar.  
Lund University, Sweden 25 Sep 2018
- *Problems related to the endpoint mapping properties of the Littlewood-Paley square function*. Analysis seminar.  
Stockholm University, Sweden 13 Sep 2017

## Scholarships and Funding

- *Juan de la Cierva Incorporación.*  
Three year postdoctoral fellowship funded by the Agencia Estatal de Investigación, Spain. The contract was terminated on the 20th of July 2023 in order to take over my current position as an Assistant Professor at the University of Patras. Jul 2022-Jul 2023
- *School of Mathematics Studentship.*  
The University of Edinburgh. Sep 2013-Feb 2017
- *State Scholarships Foundation (I.K.Y.)*  
Scholarship for MSc studies in Greece. Sep 2012-Feb 2013

## Funding awarded to attend conferences

- *Postgraduate Research Student Essay Prize Award*, The University of Edinburgh, 2016.  
£500 in the form of an allowance for conference. Used to attend the ‘10th International Conference on Harmonic Analysis and Partial Differential Equations’, El Escorial, Madrid, Spain 2016.
- *Laura Wisewell Award*, 2015.  
£250 to attend the ‘2015 International Meeting of AMS with EMS and SPM’, Porto, Portugal, 10-13 June 2015.
- Financial support (£277.75) from the Edinburgh Mathematical Society to attend the ‘EMS-SCM joint meeting’, Barcelona, Spain, 28-30 May 2015.

## Service and Other Experience

### Conference and seminar organisation

- Co-organiser with Jone Apraiz, Mateus Costa de Sousa, Aingeru Fernández Bertolin, and Ioannis Parissis of the ‘5th BCAM-UPV/EHU summer school on harmonic analysis and PDEs: Sphere packing’.  
BCAM - Basque Center for Applied Mathematics and University of the Basque Country (UPV/EHU), Bilbao, Spain 19-23 Jun 2023
- Co-organiser with Marina Iliopoulou and Marco Vitturi of ‘A Young Researchers Symposium in Harmonic Analysis’. The symposium was a satellite event to the ‘Fourier Analysis @200’ workshop.  
ICMS, Edinburgh, UK 23-24 Jun 2022
- Co-organiser with Weiwei Cui, Elsa Ghandour, Stefano Pasquali, and Eskil Rydhe of the ‘Analysis-Geometry-PDE seminar’ at the Centre for Mathematical Sciences, Lund University, Sweden. Sep 2020-Jun 2021

### Referee

Referee for Monatshefte für Mathematik, Journal of Fourier Analysis and Applications, Czechoslovak Mathematical Journal, Studia Mathematica, Analysis Mathematica, Proceedings of the Royal Society of Edinburgh (Section A).