

# David Ter-Borch Gram Lilienfeldt

✉ [david.lilienfeldt78@gmail.com](mailto:david.lilienfeldt78@gmail.com)

📄 <https://math.huji.ac.il/~lilienfeldt/>

Nationality: Danish

D.O.B.: 26/12/1993

Research Fellow in Mathematics

## Employment

2021– **Emily Erskine Endowment Fund Post-Doctoral Research Fellow**, Jerusalem, IL.  
Hebrew University of Jerusalem | Mentor: Ari Shnidman

## Education

- 2021 **Doctor of Philosophy**, Mathematics Montreal, QC.  
McGill University | Advisor: Henri Darmon | Date of defense: May 20, 2021  
Thesis: *Algebraic cycles and Diophantine geometry*
- 2016 **Master of Science**, Mathematics Lausanne, CH.  
École Polytechnique Fédérale de Lausanne (EPFL) | Advisor: Eva Bayer-Fluckiger
- 2016 **Exchange Master Thesis**, Mathematics Cambridge, MA.  
Harvard University | Advisor: Benedict H. Gross | Sep. 2015 - Feb. 2016  
Thesis: *L-series and arithmetic*
- 2014 **Bachelor of Science**, Mathematics Lausanne, CH.  
École Polytechnique Fédérale de Lausanne (EPFL)
- 2011 **French/Danish High School Diploma**, Scientific Option St-Germain-en-Laye, FR.  
Lycée International de St-Germain-en-Laye | High honours (Mention Très Bien)

## Publications and Preprints

- 6) **Experiments with Ceresa classes of cyclic Fermat quotients**, 2021, Submitted.  
Joint with Ari Shnidman  
<https://arxiv.org/abs/2112.00520>
- 5) **Torsion properties of modified diagonal classes on triple products of modular curves**, 2021, Accepted.  
Canadian Mathematical Bulletin (2022), <https://www.doi.org/10.4153/S000843952200011X>
- 4) **Heegner cycles in Griffiths groups of Kuga-Sato varieties**, 2021, Submitted.  
<https://arxiv.org/abs/2107.06731>
- 3) **Algebraic cycles and Diophantine geometry: generalised Heegner cycles, quadratic Chabauty and diagonal cycles**, 2021, PhD Thesis.  
<https://escholarship.mcgill.ca/concern/theses/6t053n310>
- 2) **Geometric quadratic Chabauty over number fields**, 2020, Submitted.  
Joint with Pavel Čoupek, Luciana X. Xiao, and Zijian Yao  
<https://arxiv.org/abs/2108.05235>
- 1) **Generalised Heegner cycles and the complex Abel-Jacobi map**, 2019, Published.  
Joint with Massimo Bertolini, Henri Darmon, and Kartik Prasanna  
*Mathematische Zeitschrift* **298**, 385-418 (2021)

## Fellowships, Scholarships, and Distinctions

- 2021–2022 **Emily Erskine Endowment Fund Post-Doctoral Research Fellowship**.  
Post-doctoral fellowship at the Hebrew University of Jerusalem working with Ari Shnidman.
- Winter 2021 **ISM Scholarship for Outstanding PhD Candidates**.  
This award by the Institut des Sciences Mathématiques au Québec is intended to support outstanding doctoral students so they can concentrate entirely on their thesis writing and defence preparation.
- Feb. 2020 **Alexis and Charles Pelletier Fellowship**.
- 2018–2019 **ISM Graduate Scholarship**, Institut des Sciences Mathématiques au Québec.
- Fall 2018 **Teaching Assistant Honourable Mention**, *Algebra I*, (MATH-235), McGill University.

- 2017–2018 **ISM Travel Award & GREAT Travel Awards**, ISM & McGill University.  
 Fall 2017 **Teaching Assistant Honourable Mention**, *Algebra I*, (MATH-235), McGill University.

## Research Talks

- 2 Mar 2022 **One-day Symposium in Number Theory**, Hebrew University Jerusalem, IL.  
 Title: *Heegner cycles in Griffiths groups of Kuga-Sato varieties*
- 8 Dec 2021 **Number Theory Seminar**, Ben-Gurion University of the Negev Be'er Sheva, IL.  
 Title: *Experiments with Ceresa classes of cyclic Fermat quotients*
- 15 Nov 2021 **Number Theory Seminar**, Hebrew University Jerusalem, IL.  
 Title: *Experiments with Ceresa classes of cyclic Fermat quotients*
- 20 May 2021 **Doctoral Oral Defence**, McGill University Montreal, CA.  
 Title: *Algebraic cycles and Diophantine geometry*
- 25 Jan 2021 **Number Theory Seminar**, IMJ-PRG Paris, FR.  
 Title: *Cycles algébriques et arithmétique des courbes elliptiques*
- 15 Dec 2020 **Number Theory Seminar**, University of Copenhagen Copenhagen, DK.  
 Title: *Algebraic cycles and arithmetic geometry*
- 26 Sep 2020 **Maine-Quebec Number Theory Conference**, Laval University Québec City, QC.  
 Title: *Geometric quadratic Chabauty over number fields*
- 11 Mar 2020 **Arizona Winter School 2020**, University of Arizona Tucson, AZ.  
 Title: *Geometric quadratic Chabauty over number fields*
- 15 Nov 2019 **Algebra and Geometry Seminar**, Laval University Québec City, QC.  
 Title: *Generalised Heegner cycles and the complex Abel-Jacobi map*
- 5 Oct 2019 **Maine-Quebec Number Theory Conference**, University of Maine Orono, ME.  
 Title: *Generalised Heegner cycles and Griffiths groups of infinite rank*
- 19 May 2019 **XXIIeme Colloque panquébécois de l'ISM**, Université de Montréal Montreal, QC.  
 Title: *Generalised Heegner cycles and Griffiths groups of infinite rank*

## Talks at Working Seminars

- Fall 2021 **Euler System Seminar**, Ben-Gurion University of the Negev Be'er Sheva, IL.  
 Title: *Beilinson's formula and the Rankin-Selberg method*
- Fall 2021 **Shnidman Group Seminar**, Hebrew University Jerusalem, IL.  
 Title: *Introduction to algebraic cycles and the Beilinson-Bloch conjecture*
- Winter 2020 **Lawrence–Venkatesh Graduate Seminar**, McGill University Montreal, QC.  
 Title: *The proof of Mordell's conjecture: outline of the strategy and first steps*
- Feb 2020 **Graduate Student Seminar**, McGill University Montreal, QC.  
 Title: *The Birch and Swinnerton-Dyer Conjecture*
- Feb 2020 **Graduate Student Seminar**, Université de Montréal Montreal, QC.  
 Title: *The Birch and Swinnerton-Dyer Conjecture*
- Fall 2019 **Derived Categories Graduate Seminar**, Concordia University Montreal, QC.  
 Title: *Localization of triangulated categories*
- Fall 2019 **Étale Cohomology Graduate Seminar**, McGill University Montreal, QC.  
 Title: *The étale structure sheaf / Spectral sequences / The cycle class map / Chern classes*
- Fall 2018 **Mazur–Tate–Teitelbaum Graduate Seminar**, McGill University Montreal, QC.  
 Title: *Hida families of ordinary  $p$ -adic modular forms and their Galois representations*
- Winter 2018 **Sato–Tate Graduate Seminar**, McGill University Montreal, QC.  
 Title: *Automorphic forms for  $GL_n$  and their  $L$ -functions*
- Fall 2017 **Mock Modular Forms Seminar**, Concordia University Montreal, QC.  
 Title: *Weak harmonic Maass forms and mock modular forms*

Winter 2017	<b>Fermat's Last Theorem Graduate Seminar</b> , McGill University Title: <i>Overview of the proof of the modularity lifting theorem</i>	Montreal, QC.
Fall 2016	<b>Iwasawa Theory Graduate Seminar</b> , McGill University Title: <i>Local units and interpolating power series</i>	Montreal, QC.

## Conferences Attended

Sep 2020	<b>Maine-Quebec Number Theory Conference</b> , Laval University	Québec City, QC.
Mar 2020	<b>AWS 2020: Nonabelian Chabauty</b> , University of Arizona	Tucson, AZ.
Oct 2019	<b>Automorphic <math>p</math>-adic <math>L</math>-functions and regulators</b> , Université de Lille	Lille, FR.
Oct 2019	<b>Maine-Quebec Number Theory Conference</b> , University of Maine	Orono, ME.
May 2019	<b>XXIIeme Colloque panquébécois de l'ISM</b> , Université de Montréal	Montreal, QC.
May 2019	<b>Geometrization of the local Langlands program</b> , McGill University	Montreal, QC.
Mar 2019	<b>Montreal-Toronto Workshop in Number Theory</b> , CRM	Montreal, QC.
May 2018	<b>The Bellairs Workshop in Number Theory</b> , Bellairs Research Institute	Barbados, BB.
Mar 2018	<b>AWS 2018: Iwasawa Theory</b> , University of Arizona	Tucson, AZ.
Jan 2018	<b>Montreal-Toronto Workshop in Number Theory</b> , CRM	Montreal, QC.
Dec 2017	<b>Recent Developments on the Arithmetic of Special Values of L-functions</b> , EPFL.	
Oct 2017	<b>Maine-Quebec Number Theory Conference</b> , University of Maine	Orono, ME.
Aug 2017	<b>Special cycles on Shimura Varieties and Iwasawa Theory</b> , EPFL	Lausanne, CH.
Aug 2017	<b>Introductory Workshop on Euler Systems and Special Values of L-functions</b> , EPFL	
Dec 2016	<b>Montreal-Toronto Workshop in Number Theory</b> , CRM	Montreal, QC.
Oct 2016	<b>Maine-Quebec Number Theory Conference</b> , Laval University	Québec City, QC.

## Teaching Experience

<b>Teaching Assistant</b> , McGill University	Montreal, QC.
<i>Algebra I</i>	Fall 2017/2018/2019
<i>Calculus II</i>	Winter 2017
<b>Teaching Assistant</b> , École Polytechnique Fédérale de Lausanne (EPFL)	Lausanne, CH.
<i>Introduction to Algebraic Number Theory</i>	Spring 2014/2015
<i>Analysis I</i>	Fall 2014
<i>Analysis II</i>	Spring 2014

## Service

- 2021 **Referee**, Letter of recommendation, McGill University.  
Provided reference in support of the nomination of Niky Kamran for the David Thomson Award for Graduate Supervision and Teaching.
- 2020 **Member**, *The Math Equity Discussion Club*, McGill University.
- 2019 **Organiser**, *Etale Cohomology Graduate Seminar*, McGill University.
- 2019 **Advisor**, *The Peer Advising Desk*, McGill University.  
Included training on how to deal with students in distress.
- 2012 **Mentor**, *Coaching de la Section de Mathématiques*, École Polytechnique Fédérale de Lausanne.  
Committee responsible for guiding incoming students in the Department of Mathematics during their first year of study, both socially and mathematically.

## Relevant Skills

<b>Languages</b>	Danish (native), French (native), English (CAE Grade A: level C2), Spanish (elementary).
<b>Software</b>	Latex (high level), C++ (medium level), HTML, SageMath, Magma (familiarity).