

Lukas Braun

Curriculum Vitae

Universität Freiburg, Mathematisches Institut
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Personal Data

Date of Birth 28.10.1989
Family Status married, two children.

Education

- 11/2019 **PhD in Mathematics, *summa cum laude***. Eberhard-Karls-Universität Tübingen.
Thesis: 'Quotient presentations of Mori Dream Spaces'.
Advisor: Prof. Dr. Jürgen Hausen.
2nd Referee: Prof. Dr. Harm Derksen.
3rd Referee: Prof. Dr. Michel Brion.
- 08/2015 **Diploma in Mathematics**. Eberhard-Karls-Universität Tübingen, grade 'excellent'.
Thesis: ' \mathbb{K}^* -surfaces with trivial canonical class'.
Advisor: Prof. Dr. Jürgen Hausen.
2nd Referee: Prof. Dr. Victor Batyrev.

Employment

- 10/21–09/23 Wiss. Mitarbeiter (research associate), Albert-Ludwigs-Universität Freiburg.
Funded by **DFG grant BR 6255/2-1** (Walter Benjamin-Stelle).
- 10/19–09/21 Wiss. Mitarbeiter (research associate), Albert-Ludwigs-Universität Freiburg.
- 04/19–09/19 Parental leave.
- 12/15–03/19 Wiss. Mitarbeiter (research associate), Eberhard-Karls-Universität Tübingen.

Grants and Academic Distinctions

- 2021–2023 German research foundation (DFG), grant BR 6255/2-1, Walter Benjamin-Stelle.
Amount: € **188.400**.
- 2021 Teaching Prize by the Student Council Mathematics at University of Freiburg,
together with Prof. Huber-Klawitter and Dr. Böcherer-Linder for the lecture
'Elementargeometrie'.
- 10/2021 Nominated by the University of Freiburg as member of '**Die Junge Akademie**' of
the German National Academy of Natural Sciences Leopoldina.
- 11/2021 Early step advancement (TVL-E13 Step 4) due to excellent scientific performance.

Publications

Preprints

12. **Reductive quotients of klt singularities**
With D. Greb, K. Langlois, and J. Moraga.
arXiv:2111.02812, submitted.
11. **Iteration of Cox rings of klt singularities**
With J. Moraga.
arXiv:2103.13524, submitted.

Articles

10. **The Jordan property for local fundamental groups**
With S. Filipazzi, J. Moraga, R. Svaldi.
Geometry & Topology 26 (2022), no. 1, 283-319.
9. **Gorensteinness and iteration of Cox rings for Fano type varieties**
Mathematische Zeitschrift 301 (2022), 1047-1061.
8. **The local fundamental group of a Kawamata log terminal singularity is finite**
Inventiones Mathematicae 226 (2021), no. 3, 845-896.
7. **Invariant rings of sums of fundamental representations of SL_n and colored hypergraphs**
Advances in Mathematics 389 (2021), 107929.
6. **Completing the classification of representations of SL_n with complete intersection invariant ring**
Transformation Groups 26 (2021), no. 1, 115-144.
5. **Canonical threefold singularities with a torus action of complexity one and k -empty polytopes**
With D. Hättig.
Rocky Mountain Journal of Mathematics 50 (2020), no. 3, 881-939.
4. **Hilbert series of the Grassmannian and k -Narayana numbers**
Communications in Mathematics 27 (2019), no. 1, 27-41.
3. **Covariants of $SL_4(\mathbb{C})$ and incidence geometry of $\mathbb{P}_3(\mathbb{C})$**
Journal of Physics: Conference Series 1194 (2019), 012015.
2. **Log-terminal singularities, platonic tuples and iteration of Cox rings**
With I. Arzhantsev, J. Hausen, M. Wrobel.
European Journal of Mathematics 4 (2018), no. 1, 242-312.

Other writings

1. **Finiteness and klt singularities**
Oberwolfach Report 24/2020, Komplexe Analysis - Algebraicity and Transcendence (2020), 1280-1283, <https://doi.org/10.4171/OWR/2020/24>

Selected Talks

- 08/2022 'TBA' at the conference 'Stability and Moduli', **Simons Centre at Stony Brook**.
- 06/2022 'Reductive quotients of klt singularities' at **Universität des Saarlandes**.
- 06/2022 'Reductive quotients of klt singularities' at the **Birational Geometry Conference, EPFL Lausanne**.
- 06/2022 'Reductive quotients of klt singularities' at **Universität Bayreuth**.
- 05/2022 'Reductive quotients of klt singularities' at **Institut Fourier / Université Grenoble-Alpes**.
- 03/2022 'Finiteness of local fundamental groups' at the MMP Learning Seminar, **Princeton University**.
- 02/2022 'Kähler metrics, orbifold structures, and fundamental groups on resolutions of klt spaces' at the **Conference on Subvarieties and foliations of complex projective varieties**, Osaka City University
- 06/2021 'Local Cox rings for klt singularities' at **Politecnico/Università degli studi di Milano**.
- 06/2021 'Local Cox rings for klt singularities' at the **Oberseminar Algebra, Zahlentheorie und algebraische Geometrie**, University of Freiburg.
- 06/2021 'Local Cox rings for klt singularities' at the **Oberseminar Algebraische Geometrie und Arithmetik**, University of Duisburg-Essen.
- 08/2020 'Finiteness and klt singularities' at the workshop **Komplexe Analysis - Algebraicity and Transcendence**, Mathematisches Forschungszentrum Oberwolfach.
- 06/2020 'Fundamental groups of smooth loci of klt spaces' at the **Groups, Arithmetic & Algebraic Geometry Seminar**, EPFL Lausanne.
- 04/2020 'Fundamental groups of smooth loci of klt spaces' at the **Yale Algebraic Geometry Online Seminar**, organised by Yuchen Liu (Yale) and Chenyang Xu (MIT).
- 06/2019 'Gorensteinness and iteration of Cox rings' at the **Basel-Dijon-EPFL joint seminar**, University of Basel.
- 05/2019 'Gorensteinness and iteration of Cox rings' at the **Oberseminar Algebra, Zahlentheorie und algebraische Geometrie**, University of Freiburg.
- 05/2019 'Gorensteinness and iteration of Cox rings' at the **Oberseminar Zahlentheorie und Arithmetische Geometrie**, University of Hannover.
- 08/2018 'Invariants of fundamental representations of SL_n and colored hypergraphs', Short Communication at the **ICM 2018** in Rio de Janeiro
- 07/2018 'Invariants of fundamental representations of SL_n and colored hypergraphs' at the **GROUP32** Conference at Technical University of Prague
- 04/2018 'Can the Big Bang be embedded somewhere and is it a quotient?', **Forum Scientiarum**, University of Tübingen
- 08/2017 'Classification of compound du Val and canonical threefold singularities with torus action of complexity one' at the workshop **Experimental Classification of Fano varieties**, University of Tübingen

Referee Service

Journal of Algebra, Transformation Groups, International Mathematics Research
Notices IMRN, Selecta Mathematica, Michigan Mathematical Journal

Teaching Experience

- 2021 Proseminar 'Einführung in die Graphentheorie' (Freiburg)
- 2021 Teaching assistant for 'Elementargeometrie' (Freiburg)
- 2020/21 Seminar 'Gröbnerbasen und Invariantentheorie' (Freiburg)
- 2020/21 Teaching assistant for 'Algebra und Zahlentheorie' (Freiburg)
- 2020 Teaching assistant for 'Mathematik für Informatiker' (Freiburg)
- 2020 Teaching assistant for 'Lineare Algebra II' (Freiburg)
- 2019/2020 Teaching assistant for 'Topological Groups' (Freiburg)
- 2019/2020 Seminar 'Representation Theory of finite groups' (Freiburg)
- 2018/2019 Teaching assistant for 'Geometry' (Tübingen)
- 2018 Seminar 'Geometry' (Tübingen)
- 2017/2018 Teaching assistant for 'Geometry' (Tübingen)
- 2017 Teaching assistant for 'Algebraic Geometry' (Tübingen)
- 2016/2017 Teaching assistant for 'Geometry' (Tübingen)
- 2016 Teaching assistant for 'Algebra' (Tübingen)
- 2015/2016 Teaching assistant for 'Geometry' (Tübingen)