Stefan Kebekus

Curriculum Vitae

Contact Details

Name	Stefan Kebekus
Address	University of Freiburg, Mathematisches Institut, Ernst-Zermelo-Str. 1, 79104 Freiburg im Breisgau, Germany
Web	cplx.vm.uni-freiburg.de
EMail	stefan.kebekus@math.uni-freiburg.de
Matrix	@sk380:matrix.uni-freiburg.de

Professional Experience

2008–today	**Professor of Mathematics**, *University of Freiburg*, Germany
2003–2008	**Associate Professor of Mathematics**, *Universität zu Köln*, Germany
1997–2003	**Postdoc**, *Universität Bayreuth*, Germany

Academic Self-Governance

2023–today	**Member of the University Senate**, *University of Freiburg*, Germany
2023–today	**Member of the senate committee on "Structure and Development"**, *University of Freiburg*, Germany
2021–2023	**Erster Prodekan (equiv. Vice Dean)**, *Faculty of Mathematics and Physics at the University of Freiburg*, Germany
2021–2023	**Geschäftsführender Director (equiv. Chairman)**, *Mathematical Institute at the University of Freiburg*, Germany
2020-–2021	**Geschäftsführender Director, Section of Pure Mathematics**, *Mathematical Institute at the University of Freiburg*, Germany

Visiting Positions

2019 **Research Professor**, *MSRI*, Berkeley, U.S.A., about four months

2002–2010 **Visiting Professorships**, *Strasbourg, Grenoble, Rennes*, about one month each

2009 **Guest Researcher**, *MSRI*, Berkeley, U.S.A., about four months

2002 **Visiting Assistant Professor**, *University of Washington*, Seattle, one quarter

1999/2000 **Guest Researcher**, *Kyoto University RIMS*, Japan, one academic year

Education

1996 **Ph.D. in Mathematics**, *Ruhr-Universität Bochum*, Germany
supervised by Alan T. Huckleberry

1995 **Diploma in Mathematics**, *Ruhr-Universität Bochum*, Germany

Grants and Honors

Awards

2023 **Niethammer Innovation Award** for the app "Enroute Flight Navigation." Issued by the "Hellmut Niethammer Foundation", the prize honors innovative developments on the way to climate-neutral flight operations, contributions to a sustainable future for air sports, and technical developments in air sports. The award includes a cash prize, to be used by the flight club "Akaflieg Freiburg" to support the app's future development. For details, see the section "Technology Project and Industry Cooperation" at the end of this CV.

2023 **Frontiers of Science Award** (shared with Christian Schnell) for the paper "Extending holomorphic forms from the regular locus of a complex space to a resolution of singularities" [Journal of the American Mathematical Society, 2021]. The award is issued by the "Yanqi Lake Beijing Institute of Mathematical Sciences and Applications". It recognizes the most important papers in the last five years and includes a personal cash prize of $25k.

2022 Student Union Teaching Award for the "Best lecture of the semester", University of Freiburg.

2021 **Aerokurier Innovation Award** for the app "Enroute Flight Navigation". The award recognizes the app as one of three top innovations of the year, in the category "Avionics". For details, see the section "Technology Project and Industry Cooperation" at the end of this CV.

2006 Albertus Magnus Teaching Award for "exceptional commitment and good didactics in mathematics courses", University of Cologne.

Grants

2012–2022 **DFG Research Training Group**, University of Freiburg, PI and Deputy Director

2017–2018 FRIAS Research Focus, Freiburg Institute for Advanced Studies, Organizer and Senior Fellow

2013–2015 FRIAS Research Group Freiburg/Strasbourg, Freiburg Institute for Advanced Studies, Organizer and Senior Fellow

2007–2014 DFG Research Unit, PI

2006–2008 **DFG Research Training Group**, Universität zu Köln, PI and Director

2004–2007 DFG Priority Program, PI

2002–2003 DFG Heisenberg Fellowship

1999–2000 DFG Research Fellowship

Other grants in my working group

I encourage postdoctoral researchers in my working group to apply for their own grants and support them in the application process.

2025–today Rosa Winter, postdoctoral position funded by the European Union through the Marie Curie program

2022-2023 Martin Kalck, postdoctoral position funded by the DFG

2021-2023 Johan Commelin, postdoctoral position funded by the DFG through the Walter-Benjamin program

2021-2023 Johan Commelin, financial support of $100,000 for his research on formalization of mathematics, provided by Microsoft Research

2020-2023 Lukas Braun, postdoctoral position funded by the DFG through the Walter-Benjamin program

Teaching

2003–today I have been responsible for numerous mathematics lecture courses, at levels ranging from introductory linear algebra courses for audiences of 700+ undergraduates, to advanced graduate courses on contemporary research topics for starting Ph.D. students. I have supervised students at all levels.

Research Supervision

2003–today I have supervised ten Ph.D. students.

2003–today I have mentored seventeen postdoctoral researchers in my working group. Out of those, eleven have found professorships or equivalent permanent academic positions.

Scientific Service

2014–today I am an editor of the Journal Algebraic Geometry, published by the Foundation Compositio Mathematica.

2010–today Mentor in Studienstiftung des deutschen Volkes, Germany's oldest scholarship foundation.

2008–today I organized eight Oberwolfach workshops and numerous international scientific schools and meetings at my home institution.

Publication List

Preprints

2026 Irregularities of special $\mathcal{C}$-pairs (with Erwan Rousseau and Frédéric Touzet). Preprint arXiv:2601.07318.

2024 Entire curves in $\mathcal{C}$-pairs with large irregularity (with Erwan Rousseau). Preprint arXiv:2410.01245.

The Albanese of a $\mathcal{C}$-pair (with Erwan Rousseau). Preprint arXiv:2410.00405.

Accepted

2026 $\mathcal{C}$-pairs and their morphisms (with Erwan Rousseau). Accepted for publication in the Annales de l'Institut Fourier, Special Volume in Memory of Jean-Pierre Demailly. Preprint arXiv:2407.10668.

Published

2024 Miyaoka-Yau inequalities and the topological characterization of certain klt varieties (with Daniel Greb and Thomas Peternell). Comptes Rendus. Mathématique, Volume 362 (2024) no. S1, pp. 141-157. DOI:10.5802/crmath.580. Preprint arXiv:2309.14121.

2022 Failure of the Brauer-Manin principle for a simply connected fourfold over a global function field, via orbifold Mordell (with Jorge Vitório Pereira and Arne Smeets). **Duke Mathematical Journal**, Volume 171, Number 17 (2022), 3515–3591. DOI:10.1215/00127094-2022-0045. Preprint arXiv:1905.02795.

Projective flatness over klt spaces and uniformisation of varieties with nef anti-canonical divisor (with Daniel Greb and Thomas Peternell). Journal of Algebraic Geometry (electronically published). DOI:10.1090/jag/785. Preprint arXiv:2006.08769.

2021 Survey paper: Generic positivity and applications to hyperbolicity of moduli spaces (with Benoît Claudon and Behrouz Taji). In Hyperbolicity Properties of Algebraic Varieties, volume 56 of Panoramas & Synthèses, pages 169–208. Société Mathématique de France, 2021. Preprint arXiv:1610.09832.

Projectively flat KLT varieties (with Daniel Greb and Thomas Peternell). Journal de l'École polytechnique — Mathématiques, Tome 8 (2021), pp. 1005-1036. DOI:10.5802/jep.164. Preprint arXiv:2010.06878.

Extending holomorphic forms from the regular locus of a complex space to a resolution of singularities (with Christian Schnell) **Journal of the American Mathematical Society**. Volume 34, Number 2, April 2021, Pages 315–368. DOI:10.1090/jams/962. Preprint arXiv:1811.03644.

2020 Survey paper: Boundedness results for singular Fano varieties and applications to Cremona groups Séminaire Nicolas Bourbaki. Vol. 2018/2019. Exp. No. 1157, 253–290 (2020) DOI:10.24033/ast.1129. Preprint arXiv:1812.04506.

Harmonic metrics on Higgs sheaves and uniformization of varieties of general type (with Daniel Greb, Thomas Peternell and Behrouz Taji) Mathematische Annalen volume 378 (2020), 1061–1094. DOI:10.1007/s00208-019-01906-4. Preprint arXiv:1804.01266.

2019 The Miyaoka-Yau inequality and uniformisation of canonical models (with Daniel Greb, Thomas Peternell and Behrouz Taji) Ann. Sci. Éc. Norm. Supér. (4) 52 (2019), no. 6, 1487–1535. DOI:10.24033/asens.2414. Preprint arXiv:1511.08822.

Klt varieties with trivial canonical class - Holonomy, differential forms, and fundamental groups (with Daniel Greb and Henri Guenancia) Geometry & Topology 23-4 (2019), 2051–2124. DOI:10.2140/gt.2019.23.2051. Preprint arXiv:1704.01408.

Nonabelian Hodge Theory for klt spaces and descent theorems for vector bundles (with Daniel Greb, Thomas Peternell and Behrouz Taji) Compositio Math. 155(2019), 289–323. DOI:10.1112/S0010437X18007923. Preprint arXiv:1711.08159.

2018 Survey paper: Uniformisation of higher-dimensional varieties (with Daniel Greb and Behrouz Taji) In: Proceedings of 2015 AMS Summer Institute on Algebraic Geometry, Proceedings of Symposia in Pure Mathematics, Volume 97.1, 2018. DOI:10.1090/pspum/097.1/01676. Preprint arXiv:1608.06644.

2017 Differential forms in positive characteristic avoiding resolution of singularities (with Annette Huber and Shane Kelly) Bull. Soc. Math. France 145 (2017), no. 2, 305–343. DOI:10.24033/bsmf.2739. Preprint arXiv:1407.5786.

Comparing $\mathbb{A}^1$-h-cobordism and $\mathbb{A}^1$-weak equivalence (with Aravind Asok and Matthias Wendt) Ann. Sc. Norm. Super. Pisa Cl. Sci. (5) Vol. XVII (2017), 531-572. DOI:10.2422/2036-2145.201503_007. Preprint arXiv:1410.3038.

2016 Singular spaces with trivial canonical class (with Daniel Greb und Thomas Peternell). in "Minimal Models and Extremal Rays (Kyoto, 2011)". Advanced Studies in Pure Mathematics 70, Pages 67-113, Mathematical Society of Japan, Tokyo, 2016. Preprint arXiv:1110.5250.

Étale fundamental groups of Kawamata log terminal spaces, flat sheaves, and quotients of Abelian varieties (with Daniel Greb und Thomas Peternell). **Duke Mathematical Journal**, Volume 165, Number 10 (2016), 1965-2004. DOI:10.1215/00127094-3450859. Preprint arXiv:1307.5718.

Survey paper: Aspects of the geometry of varieties with canonical singularities (with Thomas Peternell) Simons Symposia: Foliation Theory in Algebraic Geometry, Editors: Paolo Cascini, James McKernan and Jorge Vitório Pereira. Springer, New York, 2016. DOI:10.1007/978-3-319-24460-0. Available from this URL.

Movable curves and semistable sheaves (with Daniel Greb and Thomas Peternell). Int Math Res Notices, 2016 (2): 536-570 DOI:10.1093/imrn/rnv126. Preprint arXiv:1408.4308 contains an extended version with additional figures.

2014 Reflexive differential forms on singular spaces – Geometry and Cohomology (with Daniel Greb and Thomas Peternell). Journal für die reine und angewandte Mathematik (Crelles Journal). Vol 697, pp 57–89 (2014). DOI:10.1515/crelle-2012-0097. Preprint arXiv:1202.3243.

2013 Pull-back morphisms for reflexive differential forms Advances in Mathematics, Volume 245, pp. 78-112, 2013. DOI:10.1016/j.aim.2013.06.013. Preprint arXiv:1210.3255.

Survey paper: Differential forms on singular spaces, the minimal model program, and hyperbolicity of moduli stacks In: Handbook of Moduli, Volume II, Editors: Gavril Farkas and Ian Morrison. Number 26 in Advanced Lectures in Mathematics, International Press, Beijing Preprint arXiv:1107.4239.

Survey paper: Uniruledness criteria and applications, In: Simons Symposia: Birational Geometry, Rational Curves, and Arithmetic, Editors: Fedor Bogomolov, Brendan Hassett and Yuri Tschinkel, pp. 147-162, Springer, New York, 2013. DOI:10.1007/978-1-4614-6482-2.

2012 Deformations along subsheaves, II (with Clemens Jörder) EMS Series of Congress Reports, Contributions of Algebraic Geometry, Impanga Lecture Notes (Trends in Mathematics), EMS Publishing House, 2012. DOI:10.4171/114. Preprint arXiv:1103.5630.

2011 Positive sheaves of differentials coming from coarse moduli spaces (with Kelly Jabbusch) Annales de l'institut Fourier, 61 no. 6 (2011), p. 2277-2290, DOI:10.5802/aif.2673. Preprint arXiv:0904.2445.

Differential Forms on Log Canonical Spaces (with Daniel Greb, Sándor Kovács and Thomas Peternell) **Publications Mathématiques de l'IHÉS**, Volume 114, Number 1 (2011), 87-169. DOI:10.1007/s10240-011-0036-0. Preprint arXiv:1003.2913 contains an extended version with additional graphics.

Families over special base manifolds and a conjecture of Campana (with Kelly Jabbusch) Mathematische Zeitschrift: Volume 269, Issue 3 (2011), Page 847-878. DOI:10.1007/s00209-010-0758-6. Preprint arXiv:0905.1746.

Deformations along subsheaves (with Stavros Kousidis and Daniel Lohmann) L'Enseignement Mathématique, Vol. 56, pp. 287-313, 2010. DOI:10.4171/LEM/56-3-3. Preprint arXiv:0905.2749.

2010 The structure of surfaces and threefolds mapping to the moduli stack of canonically polarized manifolds (with Sándor Kovács) **Duke Mathematical Journal**, Vol. 155, No 1, pp. 1-33, 2010. DOI:10.1215/00127094-2010-049. Preprint arXiv:0812.2305.

Extension theorems for differential forms and Bogomolov-Sommese vanishing on log canonical varieties (with Daniel Greb and Sándor Kovács) Compositio Mathematica, Vol. 146, pp. 193–219, 2010. DOI:10.1112/S0010437X09004321. Preprint arXiv:0808.3647.

2008 A refinement of Stein factorization and deformations of surjective morphisms (with Thomas Peternell) Asian Journal of Mathematics, Vol. 12, No. 3, pp. 365-389, 2008. DOI:10.4310/AJM.2008.v12.n3.a6. Preprint arXiv:math/0508285.

Families of varieties of general type over compact bases (with Sándor Kovács) Advances in Mathematics, Vol. 218, No. 3, pp. 649-652, 2008. DOI:10.1016/j.aim.2008.01.005. Preprint arXiv:math/0704.2556.

Families of canonically polarized varieties over surfaces (with Sándor Kovács) **Inventiones Mathematicae**, Vol. 172, No. 3, pp. 657-682, 2008. DOI:10.1007/s00222-008-0128-8. Preprint arXiv:math/0511378.

Galois coverings and endomorphisms of projective varieties (with Marian Aprodu and Thomas Peternell) Mathematische Zeitschrift, Vol. 260, No. 2, pp. 431-449, 2008. DOI:10.1007/s00209-007-0282-5. Preprint arXiv:arXiv:0705.4602.

2007 Rationally connected foliations after Bogomolov and McQuillan (with Luis Solá and Matei Toma) Journal Algebraic Geometry, Vol. 16, No. 1, pp. 65-81, 2007. DOI:10.1090/S1056-3911-06-00435-8. Preprint arXiv:math/0505222.

2006 Survey paper: Existence of rational curves on algebraic varieties, minimal rational tangents, and applications (with Luis Solá) In Global Aspects of Complex Geometry, pp. 359-416. Springer, 2006 DOI:10.1007/3-540-35480-8_10. Preprint arXiv:math/0512487.

Holomorphic maps onto varieties of non-negative Kodaira dimension (with Jun-Muk Hwang and Thomas Peternell) Journal of Algebraic Geometry, Vol. 15, pp. 551-561, 2006. DOI:10.1090/S1056-3911-05-00411-X. Preprint arXiv:math/0307220.

2005 Geometry of chains of minimal rational curves (with Jun-Muk Hwang) Journal für die reine und angewandte Mathematik, Vol. 584, pp. 173-194, 2005. DOI:10.1515/crll.2005.2005.584.173. Preprint arXiv:math/0403352.

Lines on complex contact manifolds, II Compositio Mathematica, Vol. 141, No. 1, pp. 227-252, 2005. DOI:10.1112/S0010437X04000880. Preprint arXiv:math/0306260.

2004 Are minimal degree rational curves determined by their tangent vectors? (with Sándor Kovács) Annales de l'Institut Fourier, Vol. 54, No. 1, pp. 53-80, 2004. Available from this URL. Preprint arXiv:math/0206193.

2002 Projective bundles of singular plane cubics Mathematische Nachrichten, Vol. 242, No. 1, pp. 119-131, 2002. DOI:10.1002/1522-2616(200207)242:13.0.CO;2-R. Preprint arXiv:math/0009083.

Characterizing the projective space after Cho, Miyaoka and Shepherd-Barron In Complex Geometry, Collection of Papers dedicated to Hans Grauert, pp. 147-156. Springer, 2002. Preprint arXiv:math/0107069.

A reduction map for NEF line bundles (with Thomas Bauer, Frédéric Campana, Thomas Eckl, Thomas Peternell, Sławomir Rams, Tomasz Szemberg and Lorenz Wotzlaw) In Complex Geometry, Collection of Papers dedicated to Hans Grauert, pp. 27-36. Springer, 2002. Preprint arXiv:math/0106147.

Manifolds with nef rank 1 subsheaves in Ω^1_X (with Thomas Peternell and Andrew J. Sommese) In Complex Geometry, Collection of Papers dedicated to Hans Grauert, pp. 157-164. Springer, 2002.

Families of singular rational curves Journal of Algebraic Geometry, Vol. 11, pp. 245-256, 2002. DOI:10.1090/S1056-3911-01-00308-3. Preprint arXiv:math/0004023.

2001 Lines on contact manifolds Journal für die reine und angewandte Mathematik, Vol. 539, pp. 167-177, 2001. DOI:10.1515/crll.2001.072. Preprint arXiv:math/0004103.

2000 Projective Contact Manifolds (with Thomas Peternell, Andrew J. Sommese and Jarosław A. Wiśniewski) **Inventiones Mathematicae**, Vol. 142, No. 1, pp. 1-15, 2000. DOI:10.1007/PL00005791. Preprint arXiv:math/9810102.

Group Actions on S^6 and complex structures on $\mathbb{P}^3(\mathbb{C})$ (with Alan T. Huckleberry and Thomas Peternell) **Duke Mathematical Journal**, Vol. 102, No. 1, pp. 101-124, 2000. DOI:10.1215/S0012-7094-00-10214-1. Preprint arXiv:math/9812076.

On the Classification of 3-dimensional $SL_2(\mathbb{C})$-varieties Nagoya Mathematical Journal, Vol. 157, pp. 129-147, 2000. Preprint arXiv:math/9805043.

Relatively Minimal Quasihomogeneous Projective 3-Folds Nagoya Mathematical Journal, Vol. 157, pp. 149-176, 2000. Preprint arXiv:math/9805042.

1998 Simple Models of Quasihomogeneous Projective 3-Folds Documenta Mathematica, Vol. 3, pp. 15-26, 1998. Preprint arXiv:math/9805041.

Non-refereed Papers

2004 Survey paper: Extending holomorphic forms from the regular locus of a complex space to a resolution of singularities (with Christian Schnell). In: Proceedings of the International Conference of Basic Science 2023, Editors: David Gross, Andrew Chi-Chih Yao, Shing-Tung Yau. International Press of Boston, pp. 182-190, 2024. ISBN 9781571464323.

2004 Survey paper: Holomorphe Abbildungen auf Mannigfaltigkeiten mit nicht-negativer Kodaira-Dimension (German) Mathematisches Institut, Seminars, Ed.: Y. Tschinkel, Universität Göttingen, pp. 157-166, 2004.

2000 Survey paper: Bounds for Families of Singular Rational Curves Conference proceedings of the Saitama Conference in Algebraic Geometrye, Saitama University, Urawa City (Japan), 2000.

Other publications

2026 Komplexe Analysis - Analytic and Algebraic Methods in the Theory of Kähler spaces. Abstracts from the workshop held April 5-April 10, 2026. Organized by Eleonora Di Nezza, Stefan Kebekus, Mihai Păun and Stefan Schreieder. Oberwolfach Rep. 15 (2026). DOI:10.14760/OWR-2026-15.

2023 Komplexe Analysis - Differential and Algebraic methods in Kähler spaces. Abstracts from the workshop held April 9-April 14, 2023. Organized by Philippe Eyssidieux, Jun-Muk Hwang, Stefan Kebekus and Mihai Păun. Oberwolfach Rep. 20 (2023), no. 2, pp. 965–1030. DOI:10.4171/OWR/2023/18.

2020 Komplexe Analysis - Algebraicity and Transcendence. Abstracts from the workshop held August 16–August 22, 2020. Organized by Philippe Eyssidieux, Jun-Muk Hwang, Stefan Kebekus and Mihai Păun. Oberwolfach Rep. 24 (2020), no. 3, 1263–1309. DOI:10.4171/OWR/2020/24.

2017 Komplexe Analysis. Abstracts from the workshop held August 27–September 2, 2017. Organized by Philippe Eyssidieux, Jun-Muk Hwang, Stefan Kebekus and Mihai Păun. Oberwolfach Rep. 14 (2017), no. 3, 2427–2473. DOI:10.4171/OWR/2017/39.

2014 Komplexe Analysis. Abstracts from the workshop held August 24–30, 2014. Organized by Philippe Eyssidieux, Jun-Muk Hwang, Stefan Kebekus and Mihai Păun. Oberwolfach Rep. 11 (2014), no. 3, 2177–2234. DOI:10.4171/OWR/2014/39.

2013 Moduli spaces in algebraic geometry. Abstracts from the workshop held February 3–9, 2013. Organized by Dan Abramovich, Lucia Caporaso, Gavril Farkas and Stefan Kebekus. Oberwolfach Rep. 10 (2013), no. 1, 343–392. DOI:10.4171/OWR/2013/06.

2010 Moduli spaces in algebraic geometry. Abstracts from the workshop held January 10–16, 2010. Organized by Dan Abramovich, Gavril Farkas and Stefan Kebekus. Oberwolfach Reports. Vol. 7, no. 1. Oberwolfach Rep. 7 (2010), no. 1, 55–107. DOI:10.4171/OWR/2010/02.

2009 Multiplier ideal sheaves in algebraic and complex geometry. Abstracts from the workshop held April 12–18, 2009. Organized by Stefan Kebekus, Mihai Păun, Georg Schumacher and Yum-Tong Siu. Oberwolfach Reports. Vol. 6, no. 2. Oberwolfach Rep. 6 (2009), no. 2, 1101–1155. DOI:10.4171/OWR/2009/21.

Contributions to the Lean Mathematical Library

2024–today I contribute to Mathlib, the mathematical library of the theorem prover Lean. See the following page for a list of my contributions, `https://github.com/leanprover-community/mathlib4/issues?q=is%3Apr%20author%3Akebekus`

Ph.D. Thesis and Habilitation

2001 Rationale Kurven auf projektiven Mannigfaltigkeiten (German) Habilitationsschrift, Universität Bayreuth, 2001.

1996 Almost Homogeneous Projective 3-Folds Ph.D. thesis, Ruhr-Universität Bochum, 1996.

Technology Project and Industry Cooperation

In cooperation with the not-for-profit club Akaflieg Freiburg, I write and maintain **Enroute Flight Navigation**, an open source flight navigation app aimed at general aviation pilots. The program is available for Android devices, iOS devices and Linux desktop computers. At the time of writing, the app is in daily flight service, with over 23,000 active installations worldwide.

- In October 2023, the German Niethammer Foundation has honored Enroute Flight Navigation with its "Innovation Award".
- In summer 2021, the German aviation magazine Aerokurier has honored Enroute Flight Navigation with its "Innovation Award", as one of the three most important innovations of the year in the category "Avionics".

I cooperate in the development and operation of the software with AIR Avionics, a medium-sized company based in Baden-Württemberg, Germany. The main focus of the company's activities is aviation communication, air traffic control, traffic avoidance, and navigation.

July 6, 2026