

# Thomas H. Geisser

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*Birth* February 28, 1966, Wuppertal (Germany)  
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*Languages* German, English, Japanese

## EDUCATION

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**Ph.D. in Mathematics** May 1994  
*Universität Münster*  
*Supervisor: Christopher Deninger*  
*Magna Cum Lauda*

**Diploma in Mathematics** Sept. 1990  
*Universität Bonn*  
*Supervisor: Günther Harder*  
*Mit Auszeichnung*

## AWARDS

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- Sloan Fellowship 2000
- Alexander von Humboldt Research Award 2021

## EDITORIALS

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- Editor, Documenta Mathematica
- Managing Editor, Commentarii Mathematici Universitatis Sancti Pauli

## RESERCH INTERESTS

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- Arithmetic algebraic geometry
- Higher algebraic  $K$ -theory
- Motivic cohomology

## PROFESSIONAL EXPERIENCE

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<b>Rikkyo University</b> <i>Professor</i>	2015/4- now
<b>Nagoya University</b> <i>Professor</i>	2010/4-2015/3
<b>University of Tokyo</b> <i>Visiting Professor</i>	2009/8-2010/3
<b>University of Southern California</b> <i>Professor</i>	2006/9-2010/3
<b>University of Southern California</b> <i>Associate Professor</i>	2002/9-2006/8
<b>University of Southern California</b> <i>Assistant Professor</i>	2000/9-2002/8
<b>University of Tokyo</b> <i>JSPS-fellow</i>	1998/9-2000/8
<b>University of Illinois at Urbana-Champaign</b> <i>Visiting Assistant Professor</i>	1998/1-1998/6
<b>Universität Essen</b> <i>Researcher</i>	1997/1-1997/12
<b>Harvard University</b> <i>Visiting Scholar</i>	1996/1-1996/12
<b>Max Planck Institut für Mathematik Bonn</b> <i>Visitor</i>	1995/10-1995/12
<b>Harvard University</b> <i>Visiting Scholar</i>	1994/10-1995/9
<b>Universität Münster</b> <i>Assistant</i>	1993/7-1994/9
<b>Harvard University</b> <i>Visiting Fellow</i>	1992/9-1993/6
<b>Universität Münster</b> <i>Assistant</i>	1990/10-1992/8

## GRANTS/ SCHOLARSHIPS

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<b>Alexander von Humboldt Research Award</b> (60,000 Euro)	10/2021-9/2022
<b>Japanese Society for Promotion of Sciences Kiban C</b> <i>Arithmetic cohomology over local fields</i> (4,950,000Yen)	4/2018-3/2023
<b>Japanese Society for Promotion of Sciences Kiban B</b> <i>Motivic cohomology over discrete valuation rings</i> (17,680,000Yen)	4/2011-3/2016
<b>National Science Foundation</b> <i>K-theory and motivic cohomology of singular schemes</i> (204,729 \$ US)	7/2009-6/2011
<b>Japanese Society for Promotion of Sciences</b> <i>Invitation fellowship for research in japan</i>	3/2008-7/2008
<b>National Science Foundation</b> <i>Arithmetic Cohomology</i> (153,282 \$ US)	7/2006-6/2009
<b>National Science Foundation</b> <i>Motivic cohomology and arithmetic geometry</i> (105,000 \$ US)	7/2003-6/2006
<b>Japanese Society for Promotion of Sciences</b> <i>Invitation Fellowship for Research in Japan</i>	4/2002-8/2002
<b>National Science Foundation</b> <i>Motivic Cohomology and Descent on Algebraic Varieties</i> (213,000 \$ US)	7/2000-6/2003
<b>Japanese Society for Promotion of Sciences</b> <i>Postdoctoral Fellowship for Research in Japan</i>	9/1998-8/2000
<b>Deutsche Forschungsgesellschaft</b> <i>Research Fellowship</i>	1/1996-12/1996
<b>Deutsche Forschungsgesellschaft</b> <i>Research Fellowship</i>	10/1994-9/1995
<b>Deutsch Akademischer Austauschdienst</b> <i>Scholarship</i>	9/1992-6/1993
<b>Studienstiftung des deutschen Volkes</b> <i>Scholarship</i>	10/1985-9/1990

## CONFERENCE CO-ORGANIZATION

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<b>Algebraic K-theory</b> <i>Oberwolfach</i>	5/2022
<b>Algebraic K-theory</b> <i>Oberwolfach</i>	6/2019
<b>International Conference on Motives</b> <i>Tokyo University</i>	2/2019
<b>Shuji Saito's 60th birthday, Tokyo</b> <i>Tokyo University</i>	3/2018
<b>Algebraic K-theory and motivic cohomology</b> <i>Oberwolfach</i>	6/2016
<b>International Conference on Motives</b> <i>Tokyo University</i>	2/2016
<b>International Conference on Motives</b> <i>Tokyo University</i>	12/2014
<b>Algebraic K-theory and motivic cohomology</b> <i>Oberwolfach</i>	6/2013
<b>International Conference on Motives</b> <i>Tokyo University</i>	11/2013
<b>International Conference on Motives</b> <i>Tokyo University</i>	12/2012
<b>International Conference on Motives</b> <i>Tokyo University</i>	12/2011
<b>International Conference on Motives</b> <i>Tokyo University</i>	12/2010
<b>International Conference on Motives</b> <i>Tokyo University</i>	12/2009
<b>Algebraic K-theory and motivic cohomology</b> <i>Oberwolfach</i>	6/2009
<b>Workshop on Motives</b> <i>Tokyo University</i>	12/2008
<b>Workshop on Motives</b> <i>Tokyo University</i>	7/2007
<b>Workshop on Motives</b> <i>Tokyo University</i>	12/2005
<b>Homotopy theory of varieties</b> <i>Oberwolfach</i>	3/2004

## PRESENTATIONS AT CONFERENCES (all invited)

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Algebraic $K$ -theory	Fields Institute	3/1994
Arithmetic algebraic geometry	Oberwolfach	7/1994
Algebraic $K$ -theory	Paris	7/1994
Homotopy theory and algebraic $K$ -theory	Oberwolfach	11/1995
Algebraic $K$ -theory	Oberwolfach	6/1996
Section on $K$ -theory	AMS-meeting Lawrenceville	10/1996
Algebraic Geometry	Leiden	3/1997
Algebraic $K$ -theory	Seattle	7/1997
Algebraic Cycles	Newton Institute, Cambridge	2/1998
Great Lakes $K$ -theory	Notre Dame	3/1998
Homotopy theory of alg. varieties	MSRI	5/1998
Algebraic Cycles	Banff	6/1998
Algebraic Number Theory	Kyoto	12/1998
Algebraic $K$ -theory and Homotopy Theory	Münster	6/1999
Algebraic $K$ -theory	Oberwolfach	9/1999
Algebraic Number Theory	Kyoto	1/2000
Homotopy Theory of Algebraic Varieties	Toulouse	6/2000
Number theory	Waseda, Tokyo	3/2002
Algebraic $K$ -theory	Oberwolfach	8/2002
Special section on $K$ -theory	ICM, Beijing	8/2002
Homotopy theory and geometry	Newton Institute	10/2002
Great Lakes $K$ -theory	Fields Institute	5/2003
Trace Methods in Algebraic $K$ -theory	Universitaet Muenster	10/2003
Algebraic Number Theory	RIMS, Kyoto	12/2003
Algebraic Number Theory	University of Hyderabad, India	12/2003
Joint AMS-Indian Math. Soc. Meeting	Bangalore, India	12/2003
Arithmetic Algebraic Geometry	University of Tokyo	2/2004
Algebraic $K$ -theory	University of Montreal	10/2004
Arithmetic Geometry	University of Florida	2/2005
Number Theory	Oberwolfach	6/2005
Algebraic Geometry	Hiroshima University	7/2005
Meeting of Japanese Math. Society	Tokushima University	8/2005
Regulators II	Banff	12/2005
Motivic Cohomology	Tokyo University	12/2005
Great Lakes $K$ -theory	UIC Chicago	4/2006
Algebraic $K$ -theory	Oberwolfach	7/2006
Arithmetic Algebraic Geometry	RIMS, Kyoto	9/2006
Algebraic Geometry	Kinosakionsen, Japan	10/2006
Algebraic Number Theory	RIMS, Kyoto	12/2006
Workshop on Motivic Cohomology	Regensburg	2/2007
Workshop on Motives and Applicatsions	Hiroshima	3/2007
Homotopy of Varieties	Fields Institute, Toronto	3/2007
Algebraic $K$ -theory and its Applications	Trieste	5/2007

Finiteness of motives and motivic cohomology	Regensburg	2/2009
Counting rational points on varieties	Leiden	4/2009
Workshop on motivic cohomology	Tanbara	5/2009
Homotopy theory of schemes	Muenster	7/2009
Plenary talk, meeting of the Japanese Math. Soc.	Osaka	9/2009
Arithmetic Geometry	Essen	2/2010
Homotopy theory of schemes, Regulators III	Oberwolfach	5/2010
Arithmetic and Motivic Algebraic Geometry	Barcelona	7/2010
Conference in honor of A.A.Suslin	Regensburg	2/2011
Algebraic Cycles and the Geometry of Group Orbits	Los Angeles	3/2011
Algebraic Cycles and L-functions	Canberra	9/2011
Cycles, motives and homotopy theory	Regensburg	2/1012
Algebraic K-theory and arithmetic	Essen	6/2012
Algebraic Number theory	Bedlewo	7/2012
Homotopical Methods in Algebraic Geometry	Kyoto	12/2012
Workshop on Reciprocity Sheaves	Los Angeles	5/2013
Global Fields	Yatsugatake	8/2013
Number theory	Moscow	9/2013
Uwe Jannsen's 60th birthday	Kyushu University	1/2014
Motivic and etale homotopy theory, Workshop on Motives	Regensburg	3/2014
Summer School on Algebraic K-theory and Trace Methods	Heidelberg	3/2014
K-theory, Cyclic Homology and Motives, Weibel's 65th Regulators	Tokyo	12/2014
Colloquium on K-theory	Regensburg	8/2015
Workshop on arithmetic geometry 2016	Rutgers	8/2015
Algebro-geometric and homotopical methods	Niseko	9/2015
Etale and motivic homotopy theory EMH 2017	Mumbai	1/2016
Motivic Homotopy Theory	Hakodate	5/2016
Arithmetic Algebraic Geomerty, Terasoma's 60th	Mittag-Leffler Institute	3/2017
Motives in Tokyo	Heidelberg	9/2017
L-function and motives in Niseko	St. Petersburg	9/2018
	Tokyo	1/2019
	Tokyo	2/2019
	Niesko	9/2022

## SEMINAR & COLLOQUIUM TALKS (all invited)

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Universität Münster	12/1997	Universität zu Köln	12/1997
University of Utah	2/1998	University of Chicago	3/1998
Northwestern University	4/1998	University of Illinois	2/1999
Brandeis University	2/1999	University of Southern California	2/1999
Tohoku University	11/1999	University of Hongkong	12/1999
Kyushu University	1/2000	Chuo University	5/2000
Nagoya University	5/2000	Tokyo Metropolitan University	6/2000
California Institute of Technology	11/2000	University of Tokyo	12/2000
University of Utah	2/2001	MIT	3/2001
Nagoya University	5/2001	Academia Sinica	5/2001
National University of Singapore	3/2002	Waseda University	5/2002
Tsukuba University	6/2002	Tokyo University	6/2002
California Institute of Technology	10/2002	University of Utah	3/2003
Universität Regensburg	5/2003	Universität Essen	5/2003
Hiroshima University	6/2004	Tohoku University	7/2004
Nagoya University	7/2004	Universitaet Muenster	12/2004
Northeastern University	3/2005	Harvard University	3/2005
University of Tokyo	5/2005	Nagoya University	7/2005
University of Tokyo	1/2006	Caltech	2/2006
University of Utah	2/2006	University of Tokyo	5/2006
Universitaet Bielefeld (2)	6/2006	Universitaet Regensburg	7/2006
Keio University (4)	10/2006	Universitaet Bielefeld	5/2007
Nagoya University	7/2007	Nagoya University	7/2008
Northeastern University	10/2008	Brown University	10/2008
Universität Heidelberg	4/2009	Universität Regensburg	6/2009
Humboldt University Berlin	7/2009	Universität Regensburg	7/2009
Nagoya University	9/2009	Chiba University	11/2009
Paris Nord	9/2010	KAIST (Korea)	10/2010
Tohoku University	1/2011	Universität Heidelberg	9/2011
Wuppertal (Germany),	6/2012	Alfred Renyi Institute (Budapest)	9/2012
Bangkok (Thailand)	12/2012	Universität Duisburg-Essen	4/2013
St.Petersburg University	9/2013	Chuo University	10/2013
Heidelberg (3 lectures)	3/2014	Tohoku University (Colloquium)	6/2014
Universität Osnabrück	7/2014	Universität Duisburg-Essen	7/2014
Taipei (3 lectures)	12/2015	Freiburg	3/2016
Melbourne	8/2016	Sophia University	5/2017
Lynköping	3/2017	Bordeaux	3/2017
Nagoya	6/2017	Tohoku	5/2018
Chiba	10/2018	Taipei	12/2019
Heidelberg	10/2021	Düsseldorf	11/2021
Münster	10/2021	Bielefeld	11/2021
Osnabrück	12/2021	Bordeaux	12/2021
Pisa	12/2021		

## REFEREED PUBLICATIONS IN JOURNALS

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1. **Galoiskohomologie reeller halbeinfacher algebraischer Gruppen**,  
Abh. Math. Sem. Univ. Hamburg 61 (1991), 231–242.
2.  **$p$ -adic  $K$ -theory of Hecke characters of imaginary quadratic fields**,  
Duke Math. J. 86 (1997), 197–238.
3. **On  $K_3$  of Witt vectors of length two over finite fields**,  
K-Theory 12 (1997), 193–226.
4. **Tate’s conjecture, algebraic cycles and rational  $K$ -theory in characteristic  $p$** ,  
K-Theory 13 (1998), 109–122.
5. **The  $K$ -theory of fields of characteristic  $p$** ,  
Inventiones Mathematica 139 (2000), 459–493. (with M.Levine)
6. **The Bloch-Kato conjecture and a theorem of Suslin-Voevodsky**,  
J. reine angew. Math. 530 (2001), 55–103. (with M.Levine)
7. **Motivic Cohomology over Dedekind rings**,  
Mathematische Zeitschrift 248 (2004), 773–794.
8. **Weil-étale cohomology over finite fields**,  
Mathematische Annalen 330 (2004), 665–692.
9. **On the  $K$ -theory and top. cyclic homology of smooth schemes over a discrete valuation ring**,  
Transactions AMS 358 (2006), no. 1, 131–145. (with L.Hesselholt)
10. **The de Rham-Witt complex and  $p$ -adic vanishing cycles**.  
Journal Amer. Math. Soc. 19 (2006), no. 1, 1–36. (with L.Hesselholt)
11. **On the  $K$ -theory of regular local  $F_p$ -algebras**,  
Topology 45 (2006), no. 3, 475–493. (with L.Hesselholt)
12. **Arithmetic cohomology over finite fields and values of zeta-functions**,  
Duke Mathematical Journal 133 (2006), no. 1, 27–57.
13. **Bi-relative algebraic  $K$ -theory and topological cyclic homology**,  
Inventiones Mathematica 166, 359–395 (2006). (with L.Hesselholt)
14. **The affine part of the Picard scheme**,  
Compositio Mathematica 145 (2009), 415–422.
15. **Duality via cycle complexes**,  
Annals of Mathematics (2) 172 (2010), no. 2, 1095–1126.



16. **Arithmetic homology, and an integral version of Kato's conjecture,**  
J. Reine Angew. Math. 644 (2010), 1–22.
17. **On the vanishing of negative  $K$ -groups,**  
Mathematische Annalen 348 (2010), no. 3, 707–736, (with L.Hesseholt)
18. **On Suslin's singular homology and cohomology.**  
Documenta Math. Extra Volume: Andrei A. Suslin's Sixtieth Birthday (2010) 223–249.
19. **On the relative and bi-relative algebraic  $K$ -theory of rings of finite characteristic,**  
Journal Amer. Math. Soc. 24 (2011), no. 1, 29–49. (with L.Hesselholt)
20. **On a conjecture of Vorst,**  
Mathematische Zeitschrift 270, (2012) 445–452. (with L.Hesselholt)
21. **Duality for  $\mathbb{Z}$ -constructible sheaves for curves over finite fields,**  
Documenta Mathematica 17 (2012), 989–1002.
22. **Homological descent for motivic homology theories,**  
Homology, homotopy and applications, 16 (2014), No.2, 33–43.
23. **Albanese varieties, Suslin homology and Rojtman's theorem,**  
Alg. number theory and related topics 2012, 73–83, RIMS Kokyuroku Bessatsu, B51, (2014).
24. **Rojtman's theorem for normal schemes,**  
Math. Research Letters 22 (2015), no. 4, 1129–1144.
25. **Applications and conjectures in motivic cohomology theory**  
Sugaku 67 (2015), no. 3, 225–245. (in Japanese)
26. **Parshin's Conjecture and Motivic Cohomology with Compact Support**  
Comment. Math. Univ. Sancti Pauli, Vol. 64, 2 (2015), 95–107.
27. **Tame class field theory for singular varieties over algebraically closed fields,**  
Documenta Mathematica 21 (2016) 91–123. (with A. Schmidt)
28. **On the structure of étale motivic cohomology,**  
Journal Pure Applied Algebra 221 (2017) 1614–1628, Volume in Honor of Chuck Weibel.
29. **Tame class field theory for singular varieties over finite fields,**  
Journal European Mathematical Society 19 (2017) 3467–3488 (with A. Schmidt).
30. **Poitou-Tate duality for arithmetic schemes,**  
Compositio Mathematica 154 (2018), no. 9, 2020–2044. (with A.Schmidt)
31. **Motivic cohomology: Applications and conjectures,**  
Sugaku Expositions, Volume 32, Number 2, December (2019), 181–203.

32. **Hasse principles for étale motivic cohomology,**  
Nagoya Math. J., 236, Celebrating the 60th Birthday of Shuji Saito (2019), 63–83.
33. **A Weil-étale version of the Birch & Swinnerton-Dyer formula over function fields.**  
J. Number Theory 208 (2020), 367–389 (with T. Suzuki)
34. **Comparing the Brauer group to the Tate-Shafarevich group.**  
J. Inst. Math. Jussieu 19 (2020), no. 3, 965–970.
35. **Tate’s Conjecture and the Tate-Shafarevich group over global function fields,**  
J. Inst. Math. Jussieu 20 (2021), no. 3, 1001–1022.
36. **On the kernel of the Brauer-Manin pairing,**  
J. Number Theory 238 (2022), 444–463 (with B. Morin)
37. **Pontryagin duality for varieties over  $p$ -adic fields,**  
J. Inst. Math. Jussieu, to appear (with B. Morin)

## **REFEREED PUBLICATIONS IN CONFERENCE PROCEEDINGS**

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38. **Topological cyclic homology of schemes,**  
Algebraic K-theory, Proc. Symp. Pure Math. 67 (1999), 41–88 (with L.Hesselholt)
39. **Applications of de Jong’s theorem on alterations,**  
Resolution of singularities (Obergrugl 1997), 299–314, Progr. Math., 181, Birkhauser, (2000).
40. **Motivic cohomology, algebraic K-theory and topological cyclic homology,**  
Handbook of K-theory. Vol. 1, 2, 193–234, Springer, Berlin, (2005).
41. **The cyclotomic trace map and values of zeta-functions,**  
Algebra and number theory, 211–225, Hindustan Book Agency, Delhi, (2005).
42. **Parshin’s conjecture revisited,**  
K-theory and noncom. geom., 413–425, EMS Ser. Congr. Rep., Eur. Math. Soc., (2008).
43. **Finite generation conjectures for motivic cohomology theories over finite fields,**  
Regulators, 153–165, Contemp. Math., 571, Amer. Math. Soc., Providence, RI, (2012).
44. **Duality of integral étale motivic cohomology,**  
K-Theory–Proc. of the Internat. Coloq., Mumbai, 2016, 195–209, Hindustan Book Ag., (2018).

## PREPRINTS

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45. **Special values of L-functions of one-motives over function fields.**  
<https://arxiv.org/abs/2009.14504> (with T. Suzuki)

## UNREFEREED PUBLICATIONS

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46. **A  $p$ -adic analogue of Beilinson's conjectures for Hecke characters,**  
Schriftenreihe Math. Inst. Univ. Münster 14 (1995)
47. **Motivic Cohomology,**  
RIMS proc. 1097 (1999), 95–99
48. **Algebraic K-theory of Henselian pairs,**  
RIMS proc. 1154 (2000), 44–49
49. **Weil-étale cohomology and values of zeta functions,**  
Conference Proceedings Waseda University (2002), 76–88
50. **Weil-étale cohomology**  
(in Japanese), RIMS proc. 1376 (2004), 145–153