

Joachim König

Curriculum vitae

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Personal data

Date of birth 19.06.1985
Nationality German
Academic title PhD
Affiliation KAIST (Daejeon, South Korea)
Research interests Galois theory; algebraic number theory; arithmetic geometry; permutation group theory

Positions

From March 2020 Assistant professor at Korea National University of Education (Cheongju, South Korea)
Feb. 2018 - Feb. 2020 Visiting assistant professor at KAIST (Daejeon, South Korea)
Oct. 2017 - Feb. 2018 Post-doctoral research and teaching position at University of Würzburg (Germany)
Oct. 2016 - Sep. 2017 Post-doctoral research fellowship at the Technion (Haifa, Israel)
Oct. 2014 - Sep. 2016 Post-doctoral research and teaching position at University of Würzburg (Germany)

PhD studies

From Oct. 2008 PhD student under Prof. Peter Müller at the University of Würzburg
March 2014 Submission of the PhD thesis, entitled "The inverse Galois problem and explicit computation of families of covers of $\mathbb{P}^1\mathbb{C}$ with prescribed ramification"
June 2014 Doctoral examination and completion of the PhD process, graded "summa cum laude"

Undergraduate studies

October 2004 Begin of studies of mathematics (Diploma, with computer science as secondary subject) at the University of Würzburg
March 2007 Intermediate exams

- June 2008 Submission of diploma thesis, entitled "Solvability of Generalized Monomial Groups"
September 2008 Final exams, graded "excellent" ("mit Auszeichnung")

Work experience

Teaching experience

- From Feb. 2018 Full teaching position at KAIST
From Oct. 2008 Teaching assistant at University of Würzburg

Ample teaching experience in lectures, tutorials and preparation courses

Recent conference and seminar talks

- 22.1.2020 "On the set of reducible specializations of a bivariate polynomial". At TAU Field Arithmetic Seminar (Tel Aviv University, Israel)
- 13.-17.7.2019 Lecturer at 2nd French-German Summer School on Galois Theory and Number Theory (Dresden).
- 11.7.2019 ("Density of specialization sets and Hasse principle in families of twisted Galois covers". At Number Theory Days (Lille, France).
- 25.6.2019 "On arithmetic and geometric monodromy groups of rational functions". At Workshop on Algebra and Number Theory (Busan).
- 19.6.2019 "On the set of specializations of a Galois cover". Algebra Seminar at Bar Ilan University.
- 16.4.2019 "On the inverse Galois problem with ramification conditions". At Seoul National University Number Theory Seminar.
- 8.1.2019 "The inverse Galois problem with local restrictions". At Guangdong Technion I.I.T (Shantou, China).
- 4.10.2018 "Computation of Belyi maps and Hurwitz families of Galois covers". At Joint Meeting of the Korean Math. Soc. and the German Math. Soc. (Coex, Seoul).
- 5.7.2018 "Pullback and specialization of Galois covers". At KIAS Number Theory Seminar (Seoul).
- 26.6.2018 "The abc-conjecture and specializations of Galois covers". At Workshop on Number Theory and Algebra (Yeosu).
- 25.4.2018 "Finiteness results for Hilbert's irreducibility theorem". At POSTECH Number Theory Seminar (Pohang).
- 20.4.2018 "Grunwald problems and specialization of Galois covers". At Mini-Workshop "Arithmetic Geometry and Symmetries around Galois and Fundamental Groups" (Oberwolfach).
- 12.3.2018 "Finiteness results for Hilbert's irreducibility theorem". At KAIST Number Theory Seminar (Daejeon).
- 13.2.2018 "Grunwald problems and specialization of function field extensions". At Number Theory Festival (UNIST, Ulsan).
- 4.1.2018 "Specialization of Galois coverings over number fields". Colloquium talk at Hebrew University (Jerusalem).

- 28.12.2017 "Local behaviour of specializations of Galois coverings over number fields". At Algebra Seminar (Technion, Haifa).
- 20.12.2017 "Almost regular dessins on a torus and sphere". At Weihnachts-Workshop, Universität des Saarlands (Saarbrücken).
- 15.-16.11.2017 "On the inverse Galois problem with restricted ramification". Lecture series at KIAS (Seoul).
- 6.7.2017 "On parametric sets of regular Galois extensions over number fields". At conference "Journées arithmétiques" (Caen).
- 26.5. 2017 "Groups without finite parametric sets over \mathbb{Q} ". At 2017 annual meeting of the Israel Mathematical Union (Akko).
- 12.4. 2017 "On specializations of regular Galois extensions" At Algebra Seminar (Würzburg).
- 6.4. 2017 "Specializations of regular Galois extensions with prescribed local behaviour". At Number Theory Seminar (Univ. Lille).
- 23.2. 2017 "On specializations of regular Galois extensions over number fields": At KIAS Number Theory Seminar (KIAS, Seoul).
- 14.-16.2. 2017 "Problems in inverse Galois theory": Lecture series at "Yonsei talks in Algebraic number theory" (Busan)
- 5.12. 2016 "Computation of Hurwitz spaces and application in and around the Inverse Galois Problem": At Algebra Seminar (Technion, Haifa)
- 2.11. 2016 "2-coverable groups and intersective polynomials": At Field Arithmetic seminar (Tel Aviv University)

Further conference participations (selected)

- 2019 8th East Asia Number Theory Conference (KAIST, Daejeon)
- 2019 SQuaRE ("Structured Quartet Research Ensemble") on "Monodromy groups and applications to arithmetic" (AIM, San Jose)
- 2019 Annual Number Theory Workshop (KIAS, Seoul)
- 2018 Arithmetic Geometry, Number Theory and Computation (MIT)
- 2017 5th Israeli Algebra and Number Theory Day (Bar Ilan University)
- 2017 6th Number Theory Festival (Sungkyunkwan University)
- 2017 Workshop on Group Theory (Technion)
- 2016 4th Israeli Algebra and Number Theory Day (Tel Aviv University)
- 2016 Groups and Topological Groups (Würzburg)
- 2016 Explicit Methods in Number Theory (Univ. of Warwick)
- 2015 Bethe Forum "Constructive Methods in Number Theory" (Max-Planck Institute, Bonn)

Further activities

From 2015 Peer reviewer for several international journals

Grants

2019-2021 National Research Foundation of Korea (NRF) Young Researcher Grant No. 2019R1C1C1002665.

Awards

- 2015 Otto-Volk medal for outstanding dissertation
2009 Otto-Volk medal for outstanding diploma thesis

Scientific publications

- [22] *Unramified extensions over low degree number fields*. Joint with D. Neftin and J. Sonn. To appear in *J. Number Theory*.
Preprint available at <https://arxiv.org/abs/1901.03985>
- [21] *An approach for computing families of multi-branch-point covers and applications for symplectic Galois groups*. Joint with D. Barth and A. Wenz. To appear in *J. Symb. Comp.*
Preprint available at <https://arxiv.org/abs/1803.08778>
- [20] *Density results for specialization sets of Galois covers*. To appear in *J. Inst. Math. Jussieu*.
Preprint available at <https://arxiv.org/abs/1904.05051>.
- [19] *On the mod- p distribution of discriminants of G -extensions*. To appear in *Int. J. Number Theory*.
Preprint available at <https://arxiv.org/abs/1902.05666>
- [18] *The Grunwald problem and specialization of families of regular Galois extensions*. To appear in *Annali della Scuola Normale Superiore di Pisa*.
Preprint available at <https://arxiv.org/abs/1710.05548>
- [17] *On number fields with power-free discriminant*. *Isr. J. Math.* 235 (2020), 413–437.
- [16] *Some examples of quadratic fields with finite nonsolvable maximal unramified extensions II*. Joint with K.-S. Kim. *Ramanujan J.* 51 (2020), 205–228.
- [15] *On the local behaviour of specializations of function field extensions*. Joint with F. Legrand and D. Neftin. *Int. Math. Res. Not. IMRN Vol. 2019* (2019), 2951–2980.
- [14] *Almost-regular Dessins d'Enfant on a sphere and torus*. Joint with A. Leitner and D. Neftin. *Topology and its Applications* 243 (2018), 78–99.
- [13] *Galois realizations with inertia groups of order two*. Joint with D. Rabayev and J. Sonn. *Int. J. Number Theory* 14(7) (2018), 1983–1994.
- [12] *A note on families of monogenic number fields*. *Kodai J. Math.* 41 (2018), 456–464.
- [11] *The admissibility of M_{11} over number fields*. Joint with D. Neftin. *J. Pure Appl. Algebra* 222(9) (2018), 2456–2464.
- [10] *On intersective polynomials with non-solvable Galois group*. *Communications in Algebra* 46(6) (2018), 2405–2416.
- [9] *Non-parametric sets of regular realizations over number fields*. Joint with F. Legrand. *J. Algebra* 497 (2018), 302–336.
- [8] *Non-parametricity of rational translates of regular Galois extensions*. *Acta Arithmetica* 179 (2017), 267–275.

- [7] *On the reducibility behavior of Thue polynomials*. J. Number Theory 176 (2017), 37–45.
- [6] *Computation of Hurwitz spaces and new explicit polynomials for almost simple Galois groups*. Math. Comp. 86 (2017), 1473–1498.
- [5] *On rational functions with monodromy group M_{11}* . J. Symb. Comp. 79 (2) (2017), 272–283.
- [4] *Septic equations are solvable by 2-fold origami*. Joint with D. Nedrenco. Forum Geometricorum 16 (2016), 193–205.
- [3] *A note on the product of two permutations of prescribed orders*. European J. Combin. 57 (2016), 50–56.
- [2] *The inverse Galois problem and explicit computation of families of covers of $\mathbb{P}^1\mathbb{C}$ with prescribed ramification*. PhD Thesis (2014). Available online at <https://opus.bibliothek.uni-wuerzburg.de/frontdoor/index/index/docId/10014>.
- [1] *Solvability of generalized monomial groups*. J. Group Theory 13 (2010), 207–220.

Submitted works

- [25] *Reducible specializations of polynomials: The nonsolvable case*. Joint with D. Neftin.
Preprint available at <https://arxiv.org/abs/2001.03630>
- [24] *On Galois extensions with prescribed decomposition groups*. Joint with K.-S. Kim.
Preprint available at <https://arxiv.org/abs/1911.08742>
- [23] *Rational pullbacks of Galois covers*. Joint with P. D'ebes, F. Legrand and D. Neftin.
Preprint available at <https://arxiv.org/abs/1807.01937>