Curriculum Vitae

Akinari Hoshi, October 2022

Family Name: Hoshi   **First Name**: Akinari

Date of Birth: November 1978   **Place of Birth**: Yokohama, Japan   **Nationality**: Japanese

Affiliation: Department of Mathematics, Faculty of Science, Niigata University

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Education:

B.Sc., Waseda University, March 2001

M.Sc., Waseda University, March 2003

Ph.D. (D.Sc.), Waseda University, March 2005

Research and Professional Experience:

2004.4 – 2005.3, Research Fellow of the Japan Society for the Promotion of Science (DC2)

2005.4 – 2006.3, Research Fellow of the Japan Society for the Promotion of Science (PD)

2006.4 – 2008.3, Research Associate, Dep. of Math., School of Education, Waseda University

2008.4 – 2013.3, Assistant Professor, Dep. of Math., Faculty of Science, Rikkyo University

2013.4 – 2021.8, Associate Professor, Dep. of Math., Faculty of Science, Niigata University

2021.8 – present, Professor, Dep. of Math., Faculty of Science, Niigata University

2022.4 – present, Chair, Dep. of Math., Faculty of Science, Niigata University

Honors:

Niigata University President's Award, 2016.

Ph.D. Dissertation:

"Multiplicative quadratic forms on algebraic varieties and Noether's problem for meta-abelian groups",
Waseda University, March 2005.

Research Abroad:

Guest of Prof. Manfred Knebusch, Regensburg University, Germany, Sep. 2004 – Jul. 2005.

Membership:

Mathematical Society of Japan

Research Interests:

- Norm one tori and Hasse norm principle.
  Key words: Weak approximation, Schur cover, stem extension, R-equivalence, Tamagawa number
- Rationality problem for algebraic tori.
  Key words: Flabby resolution, Tate cohomology, Krull-Schmidt(-Azumaya) theorem
- Noether's problem for non-abelian groups.
  Key words: Unramified Brauer/cohomology groups, stably/retract rational, isoclinism of groups
- Rationality problem under finite group actions.
  Key words: Cremona group, (purely) monomial actions, quasi-monomial actions.
- Family of Thue equations.
  Key words: Simplest cubic fields, simplest quartic fields, simplest sextic fields
- Constructive aspects of the inverse Galois problem.
  Key words: Generic polynomial, generic dimension, essential dimension, invariant theory
- Field isomorphism problem of generic polynomials.
  Key words: Subfield/field intersection problem, multi-resolvent, Tschirnhausen transformation
- Multiplicative quadratic forms on algebraic varieties.
  Key words: Pfister Form, Composition Algebra, Sums of Squares
- Gaussian period polynomials for finite fields.
  Key words: Cyclic Polynomial, Jacobi Sum, Gauss Sum, Cyclotomic Numbers

List of Papers (Refereed Papers):

[1] A. Hoshi, Multiplicative quadratic forms on algebraic varieties, Proc. Japan Acad. Ser. A. **79** (2003) 71–75.

[2] A. Hoshi, Noether's problem for meta-abelian groups of small degree, Proc. Japan Acad. Ser. A. **81** (2005) 1–6.

[3] K. Hashimoto, A. Hoshi, Families of cyclic polynomials obtained from geometric generalization of Gaussian period relations, Math. Comp. **74** (2005) 1519–1530.

[4] K. Hashimoto, A. Hoshi, Geometric generalization of Gaussian period relations with application to Noether's problem for meta-cyclic groups, Tokyo J. Math. **28** (2005) 13–32.

[5] A. Hoshi, Explicit lifts of quintic Jacobi sums and period polynomials for $\mathbf{F}_q$, Proc. Japan Acad. Ser. A. **82** (2006) 87–92.

[6] A. Hoshi, K. Miyake, Tschirnhausen transformation of a cubic generic polynomial and a 2-dimensional involutive Cremona transformation, Proc. Japan Acad. Ser. A. **83** (2007) 21–26.

[7] K. Hashimoto, A. Hoshi, Y. Rikuna, Noether's problem and $\mathbf{Q}$-generic polynomials for the normalizer of the 8-cycle in S_8 and its subgroups, Math. Comp. **77** (2008) 1153–1183.

[8] A. Hoshi, Y. Rikuna, Rationality problem of three-dimensional purely monomial group actions: the last case, Math. Comp. **77** (2008) 1823–1829.

[9] A. Hoshi, M. Kang, A rationality problem of some Cremona transformation, Proc. Japan Acad. Ser. A. **84** (2008) 133–137.

[10] A. Hoshi, K. Miyake, A geometric framework for the subfield problem of generic polynomials via Tschirnhausen transformation, Number Theory and Applications, 65–104. Edited by S. D. Adhikari and B. Ramakrishnan. Hindustan Book Agency, New Delhi, 2009.

[11] A. Hoshi, K. Miyake, On the field intersection problem of quartic generic polynomials via formal Tschirnhausen transformation, Comment. Math. Univ. St. Pauli. **58** (2009) 51–86.

[12] A. Hoshi, K. Miyake, A note on the field isomorphism problem of $X^3 + sX + s$ and related cubic Thue equations, Interdiscip. Inform. Sci., **16** (2010) Special Section: Japan-Korea Joint Seminar on Number Theory and Related Topics 2008, 45–54.

[13] A. Hoshi, K. Miyake, On the field intersection problem of solvable quintic generic polynomials, Int. J. Number Theory **6** (2010) 1047–1081.

[14] A. Hoshi, M. Kang, Twisted symmetric group actions, Pacific J. Math. **248** (2010) 285–304.

[15] A. Hoshi, H. Kitayama, A. Yamasaki, Rationality problem of three-dimensional monomial group actions, J. Algebra. **341** (2011) 45–108.

[16] A. Hoshi, On correspondence between solutions of a parametric family of cubic Thue equations and isomorphic simplest cubic fields, J. Number Theory **131** (2011) 2135–2150.

[17] A. Hoshi, On the simplest sextic fields and related Thue equations, Funct. Approx. Comment. Math. **47** (2012) 35–49.

[18] A. Hoshi, M. Kang, B.E. Kunyavskii, Noether's problem and unramified Brauer groups, Asian. J. Math. **17** (2013) 689–714.

[19] A. Hoshi, M. Kang, H. Kitayama, Quasi-monomial actions and some 4-dimensional rationality problems, J. Algebra **403** (2014) 363–400.

[20] A. Hoshi, On the simplest quartic fields and related Thue equations, Computer Mathematics, Springer, 67–85, 2014.

[21] A. Hoshi, On Noether's problem for cyclic groups of prime order, Proc. Japan Acad. Ser. A. **91** (2015) 39–44.

[22] H. Chu, A. Hoshi, S. Hu, M. Kang, Noether's problem for groups of order 243, J. Algebra **442** (2015) 233–259.

[23] A. Hoshi, Birational classification of fields of invariants for groups of order 128, J. Algebra **445** (2016) 394–432.

[24] A. Hoshi, M. Kang, A. Yamasaki, Degree three unramified cohomology groups, J. Algebra **458** (2016) 120–133.

[25] A. Hoshi, Complete solutions to a family of Thue equations of degree 12, J. Théor. Nombres de Bordeaux **29** (2017) 549–568.

[26] A. Hoshi, A. Yamasaki, Rationality problem for algebraic tori, Mem. Amer. Math. Soc. **248** (2017) no. 1176, v+215 pp.

[27] A. Hoshi, M. Kang, A. Yamasaki, Rationality problems for relation modules of dihedral groups, J. Algebra **530** (2019) 368–401.

[28] A. Hoshi, M. Kang, A. Yamasaki, Degree three unramified cohomology groups and Noether's problem for groups of order 243, J. Algebra **544** (2020) 262–301.

[29] S. Hasegawa, A. Hoshi, A. Yamasaki, Rationality problem for norm one tori in small dimensions, Math. Comp. **89** (2020) 923–940.

[30] A. Hoshi, H. Kitayama, Three-dimensional purely quasimonomial actions, Kyoto J. Math. **60** (2020) 335–377.

[31] A. Hoshi, M. Koshiba, On Lecacheux's family of quintic polynomials, Proc. Japan Acad. Ser. A **97** (2021) 1–6.

[32] A. Hoshi, A. Yamasaki, Rationality problem for norm one tori, Israel J. Math. **241** (2021) 849–867.

[33] A. Hoshi, M. Kang, H. Kitayama, A. Yamasaki, A two-dimensional rationality problem and intersections of two quadrics, Manuscripta Math. **168** (2022) 423–437.

[34] A. Hoshi, K. Kanai, A. Yamasaki, Norm one tori and Hasse norm principle, Math. Comp. **91** (2022) 2431–2458

[35] A. Hoshi, K. Kanai, Davenport and Hasse's theorems and lifts of multiplication matrices of Gaussian periods, Finite Fields Appl. **84** (2022) Paper No. 102101, 26 pp.

[36] A. Hoshi, K. Kanai, A. Yamasaki, Norm one tori and Hasse norm principle, II: Degree 12 case, J. Number Theory **244** (2023) 84–110.

[37] A. Hoshi, M. Kang, A. Yamasaki, Multiplicative invariant fields of dimension ≤ 6, arXiv:1609.04142, to appear in Mem. Amer. Math. Soc.

Refereed Articles and Surveys:

1. A. Hoshi, K. Miyake, On the field intersection problem of generic polynomials: a survey, Algebraic number theory and related topics 2007, RIMS Kôkyûroku Bessatsu **B12** (2009) 231–247.

2. A. Hoshi, K. Miyake, Some Diophantine problems arising from the isomorphism problem of generic polynomials, Number Theory: Dreaming in Dreams, 87–105, Proceedings of the 5th China-Japan Seminar. Edited by T. Aoki, S. Kanemitsu and J. Liu, World Sci. Publ., 2010.

3. A. Hoshi, Rationality problem for quasi-monomial actions, Algebraic number theory and related topics 2012, RIMS Kôkyûroku Bessatsu **B51** (2014) 203–227.

4. A. Hoshi, Noether's problem and rationality problem for multiplicative invariant fields: a survey, Algebraic number theory and related topics 2016, RIMS Kôkyûroku Bessatsu **B77** (2020) 29–53.

Preprints:

1. A. Hoshi, M. Kang, A. Yamasaki, An application of cohomological invariants, 11 pages, arXiv:1903.03750.

2. A. Hoshi, H. Kitayama, Rationality problem of two-dimensional quasi-monomial group actions, 35 pages, arXiv:2012.12046.

3. A. Hoshi, A. Yamasaki, Birational classification for algebraic tori, 175 pages, arXiv:2112.02280.

4. A. Hoshi, K. Kanai, A. Yamasaki, Hasse norm principle for M_{11} extensions, 19 pages, arXiv:2210.09119.

International Talks (Invited Talks):

1. Noether's problem and **Q**-generic polynomials, Kolloquium in Universität des Saarlandes (invited by Prof. Rainer Schulze-Pillot), Universität des Saarlandes, Germany, May 27, 2005.

2. Noether Problems and **Q**-Generic Polynomials for the Normalizer of the 8-Cycle in S_8, Oberseminar Algebra-Zahlentheorie (invited by Prof. B. Heinrich Matzat), Universität Heidelberg, Germany, May 30, 2005.

3. Noether's problem and **Q**-generic polynomials for the normalizer of the 8-cycle in S_8 and its subgroups, Vortrag in der Arbeitsgemeinschaft üer Algebra (invited by Prof. Gregor Kemper), Technische Universität München, Germany, Jul. 5, 2005.

4. Noether's problem for Frobenius groups of prime degree up to 23, Conference: Galois groups and algebraic equations (invited by Prof. Ki-ichiro Hashimoto, Masanari Kida and Nobuhiro Terai), Kagoshima University, Japan, Sep. 5, 2005.

5. (with K. Miyake) Tschirnhausen transformation of a cubic generic polynomial and a 2-dimensional involutive Cremona transformation, International Conference on Number Theory (invited by Prof. Balakrishnan Ramakrishnan and Kalyan Chakraborty), Harish-Chandra Research Institute, India, Dec. 1, 2006.

6. Tschirnhausen transformation of a cubic generic polynomial and a 2-dimensional involutive Cremona transformation, as a part of NCTS Short Course on Number Theory given by K. Miyake, (invited by Prof. Wen-Ching Winnie Li and Jing Yu), National Center for Theoretical Sciences, Math. Division in National Tsing Hua University, Taiwan, Jun. 27, 2007.

7. Cubic generic polynomials and some Cremona transformations (joint work with K. Miyake), Seminar of Algebra (invited by Prof. Ming-chang Kang), National Center for Theoretical Sciences, Math. Division (Taipei) in National Taiwan University, Taiwan, Jul. 26, 2007.

8. On the field intersection problem of generic polynomials via resolvent polynomials, Foundations of Computational Mathematics (FoCM'08) WORKSHOP C4 Computational number theory (invited by Prof. Hendrik Lenstra, Takakazu Satoh and Peter Stevenhagen), City University of Hong Kong, China, Jun. 24, 2008.

9. (with K. Miyake) Some Diophantine problems arising from the isomorphism problem of generic polynomials, The 5th Japan-China Seminar on Number Theory (invited by Prof. Shigeru Kanemitsu), Kinki University, Japan, Aug. 27, 2008.

10. (with K. Miyake) On the field isomorphism problem of generic polynomials via formal Tschirnhausen transformation, The Japan-Korea Joint Seminar on Number Theory and Related Topics 2008 (invited by Prof. Hisao Taya), Tohoku University, Japan, Nov. 12, 2008.

11. On correspondence between solutions of a parametric family of cubic Thue equations and isomorphism classes of simplest cubic fields, Diophantine Analysis and Related Fields 2009 (DARF 2009) (invited by Prof. Noriko Hirata-Kohno, Masaaki Amou, Ryotaro Okazaki, Takao Komatsu and Isao Wakabayashi), Nihon University, Japan, Mar. 2, 2009.

12. On the simplest quartic fields and related Thue equations, The Joint Conference of ASCM2009 and MACIS2009, ASCM2009 Special Session on Computational Algebraic Number Theory (invited by Prof. Guenael Renault and Kazuhiro Yokoyama), JAL Resort Sea Hawk Hotel Fukuoka, Japan, Dec. 16, 2009.

13. Rationality problem of three-dimensional monomial group actions (joint work with H. Kitayama and A. Yamasaki), The 5th Affine Algebraic Geometry Meeting (invited by Prof. Kayo Masuda, Hideo Kojima and Takashi Kishimoto), Kwansei Gakuin University, Japan, Mar. 5, 2010.

14. Three-dimensional monomial group actions (joint work with H. Kitayama and A. Yamasaki), TIMS Lecture, Taida Institute for Mathematical Sciences (invited by Prof. Ming-chang Kang), National Taiwan University, Taiwan, Oct. 22, 2010.

15. Three-dimensional monomial group actions (joint work with H. Kitayama and A. Yamasaki), Seminar of Algebra (invited by Prof. Ming-chang Kang), National Taiwan University, Taiwan, Oct. 29, 2010.

16. On the simplest sextic fields and related Thue equations, One-day workshop of algebra (invited by Prof. Ming-chang Kang), NCTS/TPE, National Taiwan University, Taiwan, Aug. 16, 2011.

17. Quasi-monomial actions and some 4-dimensional rationality problems, The 9th Affine Algebraic Geometry Meeting (invited by Prof. Takashi Kishimoto, Hideo Kojima and Shigeru Kuroda), Kwansei Gakuin University, Japan, Mar. 3, 2012.

18. Rationality problem of algebraic tori (I) (joint work with A. Yamasaki), One-day workshop of algebra (invited by Prof. Ming-chang Kang), NCTS/TPE, National Taiwan University, Taiwan, Aug. 16, 2012.

19. Rationality problem for fields of invariants: a survey, One-day workshop of algebra (invited by Prof. Ming-chang Kang), NCTS/TPE, National Taiwan University, Taiwan, Aug. 19, 2013.

20. (with Aiichi Yamasaki) Rationality problem for algebraic tori, SEOUL ICM 2014, Short Communications, Coex, Seoul, Korea, Aug. 19, 2014.

21. Birational classification of fields of invariants for groups of order 128, New Developments in Algebraic Geometry (invited by Prof. Caucher Birkar, Jungkai Alfred Chen, Wu-Yen Chuang and Jeng-Daw Yu), NCTS/TPE, National Taiwan University, Taiwan, Sep. 5, 2014.

22. On the simplest cubic fields and related Thue equations, Joint Seminar and Reseach Camp (JSRC2015), Niigata Univ., Mar. 4, 2015.

23. On the simplest number fields and related Thue equations, 29th Journées Arithmétiques (JA2015), University of Debrecen, Hungary, Jul. 9, 2015.

24. On the simplest number fields and related Thue equations, The 4th International Congress on Natural Sciences (ICNS2015), National Changhua University of Education, Taiwan, Sep. 10, 2015.

25. Rationality problem for fields of invariants, Workshop: Rationality and selfmaps of algebraic varieties (invited by Prof. Shigeru Mukai and Keiji Oguiso), RIMS, Kyoto University, Japan, Jul. 21, 2016.

26. Rationality problem for fields of invariants, Japan-Taiwan Joint conference on Number theory 2016 (invited by Prof. Ming-Lun Hsieh and Masataka Chida), NCTS/TPE, National Taiwan University, Taiwan, Sep. 9, 2016.

27. Rationality problem for fields of invariants, Workshop: Researches on isometries from various viewpoints (invited by Prof. Takeshi Miura), RIMS, Kyoto University, Japan, Oct. 31, 2016.

28. Rationality problem for fields of invariants, The 15th Affine Algebraic Geometry Meeting (invited by Prof. Hideo Kojima, Takashi Kishimoto, Adrien Dubouloz and Kayo Masuda), Kwansei Gakuin University, Japan, Mar. 5, 2017.

29. Cubic Thue equations and simplest cubic fields, Journées Algophantiennes Bordelaises 2017 (invited by Prof. Yuri Bilu), Institut de Mathématiques de Bordeaux, Université Bordeaux, France, Jun. 8, 2017.

30. Unramified Brauer group of multiplicative invariant fields of dimension ≤ 6 (I), NCTS Seminar on Algebra (invited by Prof. Ming-chang Kang), NCTS, National Taiwan University, Taiwan, Sep. 20, 2017.

31. Rationality problem for fields of invariants, Kinosaki algebraic geometry symposium 2017 (invited by Prof. Taro Fujisawa, Takuzo Okada and Taro Sano), Kinosaki International Arts Center, Japan, Oct. 25, 2017.

32. Rationality problem for fields of invariants and unramified cohomology groups, International Workshop on Algebra (invited by Prof. Jungkai Alfred Chen and Chia-Fu Yu), NCTS, National Taiwan University, Taiwan, Jun. 9, 2018.

33. Degree three unramified cohomology groups and Noether's problem for groups of order 243, Séminaire "Variétés Rationnelles" (invited by Prof. Jean-Louis Colliot-Thélène, Cyril Demarche and Mathieu Florence), Université Pierre-et-Marie-Curie (Paris VI), France, Jun. 22, 2018.

34. Degree three unramified cohomology groups and Noether's problem for groups of order 243, NCTS Seminar on Algebra (invited by Prof. Ming-chang Kang), NCTS, National Taiwan University, Taiwan, Aug. 12, 2019.

35. Rationality problem for fields of invariants, The 41st Symposium on Commutative Algebra (invited by Prof. Tokuji Araya, Mitsuyasu Hashimoto and Futoshi Hayasaka), Kurashiki Seaside Hotel, Japan, Nov. 28, 2019.

36. Rationality problem for fields of invariants, Degenerations and models of algebraic varieties and related topics (invited by Prof. Kentaro Mitsui, Ryo Ohkawa, Masa-Hiko Saito and Taro Sano), Zoom (Kobe, Japan), Feb. 16, 2021.

37. Rationality problem for fields of invariants, Homotopic and Geometric Galois Theory, (invited by Prof. Benjamin Collas, Pierre Debes, Hiroaki Nakamura and Jakob Stix), Zoom (Oberwolfach, Germany), Mar. 9, 2021.