

Curriculum Vitæ of Fumiharu Kato (Nov. 2019)

Full Name: Fumiharu Kato

Nationality: Japan

Born: 27th of July, 1968 at Sendai (Japan)

Studies:

- Mar. 1993: Graduated from Kyoto University (Faculty of Science)
- Apr. 1993 – Mar. 1995: Master course in Mathematics at Faculty of Science, Kyoto University
- Apr. 1995 – Jan. 1997: Doctor course in Mathematics at Faculty of Science, Kyoto University

Degree: Doctor of Science, Kyoto University, Jan. 1997

Scholarships and foreign visits:

- Oct. 1995 – Sept. 1996: “Wissenschaftlicher Mitarbeiter” at Universität Mannheim (Germany)
- Apr. 1997 – Jul. 1997: Visiting Researcher at Institut Henri Poincaré (France)
- Oct. 1998 – Sept. 1999: “Gastforscher” at Max-Planck-Institut für Mathematik in Bonn (Germany)
- Mar. 2000: Visiting Professor at Université Paris 6 (France)
- Apr. 2005 – May 2005: Visiting Professor at Université de Rennes 1 (France)

Languages:

Japanese (mother tongue)

English: fluent

Conferences (selection):

- Hodge theory and algebraic geometry, Hokkaido Univ., June 20–24, 1994: invited speaker; title: *Log geometry and mixed Hodge structures*
- 40th Symposium of Algebra, Tokyo Metro. Univ., Aug. 6, 1995: invited speaker; title: *Strong rigidity theorem for non-archimedean uniformization and fake projective planes*
- Hodge theory and algebraic geometry, Kanazawa Univ., Aug. 21–25, 1995: invited speaker; title: *Log smooth deformation theory*
- Kinosaki Symposium of Algebraic Geometry, Kinosaki (Japan), Nov. 14, 1996: invited speaker; title: *Moduli of log smooth curves*

- 42th Symposium of Algebra, Niigata Univ., July. 23, 1997: invited speaker; title: *Relative log Poincaré lemma and relative log de Rham theory*
- RIMS workshop “Rigid geometry and group actions”, Kyoto, May 6, 1998: invited speaker: title: *Introduction to rigid analysis* (two lectures)
- Workshop “Drinfeld modules and non-archimedean uniformization”, University of Gent (Belgium), Jun. 2, 1999: invited speaker: title: *On a p -adic analogue of Schwarzian triangle groups*
- Symposium on algebraic geometry — vector bundles and positive characteristic, Kyushu Univ., Jan. 12, 2000: invited speaker; title *Discrete groups in positive characteristic and automorphism group of Mumford curves*
- Workshop “Rigid Geometry and Applications”, Münster University (Germany), Apr. 2000: invited speaker
- 46th Symposium of Algebra, Osaka Univ., Aug. 2, 2001: invited speaker; title: *On fake projective planes*
- Hodge theory and algebraic geometry, Osaka Univ., Nov. 29, 2001: invited speaker; title: *Log geometric approach to accessory parameter problem of Fuchsian differential equations*
- KOREA-JAPAN joint workshop in mathematics, Algebraic Geometry and Related Topics, Korea Institute for Advanced Study, Seoul, Korea, Nov. 26, 2002: invited speaker; title: *Discrete lattice for Mumford’s fake projective plane*
- Conference “Number Theory and Geometric Methods in Mathematics”, Hiroshima Univ., Nov. 12–15, 2002: organizer
- Conference “Cohomology of moduli spaces”, Amsterdam Univ. (The Netherlands), Dec. 2002: invited speaker
- Symposium on algebraic geometry — higher dimensions and positive characteristic, Kyushu Univ., Jan. 16, 2003: invited speaker; title *Restrained ramifications*
- Special Lecture in algebra session at Annual Mathematical Society of Japan Meeting (Chiba Univ.), Sept. 24–27, 2003: invited speaker; title: *Rigid geometry and uniformization*
- Conference “Symposium on Arithmetic Geometry”, Hokkaido Univ., Nov. 18–21, 2003: organizer
- Workshop “Automorphisms of Curves”, Lorentz Center, Leiden (The Netherlands), Aug. 19, 2004: invited speaker; title: *Degeneration of restrained group actions I & II* (two lectures)

- The 13th MSJ International Research Institute “Moduli Spaces and Arithmetic Geometry”, RIMS, Kyoto, Sept. 13–15, 2004: contributed speaker (with K. Fujiwara); title: *Rigid geometry and applications, I, II, III* (three talks)
- Kinoshita Symposium of Algebraic Geometry, Kinoshita (Japan), Oct. 28, 2005: invited speaker; title: *Mirror symmetry and rigid geometry*
- Symposium “Algebraic Geometry & Beyond”, RIMS, Kyoto, Dec. 12–16, 2005: organizer
- 36th Encounter with Mathematics, Chuo Univ., Mar. 10–11, 2006: invited speaker; title: *Icosahedron and Riemann surfaces* (Mar. 10), *p-adic icosahedron* (Mar. 11) (two talks)
- Workshop “Fake Projective Planes and Arithmetic Quotients”, Nagoya Univ., July 24–25, 2006: invited speaker; title: *Introduction to fake projective planes* (July 24), *Fake projective planes as Shimura varieties* (July 25) (two talks)
- Motivic Integration and its Interaction with Model Theory and Non-Archimedean Geometry, ICMS, Edinburgh (Great Britain), May 15, 2008: invited speaker; title: *Topological rings in rigid geometry*
- 53th Symposium of Algebra, Morioka Aina., Aug. 6, 2008: invited speaker; title: *Rigid geometry now*
- Conference “Arithmetic and Algebraic Geometry Related to Moduli Spaces”, Univ. of Tokyo, Jan. 21, 2009: invited speaker; title: *Artin-Schreier-Mumford curves*
- Conference “Algebraic Geometry in Characteristic p and Related Topics”, Univ. of Tokyo, Feb. 16–19, 2010: organizer
- Conference “Arithmetic and Algebraic Geometry 2011”, Univ. of Tokyo, Jan. 18–22, 2011: organizer
- Conference “South Kyushu conference of algebra 2011”, Kagoshima Univ., Aug. 26–28, 2011: contributed speaker & organizer; talk title *The densest lattices in $\mathrm{PGL}_3(\mathbf{Q}_2)$*
- Conference “2011 Taiwan-Japan Workshop on Arithmetic Algebraic Geometry and Related Topics”, Institute of Mathematics, Academia Sinica, Taiwan, Nov. 18, 2011: invited speaker; title: *Adic formal algebraic spaces of finite ideal type and rigid GAGA on algebraic spaces*
- Conference “Symposium on ARITHMETIC & GEOMETRY”, Kyushu Univ., Jun. 2, 2012: invited speaker; title *Accessory parameter in degenerations*
- Conference “South Kyushu conference of algebra 2012”, Kumamoto Univ., Aug. 29–31, 2012: organizer

- Conference “Arithmetic and Algebraic Geometry 2013”, Tokyo Univ., Jan. 28, 2013: invited speaker; title: *Yet another Fake Projective Plane via p -adic uniformization*
- Conference “Kyushu Algebraic Number Theory ’13”, Kyushu Univ., Feb. 11, 2013: invited speaker; title: *Yet another Fake Projective Plane via p -adic uniformization*
- Symposium “Combinatorics & arithmetic geometry”. Utrecht University., May 8, 2013: invited speaker; title: *Fake projective planes via p -adic uniformisation*
- Conference “ p -adic cohomology and its applications, 2014”, Tohoku Univ., Jan. 8, 2014: invited speaker; title: *Combinatorial Li-Yau inequality and rational points on curves*
- Conference “Arithmetic and Algebraic Geometry 2014”, Tokyo Univ., Jan. 27, 2014: invited speaker; title: *Combinatorial Li-Yau inequality and rational points on curves*
- Conference “Kyushu Algebraic Number Theory 2014”, Kyushu Univ., Feb. 5, 2014: invited speaker; title: *Comparison of several theories in non-archimedean geometry*
- Conference “The 4th South Kyushu workshop on algebra - complex ball quotients and algebraic geometry”, Jul. 22, 2014: contributed speaker & organizer; talk title: *Fake projective planes*
- Conference “A Symposium on the History of Functional Analysis”, Northwest University, Xian, China, May 9, 2015: invited speaker; title: *Non-archimedean geometry — past and present*
- Conference “Non-archimedean analytic geometry: theory and practice”, Papeete, French Polynesia, Aug. 25, 2015: invited speaker; title: *Zariski Main Theorem for henselian rigid spaces*
- Conference “Algebraic Geometry in East Asia 2016”, University of Tokyo, Jan. 19, 2016: invited speaker; title: *On Henselian rigid geometry*
- Conference “Arithmetic and Algebraic Geometry 2016”, University of Tokyo, Jan. 25–28, 2016: organizer
- Conference “Arithmetic and Algebraic Geometry 2016 (2)”, University of Tokyo, Dec. 12–15, 2016: organizer
- Conference “The Fourth International Conference on History and Pedagogy of Modern Mathematics”, Sichuan Normal University, Aug. 22, 2017: invited speaker; title: *History of Zariski-Riemann spaces*
- Conference “The 11th Conference on Arithmetic and Algebraic Geometry”, University of Tokyo, Jan. 22–25, 2018: organizer

- Conference “Algebraic geometry in positive characteristic and related topics”, Hosei University, Feb. 1, 2018: invited speaker; title: *On Henselian rigid GAGA*
- Conference “5th Tokyo Tech - Uppsala University Joint Symposium”, Uppsala University, Ångström Laboratory Sept. 24, 2018: invited speaker; title: *Brief introduction to non-archimedean spaces*
- Conference “Higher Dimensional Arithmetic Geometry”, Kumamoto University, Kumamoto Japan, Feb. 18, 2019: invited speaker; title: *Non-archimedean analytic space of Banach type*
- Conference “ p -adic cohomology and arithmetic geometry 2019”, Tohoku University, Katahira campus, Tokyo Electron House of Creativity, 3rd floor, Sendai Japan, Nov. 14, 2019: invited speaker; title: *Toward rigid analytic approach to uniform non-archimedean Pila-Wilkie type theorems*

Civil service and Membership:

- Member of the Mathematical Society of Japan
- Referee for several scientific journals
- Several lectures for general public

Scientific Interests:

Arithmetic/algebraic geometry, in particular: rigid geometry, non-archimedean uniformization of (Shimura) varieties, log geometry, moduli theory

List of publications and preprints

- [1] Log smooth deformation theory. *Tohoku Math. Journal*, **48** (1996), 317–354.
- [2] The relative log Poincaré lemma and relative log de Rham theory. *Duke Math. Journal*, **93** No. 1 (1998), 179–206.
- [3] Functors of log Artin rings. *Manuscripta Mathematica*, **96** (1998), 97–112.
- [4] The strong rigidity theorem for non-archimedean uniformization (with Masanori Ishida). *Tohoku Math. Journal*, **50** (1998), 537–555.
- [5] Introduction to rigid analysis (in Japanese). *Suurikaiseikikenkyuusho Koukyuuroku*, Kyoto, 1998.
- [6] Log smooth deformation and moduli of log smooth curves. *International Journal of Math.*, **11** (2000), 215–232.
- [7] Mumford curves in a specialized pencil of sextics. *Manuscripta Mathematica*, **104** (2001), 451–458.

- [8] Discontinuous groups in positive characteristic and automorphisms of Mumford curves (with Gunther Cornelissen and Aristeides Kontogeorgis). *Math. Ann.*, **320** (2001), 55–85.
- [9] Equivariant deformation of Mumford curves and of ordinary curves in positive characteristic (with Gunther Cornelissen). *Duke Math. Journal*, **116** (2003), 431–471.
- [10] Mumford curves with maximal automorphism group II: Lamé type groups in genus 5–8 (with Gunther Cornelissen). *Geom. Dedicata*, **102** (2003), 127–142.
- [11] Mumford curves with maximal automorphism group (with Gunther Cornelissen). *Proc. Amer. Math. Soc.*, **132** (2004), 1937–1941.
- [12] Non-archimedean orbifolds covered by Mumford curves. *Journal of Alg. Geom.*, **14** (2005), 1–34.
- [13] Zur Entartung schwach verzweigter Gruppenoperationen auf Kurven (mit Gunther Cornelissen). *J. Reine Angew. Math.*, **589** (2005), 201–236.
- [14] The p -adic icosahedron (with Gunther Cornelissen). *Notices Am. Math. Soc.*, **52**, No. 7 (2005), 720–727.
- [15] On the Geometry of Wiman’s Sctic (with Naoki Inoue). *J. Math. Kyoto Univ.*, **45**, No. 4, (2005) 743–757.
- [16] Arithmetic structure of CMSZ fake projective plane (with Hiroyuki Ochiai). *Journal of Algebra*, **305** (2006), 1166–1185.
- [17] Rigid Geometry and Applications (with Kazuhiro Fujiwara). In Moduli Spaces and Arithmetic Geometry (Kyoto, 2004), *Advanced Studies in Pure Mathematics*, **45** (2006), 325–384.
- [18] Rigid analytic geometry (translation of Sugaku **55** (2003), no. 4, 392–417). *Sugaku Expositions* **20** (2007), no. 1, 65–95.
- [19] On the Shimura variety having Mumford’s fake projective plane as a connected component. *Math. Z.*, **259** (2008), 631–641.
- [20] The relation between rigid-analytic and algebraic deformation parameters for Artin-Schreier-Mumford curves (with Gunther Cornelissen and Aristeides Kontogeorgis). *Israel J. Math.*, **180** (2010), 345–370.
- [21] Topological rings in rigid geometry. Motivic integration and its interactions with model theory and non-Archimedean geometry. Volume I, 103–144, London Math. Soc. Lecture Note Ser., **383**, Cambridge Univ. Press, Cambridge, 2011.
- [22] On Hausdorff completions of commutative rings in rigid geometry (with Kazuhiro Fujiwara and Ofer Gabber), to appear in *J. of Algebra*.

- [23] Un anneau de déformation universel en conducteur supérieur (with Jakub Byszewski and Gunther Cornelissen), Proc. Japan Acad. Ser. A Math. Sci. **88** (2012), no. 2, 25–27.
- [24] The densest lattices in $\mathrm{PGL}_3\mathbf{Q}_2$ (with Daniel Allcock), Adv. Math. **242** (2013), 102–115.
- [25] Foundations of Rigid Geometry I (with Kazuhiro Fujiwara), EMS Monographs in mathematics, European Mathematical Society Publishing House, Jan. 2018.
- [26] A combinatorial Li-Yau inequality and rational points on curves (with Gunther Cornelissen and Janne Kool), Math. Ann. **361** (2015), no. 1-2, 211–258.
- [27] Buchberger stratification on the space of polynomials (with Kei Ohnoshi), Kumamoto J. Math. **28** (2015), 1–10.
- [28] A fake projective plane via 2-adic uniformization with torsion (with Daniel Allcock), Tohoku Math. J. **69** (2017), 221–237.
- [29] On Henselian rigid geometry, Algebraic Geometry in East Asia — Tokyo 2016, Taiwanese J. Math. **21**, No. 3 (2017), 531–547.