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Education

Tokyo Institute of Technology¹

Doctor of Science in Mathematics

Supervisor: Kazuma Shimomoto

Tokyo, Japan

Apr 2024–Current

Tokyo Institute of Technology

Master of Science in Mathematics

Supervisor: Kazuma Shimomoto (2nd year), Fumiharu Kato (1st year)

Tokyo, Japan

Apr 2022–Mar 2024

Tokyo Institute of Technology

Bachelor of Science in Mathematics

Supervisor: Fumiharu Kato

Tokyo, Japan

Apr 2018–Mar 2022

Professional Position

JSPS Research Fellow (DC1)

Tokyo Institute of Technology

Host Researcher: Kazuma Shimomoto

Apr 2024–Mar 2027

Research Interests

Commutative algebra in mixed characteristic (via arithmetic methods such as perfectoid rings, prismatic cohomology, and almost mathematics).

Papers and Preprints

5. **R. Ishizuka**, “Perfectoid towers generated from prisms”, *arXiv:2409.15785*, 2024.
4. **R. Ishizuka** and K. Nakazato, “Prismatic Kunz’s theorem”, *arXiv:2402.06207*, 2024.
3. D. Dine and **R. Ishizuka**, “Tilting and untilting for ideals in perfectoid rings”, *Math. Z.* **307**, 66 (2024). *arXiv:2308.09600*, 2023.
2. **R. Ishizuka**, “A calculation of the perfectoidization of semiperfectoid rings”, *Nagoya Math. J.* **255**, 742–759 (2024). *arXiv:2305.07916*, 2023.
1. K. Shimomoto and **R. Ishizuka**, “A mixed characteristic analogue of the perfection of rings and its almost Cohen-Macaulay property”, *arXiv:2303.13872*, 2023.

Talks

23. Nov 2024. “Prismatic Kunz’s theorem”, The 45th Japan Symposium on Commutative Algebra., RIMS (Kyoto University), Japan.
22. Nov 2024. “Applications of higher algebra to the lifting problem of modules”, Tokyo Commutative Algebra Seminar., Online (Zoom), Japan.
21. Oct 2024. “ F -liftability obstruction in singular varieties through derived algebraic geometry”, Singularity Theory Seminar., Nihon University, Japan.

¹In Oct 2024, Tokyo Institute of Technology was merged with Tokyo Medical and Dental University and reorganized into *Institute of Science Tokyo*.

20. Sep 2024. "*Frobenius maps on mixed characteristic rings via prismatic cohomology*" (Poster Session), L-functions and Motives in Niseko 2024., Setsu Niseko and Niseko Residents Center, Japan.
19. Sep 2024. "*A generalization of Kunz's theorem to mixed characteristic via p -adic cohomology theory*", MSJ Autumn Meeting 2024., Osaka University, Japan.
18. July 2024. "*Perfectoid spaces, tilts and untilts*" (Survey talk), Atelier de Géométrie Arithmétique 2024., RIMS (Kyoto University), Japan.
17. July 2024. "*Prismatic approach to a mixed characteristic Kunz's theorem*", The 23rd Hiroshima-Sendai Workshop on Number Theory at Sendai., Tohoku University, Japan.
16. June 2024. "*Regularity criterion of mixed characteristic rings via prismatic cohomology*", Keio Algebra Seminar., Keio University, Japan.
15. June 2024. "*Prisms and regular local rings*", The 35th Seminar on Commutative Algebra in Japan., Tokushima University, Japan.
14. Apr 2024. "*Prisms and its application to regular rings*", Saturday Seminar., Meiji University, Japan.
13. Mar 2024. "*Perfectoid ideals and its correspondence*", The 20th Mathematics Conference for Young Researchers., Hokkaido University, Japan.
12. Feb 2024. "*Mixed characteristic Kunz's theorem with prismatic theory*", The 28th Conference on Algebra for Young Researchers in Japan., Waseda University, Japan.
11. Dec 2023. "*Commutative ring theoretic approach for the perfectoidization of semiperfectoid rings*", Number Theory Seminar., Kyoto University, Japan.
10. Nov 2023. "*Ideal correspondence between a perfectoid ring and its tilt*", The 44th Japan Symposium on Commutative Algebra., Lecture Hayama, Japan.
9. Aug 2023. "*Absolute integral closure*" (Survey talk), The 18th Summer School on Commutative algebra., Tokyo Institute of Technology, Japan.
8. Aug 2023. "*On the relation between perfectoidization and p -root closure*", The 9th China-Japan-Korea International Conference on Ring and Module Theory., Incheon National University, Republic of Korea.
7. July 2023. "*On the commutative ring-theoretic structure of the perfectoidization of semiperfectoid rings*", The 22nd Hiroshima-Sendai Workshop on Number Theory at Hiroshima., Hiroshima University, Japan.
6. July 2023. "*On the application of perfectoidization to commutative algebra and its structure*", The 34th Seminar on Commutative Algebra in Japan., Kitami Institute of Technology, Japan.
5. May 2023. "*On Perfectoid(ization) and its commutative ring-theoretic properties*", Ookayama Youth Seminar in Algebra., Tokyo Institute of Technology, Japan.
4. Mar 2023. "*A mixed characteristic analogue of the perfection of rings*", The 11th Japan-Vietnam Joint Seminar on Commutative Algebra - by and for young mathematicians -, Vietnam Academy of Science and Technology, Vietnam.
3. Mar 2023. "*An explicit construction of perfectoid almost Cohen-Macaulay algebras in mixed characteristic*", MSJ Spring Meeting 2023., Chuo University, Japan.
2. Mar 2023. "*An explicit construction of perfectoid almost Cohen-Macaulay algebras*", The 19th Mathematics Conference for Young Researchers., Hokkaido University, Japan.
1. Oct 2022. "*An explicit construction of perfectoid almost Cohen-Macaulay algebras in mixed characteristic*", The 43rd Japan Symposium on Commutative Algebra., Osaka University, Japan.

Membership

- Apr 2023– . Mathematical Society in Japan (MSJ)

Languages

Japanese: Native

Mother tongue

English: Intermediate

Can read, write, and, listen but may struggle with conversation

French: Beginner

Can only read mathematical texts