

Ryo ISHIZUKA | 石塚 伶

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Education

Tokyo Institute of Technology

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

22. Nov 2024. “Prismatic Kunz’s theorem”, The 45th Japan Symposium on Commutative Algebra., RIMS (Kyoto University), Japan.
21. Oct 2024. “ F -liftability obstruction in singular varieties through derived algebraic geometry”, Singularity Theory Seminar., Nihon University, Japan.
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 23nd 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., Lectore 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"*, Okayama 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