

# 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

- [4] **R.Ishizuka** and K.Nakazato. *Prismatic Kunz's theorem*. arXiv: 2402.06207.
- [3] D.Dine and **R.Ishizuka**. *Tilting and untilting for ideals in perfectoid rings*. Math. Z. **307**, 66 (2024). arXiv: 2308.0960.
- [2] **R.Ishizuka**. *A calculation of the perfectoidization of semiperfectoid rings*. Nagoya Math. J. (2024). arXiv: 2305.07916.
- [1] **R.Ishizuka** and K.Shimomoto. *A mixed characteristic analogue of the perfection of rings and its almost Cohen-Macaulay property*. arXiv: 2303.13872.

## Talks

- Sep 2024. “*p*-進コホモロジーを用いた Kunz の定理の混標数への一般化 (A generalization of Kunz's theorem to mixed characteristic via *p*-adic cohomology theory)”, MSJ Autumn Meeting 2024, MSJ Autumn Meeting 2024, Osaka University, Japan
- July 2024. “*Perfectoid spaces, tilts and untilts*” (Survey talk), Atelier de Géométrie Arithmétique 2024, RIMS (Kyoto University), Japan
- July 2024. “*Prismatic approach to a mixed characteristic Kunz's theorem*”, The 23rd Hiroshima-Sendai Workshop on Number Theory at Sendai, Tohoku University, Japan
- June 2024. “*Regularity criterion of mixed characteristic rings via prismatic cohomology*”, Keio Algebra Seminar, Keio University, Japan
- June 2024. “*Prisms and regular local rings*”, The 35th Seminar on Commutative Algebra in Japan, Tokushima University, Japan
- Apr 2024. “*Prisms and its application to regular rings*”, Saturday Seminar, Meiji University, Japan

- Mar 2024. *"Perfectoid ideals and its correspondence"*, The 20th Mathematics Conference for Young Researchers, Hokkaido University, Japan
- Feb 2024. *"Mixed characteristic Kunz's theorem with prismatic theory"*, The 28th Conference on Algebra for Young Researchers in Japan, Waseda University, Japan
- Dec 2023. *"Commutative ring theoretic approach for the perfectoidization of semiperfectoid rings"*, Number Theory Seminar, Kyoto University, Japan
- Nov 2023. *"Ideal correspondence between a perfectoid ring and its tilt"*, The 44th Japan Symposium on Commutative Algebra, Lecture Hayama, Japan
- Aug 2023. *"Absolute integral closure"* (Survey talk), The 18th Summer School on Commutative algebra, Tokyo Institute of Technology, Japan
- 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
- 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
- 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
- May 2023. *"On Perfectoid(ization) and its commutative ring-theoretic properties"*, Ookayama Youth Seminar in Algebra, Tokyo Institute of Technology, Japan
- 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
- Mar 2023. *"An explicit construction of perfectoid almost Cohen-Macaulay algebras in mixed characteristic"*, MSJ Spring Meeting 2023, Chuo University, Japan
- Mar 2023. *"An explicit construction of perfectoid almost Cohen-Macaulay algebras"*, The 19th Mathematics Conference for Young Researchers, Hokkaido University, Japan
- 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

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

## Languages

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**Japanese:** Native

*Mother tongue*

**English:** Intermediate

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

**French:** Beginner

*Can only read mathematical texts*