

TAKUYA KATAGIRI

Curriculum Vitae

RESEARCH INTERESTS

Gravitational wave physics, black hole physics, neutron star physics, extension of General Relativity and its observational signature, mathematical physics of gravity

POSITION

April 2023 - present: **Postdoctoral researcher at the Niels Bohr Institute, Denmark**

April 2022 - March 2023: **Postdoctoral researcher at Tohoku University, Japan**

EDUCATION

2017 - 2022: **Rikkyo University**
Supervisor: Prof. Tomohiro Harada
Ph.D. in Physics (received March 2022)
M.S. in Physics (received March 2019)

2013 - 2017: **Rikkyo University**
B.S. in Physics (received March 2017)

REFeree EXPERIENCE

Physical Review Letter : 1 article

Physical Review D : 9 articles

Physics Letter B : 1 article

International Journal of Modern Physics A : 1 article

Physica Scripta : 1 article

ORGANISING EXPERIENCES

Black Holes Inside and Out (August 2024, Copenhagen)

TEACHING EXPERIENCE

- December 2024- : Arun Krishna G, visiting student, teaching gravitational wave physics and neutron star physics with the aim of collaboration
- September 2024- : Rishi Gowtham, visiting student, ongoing work on modelling observational signature of neutron stars
- 2023 : Tact Ikeda, PhD student at Rikkyo University, one published and one submitted works on modelling relativistic tidal effects of compact objects
- April 2017 - September 2020 : Teaching assistant of undergraduate courses for quantum mechanics, statistical mechanics, thermodynamics, and differential equation
- September 2016 - March 2017 : Teaching assistant of undergraduate courses for mechanics, electromagnetism, special relativity, complex analysis, and vector analysis
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REFERENCE

Name : Prof. Vitor Cardoso
Affiliation : Niels Bohr Institute/Instituto Superior T cnico
e-mail : vitor.cardoso@nbi.ku.dk

Name : Prof. Kent Yagi
Affiliation : University of Virginia
e-mail : ky5t@virginia.edu

Name : Prof. Hiroyuki Nakano
Affiliation : Ryukoku University
e-mail : denden919@gmail.com

Name : Prof. Tomohiro Harada
Affiliation : Rikkyo University
e-mail : harada@rikkyo.ac.jp

PRESENTATIONS

A. Invited talks

- June 2024 T. Katagiri
"Relativistic tidal effects beyond static tides" (Seminar at Mathematical Physics Laboratory, Toyota Technological Institute)
- June 2023 T. Katagiri
"Stability of relativistic tidal response against small potential modification" (Seminar at Yukawa Institute for Theoretical Physics, Kyoto University)
- January 2023 T. Katagiri
"Vanishing Love numbers of Black Holes in General Relativity: From Spacetime Conformal Symmetry of a Two-dimensional Reduced Geometry" (Seminar at Theoretical Cosmology and Particle Physics Group, Tokyo institute of technology)

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| August 2022 | <u>T. Katagiri</u> "Ladder operators and quasinormal modes in Banados-Teitelboim-Zanelli black holes" (Workshop "Black-hole quasinormal-ringing", Rikkyo University) |
| August 2022 | <u>T. Katagiri</u> "Ladder operators and quasinormal modes in Banados-Teitelboim-Zanelli black holes" (Seminar at Beijing Institute of Mathematical Sciences and Applications, on-line) |
| October 2021 | <u>T. Katagiri</u> "Horizon-instability of extremal black holes: conserved quantities and late-time tails" (Seminar at the cosmology group and high energy astrophysics group, Waseda University) |
| January 2021 | <u>T. Katagiri, T. Harada</u> "Instabilities of small charged anti-de Sitter black holes" (Online JGRG webinar series, online) |
| November 2020 | <u>T. Katagiri</u> "The Aretakis constants from asymptotic symmetries" (Seminar at the particle physics group, Chuo University) |
| January 2020 | <u>T. Katagiri</u> "Charged scalar field dynamics in charged Anti-de Sitter black holes" (Workshop "GR in AdS", Rikkyo University) |
| June 2019 | <u>T. Katagiri</u> "Instabilities of small charged anti-de Sitter black holes" (Seminar at the particle physics group, Chuo University) |
| May 2019 | <u>T. Katagiri</u> "Instabilities of small charged anti-de Sitter black holes" (Joint seminar, Rikkyo University) |

B. International conference

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| July 2024 | <u>T. Katagiri</u> "On dynamical tides of a Schwarzschild black hole" (New horizons for psi, Instituto Superior Tecnico) |
| November 2022 | <u>T. Katagiri</u> "Vanishing Love of Black Holes in General Relativity: From Spacetime Conformal Symmetry of a Two-dimensional Reduced Geometry" (The 31st Workshop on General Relativity and Gravitation in Japan, University of Tokyo) |
| July 2022 | <u>T. Katagiri</u> "Ladder operators and quasinormal modes in Banados-Teitelboim-Zanelli black holes" (Workshop "Gravity", Yukawa Institute for Theoretical Physics, Kyoto University) |
| December 2021 | <u>T. Katagiri</u> "The Aretakis constants and instability in general spherically symmetric extremal black hole spacetimes: higher multipole modes, late-time tails, and geometrical meanings" (The 30th Workshop on General Relativity and Gravitation in Japan, online) |
| September 2021 | <u>T. Katagiri</u> "Stability of small charged anti-de Sitter black holes in the Robin boundary" (Spanish-Portuguese Relativity Meeting EREP2021, online) |
| November 2020 | <u>T. Katagiri</u> "Conserved quantities on the horizon instability of extremal black holes from asymptotic symmetries" (The online JGRG workshop) |

- November 2019 T. Katagiri
 “Instabilities of small charged Anti-de Sitter black holes” (The 29th Workshop on General Relativity and Gravitation in Japan, Kobe University)
- November 2018 T. Katagiri
 “The instability of small charged AdS Black Hole” (The 28th Workshop on General Relativity and Gravitation in Japan, Rikkyo University)

C. Conference and workshop in Japan

- March 2024 V. Cardoso, G. Carullo, M. De Amicis, F. Duque, T. Katagiri, D. Pereniguez, J. Redondo-Yuste, T. F. M. Spieksma and Z. Zhong
 “Late-time power-law tails in dynamical spacetimes” (The spring Meeting 2024, The Physical Society of Japan, online)
- September 2023 T. Katagiri, H. Nakano and K. Omukai
 “Stability of relativistic tidal response against small potential modification” (The 78th Annual meeting, The Physical Society of Japan, Tohoku University)
- September 2022 T. Katagiri, M. Kimura, H. Nakano and K. Omukai
 “Tidal deformation of black holes in general relativity: From hidden conformal symmetry” (The Autumn Meeting 2022, The Physical Society of Japan, Okayama University)
- March 2022 T. Ishii, T. Harada, T. Katagiri, N. Tanahashi
 “Charged hairy anti-de Sitter black holes in the Robin boundary” (The 77th Annual Meeting, The Physical Society of Japan, online)
- December 2021 T. Katagiri
 “Wave phenomena near extremal black holes: late-time tails and geometrical interpretations” (The 22nd Workshop on “Spacetime Singularities” in Japan, online)
- December 2021 T. Katagiri
 “Wave phenomena near extremal black holes” (The 34th Rironkon symposium, online)
- September 2021 T. Katagiri, M. Kimura
 “On the horizon-instability of extremal black holes” (The Autumn Meeting 2021, The Physical Society of Japan, online)
- March 2021 T. Katagiri, M. Kimura
 “Application of mass ladder operators to black hole physics” (The 76th Annual Meeting, The Physical Society of Japan, online)
- September 2020 T. Katagiri, T. Harada
 “Dynamics of a neutral/charged scalar field in asymptotically anti-de sitter charged black holes” (The Autumn Meeting 2020, The Physical Society of Japan, online)
- September 2020 T. Katagiri, M. Kimura
 “On the asymptotic symmetry and the horizon instability of extremal black holes” (The Autumn Meeting 2020, The Physical Society of Japan, online)
- December 2019 T. Katagiri
 “Black hole hair in scalar-tensor systems (consistent with positive mass theorems)” (The 21st Workshop on “Spacetime Singularities” in Japan at the College Plaza in Akita prefecture)
- March 2019 T. Katagiri, T. Harada
 “Instability of small charged AdS₄ black hole” (The 74th Annual Meeting, The Physical Society of Japan at Kyushu University)
- December 2018 T. Katagiri, T. Harada
 “Instability of small charged AdS black hole ” (The 20th Workshop on “Spacetime Singularities” in Japan at Kyushu University)