

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

REFERENCE

Name : Prof. Vitor Cardoso

Affiliation : Niels Bohr Institute/Instituto Superior Técnico

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)

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, online)
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 JRG webinars 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

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 JRG 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)