

# **RESCEU-NBIA workshop on gravitational-wave sources**

**Thursday, 7 December 2023 - Friday, 15 December 2023**

**University of Tokyo**

## **Program**

December 7th (Room No. 287)

9:00 Opening remark

Chair Dan D'Orazio

**9:10 Zoltan Haiman (Columbia University)**

Gravitational wave and electromagnetic signatures of binary

10:00 Break

**10:30 Niccolò Veronesi (Leiden Observatory)**

First observational constraints on the GW-AGN connection through spatial correlation analysis

**10:50 Soichiro Morisaki (University of Tokyo)**

Direct searches for dark matter with gravitational-wave detectors and their optimal data analysis methods

11:10 – 13:00 Lunch break

Chair Johan Samsing

**13:00 Nicholas Stone (The Hebrew University of Jerusalem)**

Gravitational Waves from Active Galactic Nuclei

**13:50 Evgeni Grishin (Monash University)**

The Effect of Thermal Torques on AGN Disc Migration Traps and Gravitational Wave Populations

**14:10 Lucy McNeill (Kyoto University)**

Dynamical binary black hole merger properties from simple globular cluster models consistent with N-body simulations

14:30 Break

**15:00 Discussion on SMBH binaries**

December 8th (Room No. 1042/1043)

Chair Akihiro Suzuki

**9:00 Wenbin Lu (UC Berkeley)**

Late-time accretion in neutron star mergers

**9:50 Christopher Tiede (Niels Bohr Institute)**

Eccentricity evolution, orbital decay, and apsidal precession of accreting massive binaries

10:10 Break

**10:40 Dheeraj Pasham (MIT)**

Quasi-periodic outflows (QPOs): A novel observational phenomenon to potentially uncover SMBH--IMBH pairs in the electromagnetic waveband

**11:00 Maria Paola Vaccaro (Heidelberg University)**

The impact of Gas Hardening on Hierarchical Black Hole Mergers in Migration Traps of Active Galactic Nuclei Disks

11:20-13:00 Lunch break

Chair Chris Irwin

**13:00 Rixin Li (UC Berkeley)**

Hydrodynamical Evolution of Binary Black Holes Embedded in AGN Disks

**13:50 Elena Maria Rossi (Leiden University)**

Constraining the origin of Massive Black Holes with Electromagnetic and Gravitational wave observations

**14:10 Ore Gottlieb (CCA, Flatiron Institute)**

A Unified Picture of Short and Long Gamma-ray Bursts from Compact Binary Mergers

14:30 Break

**15:00 Discussion on EM counterparts**

**19:00 Workshop Dinner**

December 9 (Room No. 1042/1043)

**10:00 Stephen Taylor (Vanderbilt University)**

Pulsar Timing Array

**10:50 Discussion on GW data analysis**

December 11th (Room No. 206)

Chair Tomoya Kinugawa

**9:00 Tejaswi Venumadhav Nerella (University of California Santa Barbara)**

New black hole mergers in LVK data from a gravitational wave search including higher-order harmonics

**9:50 Ryosuke Hirai (Monash University)**

Common envelope evolution in massive binaries

10:10 Break

**10:40 Chris Belczynski (The Polish Academy of Sciences)**

BH spins: are LIGO/Virgo/KAGRA and High-mass X-ray Binary BHs from different populations?

11:30-13:00 Lunch break

Chair Ataru Tanikawa

**13:00 Lieke van Son (CCA, Flatiron institute)**

Binary evolution leading to gravitational-wave sources (TBD)

**13:50 Davide Gerosa (University of Milano-Bicocca)**

The masses and spins of LIGO's black holes are correlated, here is a disk explanation

14:40 Break

**15:00 Discussion on Binary evolution**

**18:00 Physics Colloquium by Smadar Naoz at Room 1220 (2nd floor of Science Bldg 4)**

December 12 (Room No. 233)

Chair Yasushi Suto

**9:00 Ugo Niccolò Di Carlo (SISSA)**

Black Holes in Young Star Clusters

**9:50 Alexander Kusenko (UCLA and Kavli IPMU)**

Gravitational waves signals from the early universe accompanying supersymmetry, generation of matter-antimatter asymmetry, and formation of primordial black holes

10:10 Break

**10:40 Barry Ginat (University of Oxford)**

Three-Body Gravitational-Wave Sources

**11:00 Barak Rom (The Hebrew University of Jerusalem)**

Formation of Merging Stellar-Mass Black Hole Binaries by Gravitational Waves Emission in AGN Disks

**11:20 Suyog Garg (University of Tokyo)**

X-Ray Observations of ASASSN-14li

11:40-13:00 Lunch break

Chair Alessandro Trani

**13:00 Smadar Naoz (University of California, Los Angeles)**

It's Raining Black Holes...Hallelujah!

**13:50 Lucas Hellström (Nicolas Copernicus Astronomical Center)**

Gravitational Wave Signal From Double White Dwarf Binaries Inside Globular Clusters

**14:10 Henry Whitehead (University of Oxford)**

Gas Assisted Binary Black Hole Formation in AGN Discs

14:30 Break

**15:00 Discussion on BBHs in AGN****19:00 Workshop Dinner**

December 13th (Room No. 206)

**9:00 Yasushi Suto (University of Tokyo)**

Dynamics of a tertiary body orbiting an inner binary black hole

**9:50 Toshinori Hayashi**

A strategy to search for hidden binary black holes in triples: constraining the binarity of dark companions in Gaia BH1 and Gaia BH2

**10:10 Claire Zwicker (Illinois Institute of Technology)**

Investigating Mass Segregation of the Binary Stars in the Open Cluster NGC 6819

10:30 Break

**11:00 Discussion on Many Body Systems**

December 14th (Room No. 233)

**9:00 Eric Coughlin (Syracuse University)**

Fallback Rates from Tidal Disruption Events: Dependence on Stellar Type

**9:50 Kimitake Hayasaki (Chungbuk National University)**

Tidal disruption of a star by coalescing supermassive black hole binaries (TBD)

10:10 Break

**10:40 Clément Bonnerot (University of Birmingham)**

First light from tidal disruption events

11:30-13:00 Lunch break

**13:00 Lucio Mayer (University of Zurich)**

Uncovering the Astrophysics of LISA Massive Black Hole Binaries; from kpc scales to gravitational wave in-spiral

**13:50 Lorenz Zwick (Niels Bohr International Academy Copenhagen)**

Dynamics, periodicity and other opportunities to improve the detectability of environmental effects in gravitational wave sources

**14:10 Madeline Clyburn (Clemson University)**

Electromagnetic Signatures from the Late Inspiral of Unequal Mass Accreting Massive Black Hole Binaries

14:30 Break

**15:00 Discussion on TDEs, QPEs, other galactic nucleus phenomena**

December 15th(Room No. 1042/1043)

**9:00 Kiwamu Izumi (JAXA)**

Space gravitational wave detectors

**9:50 Daisuke Toyouchi (Osaka University)**

Radiation-driven winds from black hole X-ray binaries

10:10 Break

**10:40 Tomoya Kinugawa (Shinsyu University)**

Gravitational waves from first star remnants

Closing remark

