

# 799<sup>th</sup> ASRC Seminar

**Date:** : 5月 10日(月), 10:30~12:00

**Location:** Zoomによるオンラインセミナー

**Speaker:** 時枝 正明氏 (東北大学 理学研究科)

**Title:** Open quantum system approach to heavy-ion fusion reactions

## Abstract:

It has been recognized that dissipation and fluctuation play an important role in heavy-ion reactions, such as heavy-ion fusion reactions. For their theoretical description, the Langevin equation, which is based on the classical equation of motion, has been developed [1]. Although it has succeeded in describing various damped heavy-ion reactions, it cannot be applied to low energy reactions in which quantum effects play a crucial role [2]. To extend the applicability, a quantum mechanical extension of the Langevin approach is necessary. To this end, we have applied ideas of open quantum systems to heavy-ion fusion reactions [3].

In this talk, I will discuss heavy-ion reactions from the viewpoint of open quantum systems. I will also present our recent result of quantum Langevin calculation for heavy-ion fusion reactions.

[1] D. A. Bromley, *Treatise on Heavy-Ion Science Volume 2*, (Plenum Press New York, 1984).

[2] K. Hagino and N. Takigawa, *Prog. Theo. Phys.* 128, 1061 (2012).

[3] M. Tokieda and K. Hagino, *Front. Phys.* 8:8 (2020).

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