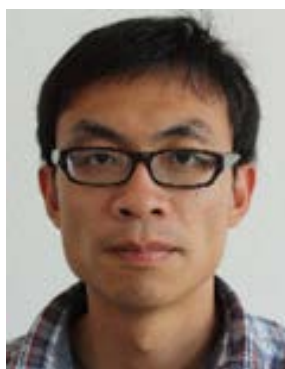




THE CHINESE UNIVERSITY OF HONG KONG
Department of Physics
COLLOQUIUM

Reveal Hidden Structures in Complex Astronomical Images – Adjacent Correlation Analysis

by



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Date: May 9, 2025 (Friday)

Time: 4:00 - 5:00 p.m.

Place: L2, Science Centre, CUHK

(Light refreshments will be served at [SCNB 1/F lobby](#) from 3:30 to 3:50 p.m.)

ALL INTERESTED ARE WELCOME

Abstract

Physics has been transforming our view of nature for centuries. While combining our physical knowledge with computational approaches has allowed people to model the evolution of physical systems in great detail, understanding the emergence of patterns and structures is limited in comparison. Correlations between quantities is the most dependable approach to describe the relationship between different quantities. However, toward complex patterns, searching for correlations directly is often not practical as complexity often undermines correlations. We find that the key is to search for correlations from local regions and develop a new method, the adjacent correction analysis to extract such correlations. The correlation vectors exhibit remarkably regular patterns and may often lead to the discovery of new laws. The vectors we derive are equivalence to the vector field in dynamical systems. By efficiently representing spatial patterns, our approach opens up venues for classification, prediction, parameter fitting, and forecast.

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