DEPARTMENT OF PHYSICS & ASTRONOMY
COLLOQUIUM SPEAKER SERIES

Interaction between Gravitational Waves and Gauge Fields

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Tuesday, January 25, 2022
1:30-2:45 pm

(Zoom Link Below)

The study of interaction of gravitational waves with matter is crucial in understanding the nature of the universe. In this talk, we will start with a brief review on gravitational waves, followed by discussion on early universe cosmology, particularly on primordial gravitational waves and quark gluon plasma. Primordial gravitational waves were generated in the very early universe and have not yet been detected. The quark gluon plasma which was present at a later stage had a chance to interact with primordial gravitational waves. By interpreting how these waves modify quark gluon plasma, we plan to predict ways to detect primordial gravitational waves.

We will then talk about the Yang Mills gauge theory, which is necessary for understanding quark gluon plasma. Our interest is to understand the interaction of gravitational waves with Yang-Mills waves. We will discuss wave solutions of Yang Mills theory in flat background and extend the solutions to gravitational wave background. There is a significant interaction between the two waves.

Finally, we will discuss the current developments about extending our solutions to early universe cosmology.

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Zoom Link: https://uleth.zoom.us/j/93720130736