



APPLIED MATHEMATICS SEMINAR

A thermal description of modified gravity as an effective dissipative fluid

by

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Abstract: There are many reasons to modify Einstein's theory of gravity, general relativity. Scalar-tensor gravity is the prototypical modification and can be described as an effective fluid by writing its field equations as effective Einstein equations with an effective “fluid” as a source. This fluid is dissipative and, almost miraculously, satisfies the constitutive laws of Eckart's thermodynamics. This leads to a thermal picture with a “temperature of gravity” and general relativity as the $T=0$ equilibrium state. Intriguing consequences are: gravity may or may not approach its equilibrium state; singularities are “hot” (deviate from relativity); the expansion of space “cools” gravity; degenerate theories with non-dynamical scalar field are also states of equilibrium; standard scalar fields in relativity and Einstein frame scalar-tensor gravity (an alternative description) correspond to $T=0$ but nonzero chemical potential, correcting the standard lore.

Date: Monday, April 24, 2023

Time: 17:00-18:00, GMT+3

Place: ZOOM

To request the event link, please send a message to yheydarzade@bilkent.edu.tr.