数物セミナー

題目：Optical geometry and the mathematics of gravitational lensing

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日時：12月15日(木) 12：50から(約1時間)

場所：2番講義室（理工1号館2階)

概要：

Geometrical optics in gravity can be approached from different points of view: the quasi-Newtonian impulse approximation of gravitational lensing as used in astronomy; optical (or Fermat) geometry, defined by the 3-space whose geodesics are the spatial light rays; and null geodesics in spacetime. In this seminar, I discuss the rich geometrical properties exhibited by these approaches, including: image counting and Morse theory; magnification invariants and Lefschetz fixed point theory; the Gauss-Bonnet method for the Riemannian optical geometry of static spacetimes, as well as the Finslerian optical geometry of stationary spacetimes; and finally, an extension of the standard definition of lensing magnification to spacetime, with its geometrical interpretation in terms of the van Vleck determinant and the exponential map. In this context, I also mention a recent observational development, namely the discovery of the first strongly lensed type Ia supernovae.

興味をお持ちの方は、ぜひご参加下さい。

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