Canadian Association of Physicists | Association canadienne des physiciens et physiciennes

Contribution ID: **1909** Type: **CLOSED - Oral (Non-Student) / orale (non-étudiant)**

Black Hole Graviton Laser TIME BOMB!

Tuesday 30 May 2017 17:00 (15 minutes)

We study the possibility that a graviton in the presence of a black hole can be coherently amplified through stimulated emission. Because of the extremely weak coupling of gravitons to matter, the gain that can be obtained as the graviton passes through a lasing medium is untenably small, to achieve significant gains, with a typical absorption cross section, it will take a trajectory that is longer than the observable universe. However, in a black hole background, if emitted in the right direction at the right radius, a graviton can make arbitrarily many trips around the black hole before eventually escaping to infinity. If the black hole is surrounded by a lasing medium, the graviton can be amplified to arbitrarily high intensity if it makes enough circuits. The existence of very light axions or other bosonic dark matter, can give rise to exactly the required lasing medium. In principle, amplified gravitons are being emitted at all times from all black holes but since the big bang, there has not been enough time to have significant amplification. Eventually, after a sufficient amount of time, black holes will start emitting coherent rays of extremely amplified, intense, gravitons, that will in principle destroy everything in their path.

Presenters: PARANJAPE, Manu (Université de Montréal); DUPUIS, Éric (Université de Montréal)

Session Classification: T4-4 General Relativity II (DTP) | Relativité générale II (DPT)

Track Classification: Theoretical Physics / Physique théorique (DTP-DPT)