



Canadian Association
of Physicists

Association canadienne
des physiciens et physiciennes

Contribution ID: 3152 Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

(G*) Evolution of exotic marginally outer trapped surfaces in an accreting black hole

Monday, 6 June 2022 14:00 (15 minutes)

Marginally outer trapped surfaces (MOTS), (closed surfaces of vanishing outward null expansion) provide a useful tool to study the local and global dynamics of black holes. They can be used both to locate black hole boundaries as well as study their internal geometry. Understanding the evolution of these objects can play an important role in understanding realistic black dynamics: in particular their complex dynamics has recently been studied in black mergers. In this talk, I summarize a method that can be used to identify axisymmetric MOTSs with arbitrarily complicated geometries in arbitrary axisymmetric spacetimes. Using this method, I find new MOTSs in dynamical Lemaitre-Tolman-Bondi spacetimes, focusing on the case of a large dust shell falling into an existing black hole. I will present the evolution of the many MOTS (both standard and exotic) that can be observed during this process.

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Session Classification: M2-10 Black Holes (DTP) | Trous noirs (DPT)

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