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Massive primordial black holes from hybrid inflation as dark matter and the seeds of galaxies

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A scenario where massive Primordial Black Holes (PBH) are produced from the collapse of large curvature perturbations generated during a mild waterfall phase of hybrid inflation will be presented. I will give the values of the inflaton potential parameters leading to a PBH mass spectrum producing abundances comparable to those of Dark Matter today, while the matter power spectrum on scales probed by CMB anisotropies agrees with Planck data. These PBH could have acquired large stellar masses today, via merging, and the model passes both the constraints from CMB distortions and micro-lensing. This scenario is supported by Chandra observations of numerous BH candidates in the central region of Andromeda. Moreover, the tail of the PBH mass distribution could be responsible for the seeds of supermassive black holes at the center of galaxies, as well as for ultra-luminous X-rays sources. The considered effective hybrid potential can originate e.g. from D-term inflation with a Fayet-Iliopoulos term of the order of the Planck scale but sub-planckian values of the inflaton field.

Presenter: CLESSE, Sebastien (University of Namur, Belgium) **Session Classification:** Inflation and phase transitions