



Studying the Hot and High-Energy Universe at Masaryk University


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 Posluchárna F2, budova 6, 14:00 - 15:00

Lecture Abstract

 In the course of structure formation, only a small fraction of the baryons turned into stars - most remain in a diffuse hot intergalactic medium (IGM). The growth and evolution of galaxies is controlled by feedback processes, such as energy and metal input to the IGM from supernovae, and from the jets and winds of accreting supermassive black holes. I will start my talk by showing observational results on the role of supermassive black holes in maintaining a delicate balance between heating and cooling in clusters of galaxies. I will present new measurements from the Hitomi satellite, which show that the jets emanating from the central supermassive black hole are stirring the hot intra-cluster medium. I will then present a novel way for monitoring gamma ray bursts - the most energetic explosions in the Universe, some of which are the electromagnetic counterparts of gravitational wave signals - using nano-satellites. Miniaturisation recently opened opportunities for novel breakthrough science using nanosatellites (often called 'cubesats'), which are affordable also for small countries or universities. I will finish my talk by presenting a vision for a world-class high-energy astrophysics research group at Masaryk University, which is involved in the development of large space missions led by the European Space Agency - such as Athena - but also leads smaller nano-satellite projects to perform well focused breakthrough science.