

Spring 2020 Colloquium

Department of Physics & Astronomy, TAMU-Commerce

Jan 23, Thursday, 4-5 PM in Science Building 127

(coffee and cookies will be served at 3:50 PM)

Astronomy

One (disk) ring to rule them all: linking accretion from protostars to supermassive black holes

Dr. Simone Scaringi

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Dr. Scaringi earned B.Sc (2005) in Mathematics with Astronomy and M.Phil (2007) in Astrophysics from the University of Southampton, and a Ph.D in Astrophysics from the same institution (2010). His Ph.D. research topic was on the applications of machine learning algorithms to large astronomical datasets. Dr. Scaringi worked as a postdoc at Radboud University Nijmegen (NL) on the IPHAS Galactic plane survey and data from the Kepler mission. He further obtained a Marie Curie Fellowship which brought him to KU Leuven (BE) in 2012 and a Humboldt Fellowship which brought him to the Max-Planck-Institute for Extraterrestrial Physics in Garching (DE) in 2015. In 2017, Dr. Scaringi began a Faculty appointment at the University of Canterbury (NZ), and in 2018 became Assistant

Professor at Texas Tech University where he is currently doing research in astrophysics. More information about Dr. Scaringi can be found at <http://www.phys.ttu.edu/~simo/>.

Abstract

From planets to super-massive black holes, accretion (the accumulation of matter on a self-gravitating body through gravity) is the process by which most objects in the Universe grow in mass. Accretion requires angular momentum to be lost from the in-falling material, usually resulting in the formation of a so-called accretion disk. Although the importance of accretion disks have been recognized for many years, the detailed physics and dynamics are still poorly understood. Over the last decade we have been able to link the accretion physics of stellar-mass black holes with those of super-massive black holes, with over nine orders of magnitude difference in mass. However, we do not yet know if the physics of accretion can be extended to include other systems, such as accreting white dwarfs, neutron stars, and young-stellar objects. Although seemingly different observationally, I will show how all these different types of accreting systems have also revealed strikingly similar properties. Being just the "tip of the iceberg", the discoveries I will present suggest that a single unifying physical model might exist to explain how accretion disks behave throughout the Universe, irrespective of the mass, size, or type of the accreting object. I will end the talk by briefly reviewing current and future missions/instruments which will provide exciting new insights into this topic, including the BlackGEM array currently under construction in Chile.