

## NITheP Colloquium

Monday, 26 October 2020, 16h00

**Dr Cora Dvorkin**  
Harvard University



### Unveiling the Nature of Dark Matter with Cosmological Observables

**Abstract:** Measurements of the Cosmic Microwave Background and the large-scale structure of the universe have made it possible to determine with great precision the universe's inventory, as well as properties of its initial conditions. However, there are profound questions that remain unanswered. Cosmological observations and galaxy dynamics seem to imply that 84% of all matter in the universe is composed of dark matter, which is not accounted for by the Standard Model of particles. The particle nature of dark matter is one of the most intriguing puzzles of our time. The wealth of knowledge which is and will soon be available from cosmological surveys will reveal new information about our universe. I will discuss how we can use new and complementary data sets to improve our understanding of the particle nature of dark matter at different scales.

**Bio:** Dr. Cora Dvorkin is an Associate Professor in the Department of Physics at Harvard University. Prof. Dvorkin is a theoretical cosmologist. Her areas of interest are: the physics of the early universe, the particle nature of dark matter, the source of the accelerated expansion of the universe, neutrinos/light relics. She uses observables such as the Cosmic Microwave Background (CMB), the large-scale structure of the universe, 21-cm radiation, and strong gravitational lensing to shed light on these questions. She was the co-leader of the Inflation analysis group for the proposed CMB-S4 experiment. Prior to this, she was the leader of the Dark Matter analysis group. Prof. Dvorkin is the Harvard Representative at the newly NSF-funded Institute for Artificial Intelligence and Fundamental Interactions (IAIFI)'s Board. Dvorkin has been awarded the 2019 DOE Early Career award and has been named the "2018 Scientist of the year" by the Harvard Foundation for "Salient Contributions to Physics, Cosmology and STEM Education". She has also been awarded a Radcliffe Institute Fellowship for 2018-2019 and a Shutzer Professorship at the Radcliffe Institute for the period 2015-2019. In 2012, she was given the "Martin and Beate Block Award", awarded to the best young physicist by the Aspen Center for Physics.

Professor Dvorkin, born and raised in Buenos Aires, Argentina, received her Diploma in Physics from the University of Buenos Aires with honors. She earned her Ph.D. in the Department of Physics at the University of Chicago in 2011, where she won the "Sydney Bloomenthal Fellowship for "outstanding performance in research". She has conducted postdoctoral research at the School of Natural Sciences at the Institute for Advanced Study in Princeton (from 2011 to 2014) and at the Institute for Theory and Computation at the Center for Astrophysics at Harvard University (from 2014 to 2015), where she was both a Hubble Fellow and an ITC fellow. She has conducted postdoctoral research at the School of Natural Sciences at the Institute for Advanced Study in Princeton (from 2011 to 2014) and at the Institute for Theory and Computation at the Center for Astrophysics at Harvard University (from 2014 to 2015), where she was both a Hubble Fellow and an ITC fellow.

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