Contribution ID: **1300**   Type: **Parallel Talk**

Dark Matter Data Center

Saturday, 9 July 2022 18:20 (20 minutes)

The quest for Dark Matter (DM) and its nature has been puzzling scientists for nearly a century. This puzzle has engendered theories that span nearly hundred orders of magnitude in mass scales with widely contrasting nature. It has also motivated decades of experimental efforts correspondingly different in the wide variety of their target masses, observables, technologies and interpretations. The last two decades have seen no less than twenty experiments designed to directly detect the Weakly Interacting Massive Particle (WIMP) paradigm of DM alone. Their sensitivities span five orders of magnitude and use Ionization, Scintillation, Heat, Sound, Images and several combinations of these as their detection methods. In addition, WIMPS are also searched for at Indirect Detection and Collider experiments. This labyrinth of theories and experiments make their analyses and combination a daunting task. The Dark Matter Data Center (DMDC) is an ORIGINS Excellence Cluster initiative, supported by the Max Planck Computation and Data Facility (MPCDF). It aims at bringing together the large amount of recorded data and theories in a unified platform, making it easily accessible for the DM community. It offers a repository where data, methods and code are clearly presented in a unified interface for comparison, reproduction, combination and analysis. The DMDC is a forum where Experimental Collaborations can directly publish their data and Phenomenologists the implementation of their models, in accordance to Open Science principles. Alongside the repositories, it also offers easy online visualization of the hosted data. It offers an online simulation of signal predictions for experiments using model data supplied by the users, all in a friendly web-based GUI. The DMDC also hosts guidance tools from the Collaborations illustrating the usage and analysis of their data through Binders that run online and support all popular programming platforms. It hosts a continuously growing compendium of ready-to-use, copy-pastable code examples for inference and simulations. It can also provide support and computational power for comparison of model and experimental observations as well as the combination of these results using modern and robust statistical tools through similar Binders. We are already online with more databases and features being added continuously! Find us at https://www.origins-cluster.de/odsl/dark-matter-data-center

In-person participation

Yes

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Session Classification: Dark Matter

Track Classification: Dark Matter