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Distinguishing dark matter interactions with direct dark matter detection experiments JAYDEN NEWSTEAD, LAWRENCE KRAUSS, SUBIR SABHARWAL, Arizona State Univ, JAMES DENT, University of Louisiana — The nature of the observed dark matter is almost entirely unknown, only indirect observations have been made via its gravitational effects. Working under the assumption that the dark matter is made up of microscopic particles, experiments have been devised to confirm their existence. While there has yet to be any convincing evidence for particle dark matter, it is interesting to ask the question: "what can we learn about the nature of dark matter particles through experiment?". In this talk I will present work aimed at answering this question for direct dark matter detection experiments. Our approach maps out a general model space for weakly interacting massive particles (WIMPs) and analyzes the experimental signatures of the various models. Recently we found that direct detection experiments may have a greater discriminating power than previously thought.

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