

Prize Talk

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Direct dark matter detection: What if there's no WIMP?

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More than a century has passed since the first hint of the existence of dark matter in the Universe. This hint has since been corroborated by a plethora of further astronomical observations revealing that even most of the matter in the Universe is dark. Observing the respective dark matter particles, and elucidating their nature, became one of the most tantalizing endeavors of modern physics, with the Weakly Inter-

acting Massive Particle (WIMP) being a prime suspect. Tremendous experimental efforts and successes have allowed a large portion of the WIMP parameter space to be explored in recent decades, with optimized experiments for direct dark matter detection taking the lead in these searches. But no WIMP in sight thus far. Today, a new generation of highly sensitive, large-scale direct detection experiments is at the ready to observe WIMPs, and their successors are already being planned. But what if there's no WIMP? This talk will discuss the diversity of the worldwide direct dark matter search program beyond the traditional WIMP and provide a glimpse of where the near future will take us in this effort to directly observe dark matter in the laboratory.