

# Robert E. Bell Lecture



## You Can't See Them, But They're EVERYWHERE!

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MIT

Friday 25<sup>th</sup> October, 3:30-4:30pm  
Ernest Rutherford Physics Building  
Keys Auditorium (room 112)

Our sun emits around  $10^{38}$  neutrinos per second. And more than 40 billion neutrinos go through your thumbnail every second. There are approximately a billion neutrinos per cubic meter in all parts of space, left over from the big bang. But despite being surrounded by them, we know surprisingly little about these fundamental particles. This is because their cross section is very small and so we must build monumental detectors to have any chance to see them interact. With this said, one thing we have learned, is that they do not obey one rule of the Standard Model: neutrinos are not massless, as predicted. Given this discovery, it is well worth exploring what other surprising behaviour neutrinos might have. This colloquium examines our latest plan of attack to learn more about these independent particles, as neutrino physics enters the "precision age."



Illustration by Sandbox Studio, Chicago