1125-A0-602      **Matthew Richey\***, St. Olaf College, Northfield, MN 55057. *Take what you have gathered from coincidence: understanding and using randomness.*

What does it mean to be random? We all encounter randomness every day – it is part of how we talk about the weather, sports, and even love. Despite being so familiar, randomness has proven to be an elusive idea to pin down. Even mathematicians have struggled to define randomness, leading to competing and sometimes conflicting definitions. Whatever it is, randomness is a driving force behind many modern computational algorithms. These algorithms — the Metropolis Algorithm, Markov chain Monte Carlo Methods, and others — use randomness as the secret ingredient that makes it possible to tackle famously difficult problems such as the Traveling Salesperson Problem and image reconstruction. Using many pictures (and even a few Bob Dylan references), this lecture will reveal the historical quest to define randomness and illustrate how randomness allows us to solve many of today's most challenging applied mathematics problems. (Received September 07, 2016)