MATHEMATICS & COMPUTER SCIENCE SEMINAR SERIES

Irrationality: Like Blackness in the Night Sky

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Recall that every real number falls into exactly one of two categories: either it's rational (that is, it can be expressed as a ratio, or fraction, of two whole numbers), or it's not. Though you probably learned this seemingly fundamental fact in middle school or high school, it's important to remember that the concept of irrationality was not always so widely accepted. In fact, the discovery of irrational numbers (by the Pythagorean philosopher Hippasus in the 5th century BC) is rumored to have greatly angered the gods. Despite the fact that mankind's relationship with irrational numbers has come a very long way in the past two-and-a-half millennia, we *still* seem to favor rational numbers. It's famously been said that rational numbers are like the stars in the night sky. In this talk, however, we will focus on the often-overlooked blackness in the night sky: the irrational numbers. And we will do this by considering "rational approximations" of them. Through this process, we will uncover a number which is more irrational than all of the others. And, what's even more surprising: this particular number is ubiquitous in nature precisely because of its irrationality!

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