1145-01-110 **William Dunham*** (bdunham@brynmawr.edu). *A Morsel from Euler.*

Consider the infinite series:

$$\tan(\pi/4) + \frac{1}{2}\tan(\pi/8) + \frac{1}{4}\tan(\pi/16) + \frac{1}{8}\tan(\pi/32) + \frac{1}{16}\tan(\pi/64) + \cdots .$$

A comparison test easily establishes convergence, but determining the *exact* sum is not for the faint of heart. Who could possibly do such a thing?

The answer is Leonhard Euler. To find the exact value, he developed a peculiar trig identity and then employed logarithms, derivatives, and something he called "infinite numbers." The sum of this series, which is simple in form but far from obvious, provides striking evidence of Euler's mathematical agility.

This talk is for those who want to match wits with one of history's great mathematicians. (Received July 31, 2018)