



## Colloquium

March 27, 4:05 p.m. (9<sup>th</sup> Period)  
(in the Atrium)

**Speaker:** Dr. Paul Robinson

**Title:** Higher Trigonometry

### Abstract

Everyone knows that the trigonometric functions sine and cosine are the unique solutions to the initial value problem

$$s' = c, c = s; s(0) = 0, c(0) = 1$$

Everyone should also know that the whole of trigonometry may be constructed upon this foundation. It is perhaps natural to ask what develops from the initial value problem

$$s' = c^2, c = s^2; s(0) = 0, c(0) = 1$$

The functions that satisfy this system were first properly investigated towards the end of the nineteenth century. They were then largely ignored until the start of the twenty-first century, when interesting connections to geometry and combinatorics came to light. We shall present some of the theory of these functions, with historical sidelines.