Colloquium

March 27, 4:05 p.m. (9th 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

\[ s' = c, \quad c = s; \quad s(0) = 0, \quad c(0) = 1 \]

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

\[ s' = c^2, \quad c = s^2; \quad s(0) = 0, \quad c(0) = 1 \]

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.