



**PURDUE UNIVERSITY**

**Department of Mathematics Colloquium**

Speaker: Professor Louis de Branges, Purdue University

Title: "A Generalization of the Gamma Function"

Date: Tuesday, August 24, 2010

Time: 4:30 P.M.

Place: MATH 175

**Abstract**

The gamma function was discovered by Leonard Euler in 1730 as the solution of a recurrence relation. In the notation of Weierstrass the gamma function is a function  $\Gamma(s)$  of a complex variable  $s$  which is analytic in the complex plane with the exception of singularities at the nonpositive integers and which satisfies the recurrence relation

$$s\Gamma(s) = \Gamma(s + 1).$$

The solution given by Euler is best possible in a sense which is now clarified. Analytic functions are now constructed which resemble the gamma function in its relationship to a shift but which do not satisfy a functional identity. The functions are analytic and without zeros in a half-plane. In 2009 an argument was found showing that such functions can be constructed from Hecke zeta functions. It is unfortunate that no reader has been found and that no seminar presentation has been possible as a proof of the Riemann hypothesis results for those Hecke zeta functions which have no singularity. Since the argument in Fourier analysis is elementary, the obstacle may lie in the generalization of the gamma function. This lecture may resolve the obstacle.

Refreshments will be served in the Math Library Lounge at 4:00 p.m.