The Fullerton College Mathematics Colloquium
presents

Dr. Bernard Russo

UCI

"Derivations or Playing Havoc with the Product Rule, Part V: The Meaning of the Second Cohomology Group"

ABSTRACT:

As stated in part IV, which participants/websurfers can find the slides for, along with Parts I-III, at

http://staffwww.fullcoll.edu/dclahane/ma/ma2012to2013.htm (see the Nov. 1 calendar entry),

the statement that all derivations of an associative algebra are inner is the same as saying that the first cohomology group vanishes. In this talk, we shall give the background on equivalence relations and quotients of abelian groups in order to define rigorously the cohomology groups of an associative algebra. Then we shall give an interpretation of the statement that the second cohomology group vanishes.

Professor Russo served for several years as the Chair of the UCI Department of Mathematics during a period of explosive growth in the stature of the Department, and he also served as the Associate Secretary of the Western Section of the American Mathematical Society. He has authored or coauthored many papers in classical and modern analysis and operator algebras.

Christopher Lao

Fullerton College

"Lehmer's Mahler Measure Problem"

ABSTRACT:

Suppose that $P(x)$ is a polynomial with integer coefficients. It turns out that $P(x)$ is either constant, or can be factored into a product of the form $a(x-\alpha_1)(x-\alpha_2)(x-\alpha_3)\dots(x-\alpha_n)$, where a is the leading coefficient of $P(x)$ and α_i is a complex number for each i. For each such i, let β_i be the larger of the two numbers 1 and $|\alpha_i|$. The *Mahler measure* of $P(x)$ can be defined as $|a|\beta_1\beta_2\dots\beta_n$ if $n \geq 1$ and $|a|$ if $P(x) = a$. In a now famous paper that appeared in 1933 in the *Annals of Mathematics*, widely considered to be one of the top 2 journals in mathematics (if not the best), the mathematician Derrick H. Lehmer conjectured that there is a real number $\mu > 1$ such that for all such $P(x)$, either $P(x)$ is 0 only at roots of unity or 0, or the Mahler measure of $P(x)$ is at least μ. This problem has remained unsolved for nearly 80 years.

Mr. Lao is completing his senior year in high school and is mentored by Dr. Dana Clahane, after having placed at the top of his summer calculus class at FC.

Thursday, October 25, 2012
12:45-2:50pm
North Science Building, Room 623
Fullerton College
321 E. Chapman, Fullerton CA 92832-2095

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