



Department of Mathematics

Colloquium Series

Dr. Phil Kutzko

Department of Mathematics
University of Iowa

Local Number Theory: An Introduction

Abstract: One of the oldest questions in mathematics is the question of what – if any – solutions an equation has if we only allow solutions that are whole numbers. Europeans called these equations *Diophantine* equations when they first began to study them but these equations and their solutions were studied in all ancient cultures. One approach to studying such an equation is to ask the easier question of finding all solutions *modulo* p^n . That is, we replace the equation by a congruence modulo p^n where p is a given prime number and n is a positive integer. Attempts to study such congruences for a fixed prime p and all integers n led to the development of what is called the *p-adic numbers* and this in turn led to the rise of what is called today *local number theory*. I will, in this talk, provide an elementary introduction to this area and describe some recent areas of research.

About the Speaker: Phil Kutzko was born and raised in New York City and is a product of the New York City public schools. He attended the City College of New York and received his M.S. and Ph.D. degrees at the University of Wisconsin. He joined the University of Iowa mathematics faculty in 1974. Kutzko's research is in the area of pure mathematics known as *the representation theory of p-adic groups*, an area with applications to the theory of numbers. He is the author, with Colin Bushnell, of a monograph in *the Annals of Mathematics Studies* (Princeton) and has lectured widely on his work. He is presently a University of Iowa Collegiate Fellow, Fellow of the AAAS and a Fellow of the American Mathematical Society. Kutzko is honored to have played a part in the University of Iowa Department of Mathematics' activities in minority graduate education and in the extension of these activities to other departments of math sciences nationally as well as to STEM departments at the Iowa Regents universities. In this context, he serves as Principal Investigator and Senior Advisor to the Alfred E. Sloan Foundation/University of Iowa Center for Excellent Mentoring as well as director of the National Alliance for Doctoral Studies in the Mathematical Sciences, an NSF funded project which involves mathematical sciences departments at a variety of colleges and universities and whose goal is to increase the number of doctoral degrees in the mathematical sciences awarded to underrepresented US minority students. Kutzko was honored for his work in this area with the 2008 Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring. This award was presented to him by President Obama in a White House ceremony in January, 2010.

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(Refreshments will be served)

Contact Information: Dr. Csaba Toth, 818-677-2826 csaba.toth@csun.edu

