

Submittee: Nils Bruin
Date Submitted: 2013-09-16 12:44
Title: Distinguished Visitor Frits Beukers
Event Type: Lecture-Seminar-Series

Location:
Simon Fraser University

Dates:
Visit: April 28 - May 11, 2013

Topic:
Hypergeometric functions

Scientific Highlights:

PIMS Colloquium /// Thursday, May 2, 2013, Irmacs Theatre /// 2:00 pm, Frits Beukers (Utrecht University) /// Title: What are hypergeometric functions? /// Abstract: Hypergeometric functions occur in many shapes and flavours throughout mathematics and mathematical physics. The first such functions were introduced by Euler and studied in depth by Gauss. Since the end of the 19th the concept of hypergeometric functions was extended in many directions, thus creating a veritable zoo of different functions both in one variable and several variables. By the end of the 1980's Gelfand, Kapranov and Zelevinsky introduced the concept of A-hypergeometric functions, which created a remarkable amount of order through combinatorial ideas. In this lecture we give a first introduction to hypergeometric functions and explain the idea of A-hypergeometric functions. /// 2:50 - 3:10: Coffee/tea /// 3:10 pm, Tom Archibald (SFU) /// Title: The hypergeometric series and the hypergeometric equation: highlights of their roles in classical mathematics /// Abstract: Things hypergeometric reach out in various directions that may be a little surprising. In this talk we will look at some nineteenth-century developments. Beginning with some results of Gauss, we will sample from work by E. E. Kummer (who, in providing solutions for the hypergeometric equation, had noticed connections to Legendre's period relations for elliptic integrals); and by L. Fuchs (who characterized the hypergeometric equation among linear DEs of the "Fuchsian" class). These studies are linked to work by Fuchs, Hermite and others on modular equations, and the detailed history reveals some surprising connections in classical mathematics.

----- PIMS Number Theory Seminar ///
Tuesday, May 7, 2013, SFU K9509 /// 2:00 pm, Frits Beukers (Utrecht University) /// Title: Analytic aspects of hypergeometric functions /// Abstract: The hypergeometric functions of Gauss formed the perfect testing ground for Riemann's ideas on analytic continuation of complex analytic functions. Many properties of hypergeometric functions became evident through the use of the so-called monodromy group. We shall explain these ideas and show some applications. Time permitting, we discuss possibilities to extend these ideas to the several variable setting. /// 3:00pm, Frits Beukers (Utrecht University) /// Title: Arithmetic aspects of hypergeometric functions /// Abstract: By the end of the 1980's several authors introduced the concept of hypergeometric function on a finite field. Although this is a purely number theoretical finite sum, it shares many properties with its analytic counterpart. The special values of these functions turn out to be related to point counting on algebraic varieties over finite fields or better, traces of Frobenius operators. In this lecture we introduce these finite hypergeometric functions and describe some of

their properties.

Organizers:

Bruin, Nils, Mathematics, SFU

Speakers:

Beukers, Frits, Mathematics, Utrecht

Links:
