Analysis Seminar

Speaker:

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Date:

Aug. 13, 2018, at 10:00 am

Location: HH3017

Title:

Some Arithmetical Results on Certain Multivariate Power Series

Abstract:

In this talk, we discuss some irrational and transcendental properties of certain multivariate power series, such as the q-exponential series

$$\sum_{i_1+\cdots+i_n \geq k} \frac{x_1^{i_1} \cdots x_n^{i_n}}{[i_1 + \cdots + i_n - k]_q!}'$$

where q, k are integers with $k \geq 0$ and $|q| > 1$, and

$$[n]_q! = [n]! = \frac{(1-q^n)(1-q^{n-1})\cdots(1-q)}{(1-q)^n},$$

the partial theta series

$$\sum_{\substack{i_1+\cdots+i_n \geq k \\ i_1,\ldots,i_n \geq 0}} q^{(i_1+\cdots+i_n-k)(i_1+\cdots+i_n-k+1)/2} \; x_1^{i_1} \cdots x_n^{i_n},$$

and many other series. The main idea is to use Cauchy's formula and an integral representation to derive a finite sum representation for the given series, and then use some well-known arithmetical properties to obtain the new properties. The results discussed here are mainly from my joint work with Peter Bundschuh (Arithmetical results on certain multivariate power series, *Bull. London Math. Soc.*, 38(2006), 192-200), and with Qiang Wu (Transcendence of some multivariate power series, *Front. Math. China*, 2014, 9(2): 425-430).