UNIVERSITÄT SALZBURG

Fachbereich Mathematik
Hellbrunnerstraße 34
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Gastvortrag

Dienstag, 2. April 2019
Uhrzeit: 15:15 Uhr
Seminarraum I

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On Goormaghtigh's equation

Abstract:

In my talk I will present results that come from a joint work with M. Bennett and A. Gherga from The University of British Columbia. We studied Goormaghtigh's equation:

$$\frac{x^m-1}{x-1} = \frac{y^n-1}{y-1}\ ,\ y > x > 1,\ m > n > 2.$$

There are two known solutions $(x, y, m, n) = (2,5,5,3), (2,90,13,3)$ and it is believed that these are the only solutions. It is not known if this equation has finitely or infinitely many solutions, and not even if that is the case if we fix one of the variables. It is known that there are finitely many solutions if we fix any two variables. Moreover, there are effective results in all cases, except when the two fixed variables are the exponents m and n. If the fixed m and n additionally satisfy $\gcd(m-1, n-1) > 1$, then there is an effective finiteness result. My co-authors and I showed that if $n \geq 3$ is a fixed integer, then there exists an effectively computable constant $c(n)$ such that $\max\{x, y, m\} < c(n)$ for all x, y and m that satisfy Goormaghtigh's equation with $\gcd(m-1, n-1) > 1$. In case $n \in \{3,4,5\}$, we solved the equation completely, subject to this non-coprimality condition.

Eingeladen von Clemens Fuchs