

## ***PhD Position***

### ***“Algebra meets Analysis and Number Theory”***

In our research group at the Faculty of Mathematics of the University of Vienna a new PhD-position is available. Candidates are expected to have a strong background in algebra and algebraic geometry and an interest in applying the respective techniques to the study of algebraic aspects of

### ***Fuchsian Differential Equations.***

These are ordinary linear differential equations with polynomial or holomorphic coefficients whose intricacy lies in the singularities of the equation: points where the leading coefficient vanishes to a high order. The main question, studied for two centuries without finding a complete answer yet, is to understand the equations whose solutions are *algebraic* functions, culminating in the famous Grothendieck-Katz  $p$ -curvature conjecture for equations defined over the integers: Can one characterize the existence of a basis of algebraic solutions by the reduction of the equation modulo  $p$ , for almost all primes  $p$ .

Despite many important results, the general case remains open, as well as many related questions and problems. The beauty of the subject is the variety of methods one can apply: commutative algebra and algebraic geometry, differential Galois theory, complex and functional analysis, analytic number theory, combinatorics.

Candidates are encouraged to contact me at <herwig.hauser@univie.ac.at> for further information.

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