



SCUOLA  
NORMALE  
SUPERIORE

## SEMINARI MATEMATICA

**Il dr. Lars Kuehne**  
(SNS)

Terrà due seminari dal titolo:

**“Modular forms”**

secondo il seguente calendario:

Lunedì 24 novembre 2014  
ore 14:00, Aula Mancini

Lunedì 1 dicembre 2014  
Ore 14:00, Aula Mancini

**Abstract:** *In these two talks, a quick introduction to modular forms and some of their arithmetic utilizations shall be given. On the one hand, basic facts about modular forms (e.g. Atkin-Lehner theory) are given to promote a better understanding of an upcoming talk of Rafael van K nel about modularity and the  $S$ -unit equation. On the other hand, I highlight some more advanced aspects of this ever-growing area of mathematical research, which hopefully present good motivation to the novice. The relation between modular forms and Dirichlet series as well as the construction of Galois representations associated with modular forms is covered (without complete proofs, of course). As far as time permits, I indicate how these representations are used, in particular if they are combined with modularity results. Such applications include congruences of arithmetic functions, diophantine equations (Hellegouarch-Frey, Bennett-Dahmen) and the Sato-Tate conjecture for elliptic curves. However, the modularity results (Wiles-Taylor et al.) will be used solely as a blackbox, avoiding a rather intricate part of modern arithmetic.”*