

Gemeinsame Veranstaltung von  
**Humboldt-Universität zu Berlin, Institut für Physik**  
(Theorie der Elementarteilchen / Computerorientierte Theoretische Physik)  
**DESY, Zeuthen**

**SEMINAR**  
**Feldtheorie auf dem Gitter und**  
**Phänomenologie der Elementarteilchen**

Am Montag, dem **04. Juli 2011**, um **16:00 Uhr s.t.** spricht

Robert Wells

Cambridge U.

zum Thema

**Perturbative Renormalisation of Lattice**  
**N=4 Super Yang-Mills Theory**

**Abstract**

In the first half of the talk we will give a short introduction to SUSY on the lattice using the simple example of supersymmetric quantum mechanics. We will focus on how the additional symmetry maintained by the lattice construction reduces the number of counterterms that need to be fine-tuned. In the second part we will discuss N=4 super Yang-Mills theory on a four dimensional lattice. We will show that the counterterms that can appear as the lattice spacing is taken to zero are heavily restricted by the retained supercharge and highly symmetric nature of the A4\* lattice. We then calculate the logarithmic part of the counterterms and indicate how the finite pieces can also be extracted. Knowledge of these divergent pieces allows us tune the bare couplings of the lattice theory as the continuum limit is approached in such a way as to ensure that full supersymmetry is restored in the limit of vanishing lattice spacing.

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(Lageplan: [http://linde.physik.hu-berlin.de/images/lageplan\\_neu.gif](http://linde.physik.hu-berlin.de/images/lageplan_neu.gif))

**Web:** <http://latticeseminar.desy.de/>