

COURS D'ÉCOLE DOCTORALE

**Conformal Field Theory Techniques in  $D \geq 3$  dimensions**

S. RYCHKOV, LPTENS et Université Pierre et Marie Curie

**Cours de 14h à 17h**

**Les mardis 14, 21 et 28 Février et les jeudis 16, 23 Février et 1<sup>er</sup> Mars 2012**

Salle L367, Département de Physique de l'ENS  
24 rue Lhomond – 75005 Paris

1. Physical and mathematical foundations of conformal symmetry.  
Examples of conformally invariant quantum field theories.  
Relation between scale and conformal invariance.
  
2. Primary operators and their properties.  
Constraints on operator dimensions imposed by unitarity and reflection positivity.
  
3. Two and three point functions of primary operators.  
Embedding formalism for dealing with correlators of tensor operators.
  
4. Operator Product Expansion.  
Conformal blocks and various their representations.  
Conformal blocks for tensor fields.
  
5. Constraints imposed by crossing symmetry. Conformal bootstrap.  
Applications: General bounds on the operator dimensions and OPE coefficients.  
Critical exponents of the 3D Ising model.
  
6. Open problems.