

**ESI - SIMONS JUNIOR PROFESSOR  
LECTURE COURSE  
Summer Term 2015**

The Erwin Schrödinger International Institute of Mathematical Physics (ESI) of the University of Vienna is pleased to offer the following Lecture Course held by Simons Junior Professor **Nils Carqueville** during the Summer Term of 2015:

**Introduction to category theory**  
**Nils Carqueville** (U Vienna)

Lecture Course (250093 VO): Thursday, 11:15 - 12:45  
Begin: March 5, 2015  
Venue: ESI, Schrödinger Lecture Hall

**Abstract:** This course is an introduction to category theory, a theory of structures and powerful organising principles with many applications. We start with an extended discussion of the basic definitions and properties of categories and functors, with many illustrating and motivating examples from various areas of mathematics.

Important milestones of later parts of the lecture course will be the study of universal properties in the following guises: (i) adjoint functors; (ii) representability and the Yoneda lemma; (iii) limits (special cases of which are products, equalisers, or pullbacks) and colimits (e.g. sums, coequalisers, or pushouts).

The last part of the course will depend on the audience's taste; possible topics include (a) (co)ends (generalising (co)limits) and Kan extensions; (b) the relation to logic and computer science (lambda calculus and Curry-Howard correspondence), (c) monoidal categories with additional structures (relevant e.g. for topological and conformal field theories), or (d) aspects of "categorification" (e.g. of representations of Lie algebras or of polynomial knot invariants).

Joachim Schwermer  
Director