

**ESI SENIOR RESEARCH FELLOW
LECTURE COURSE
Summer Term 2019**

The Erwin Schrödinger International Institute for Mathematics and Physics (ESI) of the University of Vienna offers the following Lecture Course held by a Senior Research Fellow in residence during the Summer Term 2019:

Supergravity**Antoine Van Proeyen** (KU Leuven)**Lecture Course (260091 VU): March 7 - 29, 2019**

Time: 13:15 - 14:45

Start: Thursday, March 7, 2019**Further Dates:** Friday, March 8, 2019

Thursday, March 14, 2019, Friday, March 15, 2019

Friday, March 22, 2019

Thursday, March 28, 2019, Friday, March 29, 2019

End: Friday, March 29, 2019**Venue:** ESI, Schrödinger Lecture Hall**Abstract:**

Students with a basic knowledge of supersymmetry will be introduced in the basic ingredients of a supergravity theory. They will learn how to obtain an action that is invariant under a set of local supersymmetry transformations satisfying an algebra that contains general coordinate transformations. They will be introduced in the tools that are useful for constructing couplings of matter fields to the simplest supergravity theories: the superconformal calculus. In particular they will in this way obtain the basic structure of N=1 matter-coupled supergravity.

Content of the lecture course:

1. A few ingredients. Here could come a bit notation on the spinors, the Rarita-Schwinger field, symmetry transformations in general, and differential geometry.
2. The basic N=1 supergravity in D=4. First a repetition about first and second order formulation of general relativity and then generalizing it to the the basic N=1 supergravity in D=4.
3. Gauged spacetime translations and the superconformal group.
4. The conformal approach to pure N=1 supergravity.
5. Construction of the matter-coupled N=1 supergravity.
6. The physical N=1 matter-coupled supergravity.

Aims for the course:

These lectures are intended to learn the students the basic ingredients of a supergravity theory and teach them how to obtain a supergravity theory using the tools of superconformal calculus.

Course website: <https://www.esi.ac.at/activities/events/2019/srf-lecture-course-antoine-van-proeyen-ss19>Christoph Dellago
Director