



EDDY ARDONNE

From Sweden to France



Project: **Topological phases of condensed matter**

Research topic: **Physics**

Swedish Institution: **Stockholm University**

French Institution: **Paris-Saclay / Sorbonne / Uni of Toulouse / Uni of Strasbourg**

Dates of mobility: **08/02/2015 to 19/02/2015**

Program: **SFVE-A (ex-FRÖ)**



PRESENTATION

[Eddy Ardonne](#) is Associate Professor and member of the [Theory of Quantum Matter group](#) at the [Department of Physics](#) of [Stockholm University](#). He obtained his PhD in 2002 from the [University of Amsterdam](#). His main field of research is condensed matter theory, hosting a particular proclivity for low dimensional and strongly interacting systems, e.g., topological phases of matter.

ACTIVITIES IN FRANCE

Eddy Ardonne started his mobility by visiting [Benoit Estienne](#), [Yacine Ikhlef](#) and [Raoul Santachiara](#) at the [Sorbonne University](#) (previously UPMC), with whom he discussed the matrix product state representation for fractional quantum Hall states. A future collaboration was tabled. He then travelled to the [University of Toulouse](#) and the [Laboratory of Theoretical Physics](#), where he met with [Dider Poilblanc](#), [Pierre Pujol](#) and [Sylvain Capponi](#). They discussed among others Poilblanc's work on chiral edge modes of critical spin liquids. Ardonne held a journal club discussion on parafermionic zero modes.

Subsequently, he travelled to the [University of Lorraine](#) and the Laboratory of Theoretical Physics and Chemistry ([LPCT](#)) in Nancy and visited the [Statistical Physics group](#), where he exchanged views on fractional quantum Hall states with [Jérôme Dubail](#) and [Malte Henkel](#). Dubail and Ardonne planned a joint publication and Ardonne held the same talk on parafermionic zero modes.

He then travelled to the [University of Strasbourg](#) and [Guido Pupillo](#) at the [Laboratory of Quantum Physics](#), with whom he discussed how to realize topological phases using systems of ultra cold atoms, and the relation between critical points of one-dimensional models that exhibit topological phases, on which Ardonne also held a presentation. Finally, he returned to Paris and visited [Vincent Pasquier](#) at the [CEA Institute for Theoretical Physics](#) at [University Paris-Saclay](#). They deliberated on the representation of the Braid group, using a quantum Hall state with excitations that exhibit non-Abelian statistics. They both work on the problem and might initiate a collaboration on this matter in the future.