

## Invitation to IQ<sup>ST</sup> Seminar

on Monday, May 7th, 2018, 10am  
University of Stuttgart  
PI5, Room 3.123  
Pfaffenwaldring 57

### **Julius de Hond**

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### **Rydberg interactions in 1D on an atom chip**

Rydberg states are often cited as interesting candidates for controlling the interactions between atoms in an ultracold gas. There are many proposals and demonstrations of their usefulness as a tool for quantum information, be it via resonant excitation of Rydberg states, or via off-resonantly mixing in Rydberg character into the ground state (so-called ‘dressing’). In my talk I will discuss our efforts at the University of Amsterdam towards demonstrating and utilizing interactions between Rydberg atoms in the CELSIUS atom chip experiment. Our atom chip permits us to trap and cool highly elongated gases down to the point of condensation. We have theoretically investigated Rydberg dressing of such (quasi-)condensates, and found it to be favorable over their 3D counterparts. Experimentally, we were initially marred by electric fields emanating from the surface of our chip, strongly limiting the coherence. I will briefly discuss our attempts to circumvent this, and finally show how we were able to observe Rydberg–Rydberg interactions when exciting resonantly.