QUANTUM WHIRLWIND

Lauriane Chomaz –I started my PhD in the Jean Dalibard's team four months ago. It is an experimental PhD on cold atom systems. Our goal is to simulate, through these cold atom samples, some more complex physical systems that we can't solve theoretically. We will try, through our system of cold atoms, which is a gas trapped and cooled thanks to lasers down to very low temperatures, a few billionths of a degree above the absolute zero. This system that we control very precisely and probe in an accurate and quantum way, we want to place it in a situation equivalent to that of quantum Hall effect, which is another effect of quantum physics that appears in conductors, in an electron gas in fact, which is subjected to a magnetic field.

I find it quite fascinating, like discovering new landscapes. We see things that very few people have seen around the world, about ten of them. We see here vortex networks in our gases, six or seven vortices which organize themselves and it is something that very few people have seen besides us. A vortex is a point where, for us, there are no atoms, around which the phase of the macroscopic wavefunction of the gas winds. It is really like a whirlwind, nothing in the center and the fluid whirl around. We see it by performing an expansion of our cloud of atoms. This expansion is really like a magnifying glass in front of our cloud. So we get to see these holes where there are no atoms. What I like is the wonder we feel facing what we manage to do from the equations, the realities that we achieve, which are logical but in a logic that goes beyond the common world.

Teaching was pretty funny the first few times, as I went back to my school. It was the first time I went back, to teach. My school was the École Polytechnique. Going back onto the Saclay plateau, passing the military grids, it felt weird. Then ending up in front of a classroom and getting to explain what we understood very few years earlier and actually raising some passion in people, at least some interest, this gratifying and enhancing aspect, to say that we are a little useful, it's rather enjoyable....

3min 24sec