The many-body physics of composite quantum particles

By
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Host: Prof. Alfred Huan

Abstract
In this talk, I will first explain why to properly treat interactions between composite quantum particles is indeed tricky. I will then show, through fully intuitive arguments, how to handle these interactions and to visualize the resulting many-body effects through new diagrams, called Shiva and Kali. In a third part, I will briefly outline the many-body formalism I have constructed. I will end with a few predicted physical effects, taken in nonlinear semiconductor optics, which directly follow from these new ideas.

Biography
Monique learnt Maths and Physics at the Ecole Normale Superieure of Paris and did her PhD with Philippe Nozieres. After graduation, she spent two years doing postdoctoral research at Cornell - working on renormalization group with Ken Wilson and Michael Fisher. During these years, she also collaborated with researchers (including Anderson, Rice and Brinkman) from Bell Labs working on exciton physics. Subsequently, Phil Anderson offered her husband Roland and her permanent positions at Bell labs. However, they preferred Paris and declined the offer. Back in Paris, Monique worked among experimentalists studying nonlinear optics in semiconductors. She has made a few important predictions, one being the "exciton optical Stark effect".

About ten years ago, Monique started developing a new formalism for many-body effects of composite quantum particles and has cumulated about sixty publications in this area. Interestingly, her formalism does not use the conventional Green functions, Feynman diagrams etc.

Besides Physics, Monique loves travelling and is a very good cook.