De Oosterpoort, Groningen
Friday, 7 April 2017

Plenary Lecture

Bart van Wees (Physics of Nanodevices group, Zernike Institute for Advanced Materials, RUG) - Nanospintronics

Abstract:

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The discovery of graphene, a single layer of hexagonally arranged carbon atoms, as the ultimate two-dimensional material over a decade ago has triggered a broad range of basic and applied research. Graphene has many unique properties, which are currently being explored. In this talk I will address one important aspect of graphene, its ability to carry electron spins and magnetic spin information efficiently and over long distances. I will give an introduction into spintronics and its applications, and then proceed to show that graphene is the ideal platform for new applications, which make use of the spin of the electrons. I will show that it is possible to make spin logic devices, where the logic operations and calculations are not done by the electronic charge, such as in conventional electronics, but by the spin degree of freedom of the electrons. I will also discuss other new classes of two-dimensional materials, such as transition metal dichalcogenides, which can make a unique connection between light, spin, and charge. Finally I will show how we work towards graphene spintronics applications in the framework of the EU Graphene Flagship.