

**Thursday 15<sup>th</sup> march**

**Speaker:** Olivier Dousse, Deutsche Telecom Laboratories, Germany.

**Title:** Connectivity and capacity in multi-hop wireless networks.

**Abstract:**

Multi-hop wireless networks are networks where nodes are typically able to communicate wirelessly only to a limited amount of close neighbors, and where long distance communications are carried over multiple relay nodes. This kind of networks brings up a lot of new challenges, as their communication channel should not only be measured in terms of bandwidth, but also in terms of space. The purpose of this tutorial is to understand the fundamental limitations of such networks, in terms of connectivity and capacity. We cover the most popular models used in the literature to derive asymptotic bounds on their performance. Furthermore, we enlighten the relationship between these models, as well as the connectivity-capacity duality. In a first part we address two classes of asymptotic connectivity results, one giving scaling laws for networks of large size, and the other applying to infinite networks. The second class of results are closely related to percolation theory, to which we give a short introduction. In a second part, we cover the major capacity results, ranging from those based on the simplest geometric models, to sophisticated information theoretic approaches.