



## **ICTS Seminar (Bangalore Probability Seminar)**

**Title** : The Friendship Paradox for Social Networks

**Speaker** : Frank den Hollander (Leiden University, Netherlands)

**Date** : Monday, 23 September 2024

**Time** : 3:15 PM (IST)

**Abstract** : Consider a group of individuals who form a social network. For each individual in the group, compute the difference between the average number of friends of friends and the number of friends (all friendships are mutual), and average these numbers over all the individuals in the group. It turns out that the latter average is always non-negative, and is strictly positive as soon as not all individuals have exactly the same number of friends. This bias, which at first glance seems counterintuitive, goes under the name of friendship paradox, even though it is a hard fact. In this talk we model the social network as a sparse random graph. We explain where the bias comes from, how it can be quantified, and illustrate it with two examples. We also look at the multi-level friendship paradox, where friends are selected according to an exploration process. We show that different types of scaling may or may not occur as the size of the graph and the depth of the exploration tend to infinity jointly. Based on joint work with R.S. Hazra and A. Parvaneh.

**Venue** : Feynman Lecture Hall

Zoom Link: <https://us02web.zoom.us/j/88670406480>

Meeting ID: 886 7040 6480