Empirical phenomena and universal laws

Professor Peter McCullagh

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Wednesday 6th April 2016 from 5:00 p.m., Centre Hospitalier Luxembourg (Amphitheatre)

Abstract

In 1943 Fisher, together with Corbet and Williams, published a study on the relation between the number of species and the number of specimens in random samples. This very short paper has since been recognized as one of the most influential papers on species diversity in 20th century ecology.

It was a combination of empirical work backed up by a simple theoretical argument pointing to the log-series distribution for species diversity in random samples. Fisher's work is closely related to more recent mathematical developments on random partitions, such as the Ewens partition and the Chinese restaurant process.

In this talk, I will explain how Fisher's log-series distribution is a consequence of three mathematical axioms: exchangeability, consistency and self-similarity.

If time permits, I will discuss the implications for empirical studies of a similar sort, including Fairfield-Smith's work on the variance of spatial averages.

References:

- R. A. Fisher, A. Steven Corbet and C. B. Williams, *The Relation Between the Number of Species and the Number of Individuals in a Random Sample of an Animal Population*, Journal of Animal Ecology Vol. 12, No. 1 (May, 1943), pp. 42-58
- Peter McCullagh, *Random permutations and partition models*, University of Chicago, January 2010

Short biography

Professor Peter McCullagh was an undergraduate at the University of Birmingham and a graduate at Imperial College in the 1970's. Afterwards, he taught at the University of Chicago, Imperial College, Bell Labs and the University of British Columbia. For the past 30 years, he has been in the Department of Statistics at the University of Chicago.

Personal homepage

Location

Centre Hospitalier Luxembourg (CHL) - Amphithéâtre

4, rue Ernest Barblé L-1210 Luxembourg
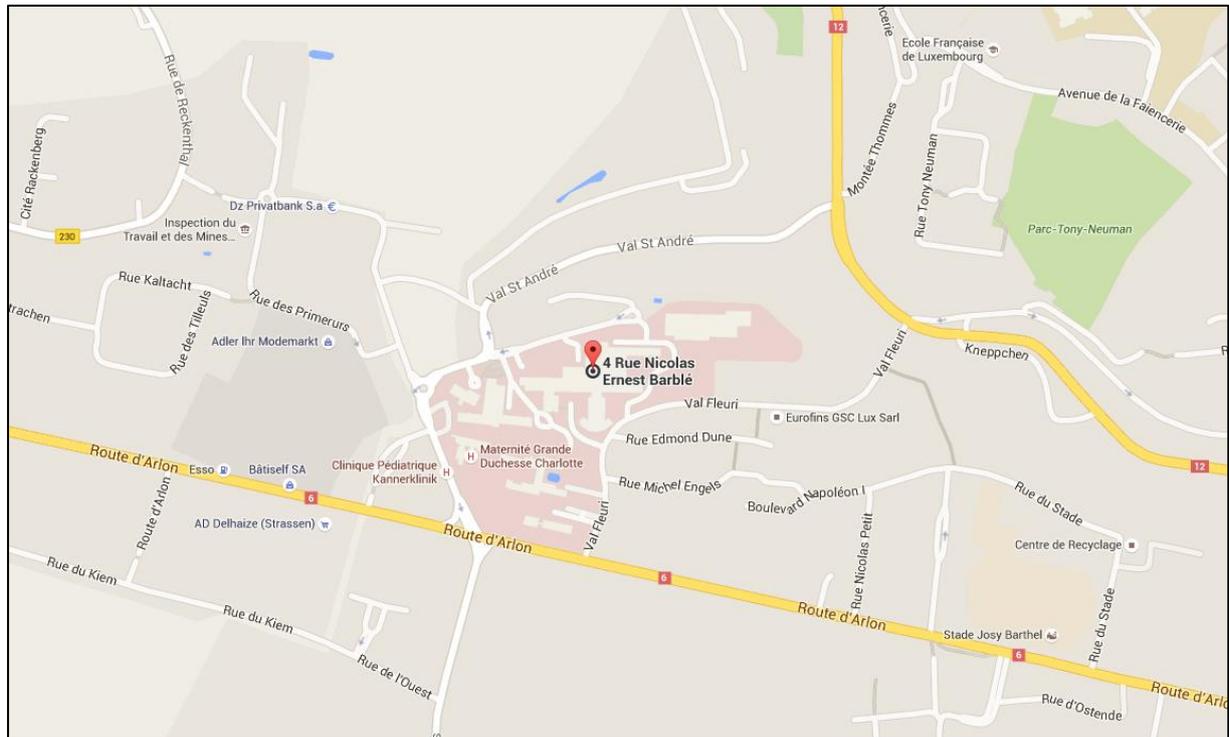
The conference will start at 5:00 p.m.

Send an email at admin@luxstat.lu to register.