

Introducing Bayesian Reasoning in Measurements with a Toy Experiment:

Probabilistic reasoning is of greatest importance in tackling what Poincaré used to call "the essential problem of the experimental method", i.e. how to infer, from the observed effects, the causes that have produced them, all times when there is no deterministic link between causes (the parameters of our models of reality) and detectable consequences (the experimental observations).

The approach outlined is basically that developed organically by Laplace, although it is presently known with the appellation 'Bayesian'. The tutorial will be based on a real time toy experiment, with variations, that allows the participants to get familiar with the most important concepts of "Bayesian reasoning" and how they can be applied in the real experiments.

Particular emphasis will be given to the conceptual and practical importance of the graphical representation of the inferential and predictive problems ("Bayesian networks").