Knowledge modelling after Shannon

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All researchers – whatever field they represent – encounter situations where elements of cognition such as truth, belief, perception and knowledge are important. A main aim in such situations is to make inference based on sound rational considerations. Since uncertainty is an inevitable element in these situations, it is not surprising that models based on probabilistic thinking have had a dominating role. This is also true of information theory, especially having Shannon Theory in mind. However, models have been suggested which are more abstract in nature. Three types of such models are: *Geometric* models with a focus on geodesics (initiated by Amari), models based on *convexity* with a focus on duality (with Csiszár and Matús as central researchers) and then models based on *game theory* with a focus on notions of equilibrium (models promoted by the author).

The talk will focus on game theoretical models. It will be consistent with previous research of the author but more abstract in nature and, as a pronounced element, motivated to a large extent by philosophical considerations. As examples of the kind of philosophy that enters we mention two: Firstly, the mantra going back to Good that *belief is a tendency to act* and then the view – emerging from discussions with Harremoës – that there are limits to what can be known, indeed, *you can only know what you can describe*. The technical modelling takes as starting point a bivariate function, *description effort* depending on elements of truth and of belief. Features which may be touched upon: A notion of *robustness* to ease inference; discussion of the role of convexity and affinity and, related to this, the introduction of a notion of *control*; introduction of the simplest type of models from the theory developed, emphasizing the close relation to *Bregman divergencies*; examples to show that both geometric problems – in casu *Sylvesters problem* from location theory – and well known problems from information theory – such as *capacity problems* – can be discussed conveniently based on the game theoretical modelling.