



Th. Clausen 1840

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Jesper Grodal (Københavns Universitet): *Groups and Homotopy Theory*

In algebraic topology, one classically tries to reduce problems in topology to questions in algebra. In my talk I will survey various ways of going the other way, using tools from topology and homotopy theory to study questions in group theory



Søren Risbjerg Thomsen (Aarhus Universitet): *On Mathematics in Political Science*

In political science the use of mathematics has mainly been seen as only feasible if it was possible to make quantitative measurement. However, until the 1960's the metric status of direct observations of individual human behaviour was highly uncertain and mathematics was mostly used for statistical description of frequencies of qualitative categories. This all changed with the invention of probability measurement models for individual responses borrowed from psychometrics and with the adoption of theories and statistical methods from econometrics. In my talk I will present some of my favourite examples of this development.



Jens Gravesen (Danmarks Tekniske Universitet): *The Geometry of the Moineau Pump*

At the 57th European Study Group with Industry in Lyngby 2006 Grundfos asked for a mathematical analysis of the Moineau pump. The pump was invented in 1931 by the French engineer René Moineau. It is an example of a progressive cavity pump and exhibits an intriguing geometry. The original design is based on hypo- and epi-cycloids and all except one design has either cusps or inflexion points with infinite curvature. By using the support function to represent planar curves it is possible to make an explicit analysis of a general design and we can show that points of infinite curvature can not be avoided.