

MATEMATISKA INSTITUTIONEN  
STOCKHOLMS UNIVERSITET  
Avd. Matematik

## SJÄLVSTÄNDIGT ARBETE I MATEMATIK

Onsdagen den 8 juni kl. 13.00–14.00 presenterar Cecilia Lövkvist sitt arbete “Mathematical models of n-player social dilemmas” (15 högskolepoäng, grundnivå).

Handledare: Kimmo Eriksson och Pontus Strimling

Plats: Sal 21, hus 5, Kräftriket

Abstract: The research of *social dilemmas* is a popular research field that combines social science and mathematics. In this field human behavior is studied in situations where people have to choose between doing what is the best for the group and making the best individual choice. These situations can be described in mathematical models and they can be analyzed to predict how humans behave. In game theoretic terms these models form a family of games sharing the same strategic structure. In this report different models of *social dilemmas* reported in the literature have been analyzed. Two new models are proposed and analyzed. First the well-known *common resource dilemma*, which previously has been studied with the assumption that the resource is linearly decreasing, is modified. In this report it has been changed with the assumption that the resource is decreasing nonlinearly. This models a situation where it is more difficult to exploit a resource the less there is left of it. Second, a novel type of social dilemma is described where the *public goods dilemma* and the *common resource dilemma* are combined into the model *the dormitory kitchen dilemma*. For both new models, the analysis includes computation and comparison of strategies and outcomes in the *social optimum* and the *Nash equilibrium*.

Alla intresserade är välkomna!