# 数学与系统科学研究院

## 计算数学所学术报告

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报告题目：**Perturbing the external forces in the obstacle problem**

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报告地点：科技综合楼 **311**

计算数学所报告厅

摘要：

**The so-called obstacle problem, is the problem we get when the solution of a set of partial differential equations in a given**

**domain must satisfy an inequality in the domain. The most common case of such a situation in mechanics is the equilibrium of a structure (beam, plate, membrane or shell) which enters into contact with an obstacle when submitted to external forces. Within linear elasticity, it is known that the unilateral contact between the structure and the obstacle leads to a variational inequality which has a single solution as long as the deformations are small enough, and that the solution is characterized by the size and the shape of the part of the domain which is in contact with the obstacle.**

**The topic of this talk could be seen as a stability result: having the solution for a given value of the force, are we able to follow the solution, which amounts to saying: are we able to follow the boundary of the contact zone, when we change the external force?**

**This has been solved in the seventies in the**

**case of a membrane that is to say in the case of a problem associated with the harmonic operator. We now give the result in the case of a plate that is to say when we are dealing with the bi-harmonic operator, which rules out any possibility of using tools like for example the maximum principle. After a conjecture concerning the smoothness of the solution, the result is based upon an implicit function argument which is Nash-Moser theorem, that we shall introduce and discuss carefully.**

**Having in mind applications to mechanics, we shall comment on the problems which arise if we change the geometry from a plate to a shell, or if we add friction, or if we try to study the dynamics.**

欢迎大家参加！