# FMSP Lectures


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# NUMERICAL ANALYSIS, COBORDISM OF MANIFOLDS AND MONODROMY.

January 25 (Thu) 15:00 ～ 16:30 Room 002


ABSTRACT. Solving numerically equations appears as a tool in many areas of thought. One can think an equation as a differentiable map $f : M \to N$ between manifolds. The aim is to study fibers $F_t = f^{-1}(t) \subset M$, $t \in N$. For "generic" $t$ the fiber $F_t$ is again a manifold, even of finite dimension if $M$ is of finite dimension, or if the map $f$ is Fredholm. It is common that the map $f$ is only known up to deformation or up to approximation. What about the fiber $F_t$ is independent of deformations or approximations? The answer is: its cobordism class. We will illustrate this answer by examples. An elementary example is the proof that the real projective plane admits no embedding in numerical three space. A more advanced example is to study the manifold

$$\Sigma = \{(x, y, u, v, w) \in \mathbb{C}^5 \mid x^5 + y^3 + u^2 + v^2 + w^2 = 0, x\bar{x} + y\bar{y} + u\bar{u} + v\bar{v} + w\bar{w} = 1\}$$

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