# PH.D KURSUS I

# IKKE-LINEÆR DYNAMIK, BIFURKATIONER

AFHOLDT AF

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**TIRSDAG DEN 17. JUNI , ONSDAG DEN 18. JUNI, FREDAG DEN 20. JUNI**

**MANDAG DEN 23. JUNI, TIRSDAG DEN 24. JUNI, TORSDAG DEN 26 JUNI**

ALLE DAGE FRA KL. 10-12 OG 13-14

KURSET GIVER 5 ECTS-POINT.

BEDØMMELSE AF 2 SÆT HJEMMEOPGAVER PLUS EN SKRIFTLIG QUIZ
Fredag den 27. juni
 (yes, no) -  Bestået/Ikke bestået

## INDHOLD:
**Center manifold reduction and elementary bifurcations in presence of simple symmetries (including reversibility) – Applications  to hydrodynamic instabilities, and to travelling water-waves and travelling waves in lattices.**

The series of lectures provides techniques of local analysis used for the study of bifurcations of evolution systems and of reversible systems (infinite dimensional in general). We present the center manifold reduction with sufficiently general assumptions for being applicable in particular to a large class of systems, with a special emphasis in case of existing symmetries of the system (applications in hydrodynamic instabilities problems like the Couette-Taylor problem). Then we present normal form theory useful to clarify all possible solutions in various elementary bifurcations (travelling waves, standing waves, quasi-periodic solutions, defect solutions,...). In particular, for elementary reversible bifurcations,  we prove for instance the existence of solutions homoclinic to a point or to a periodic solution.  The basic applications are in the study of travelling waves in water wave theory (with emphizise on solitary waves) and in the study of travelling waves in one dimensional lattices (solitary waves, fronts, ...).

**Bibliography:**

P.Chossat, G.Iooss. The Couette-Taylor problem, Appl. Math. Sci. 102,
Springer, 1994.
G.Iooss, M.Adelmeyer. Topics in bifurcation theory. Adv. series in
nonlinear dynamics, 3, World Sci. 2nd ed. 1999.

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