Faculty Engineering Technology
Program Mechanical Engineering

University of Twente.

COLLOQUIUM

In accordance with article 4.6.8 of the SSNS-wb.

Group: **Engineering Fluid Dynamics**

As part of his MSc thesis assignment

Albert Nico op de Hoek

will give a presentation, entitled:

Experiments on the Behavior of Dense-phase, Neutrally-buoyant Particle-liquid Suspensions

Date: Friday February 11, 2011

Time: 14:00

Room: HR N 109

Summary:
Dredging companies transport and process large quantities of sand-water mixtures. For improvements in the handling of these suspensions, a better understanding of the flow behavior of such mixtures is required.
As a first step towards the description of sand-water mixtures, the rheological properties are determined of neutrally buoyant particle-liquid suspensions. For such mixtures the complexities of sedimentation of particles are avoided. A concentric-cylinder rheometer is employed to measure the influence of shear rate on shear stress for these suspensions.

The analysis of the results of the experiments resulted in a constitutive relation between shear rate and shear stress for two suspensions: Talisman particles suspended in water-ethanol and polystyrene particles suspended in water-glycerol. The influence of the volume fraction of the particles on the parameters in the constitutive relation has been determined as well. The results for the suspensions containing polystyrene particles have been compared with results of experiments on polystyrene particle suspensions from the literature.
For each of the two neutrally buoyant particle-liquid suspensions, the particle-fluid flow is visualized by employing a transparent acrylate tube. Several flow features, like secondary flows have been identified.

Assessment committee: **Chairman:**

Prof.dr.ir. H.W.M. Hoeijmakers (chairman)
Dr.ir. N.P. Kruyt (mentor)
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