



# COLLOQUIUM

Conform artikel 4.6.8 van het SSNS-wb.

Vakgroep: **Technische Stromingsleer**

In het kader van zijn doctoraalopdracht zal

## Tom Vincent Huijgen

een voordracht houden getiteld:

### **Improving a Medical Aerosol Generating Inhaler by Experiment and Numerical Simulation**

Datum: vrijdag 3 april 2009

Tijd: 14:00

Zaal: HR N109

#### **Summary:**

Current inhalers for the treatment of asthma and COPD have a low efficacy. Most inhaled medicine never reaches the lungs. Losses occur in the inhaler and in the mouth-throat region causing this low efficacy and side effects, such as tremor and oral candidiasis. At Medspray XMEMS BV a new type of inhaler is in development that aims for much higher efficacy, however, some losses of medicine do still occur. A better understanding of the causes of these losses is desired to be able to improve the performance of the inhaler.

The goal of the present research is to further increase the fraction of the dose of medicine reaching the lungs. To achieve this goal the most important particle deposition mechanisms in the inhaler and mouth-throat region are studied using theory, experiments and numerical simulations. Based on diffuser theory the design of the mouthpiece of the inhaler is assessed and improved. Flow separation is thought to be the primary cause of unwanted mouthpiece deposition. New designs of inhaler mouthpiece have been developed and prototypes have been realized, numerically simulated and experimentally tested.

The results of the numerical simulations for and experiments with the new inhaler mouthpieces are very promising and contribute to the development of a new high performance medical aerosol inhaler.

Examencommissie:

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