COLLOQUIUM

Conform artikel 4.6.8 van het SSNS-wb.

Vakgroep: **Technische Stromingsleer**

In het kader van zijn doctoraalopdracht zal

Eelco Hoogendoorn

een voordracht houden getiteld:

Discrete Exterior Calculus with Applications in Fluid Dynamics

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Summary:

Traditionally, computational fluid dynamics deals with discretized partial differential equations. These equations are obtained by means of discretizing the conservation equations of fluid flow assuming the fluid to be a continuum. An example is, applying a finite-element method to the (Navier) Stokes equations describing conservation of momentum in a viscous flow.

Alternatively, one may directly formulate discrete structures representing fluid flow from first principles. This is the aim of the emerging field of discrete exterior calculus (DEC). In this way, additional insight is gained into existing discretisation schemes, and novel results can be obtained.

It will be shown that for some problems to which DEC can be applied, the most general form of boundary conditions permissible follows directly from discrete topological considerations. Applied to the Stokes equations, this leads to theoretical insight and suggests practical solution methods.

Examencommissie: De afstudeerdocent,

Prof.dr.ir. H.W.M. Hoeijmakers (afstudeerdocent)

Dr.ir. E.T.A. van der Weide (mentor)

Dr.ir. R. Hagmeijer

Dr. Ir. O. Bokhove   d.d. _____