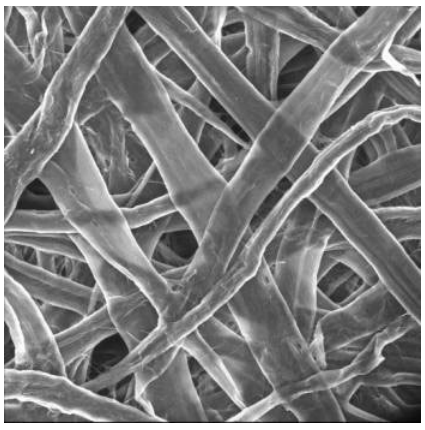
Master thesis project

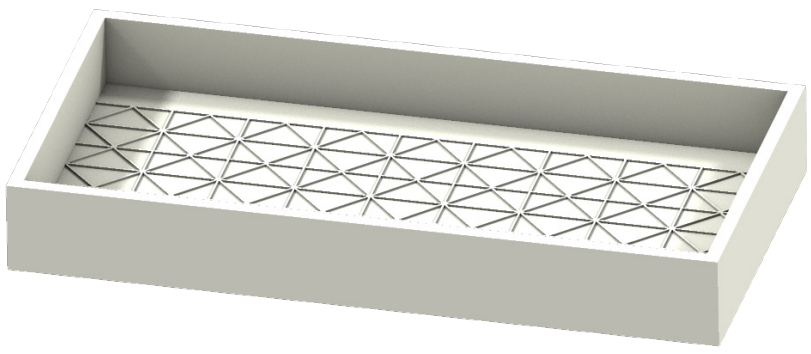
Determine preferred pathsways of a wetting liquid in a porous material

Real Paper Structure



M. Alava, K. Niskanen,
Reports on Progress in Physics. 69
(2006) 669–723.

3D-drawn model



Background
Mass transport in porous materials is the key focus in the VINN excellence centre SuMo Biomaterials (Supramolecular Biomaterials), consisting of academia and industry.

Comercial printing techniques usually involve pressure applied with which a liquid is printed on paper board. Part of the liquid will penetrate the paper. While studying the visible liquid front over time is easily done, however, a part of the voids in the porous material usually remain unfilled. The liquid takes a preferred pathway, which should be investigated in this project.

The aim of the project
The project aims to understand and determine what kind of geometries in a porous material prevent a wetting liquid to penetrate a channel.

What you will do
In collaboration with Stora Enso in Karlstad you will draw various computer based channel geometries, which should mimic paper structures. Those models will be either 3D printed or produced with microfabrication techniques. Flow experiments using external pressure following the front of a suitable wetting liquid will be conducted by recording the capillary uptake over time and tracking the liquid.

About you
We are looking for a master student who is willing to work at Chalmers as well as at Stora Enso in Karlstad for part of the time. You should have knowledge about surface chemistry, surface engineering and polymer technology.

What is in for you
Besides 30 Credit points you will gain valuable experience and will learn plenty from drawing CAD-models over 3D-printing to working with hydrogels and flow simulations. And further you get in contact to Stora Enso.

Suggested start: autumn 2016

For further information, please contact:

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The examiner of the thesis will be Prof. Anette Larsson