

Type

Computational.

Requirements

- Knowledge of fluid dynamics
- Programming skills
- Knowledge of c++ and graphical tools

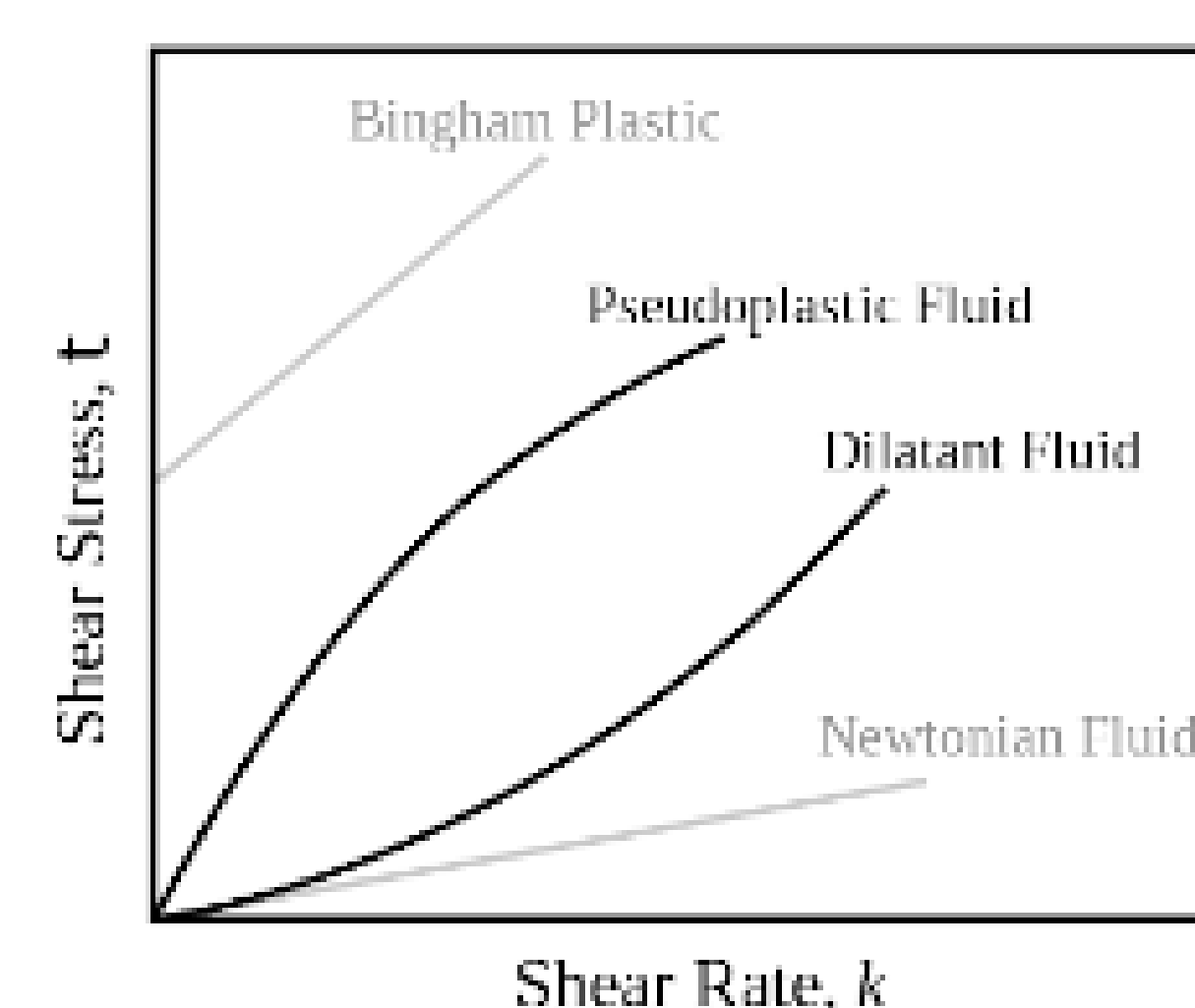
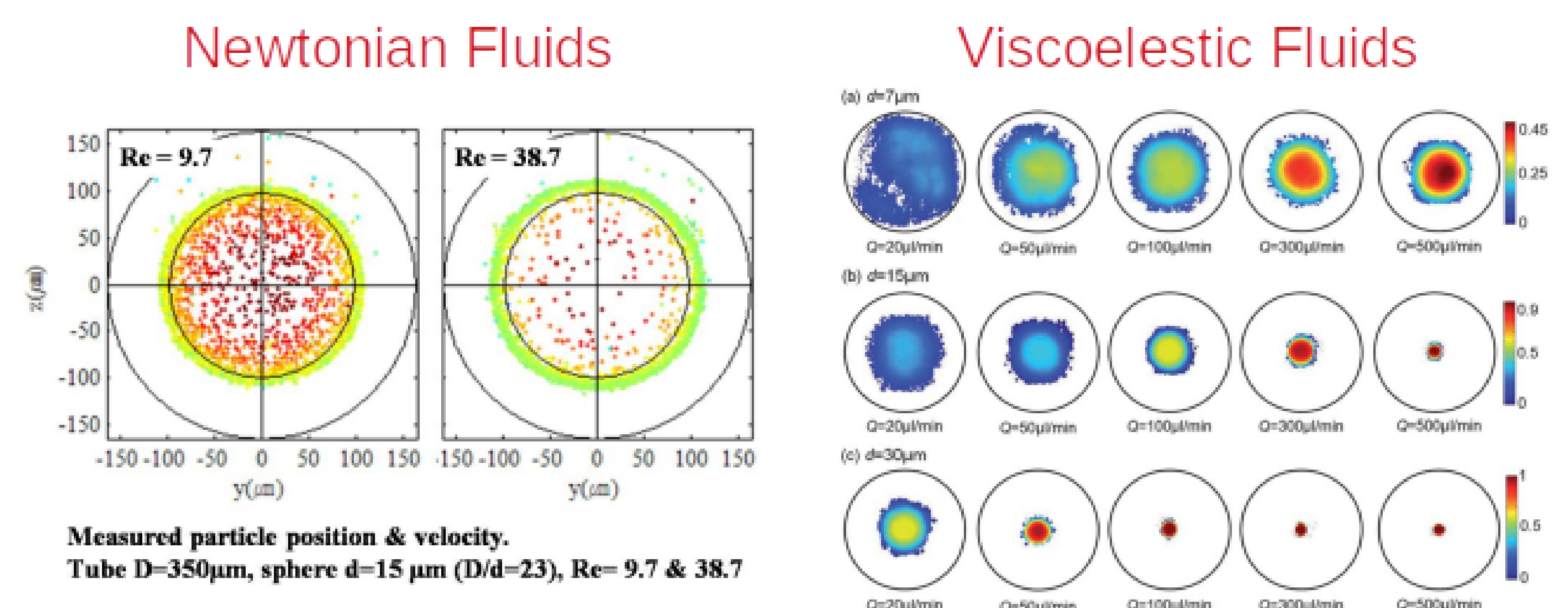


QR code
zum pdf der Ausschreibung

Spontaneous particle focusing in non-Newtonian microfluidics

Background

The equilibrium distance of colloidal transport in a laminar flow (Poiseuille Flow) is explained by the Segre-Silberberg effect. It has been extensively studied in microfluidic systems, and it is shown that particles of different sizes accumulate at different specific equilibrium distances, referring to channel axis. Little is known about the corresponding velocities and dynamics of the particle migration. Furthermore, it is found the shear-thinning fluids cause particle focusing in the transportation process, leaving the actually mechanism still unclear. We propose to use particle-based CFD with shear-related viscosity to study the detailed dynamics.



For further information contact:

Dr. Jeff Lee
Institute for Multiscale Simulation
(MSS)
Department of Chemical and
Biological Engineering (CBI)
Cauerstrasse 3, IZNF,
91058 Erlangen,
Room 03.155
email: kuang-wu.lee@fau.de
web: www.mss.cbi.fau.de

Aim

- Modify the current Newtonian fluid model to include non-Newtonian effect.
- Analyze the hydrodynamic forces acting on particles of different sizes.
- Implement realistic microfluidic geometries