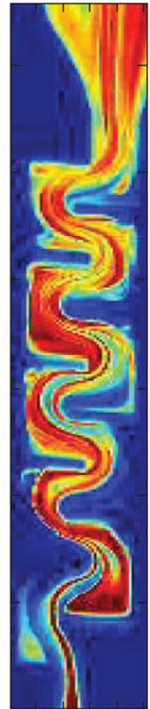


Theoretical Microfluidics

MICRO-718

T. Lehnert and M.A.M. Gijs (EPFL-LMIS2)

EPFL - Lausanne
Doctoral Program in Microsystems and
Microelectronics (EDMI)



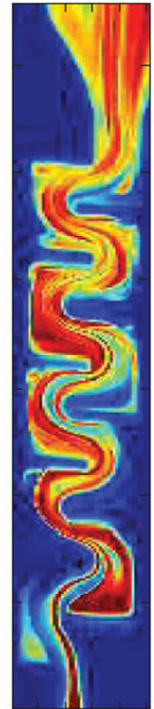
“Theoretical” microfluidics and more...

EPFL

Course topics

Part I: *T. Lehnert* (EPFL-LMIS2)

1. Introduction
2. Governing equations and flow solutions
3. Microfluidic channels and circuits
4. Diffusion and mixing in microscale
5. Capillary effects and microdroplets

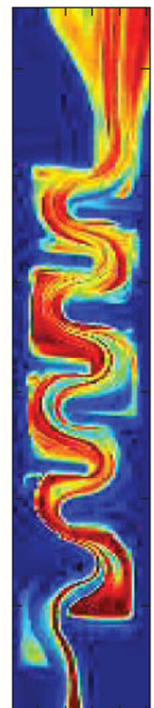


Course topics

EPFL

Part II: *Prof. M.A.M. Gijs* (EPFL-LMIS2)

1. Electrohydrodynamics
Debye-layer, electro-osmotic flow, (di-)electrophoresis
2. Magnetophoresis
3. Nanofluidics



The theoretical parts of this course are mainly based on:

Theoretical Microfluidics

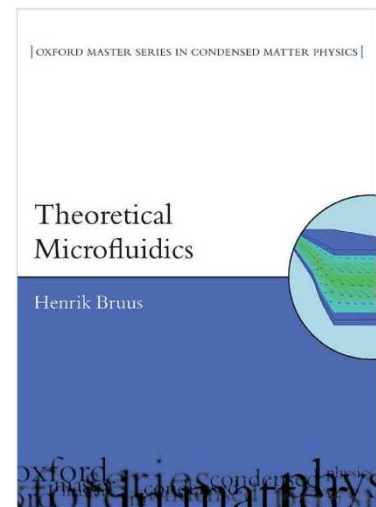
Henrik Bruus

Oxford University Press, 2008 (Reprint 2010)
(ISBN 978-0-19-923509-4)

Equation/figure numbering in PART I of these lecture notes refers to the indicated edition of the book.

Numbering in PART II refers to an earlier edition !

All other references are indicated in the text.



"Microfluidics" -- Thomas Lehnert -- EPFL (Lausanne)

Further reading:

J. Kirby, ***Micro- and nanoscale fluid mechanics: Transport in microfluidic devices***
Cambridge University Press 2010, ISBN: 978-0-521-11903-0

NT. Nguyen and S.T. Wereley, ***Fundamentals and applications of microfluidics***
Boston, Mass.: Artech House, 2006, ISBN: 1-58053-972-6

P. Tabeling, ***Introduction to microfluidics***
Oxford University Press 2005, ISBN: 0-19-856864-9

T.M. Squires and S.R. Quake, ***Microfluidics: Fluid physics at the nanoliter scale***
Reviews of Modern Physics, Vol. 77, pp. 977-1026 (2005)

"Microfluidics" -- Thomas Lehnert -- EPFL (Lausanne)