Invitation to a special issue in Comptes Rendus de Physique entitled
Wetting of solids on solids: statics and dynamics

Invited editor: O. Pierre-Louis
LPMCN, Université Lyon 1, France.

(Dated: June 13, 2012)

As an invited editor and on the behalf of Jacques Villain, editor of "Comptes Rendus de Physique" it is my pleasure to invite you to write a contribution for a special on the wetting of solids which is scheduled to be published in 2013 in "Comptes Rendus de Physique".

This special issue will focus on the wetting behavior of solid films and islands in various systems. In the past decade, much attention was devoted to the wetting behavior of nano-scale solids on solid substrates. A non-exhaustive list of recent prominent scientific fields of investigation include: (1) the role of the wetting potential on the formation and morphology of nanostructures, with a nontrivial coupling or competition between wetting and strain energies; (2) Dewetting dynamics of thin solid films, and related instabilities. (see e.g. recent experiments on SOI systems and on metal/Oxydes systems); (3) Islands on patterned substrates where the position and morphology of nanoscale islands at equilibrium or during growth can be controlled; (4) Reactive wetting, where alloying or reactivity can modify the island morphology and dynamical properties. This is exemplified in the wetting of seed particles controlling nanowire growth, or in self-propelled solid particles.

The goal of this special issue is not an exhaustive description of the field. It is to point out recent advances and fundamental issues related to the question of the statics and dynamics of wetting in solids.

The papers of this special issue can be original contributions or short reviews. The recommended length is about 10 pages, but the papers can be much shorter.

A more detailed list of some relevant questions which could be addressed follows, with illustrative references. Other issues could be addressed

- (1) On the role of the wetting potential on the formation and shape of nanostructures, fundamental understanding of the wetting layer, and coupling or competition between wetting and strain energies.
  
  [1.1] Nanometer-Thick Equilibrium Films: The Interface Between Thermodynamics and Atomistics
  Mor Baram, Dominique Chatain, and Wayne D. Kaplan
  Science 8 April 206 (2011)

  [1.2] Self-assembly of quantum dots in a thin epitaxial film wetting an elastic substrate
  M. S. Levine, A. A. Golovin, S. H. Davis, and P. W. Voorhees,

  [1.3] Influence of surface energy anisotropy on the dynamics of quantum dot growth
  Jean-Nol Aqua and Thomas Frisch

  [1.4] Do stresses modify wetting angles
  D.J. Srolovitz, S.H. Davis D.J. Srolovitz and S.H. Davis,
  Acta mater. 49 1005 (2001)

- (2) Dewetting dynamics of thin solid films, and related instabilities.
  Experiments on SOI systems:

  [2.1] Self-organization of semiconductor nanocrystals by selective surface faceting
  Bin Yang, Pengpeng Zhang, D. E. Savage, M. G. Lagally, Guang-Hong Lu, Minghuang Huang, and Feng Liu
Dynamics, anisotropy, and stability of silicon-on-insulator dewetting fronts
F. Leroy, F. Cheynis, T. Passanante, and P. Müller

Refs. Experiments on metal/Oxides systems:

Agglomeration of Pt thin films on dielectric substrates
H. Galinski, T. Ryll, P. Elser, J. L. M. Rupp, A. Bieberle-Htter, and L. J. Gauckler

Refs. on modeling

Dewetting of Ultrathin Solid Films
O. Pierre-Louis, A. Chame, and Y. Saito

Fingering instability of a retracting solid film edge
Wanxi Kan and Harris Wong

• (3) Islands on patterned substrates where the position and morphology of nanoscale islands at equilibrium or during growth can be controlled.

Nanoheteroepitaxial growth of GaN on Si nanopillar arrays
S. D. Hersee, X. Y. Sun, X. Wang and M. N. Fairchild

Positioning of Strained Islands by Interaction with Surface Nanogrooves

Imbibition of Solids in Nanopillar Arrays
Philippe Gaillard, Yukio Saito, and Olivier Pierre-Louis

Theory of Directed Nucleation of Strained Islands on Patterned Substrates
Hao Hu, H. J Gao, and Feng Liu

Self-assembly and ordering mechanisms of Ge islands on prepatterned Si(001)
A. Pascale, I. Berbezier, A. Ronda, and P. C. Kelires

• (4) Reactive wetting, where alloying or reactivity can modify the island morphology and dynamical properties.

Solid running droplets
Alloying at Surfaces by the Migration of Reactive Two-Dimensional Islands
A. K. Schmid, N. C. Bartelt, and R. Q. Hwang

Reactive etching in SOI systems:
Interfacial reaction of Si islands on SiO2 during high-temperature annealing
K. Sudoh and M. Naito

Wetting of seed particles controlling nanowire growth:
Periodically Changing Morphology of the Growth Interface in Si, Ge, and GaP Nanowires