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Wetting

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► **To cite this version:**

P.-G. de Gennes. Wetting. Revue de Physique Appliquée, 1988, 23 (6), pp.974-974.
10.1051/rphysap:01988002306097400 . jpa-00245925

HAL Id: jpa-00245925

<https://hal.science/jpa-00245925>

Submitted on 4 Feb 2008

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Wetting

Introduction

The first studies on the wetting of a solid by a liquid date from the 19th century, with the capillarity pioneers. A second wave has started with Zisman at the Office of Naval Research, and another one with the Deryaguin school in the U.S.S.R. More recently, this area of research has been revived by contributions from very different origins : 1) the interest of oil companies for enhanced oil recovery — unfortunately linked to the price of oil — has played a non negligible role in France ; 2) the interest of metallurgists, stimulated by the remarkable predictions of Cahn concerning the wetting transition ; 3) the improvement of model systems, in particular due to the progress of microelectronics, which allows the preparation of marvelous surfaces, and the development of chemical surface treatments ; 4) the theory also has progressed, despite the repeated misunderstandings between mechanicians and physicists.

The papers collected here by J. F. Joanny illustrate quite well these various aspects. Some of them are concerned with capillarity in the more classical sense : drops, ferrofluids, behaviour on a thin substrate or on a fiber. Others are more concerned by the role of long range forces — the review of Churaev, describing the work of the russian school is particularly interesting. The others study the effects of random surfaces : porous media or rough surfaces. The properties at a *chemical* level are rather underdevelopped and this can be regretted, the reader will however find in this area a living description of the metal-oxyde interface. On the whole, although this issue does not cover the whole domain, it gives a current and reasoned view of some major problems : it will, I think, be very useful.

P. G. de Gennes