“凝聚态物理-北京大学论坛”

2008-09

时 间： **2008 年 5 月 9 日（星期五）下午 15:00－16:40**

地 点： **北京大学物理大楼中 212 教室**

题目

Interfaces and Plastic Deformation of Materials
From Theory to Engineering

摘要：

During plastic deformation, lattice dislocations impinge on grain boundaries (GBs) that play the role of strong obstacles for glide. If the temperature and/or the stress increase, some dislocations enter a GB creating intergranular stresses. In order that the deformation may go further, these stresses must be relieved. This may be realized by different processes that depend on the core structure of the GB. These processes are particularly important in the first deformation stage when the Hall-Petch law (that relies the yield stress to the grain size) applies. *In the first part of the talk,* the GB structure and the different GB accommodation processes will be described.

***In the second part*, each phenomenon previously modeled is illustrated by Transmission Electron Microscopy (TEM) including different techniques: conventional, weak beam, in situ and High Resolution (HRTEM) investigations. The dislocation reactions are observed in different types of GBs (singular, vicinal and general) in copper specimen with different grain sizes Some particular GB behaviors in nanocrystalline copper are emphasized.**

***Finally*, an attempt is made to relate the GB mechanisms observed at the micro/nano scales to the macroscopic behaviors of a polycrystal where the GBs form an ensemble. This approach constitutes a first step towards a “Grain Boundary Engineering”.**

报告人：

Prof. Louisette Priester

Professor emerita – University Paris 11 – Orsay - France

报告人简历：

Louisette Priester got her PhD in the field of Material Sciences in 1971 at Paris 11 University. She entered as a assistant-professor in the same university where she became full professor in 1981. Then, according to the French system, she progressively reached different levels until the highest one named “exceptional”. Since 2005, she is professor emerita. Among her teaching activities, she had lectures for undergraduate and graduate students in different material domains: elemental metallurgy bases, phase transformations, structural defects, plasticity, electron microscopy.

After her thesis, she worked in the field of “Phase Transformations” until 1978. Then she spent 6 months at Cornell University (USA) in the group of professor R.W. Balluffi, one of the best specialist in the “Grain Boundaries and Interfaces” science. Coming back to France, she created a new research group in the “Metallurgy” laboratory in Orsay named “Grain Boundary Structures, Defects and Properties”. Not only GBs in metal (iron and alloys, nickel, chromium) were investigated but also ceramics (alumina). The group was maintained until 2000 at Orsay campus, then it moved to the ICMPE (Institute of Chemistry and Materials of Paris East) in Vitry (now in Thiais, very close to Paris), going on with the same activity.

Louisette Priester wrote about 150 articles in international journals, had the same number of communications most of then as invited speaker. She was invited to stay from one to six months in several foreign institutes in USA (New York State University, Ohio state University at Columbus, Case Western University at Cleveland), in Russia (Lomomossov University), in Japan (Institute of Industrial Sciences at Tokyo, University of Kyoto) and other European countries (Germany, Poland …). She recently wrote two books in French. One, in the field of her researches, is entitled “ Grain Boundaries – From Theory to Engineering” and has been published by EDP Science ; The second book is addressed to a large audience, but its main objective is to attract young people towards Material Science (including three components: physics, chemistry and mechanics). Its title is “The materials – History, Science and Perspective”, it has been published by the CNRS Editions.

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