Geodynamics Seminar

第350回ジオダイナミクスセミナー

Melting, Hydrogen, Severe Plastic Deformation – Some Possible Links in the Properties of Metals

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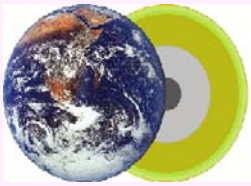
主催：愛媛大学地球深部ダイナミクス研究センター
日時：2/22（金）午後 4時30分～
場所：総合研究棟 4F 会議室



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Abstract

Unlike orthodox seminar talks reporting progress in some specific area of research, the present talk is an exposition of a number of still unsettled problems in three different areas that have occupied my mind for the last years, i.e. melting, hydrogen and severe plastic deformation.

Melting is one of the oldest problems in materials science, but it is only recently that a distinction between the melting as a phase transition in the thermodynamic sense and the point of shear instability has come to be clearly recognized. The relation between the two specific temperatures, the temperature of thermodynamic melting and mechanical melting, is yet to be explored.

Hydrogen dissolved in metals sometimes causes drastic changes in materials properties; diffusion enhancement, superplasticity, and even “liquidization”. The diffusion enhancement is known to be the consequence of superabundant vacancy formation, but the mechanism of superplasticity and liquidization remains a puzzle.

A method of severe plastic deformation (SPD) has been developed to produce bulk nano-grain materials and thereby to induce novel mechanical properties, but the ultimate state of matter to be attained by SPD has not been tested so far.

After briefly reviewing these problems, I wish to explore possible links between them, and attempt to draw a perspective looming from behind. Then I wish to propose, specifically, a design of new SPD experiments to manufacture novel functional alloys hardly accessible by any ordinary methods.

詳細は当センターホームページ: http://www.ehime-u.ac.jp/~grc/をご覧ください
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