ScienceWatch Home
Interviews

Featured Interviews
Author Commentaries
Institutional Interviews
Journal Interviews
Podcasts

Analyses

Featured Analyses
What's Hot In...
Special Topics

Data & Rankings

Sci-Bytes
Fast Breaking Papers
New Hot Papers
Emerging Research Fronts
Fast Moving Fronts
Research Front Maps
Current Classics
Top Topics
Rising Stars
New Entrants
Country Profiles

About Science Watch

Methodology
Archives
Contact Us
RSS Feeds

NEW HOT PAPERS - 2008

July 2008

PDF

Wei Hua Wang talks with *ScienceWatch.com* and answers a few questions about this month's New Hot Paper in the field of Materials Science.

Article Title: Super plastic bulk metallic glasses at room temperature
Authors: Liu, YH;Wang, G;Wang, RJ;Zhao, DQ;Pan, MX;Wang, WH
Journal: SCIENCE
Volume: 315
Issue: 5817
Page: 1385-1388
Year: MAR 9 2007
* Chinese Acad Sci, Inst Phys, POB 603, Beijing 100080, Peoples R China.
* Chinese Acad Sci, Inst Phys, Beijing 100080, Peoples R China.

SW: Why do you think your paper is highly cited?

The study on the plasticity of bulk metallic glasses (BMGs) is one of the hottest topics in the field of materials science because of the great scientific and technological importance of these materials. But metallic glasses have an Achilles' heel: an almost total lack of plasticity at room temperature. This problem, to some extent, limits applications.

Our paper shows that large plasticity in terms of compressive ductility can be achieved in ZrCuNiAl BMGs synthesized through the appropriate choice of composition by controlling elastic moduli. This finding suggests a possible solution for the inherent brittleness problem found in metallic glasses.

SW: Does it describe a new discovery, methodology, or synthesis of knowledge?

The new discovery is that extraordinarily plastic BMGs can be obtained by an appropriate choice of the composition utilizing the Poisson's ratio strategy. These super-large plastic BMGs provide a model system for deformation mechanism studies in glassy materials. The methodology used to search the plastic metallic glass is described, with knowledge and analysis provided.

"Our group shall cooperate with other scientists within this field who are also trying to achieve further scientific understanding

SW: Would you summarize the significance of your paper in layman's terms?

The common wisdom on glassy materials is that glass is brittle and cannot be bent. But our paper shows that we've come up with a new type of metallic glass that flexes and bows like a copper wire. This advance could potentially usher in an entirely new family of wonder materials and change the understanding of these materials.

SW: How did you become involved in this research, and were there any problems along the way?

I have worked on metallic glassy materials for over 20 years, maintaining a keen interest in the preparation, structure, mechanical, and physical properties of metallic glasses.

of the deformation mechanism in metallic glasses."

SW: Where do you see your research leading in the future?

These super-large plastic bulk metallic glasses provide model systems for study of the long-standing issue of the deformation mechanism in glassy materials. Our group shall cooperate with other scientists within this field who are also trying to achieve further scientific understanding of the deformation mechanism in metallic glasses.

SW: Do you foresee any social or political implications for your research?

We hope that our strategy will provide useful guidelines for the development of plastic metallic glasses as high-performance structural materials in other known or as yet unknown bulk metallic glass-forming alloys which might benefit society.

Wei-Hua Wang, Ph.D.
Professor
Institute of Physics
Chinese Academy of Sciences
Beijing, China

Keywords: super-large plastic bulk metallic glasses (BMGs), compressive ductility, ZrCuNiAl BMGs, Poisson's ratio, metallic glassy materials.

PDF

back to top

Copyright Notices | Terms of Use | Privacy Statement