



100 Innovations for a better world



EXPO
2010
SHANGHAI CHINA

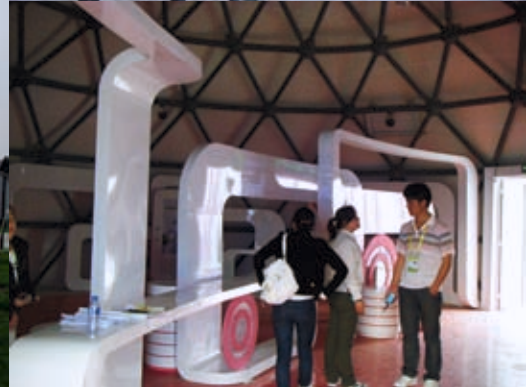


EXPO 2010
全球青年创新之旅
YOUTH INNOVATION



YOUTH INNOVATION

中国2010年上海世博会 EXPO 2010 SHANGHAI CHINA







+++ 100 innovations for a better world +++

The magnolia, the symbol of the city of Shanghai,
is the model for the Youth Innovation Centre at EXPO 2010

What issues will we be grappling with tomorrow? What does our dream of life in the future look like? Human culture is characterised by technological progress – so we have always been tempted to sneak a look into the future.

100 innovations that are set to change our lives over the next few decades will be showcased in the Youth Innovation Centre for all to see and experience. We want them to inspire young people to innovate and discover a new technological world - and generate a sense of excitement about the future. 100 futuristic exhibits have been brought together under one roof in this pavilion.

Like the symbol of Shanghai - the magnolia - the seven themed rooms of the pavilion open up in the shape of a flower. The underlying design concept: this magnificent bloom represents new beginnings and a pioneering spirit, or to put it another way, young ideas and the spirit of innovation.

All of the themes refer back to the motto of Expo Shanghai: "Better City – Better Life". In each of the seven themed rooms in the Youth Innovation Centre's magnolia halls we will be showcasing and demonstrating futuristic innovations from the worlds of science and commerce. Visitors will leave the centre with a taste of the visions, concepts and prototypes that could





+++ Deep sea snail shell inspiration for space travel +++

Armour to serve as model for highly resilient materials

From the depths of the ocean to the far reaches of outer space: US scientists are exploiting the properties of *Crysomallon squamiferum*. This snail from the deep has a particularly stable and yet highly flexible shell. Just a few centimetres in size, the snail lives on the ocean bed at depths of more than 2400 m in conditions of extreme heat and pressure. So its armour has to be particularly robust and resilient – properties that can be used for applications such as new types of protective space suits.



Scientists have analysed the structure of the shell and have discovered that the unusual strength comes from the special layering of the exoskeleton. The shell is made up of three different layers, each with its own special properties. The middle layer consists of a soft, flexible substance that can absorb knocks and pressure from outside. The inner and outer layers, on the other hand, are made of a stiff, extremely hard material. On the very outside is an additional reinforcement made of hard iron sulphide particles just 20 nanometres in size. When the snail is attacked, this layer cracks and dissipates the energy from the attack while at the same time preventing larger cracks from forming. The soft middle layer absorbs the shock, and the lower layer protects the vulnerable insides.

Scientists hope to use this knowledge to develop new, high-performance protective materials. This would allow protective equipment such as space suits or even motorbike or racing helmets to be made lighter and stronger.

Massachusetts Institute of Technology (MIT), USA;
www.web.mit.edu





深海蜗牛给宇航工业带来灵感 其外壳成为高负荷材料的模型

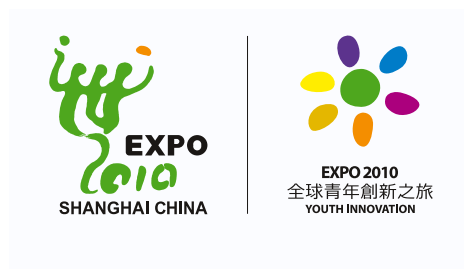
从海洋的深处在直到浩瀚的宇宙：美国研究人员正在尝试借鉴一种“鳞角腹足蜗牛”（*Crysmallon squamiferum*）的特性。这种深海蜗牛拥有非常坚固，并十分灵活的外壳。这种大概1厘米左右的动物生活在深度超过2400米、极端的高温、高压的海底深处。它的外壳因此必须具备坚硬和耐腐蚀的特性，这些特性都可以被应用于宇航工业中全新的装甲铸造。



科学家们对蜗牛壳的结构进行了分析并给出结论，这种蜗牛的外壳，由一种特殊的结构层来负责其异常坚固的保护结构：蜗牛的保护外壳构成于三种不同特性的层面，中间层由柔软、有韧性的物质组成，它可以缓解来自外部的冲击和压力，与之相反的，内层和外层由非常坚硬的物质组合而成。蜗牛壳的最外层，还有20纳米厚的硫化铁鳞片附加其硬度。在攻击下，蜗牛的这层防御壳就会出现断裂，这样以来，攻击力量就被分散了，同时，也避免了裂痕的进一步延展。中间的柔软层则作为缓冲，起到让最底层保护脆弱的内部的作用。

利用这些知识，可以开发出新颖的、高负荷的保护材料。保护装备——如宇航服——可以更轻、更耐腐蚀，同样的，也适用于摩托车或赛车的安全头盔。

美国麻省理工学院（MIT）；网址：www.web.mit.edu



www.dkks-china.com; www.dauthkaun.com

EXPO 2010 全球青年創新之旅 YOUTH INNOVATION CREATIVE.DREAM.FUTURE 啓動夢想 未來我創
CREATIVE.DREAM.FUTURE 啓動夢想 未來我創 creativo, el sueño, el futuro 創造的な、夢、将来 schöpferisch Traum Zukunft
el sueño, el futuro 創造的な、夢、将来 schöpferisch Traum Zukunft 뜻있는, 꿈, 미래 créatif, le rêve, l'
新之旅 YOUTH INNOVATION CREATIVE.DREAM.FUTURE 啓動夢想 未來我創
な、夢、将来 créatif, le rêve, l'avenir CREATIVE.DREAM.FUTURE 뜻있는, 꿈, 미래
FUTURE 全球青年創新之旅 schöpferisch Traum Zukunft 뜻있는, 꿈, 미래 cre
創造的な、夢、将来 EXPO 2010 全球青年創新之旅
creativo, el sueño, el futuro 創造的な、夢、将来 schöpferisch Traum Zukunft 뜻있는, 꿈, 미래 créatif, le
O 2010 全球青年創新之旅 CREATIVE.DREAM.FUTURE 啓動夢想 未來我創 뜻있는, 꿈, 미래 creat
뜻있는, 꿈, 미래 EXPO 2010 創造的な、夢、将来 YOUT