

21世纪科技新视野丛书

New Horizons in The 21st Century's Science & Technology

(英汉对照读物)

◆丛书主编 吴文智 徐 新

THE FUTURE Space Exploration

未来太空探索

◆袁霞 王颖 编译

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丛书主编 吴文智 徐新

编译 袁霞 王颖

策划 向云霞

责任编辑: 陈钊 李星 杨成俊

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主 编：吴文智 徐 新
副 主 编：金光辉 王立非 张 权
编 委：王 坤 陈东东 李 瑛
 梅智宇 李恩宁 王慧娟
电子编辑：靳红华 何 磊

序

人类社会进入 21 世纪的今天,科学技术日新月异的发展速度真正地到了匪夷所思的程度。那些在过去常常被人们认为不可能的梦想,今天大多成了事实。如果将来有一天你突然发现汽车可以像飞机一样在大街小巷穿梭飞行,或当你在某个餐厅就餐时竟然发现你对面就坐着一个与你百分之百相象的你,请不要吃惊,因为这正是现代科学技术创造的结果。

科学探索是一项伟大的冒险活动,充满了刺激与振奋。它使人类的求知欲和好奇心得到满足,并且益发地激起人们愈来愈大的想像力,去欣赏和理解科学技术所带来的种种美妙与神奇。e 时代的到来更使人们对知识的力量不再有丝毫的怀疑,唯有对科学知识的需求更多地增添了紧迫感。“让科学知识为我们插上腾飞的双翅”成了我们绝大多数人潜意识的追求,正是在这样一种背景下,我们构想了这套《21 世纪科技新视野》丛书。意欲从浩瀚的科学海洋中撷取那些对我们明天的开拓进取富有启迪意义的新知识,奉献给一切热爱学习,热爱科学的人们。

《21 世纪科技新视野》是一套以英汉对照方式编排的“语言学习+科技知识”的“链接”式丛书。在编写过程中,所有参编者遵照“应用价值、文化价值、精神价值”相结合的原则精心选择每篇文章,努力把最能体现人类创造力与想像力的科学成果介绍给广大读者,所有原文均摘自英语国家的现版期刊或网络杂志。英文地道,原汁原味。内容讲求知识性、趣味性、通俗性、新颖性,

使得广大英语爱好者在学习英语的同时可以接受新科学知识的熏陶,也使那些钟爱新科学知识的人们在掌握新知识的同时得以强化和提高自己的英语水准,特别是与这个时代特点相融合的那些“与时俱进”的科技英语水准。这在加入 WTO 后的今天犹为重要,因为 WTO 已不容置疑地把每一个中国人深深地卷入到了全球一体化发展的新浪潮中。作为链接未来科学技术的知识纽带——《21 世纪科技新视野》丛书,将把我们与新科学和新知识紧紧地联接在一起,从而为广大读者打造出一个再次提升自己的知识平台,以便可以从容应对 WTO 时代扑面而来的任何挑战。

如果本丛书的出版发行确能使读者对我们的上述编写意图认同十之一二,那就是对我们所有编写人员的莫大奖赏。此外,本书得以顺利出版,除了我们所有编写人员的努力外,还折射了煤炭工业出版社决策者的创新意识和与时俱进的奋发精神,渗透了本丛书责任编辑的辛勤汗水。在此一并表示感谢。

对于书中可能存在的不足之处,我们将在下次再版时改进,敬请广大读者批评指正。

《21 世纪科技新视野》丛书编委会

2002 年元旦于南京

CONTENTS

目 录

Space Fun	2
太空的乐趣	
The Prospects for Space Tourism	16
太空旅游展望	
Making Money in Space	26
去太空淘金	
Space Sports	44
太空体育	
A Bus Between the Planets	50
星际公共汽车	
Bring Tangible Resources From Space to Earth	64
将太空有形资源带回地球	
Paving the Way for Humans On Mars	82
为人类登上火星铺平道路	
The Mysterious Middle of the Milky Way	88
神秘的银河系中心地带	
Is Earth in Danger of Being Hit by an Asteroid?	114
地球有被小行星撞击的危险吗?	
Antimatter Hunting	124
寻找反物质	



These guys are in charge of the greatest fun-fair ride in the solar system—and they can't even see it! Luckily most people are much smarter than this, and know that space is a playground of unique things to do, that are impossible on Earth. To keep it simple we can say that the fun of living in orbit boils down to two main ideas—the view, and zero gravity. That sounds a bit limited, so let's look at each in turn.

这些人掌管着太阳系最了不起的游乐交通工具，却视而不见！幸运的是，大多数人要聪明得多，知道太空是个游乐场，能在上面干一些地球上无法做到的独一无二的事。简而言之，我们可以说在太空中生活的乐趣主要归结为两个方面：风景和零重力。这听起来似乎有点受局限，那就让我们一个一个来看看吧。



Space Fun

“**W**hat is there to do in orbit?” Or, as some of the “real” space industry guys have said “Why would anyone want to go to orbit? There’s nothing there—no air, no shops—it’s just cold, dark nothing” (except when it’s scorching bright nothing, as it were…….)

Amazing, isn’t it? These guys are in charge of the greatest fun-fair ride in the solar system—and they can’t even see it! Luckily most people are much smarter than this, and know that space is a playground of unique things to do, that are impossible on Earth. To keep it simple we can say that the fun of living in orbit *boils down¹ to two main ideas—the view, and zero gravity. That sounds a bit limited, so let’s look at each in turn.

Yes—it’s round!

In questionnaires, the first thing that most people say they want to do in orbit is to look at the Earth. That’s because it’s a very very beautiful sight. “The Earth is blue,” some people say, “Earth is the planet of sea and clouds.” And the view at any time certainly depends on the local weather below you, but it’s continually changing as you go right round the Earth every 90 minutes or so. And *provided² you’re in a high inclination orbit (that is one which is at a large angle to the equator, and so goes over places at high latitudes) then you get to see most of the Earth as it rotates below you.

The sights are *pretty well³ limitless, from the extremes of na-



太空的乐趣

“在太空轨道上可以干些什么？”或者，正如一些“真正”的太空业内人士说的“为什么会有人想去轨道？那儿什么都没有——没有空气，没有商店——只有寒冷和黑暗。”（除了有些时候又可以说是亮得灼人）

令人吃惊，是不是？这些人掌管着太阳系最了不起的游乐交通工具，却视而不见！幸运的是，大多数人要聪明得多，知道太空是个游乐场，能在上面干一些地球上无法做到的独一无二的事。简而言之，我们可以说在太空上生活的乐趣主要归结为两个方面：风景和零重力。这听起来似乎有点受局限，那就让我们一个一个来看看吧。

是啊——它是圆的！

在问卷调查中，大多数人谈到在太空上第一件想做的事就是看看地球。因为那是非常非常漂亮的景色。“地球是蓝的，”有人说，“地球是海和云的行星。”任何时候的景色当然都得以你下面当地的天气为依据，但在你每隔 90 分钟左右绕地球旋转时，它也在持续不断地变换着。假如你正处于高倾角轨道（指它相对于赤道的角度很大，所以经过的是高纬地区），那你就看到地球的大部分正在你身下旋转。

风光几乎是无限的，从纯粹的自然景观——沙漠和高山，丛林

1. boil down: 在数量上减少

2. provided: 假如

3. pretty well: 几乎



ture—deserts and mountains, jungles and plains, ice-pack and whirling storms—to the night-time view of the human-made world—cities, oil-field gas-flares and fishing-fleets. There are also interesting natural views at night too—parts of the globe flicker continually with lightning storms, and you may be lucky enough to see a volcano, forest fire or the aurora: seen from above, it's said to be like floating through giant fronds of light.

Looking out from Earth is also spectacular. According to those who have been to orbit, the stars don't twinkle in space (because there's no atmosphere between you and them) — they're much brighter and "closer", and their colours are clearer. And we mustn't forget that everyone who's been to space so far has been busy, with limited time to spend looking out of the windows. And their windows weren't designed for gazing—yet they still say that the view is amazing.

So imagine a picture window, *say⁴, 1 meter across, and you and some friends are lounging in front of it, with drinks in your hands, and just passing the time with this view rolling by in front of you. And you can float round the window in any direction and you can look east, west, north or south and see the stars beyond the Earth's rim... Somewhat better than looking at a picture book.

Evolution in Action

But to get the full flavour of what it will feel like to look down at the Earth from a panoramic window in a hotel lounge—or in a space-suit outside—you have to stand back and look at the present stage of human history in its cosmic background and think of its significance. We humans have evolved on this tiny little planet literally out on the rim of



和平原，流冰群和旋风——到人造世界的夜景——城市、油田的天然气照明灯和捕鱼船队，还能见到有趣的自然风貌——闪电风暴使地球的某些部分忽隐忽现，你可能会非常幸运地看到火山、森林大火或是曙光：据说从上面看起来，它像是在巨大的呈叶状扩张的光里面漂浮。

从地球往外看景色也无比壮观。据去过太空的人声称，太空里的星星并不闪闪发光（因为你和它们之间没有大气）——它们要明亮得多，“近”得多，颜色也更加清晰。我们不应忘记，凡去过太空的人在上面时都很忙，很少有时间朝窗外看。而且他们的窗户并非设计来往外看的——然而他们还是说景色美得让人心旷神怡。

所以让我们来想像一扇约莫 1 米宽的观景窗吧，你和一些朋友倚在窗前，手里拿着饮料，观看着面前滚滚而过的景色。你可以以窗子为中心向各个方向飘动；你可以向东、向西、向北或向南看，观察地球边缘外的星星……比看画册还好一些吧。

在进取中进化

但是要想真真切切地体验到从旅馆休息室的全景窗——或是从需穿宇航服的外层空间——往下看地球的感受，你就得退后一步，看看人类历史目前在宇宙背景中所处的阶段，并思考一下它的意义。我们人类确实已经在“我们的”银河系边缘的这颗小行星上得

4. say: (美口)[用以唤起注意,或表示惊讶、惊叹、突然想起]哎呀



“our” galaxy. It’s taken the Earth about 5 billion years, and most of the time this evolution was pretty leisurely. For example, for about a billion years there were just slimy things, and then another billion years or so of fishes, plants and creepy-crawly things. Then once things got moving on the land the dinosaurs were crashing around the place for 150 million years before a huge chunk of rock smashed into the Earth, plunged the place into a freezing night, and *wiped them out⁵ (scientists are still arguing about the details).

That gave some little tree-living mammals their big chance—and they took it, growing into a whole range of new species, including apes—small, nifty animals which were clever with their hands. Then about 60 million years later a bunch of apes living on the north coast of Africa *took to⁶ eating shell-fish and swimming a good deal of the time. Like other swamp-living monkeys are doing today, they learned to walk upright. And like a number of other mammals that had taken to the sea before them these monkeys also learned to control their breathing—and then finally to talk.

This mixture was a considerable success! And these walking talking monkeys gradually spread throughout Africa, and then out to Europe and Asia, and then to every possible living place in the entire world—from sweltering jungles to the northern ice-pack, from mountains to marshes, from deserts to the tiniest Pacific islands. Compared to the earlier rate of evolution on Earth, it took them no time at all to discover agriculture and then engineering—enabling them to travel over the seas and through the atmosphere, and to talk and see each other wherever they were.



到了进化。这期间地球度过了约 500 亿年,在大部分阶段里,这种进化相当缓慢。例如,大约经过 10 亿年的光景才出现了分泌黏液的生物,而后又经过 10 亿年左右有了鱼类、植物和爬行动物。等到动物可以在陆地上了,恐龙便在这块土地上横行了 1 亿 5 千万年,最后一块巨石撞上地球,使它突然陷入冰冷的黑夜,恐龙因而遭到灭绝(科学家们仍在争论有关的细节)。

于是,一些生长在树上的小型哺乳动物撞上了好运——而它们也抓住这一机会,进化成一整系列的新物种,包括类人猿——擅长用手的漂亮小动物。随后大约过了 6 千万年,一群生活在非洲北海岸的类人猿开始吃有壳的水生动物,并且花大量时间游泳。正如今天另一些生长在沼泽里的猴子一样,他们学会了直立行走。而且,和在他们之前适应海洋生活的许多其他哺乳动物一样,这些猴子也学会了控制呼吸,最后学会了说话。

这种混合状态是一个重大进步!这些能走路会说话的猴子渐渐地遍布到非洲的各个角落,然后向欧亚迁移,最后在世界各地凡是可以居住的地方立下了脚——从闷热的丛林到北方的浮冰群,从高山到沼泽,从沙漠到最小的太平洋群岛。与早先地球上的进化速度相比,他们根本没用多少时间就发现了农业,然后是机械——使他们在海上和空中旅行,而且不管身在何处,都能互相通话,并看到对方。

5. wipe sth. out: 清除、除去

6. take to: 采纳某事(作为习惯或嗜好,或作为谋生的方法);从事;养成;耽于



Call us what you like—the talking animal, the “conscious” animal, the property-owning animal—we’re also certainly the animal that spreads out. And now we’ve reached the next stage, and we’re moving on again—just because there’s nowhere new left to go on Earth. And this time, the new place we’re going to is one zillion times bigger than the whole of the Earth, and we’re just on the absolute threshold of literally exploding out through the galaxy. . .

That’s what makes looking down at the Earth and out towards space so riveting. We’re looking down on the cradle of this amazing life-form that we are, spinning in the midst of infinite space, and looking out at the galaxy where our descendants are going to spread and have adventures that we can only faintly guess at today. Even for those who don’t feel the urge to go on and out themselves, there’s a deep fascination in just looking out at it...

Throughout human history there have been those who’ve stayed behind, and those who’ve moved on. And it’s “horses for courses” — many, if not most people will stay on the Earth—but some of the human race are going to move on. And you only have to look briefly at human history to see the dynamic economic and cultural effects that discovering new territories also has for the people who stay behind—and who finance the pioneers, among other things! The Roman empire, the British empire, the *New World⁷ all greatly enriched not only the pioneers, but also the existing economic centers of the day. It’s going to be the same again - just as soon as some big business can get started in space to pay back the investment. And that day is surprisingly close now.



随便称我们什么——说话的动物，有“意识”的动物，拥有财产的动物——我们当然还是向外扩张的动物。如今我们已经到达了下一阶段，我们又在继续前进了——只是因为地球上已经没有新的地方可去。这一次，我们要去的地方比整个地球大无限倍，我们正不容置疑地处于冲出银河系的临界。

这就是朝下看地球，向外看宇宙的魅力。我们正向下看着我们这种令人惊奇的生命形式的发源地，在无限宇宙之中旋转，我们正朝外看着银河系，我们的子孙将往那儿扩展，还会进行一些今天我们只能隐隐约约做一些猜测的冒险活动。即使对那些并不迫切想去的人来说，就朝它看一眼也是极有吸引力的一件事……

纵观人类历史，总有一些落后于时代的人，也总有一些一往无前的人。这就是所谓的“跑马道上的马”——即使不是绝大多数，也会有很多人留在地球上——但是其中一些会继续前进。你只需稍稍瞧一眼人类历史，就能看到发现新大陆对落后于时代的人——还有资助开拓者的人——所具有的动力经济学和文化方面的影响！罗马王国、不列颠王国和新大陆不仅大大地充实了开拓者的腰包，而且使得当今现存的经济中心繁荣富强。相同的事还会发生——只要一些太空大企业能够开始收回投资。而那一天已经令人惊讶地离我们越来越近了。

7. New World: 新大陆, 西半球(即美洲)



Zero Gravity

Okay, so much for the view! Being, living in zero gravity is a new world—literally. Ordinary activities, even just moving around, are all transformed in weightlessness. Simply floating slowly around lets you play all sorts of games—like trying to float precisely across the room and pick something up without bumping into anything else. The 9 US astronauts who lived (in teams of 3) on board the first US space station, Skylab (which was much more spacious than either the Space Shuttle or Mir) back in 1973-4 said that they couldn't resist making acrobatic movements, somersaults, spins and so on, whenever they had to move some distance, seeing if they could spin and still land right on their feet—*kind of ⁸ like an Olympic gymnast, but at low speed!

You'll be able to practise in your own room, and going along the corridors -there're going to be some collisions, I guess (maybe there'll have to be speed limits) and in dedicated zero-gravity play-rooms. Once hotels get started they're surely going to add more and more, larger and larger chambers to them because guests will find them more and more entertaining as the possibilities increase . And once these rooms get to be 10 or 20 meters in diameter you can start playing sports.

Water, Water, Everywhere...

Quite different from moving around, there's playing with things in zero gravity. Even on just a small scale, playing with water is fun. . . Squeeze a few blobs out of a bottle and they form little spheres, which you can line up and move around in mid-air in front of you just by blowing them. Or you can add colours to them, or blow air into one