

Science and Technology

科技

Air travel

飞机旅行

Please be seated

请就坐

A faster way of boarding planes could save time and money

一种更快速的登机方法可以节约时间和金钱

THE job of the professional astrophysicist is to contemplate the music of the spheres.

天体物理学家的工作是凝视太空，欣赏太空中的天体音乐（天文学家一直相信有天体音乐之说）。

Given the global nature of modern science, however, today's astrophysicists often spend just as much time confronting the cacophony of the airport.

然而，全球化的现代科学使得今天的天体物理学家也经常花费同样的时间去消除机场方面的不和谐音符。

Now, one of them has devised a way to make that experience a little less tedious.

现在他们中的一员已经想出了一种方法可以使得登机的过程不再那么乏味。

Jason Steffen, from Fermilab, near Chicago, has designed and experimentally tested a faster method of boarding aeroplanes.

贾森·史蒂芬，来自于芝加哥附近的费米实验室，已经设计并且实践测试了一种快速登机的方法

By his calculation, it could save airlines hundreds of millions of dollars a year.

。经过他的测算，这种方法可以为航空公司每年节约数亿美元的开销。

Dr Steffen spends his time thinking about such things as extrasolar planets, dark matter and cosmology.

史蒂芬博士致力于例如太阳系外行星、暗物质、宇宙学等方面的研究。

After waiting in a particularly long queue to board a flight, though, he began to harbour an interest in the mechanics of getting people on to planes.

但是在经历了一次超长的登机过程后，他对此展示出了兴趣。

In 2008 he wrote a computer simulation to test different methods.

2008 年他写了一个计算机模拟程序来对不同的登机方法进行测试。

Using a numerical technique familiar to him from his day job, he was able to find what looked like the best.

通过他日常工作中擅长的数值计算方法来查找最佳方案。

He has put his answer to the test, and the results have just been submitted for publication to the Journal of Air Transport Management.

最终他得到了测试的结论，并且将其投稿到了《空运管理杂志》上。

According to Dr Steffen, two things bog down the boarding process.

史蒂芬博士提出有两大因素容易阻碍登机过程。

The first is that passengers are often forced to wait in the aisle while those ahead of them stow their luggage and then get out of the way. The second is that passengers already seated in aisle or middle seats often have to get up and move into the aisle to let others take seats nearer the window.

第一个是前面的乘客需要安放好他们的行李后才能让开过道，让后面被迫等候的乘客通过；第二个是已经就坐在靠过道或者中间位置的乘客需要重新起身站到过道上，让同排靠窗的乘

客就坐。

Dr Steffen's proposal minimises the former type of disturbance and eliminates the latter.

史蒂芬博士实验的目标是将第一个因素的影响最小化同时消除第二个因素。

In the Steffen method, passengers are boarded by seat type (ie, window, middle or aisle while also ensuring that neighbours in the boarding queue are seated in alternating rows.

史蒂芬的方法是将乘客按照座位类型分类（例如靠窗、中间、过道），同时确认前后的乘客都是按照座位的不同排次交替排队的（例如 1、3、5 排或者 2、4、6 排）。

First, the window seats for every other row on one side of the plane are boarded.

首先让飞机侧靠窗的隔排乘客率先登机，接着再换另一侧靠窗的隔排乘客登机。

Next, alternate rows of window seats on the opposite side are boarded.

接下去让两边被跳过的排序乘客先后就坐，这样就靠窗的位子就坐满了。

Then, the window seats in the skipped rows are filled in on each side. The procedure then repeats with the middle seats and the aisles.

然后重复同样的方法来使得中间位子和靠过道的位子相继就坐。

By boarding alternate rows in this way, passengers are spaced far enough apart along the aisle to stow their luggage in parallel, all at the same time. Because passengers in the same seat types board together, they do not have to step over each other to swap seats.

用这种方法让交叉排序的乘客登机，使得他们可以同时在过道上有足够的空间来将他们的行李安放到行李架上，而且因为每次登机时的乘客都是同一个座位分类，因此他们不需要从座位上起身给别人让行。

To test the idea, Dr Steffen conducted a test using passengers and a mock Boeing 757 fuselage.

为了测试这个想法，史蒂芬博士用一个模拟的波音 757 机身和一些乘客做了个实验。

The fuselage had a single aisle and 12 rows.

这个模拟机身有一条过道和 12 排。

Seventy-two passengers (including families with children boarded, towing their bags and roll-aboard suitcases.

实验中 72 名乘客（包括带小孩的家庭）登机，并安放他们的包裹和行李箱。

In addition to the Steffen method, the team tried boarding in a strict back-to-front order, block boarding (the system now used by most airlines, with passengers assigned to groups within the cabin and boarding in random order (which made its debut at American Airlines earlier this summer.

除了史蒂芬的方法外，实验团队还尝试了另外两种登机方法，有严格按照后排先上按区块顺序登机的分块登机法（这个方法目前被大部分的航空公司采用，它根据乘客在机舱中的位置进行分组）和随机登机法（这个方法在今年夏初被美国的航空公司采用）。

Standard block boarding turned out to be the slowest way to do things, taking almost seven minutes to fill the 12 rows.

标准的分区登机方法被证实是速度最慢的。坐满 12 排几乎需要 7 分钟的时间。

Dr Steffen's system took half that time.

而史蒂芬博士的方法只需要其一半左右的时间。

Indeed, it was the fastest performing of the methods tested.

事实上，它是被测试的几个方法中速度最快的了。

With full-sized planes, the benefit should increase, as more people can stow their luggage simultaneously along the longer aisles.

如果全尺寸的飞机使用这个方法，那受益会更多，因为会有更多的乘客在更长的通道上同时

安放他们的行李。

Although Dr Steffen admits that the airline industry has shown no interest in his method so far, he points out that, in principle, there should be no barriers to its adoption.

尽管史蒂芬博士承认，还没有航空公司对他的方法表现出兴趣，但他指出，这个方法实施起来是没有障碍的。

Though directing airline passengers on to a plane is a little like herding cats some airlines, such as Southwest, already try to get their passengers to line up in a certain order before boarding.

尽管有些廉价的航空公司例如美国西南航空，乘客们经常会一窝蜂的登机，但是也已经在尝试让他们的乘客们在登机前按照某种次序排队。

If travellers believed that complying with the new arrangements really would make their lives easier, they would probably do so.

一旦乘客们确信遵照这种方法可以使他们活得更轻松，他们是会愿意这么做的。

And by Dr Steffen's calculations, airlines have a pretty strong incentive to persuade them.

而且经过史蒂芬博士的计算，航空公司有足够吸引力的理由说服他们。

Previous work has shown that every minute a plane spends at the terminal costs \$30. Assuming the average carrier runs 1,500 flights a day, saving as little as six minutes per flight would add up to \$100m a year.

有数据表明飞机在停机位每分钟的开销是 30 美元，假设平均每个机场每天起飞 1500 架次飞机，每架次可以节约 6 分钟的话，那每年至少可以节约一亿美元。

For hard-pressed airlines running on razor-thin margins, that really would be astronomical.

对于处于重压之下且薄利的航空公司来讲，这无疑是个天文数字。