**TED演讲者：Stephen Webb | 斯蒂芬·韦伯**

**演讲标题：Where are all the aliens? | 外星人在哪里?**

**内容概要：The universe is incredibly old, astoundingly vast and populated by trillions of planets -- so where are all the aliens? Astronomer Stephen Webb has an explanation: we're alone in the universe. In a mind-expanding talk, he spells out the remarkable barriers a planet would need to clear in order to host an extraterrestrial civilization -- and makes a case for the beauty of our potential cosmic loneliness. "The silence of the universe is shouting, 'We're the creatures who got lucky,'" Webb says.**

**宇宙非常古老，大得不可思议，并且有数万亿颗行星——那么外星人都在哪里呢？天文学家斯蒂芬·韦伯对此有一个解释：我们在宇宙中是独一无二的。在这个让人大开眼界的演讲中，他讲述了一颗行星为了容纳外星文明而需要清除的巨大障碍——并且说明了我们可能是宇宙中绝无仅有的美丽之处。 “宇宙的沉默是在呐喊：'我们是幸运的生物'。” 韦伯说。**

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| I saw a UFO once. | 我见过一次不明飞行物。[00:13] |
| I was eight or nine, playing in the street with a friend who was a couple of years older, and we saw a **featureless** silver **disc hovering** over the houses. | 那时我八、九岁, 和一个比我大几岁的朋友在街上玩, 我们发现一个普通的 银色碟子在上空盘旋。[00:15] |
| We watched it for a few seconds, and then it shot away **incredibly** quickly. | 我们盯着它看了几秒钟, 然后它飞走了,速度极快。[00:25] |
| Even as a kid, I got angry it was ignoring the laws of physics. | 虽然我只是个小孩, 但我依然感到气愤, 因为它不符合物理规律。[00:30] |
| We ran inside to tell the **grown-ups**, and they were **skeptical** -- you'd be **skeptical** too, right? | 我们跑回家告诉大人们, 但他们表示很怀疑—— 谁都会怀疑的,对吧？ [00:34] |
| I got my own back a few years later: one of those grown-ups told me, "Last night I saw a flying **saucer**. | 几年后,我扳回一局: 那些大人中的一个对我说, “昨晚我看到一个飞碟,[00:41] |
| I was coming out of the pub after a few drinks." | 我当时刚在酒吧喝了几杯出来。” [00:47] |
| I stopped him there. I said, "I can explain that **sighting**." | 我当时就打断他说, “我可以解释你看到的是什么。” [00:49] |
| (Laughter) **Psychologists** have shown we can't trust our brains to tell the truth. | （笑声） 心理学家已经证明, 我们不能相信自己的大脑 说的都是事实。[00:52] |

**featureless:** adj.无特色的 **disc:** n.圆盘,[电子]唱片(等于disk)/vt.灌唱片 **hovering:** n.停悬;空中悬停/v.徘徊(hover的ing形式);盘旋 **incredibly:** adv.难以置信地；非常地 **grown-ups:** n.成人(grown-up的复数形式) **skeptical:** adj.怀疑的；怀疑论的，不可知论的 **saucer:** n.茶托,浅碟;浅碟形物;眼睛 **sighting:** n.瞄准;照准;视线/v.看见(sight的ing形式) **Psychologists:** n.[心理]心理学家(psychologist的复数形式)

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| It's easy to fool ourselves. | 我们很容易被自己欺骗。[00:57] |
| I saw something, but what's more likely -- that I saw an alien spacecraft, or that my brain **misinterpreted** the data my eyes were giving it? | 我看到了某种东西, 但哪种情况可能性更大—— 我看到的是外星飞船？ 还是我的大脑误解了眼睛传给它的数据？ [00:59] |
| Ever since though I've wondered: Why don't we see flying **saucers flitting** around? | 从那以后,我一直在想: 为什么我们在周围看不到飞碟呢?[01:10] |
| At the very least, why don't we see life out there in the **cosmos**? | 至少, 我们为什么看不到 宇宙中的其它生命呢? [01:14] |
| It's a puzzle, and I've discussed it with dozens of experts from different **disciplines** over the past three decades. | 这是一个谜, 过去的三十年里,我与不同领域的 数十位专家讨论过这个问题。[01:18] |
| And there's no **consensus**. | 我们并没有达成共识。[01:25] |
| Frank **Drake** began searching for alien signals back in 1960 -- so far, nothing. | 弗兰克·德雷克从1960年 开始寻找外星信号—— 到目前为止,什么都没找到。[01:27] |
| And with each passing year, this nonobservation, this lack of evidence for any alien activity gets more **puzzling** because we should see them, shouldn't we? | 一年又一年, 什么也观测不到, 没有任何外星活动的证据, 这越来越让人困惑, 因为我们应该能看到它们的,不是吗?[01:33] |
| The universe is 13.8 billion years old, give or take. | 宇宙已经存在了大概 138亿年了。[01:46] |

**misinterpreted:** vt.曲解,误解 **saucers:**(放茶杯的)浅碟/茶托/茶碟(saucer的复数) **flitting:** v.翩翩飞起;高速移动(flit的现在分词);调拨,搬运,搬移 **cosmos:** n.宇宙;和谐;秩序;大波斯菊 **disciplines:** n.[管理]纪律(discipline的复数);科目/v.训导;使有纪律(discipline的单三形式) **consensus:** n.一致；舆论；合意 **Drake:** n.公鸭;蜉蝣类(等于drakefly) **puzzling:** adj.使迷惑的;使莫名其妙的

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| If we represent the age of the universe by one year, then our species came into being about 12 minutes before midnight, 31st December. | 如果我们用一年来代表宇宙的年龄, 那么我们这个物种形成于[01:52] |
| Western civilization has existed for a few seconds. | 西方文明刚出现几秒钟。[02:01] |
| **Extraterrestrial civilizations** could have started in the summer months. | 而外星文明可能是夏季开始的。[02:05] |

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| Imagine a summer civilization developing a level of technology more advanced than ours, but tech based on accepted physics though, | 想象一个夏季出现的文明 开发出比我们更先进的技术, 但我是说符合公认的 物理理论的技术,[02:10] |
| I'm not talking **wormholes** or **warp** drives -- whatever -- just an **extrapolation** of the sort of tech that TED celebrates. | 而不是虫洞或曲速引擎 ——那种类型的—— 我只说像TED在这儿庆祝的 那种技术的进步。[02:19] |
| That civilization could program **self-replicating probes** to visit every **planetary** system in the galaxy. | 这个文明也许会编写 可自我复制的探测器, 去访问银河系中的每一个星系。[02:28] |
| If they launched the first probes just after midnight one August day, then before breakfast same day, they could have **colonized** the galaxy. | 如果他们在8月的某天午夜, 发射了第一颗探测器, 那么在当天早餐之前, 他们可能就已经统治银河系了。[02:35] |
| **Extraterrestrial:** adj.地球外的/n.天外来客 **civilizations:** n.文明(civilization的复数形式) **wormholes:** n.虫洞(wormhole的复数形式) **warp:** n.弯曲,歪曲;偏见;乖戾/vt.使变形;使有偏见;曲解/vi.变歪,变弯;曲解 **extrapolation:** n.[数]外推法;推断 **self-replicating:** adj.自我复制的/自我复制 **probes:** n.探索;[电子][医]探针;试样(probe的复数)/v.探查;用尖物刺穿(probe的三单形式) **planetary:** adj.行星的 **colonized:** vt.将...开拓为殖民地;移于殖民地;从他地非法把选民移入/vi.开拓殖民地;移居于殖民地 | |
| **Intergalactic colonization** isn't much more difficult, it just takes longer. | 银河系之外的星际统治也不算太难, 只是要多花点时间而已。[02:46] |
| A civilization from any one of millions of galaxies could have colonized our galaxy. | 在数百万星系中, 任何一个星系的文明 都有可能统治我们的银河系。[02:50] |
| Seems **far-fetched**? | 听起来很牵强?[02:56] |
| Maybe it is, but wouldn't aliens engage in some **recognizable** activity -- put worldlets around a star to capture free sunlight, **collaborate** on a **Wikipedia Galactica**, or just shout out to the universe, "We're here"? | 也许是的, 但外星人难道就不做一些 可以被探测到的活动吗? 比如在恒星周围造个小世界获取阳光, 合作一个星际维基百科, 或者只是对着宇宙大喊: “我们在这里！” [02:58] |
| So where is everybody? | 那么他们到底在哪儿?[03:16] |
| It's a puzzle because we do expect these civilizations to exist, don't we? | 这是个谜,因为我们确实认为 有这种文明存在,不是吗?[03:18] |
| After all, there could be a **trillion** planets in the galaxy -- maybe more. | 毕竟,银河系中可能有 一万亿颗星球—— 也许更多。[03:24] |
| You don't need any special knowledge to consider this question, and I've explored it with lots of people over the years. | 你不需要任何专业知识 来思考这个问题, 多年来, 我和很多人 都探讨过这个问题。[03:29] |
| And I've found they often frame their thinking **in terms of** the **barriers** that would need to be cleared if a planet is to host a **communicative** civilization. | 我发现他们对这个问题的 思考有个标准, 就是如果一个星球要 承载可交流的文明, 它需要清除一些障碍。[03:37] |
| **Intergalactic:** adj.星系间的;银河间的 **colonization:** n.殖民;殖民地化 **far-fetched:** adj.牵强附会的 **recognizable:** adj.可辨认的;可认识的;可承认的 **collaborate:** vi.合作;勾结,通敌 **Wikipedia:** 维基百科 **Galactica:** 银河号 **trillion:** n.[数]万亿/adj.万亿的/num.[数]万亿 **in terms of:** 依据;按照;在...方面;以...措词 **barriers:** n.障碍;栅栏;篱笆墙(barrier的复数形式) **communicative:** adj.交际的;爱说话的,健谈的;无隐讳交谈的 | |
| And they usually identify four key barriers. | 他们通常会考虑四个关键障碍。[03:48] |
| **Habitability** -- that's the first barrier. | 宜居性—— 这是第一个障碍。[03:52] |
| We need a terrestrial planet in that just right "**Goldilocks** zone," | 我们需要一颗刚好位于 “适居带” 中的陆地行星,[03:55] |
| where water flows as a liquid. | 上面的水以液态形式流动。[04:00] |
| They're out there. | 这样的星球是存在的。[04:03] |
| In 2016, **astronomers** confirmed there's a planet in the **habitable** zone of the closest star, **Proxima Centauri** -- so close that Breakthrough Starshot project plans to send probes there. | 2016年,天文学家证实, 有一颗行星位于最近的恒星的 适居带中, 接近于半人马座—— 非常近,所以 “突破摄星” 工程 计划发送一个探测器过去。[04:04] |
| We'd become a starfaring species. | 我们已经成为 可以穿越星际的物种了。[04:17] |
| But not all worlds are habitable. | 但不是所有的星球都适合居住。[04:21] |
| Some will be too close to a star and they'll fry, some will be too far away and they'll freeze. | 有些离恒星太近,会被烤焦, 有些离得太远,会被冻结。[04:22] |
| Abiogenesis -- the creation of life from nonlife -- that's the second barrier. | 生命起源—— 从非生命中孕育出生命—— 这是第二个障碍。[04:28] |
| The basic building blocks of life aren't unique to Earth: **amino acids** have been found in **comets**, complex organic **molecules** in **interstellar** dust clouds, water in exoplanetary systems. | 构成生命的基本要素并非地球独有: 彗星上已经发现了氨基酸, 在星际尘埃云中的复杂有机分子, 在外层空间发现了水。[04:33] |
| **Habitability:** n.可居住;适于居住 **Goldilocks:** n.金发的;金凤花的一种 **astronomers:** 天文学家 **habitable:** adj.可居住的;适于居住的 **Proxima:** n.(半人马座)比邻星(等于ProximaCentauri) **Centauri:** 半人马座 **amino:** adj.氨基的/n.[化学]氨基 **acids:** n.[化学]酸,酸类;有酸味的东西(acid的复数) **comets:** n.[天]彗星(comet的复数) **molecules:** n.[化学]分子,微粒;[化学]摩尔(molecule的复数) **interstellar:** adj.[航][天]星际的 | |

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| The **ingredients** are there, we just don't know how they combine to create life, and **presumably** there will be worlds on which life doesn't start. | 那些成分都是存在的, 我们只是不知道 它们如何结合起来创造生命, 而且可能在一些世界里, 生命还没有诞生。[04:46] |
| The development of technological civilization is a third barrier. | 第三个障碍是技术文明的发展。[04:55] |
| Some say we already share our planet with alien **intelligences**. | 有人说我们已经在和外星人 共享我们的星球。[05:00] |
| A 2011 study showed that elephants can cooperate to solve problems. | 2011年的一项研究表明, 大象可以合作解决问题。[05:05] |
| A 2010 study showed that an **octopus** in **captivity** can recognize different humans. | 2010年的研究表明, 人工饲养的章鱼可以识别不同的人。[05:10] |
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| 2017 studies show that **ravens** can plan for future events -- wonderful, clever creatures -- but they can't **contemplate** the Breakthrough Starshot project, and if we **vanished** today, | 2017年的研究表明, 乌鸦可以为未来的事件做规划 —— 多么奇妙的、聪明的生物—— 但是它们想不出“突破摄星”计划, 如果今天,我们消失了,[05:17] |
| they wouldn't **go on to** implement Breakthrough Starshot -- why should they? | 它们也不会继续“突破摄星”之旅—— 它们为什么要去呢?[05:29] |
| Evolution doesn't have space travel as an end goal. | 进化的最终目标又不是太空旅行。[05:33] |
| **ingredients:** 材料;作料 **presumably:** adv.大概；推测起来；可假定 **intelligences:** [军]情报 **octopus:** n.章鱼/章鱼肉 **captivity:** n.囚禁;被关 **ravens:** n.乌鸦(raven的复数);低质煤 **contemplate:** vt.沉思;注视;思忖;预期/vi.冥思苦想;深思熟虑 **vanished:** n.销声匿迹,无影无踪(美国电视连续剧剧名) **go on to:** 接着,继续去;转入;延续到 | |
| There will be worlds where life doesn't **give rise to** advanced technology. | 有些世界里的生命 没有发明先进的技术。[05:36] |
| Communication across space -- that's a fourth barrier. | 跨太空通信——这是第四个障碍。[05:42] |
| Maybe advanced civilizations choose to explore inner space **rather than** outer space, or engineer at small distances **rather than** large. | 也许先进的文明选择探索内部空间, 而不是外太空, 或者在小范围内而不是大范围上活动。[05:45] |
| Or maybe they just don't want to risk an encounter with a **potentially** more advanced and hostile neighbor. | 或者,他们只是不想冒险, 遇到一个潜在的,更先进的敌对的邻居。[05:56] |
| There'll be worlds where, for whatever reason, civilizations either stay silent or don't spend long trying to communicate. | 会有一些世界,无论出于什么原因, 那里的文明要么保持沉默, 要么不花太长的时间交流。[06:03] |
| As for the height of the barriers, your guess is as good as anyone's. | 至于障碍的高度, 大家的猜测都差不多。[06:12] |
| In my experience, when people sit down and **do the math**, they **typically** conclude there are thousands of civilizations in the galaxy. | 根据我的经验, 当人们进行数学计算, 通常得到的结论是, 银河系中存在数千个文明。[06:17] |
| But then we're back to the puzzle: Where is everybody? | 但我们又回到了刚才的谜题: 外星人到底在哪儿?[06:27] |
| By definition, UFOs -- including the one I saw -- are **unidentified**. | 根据定义, 不明飞行物—— 包括我看到的那个 —— 是身份“不明”的。[06:31] |
| **give rise to:** 使发生,引起 **rather than:** 而不是;宁可...也不愿 **potentially:** adv.可能地,潜在地 **do the math:** 盘算一下 **typically:** adv.代表性地;作为特色地 **unidentified:** adj.未经确认的;未辨别出的,身份不明的 | |
| We can't simply infer they're spacecraft. | 我们不能简单地推断 它们是宇宙飞船。[06:36] |
| You can still have some fun playing with the idea aliens are here. | 你仍然可以饶有兴趣地 想象着外星人就在这里。[06:40] |
| Some say a summer civilization did colonize the galaxy and **seeded** Earth with life ... | 有人认为,夏季文明确实统治了银河系, 并给地球播下了生命的种子.....[06:44] |
| others, that we're living in a **cosmic** wilderness **preserve** -- a zoo. | 还有人认为,我们生活在 宇宙的野生保护区—— 动物园。[06:51] |
| Yet others -- that we're living in a **simulation**. | 也有人说—— 我们生活在一个模拟世界里。[06:56] |
| Programmers just haven't revealed the aliens yet. | 只是程序员还没安排外星人出场而已。[07:00] |
| Most of my colleagues though argue that E.T. is out there, we just need to keep looking, and this makes sense. | 大多数我的同事认为 外星人是存在的, 只是我们仍需寻找, 这是有道理的。[07:03] |
| Space is vast. | 宇宙空间是巨大的。[07:11] |
| **Identifying** a signal is hard, and we haven't been looking that long. | 识别一个信号是很难的, 我们寻找的时间也不算很久。[07:12] |
| Without doubt, we should spend more on the search. | 毫无疑问,我们应该在搜寻上加大投入。[07:18] |
| It's about understanding our place in the universe. | 这有助于理解 我们在宇宙中的位置。[07:22] |
| It's too important a question to ignore. | 这个问题太重要了,不容忽视。[07:25] |
| **seeded:** adj.已播种了的;去籽的 **cosmic:** adj.宇宙的(等于cosmical) **preserve:** vt.保存;保护;维持;腌;禁猎/n.保护区;禁猎地;加工成的食品 **simulation:** n.仿真;模拟;模仿;假装 **Identifying:** n.识别,标识;标识关系/v.识别(identify的现在分词) | |

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| But there's an obvious answer: we're alone. | 但有一个显而易见的答案: 我们是孤单的。[07:29] |
| It's just us. | 宇宙中只有我们存在。[07:33] |
| There could be a trillion planets in the galaxy. | 银河系中可能有一万亿颗行星。[07:34] |
| Is it **plausible** we're the only creatures **capable of contemplating** this question? | 是否可能,我们是唯一有能力 思考这个问题的生物呢?[07:38] |
| Well, yes, because in this context, we don't know whether a trillion is a big number. | 没错,因为在这种情况下, 我们不知道一万亿这个数量大不大。[07:43] |
| In 2000, Peter Ward and Don Brownlee **proposed** the Rare Earth idea. | 2000年,彼得 · 瓦尔德和唐 · 布朗尼 提出了 “稀有地球” 的概念。[07:49] |
| Remember those four barriers that people use to estimate the number of civilizations? | 还记得人们用来 估算文明数量的四个障碍吗? [07:55] |
| Ward and Brownlee said there might be more. | 瓦尔德和布朗尼认为, 可能还有更多的障碍存在。[08:00] |
| Let's look at one possible barrier. | 咱们来看一个可能存在的障碍。[08:03] |
| It's a recent suggestion by David Waltham, a **geophysicist**. | 这是地球物理学家大卫 · 沃尔瑟姆 最近提出的建议。[08:05] |
| This is my very simplified version of Dave's much more **sophisticated** argument. | 这是我对大卫的复杂论证 做了简化处理的版本。[08:09] |
| We are able to be here now because Earth's previous **inhabitants** enjoyed four billion years of good weather -- **ups and downs** but **more or less clement**. | 我们能够存在于此, 是因为地球的早期居民享受了40亿年的好天气—— 时好时坏,但基本上是温和的。[08:16] |
| **plausible:** adj.貌似可信的，花言巧语的；貌似真实的，貌似有理的 **capable of:** 有...能力的;可...的 **contemplating:** 注视 **proposed:** adj.被提议的;所推荐的/v.提议;计划(propose的过去式和过去分词) **geophysicist:** n.[地物]地球物理学者 **sophisticated:** adj.复杂的；精致的；久经世故的；富有经验的/v.使变得世故；使迷惑；篡改(sophisticate的过去分词形式) **inhabitants:** n.居民(inhabitant的复数) **ups and downs:** n.沉浮;盛衰;高低 **more or less:** 或多或少 **clement:** adj.温和的;仁慈的 | |
| But **long-term** climate stability is strange, if only because **astronomical influences** can push a planet towards freezing or **frying**. | 但是气候的长期稳定是值得探究的, 因为仅仅是天文影响, 都会让一个星球走向冰冻或炙烤。[08:26] |
| There's a hint our moon has helped, and that's interesting because the **prevailing** theory is that the moon came into being when Theia, a body the size of Mars, crashed into a newly formed Earth. | 有一种迹象表明, 我们的月球起了作用, 这很有趣, 因为普遍流行的理论是, 月球形成的时候,一个火星大小的 天体忒伊亚 撞上了刚形成的地球。[08:35] |
| The outcome of that crash could have been a quite different Earth-Moon system. | 那次撞击的结果可能产生了 一个截然不同的地月系统。[08:48] |
| We ended up with a large moon and that **permitted** Earth to have both a stable **axial tilt** and a slow **rotation** rate. | 然而实际上,我们最终 得到的是一个大月球, 这使得地球既可以稳定地轴向倾斜, 也可以缓慢地旋转。[08:53] |
| Both factors influence climate and the suggestion is that they've helped moderate climate change. | 这两个因素都影响着气候, 它们有助于缓和气候变化。[09:03] |
| Great for us, right? | 对我们来说很棒,对吧? [09:09] |
| But Waltham showed that if the moon were just a few miles bigger, things would be different. | 但沃尔瑟姆指出, 如果月球的直径再大几英里, 情况就会不同了。[09:11] |
| **long-term:** adj.长期的/从长远来看 **astronomical:** adj.天文的,天文学的;极大的 **influences:** n.影响,影响力;作用(influence的复数形式)/vt.影响,感化(influence的三单形式) **frying:** v.煎(fry的ing形式);油炸/n.油炸,油煎 **prevailing:** adj.流行的；一般的，最普通的；占优势的；盛行很广的/v.盛行，流行(prevail的现在分词形式)；获胜 **permitted:** adj.被允许的/v.允许(permit的过去分词) **axial:** adj.轴的;轴向的 **tilt:** vi.倾斜;翘起;以言词或文字抨击/vt.使倾斜;使翘起/n.倾斜 **rotation:** n.旋转;循环,轮流 | |
| Earth's spin **axis** would now wander **chaotically**. | 地球的自转轴将会混乱地漂移。[09:16] |
| There'd be episodes of rapid climate change -- not good for complex life. | 气候会快速变化—— 这对复杂生命的形成非常不利。[09:19] |
| The moon is just the right size: big but not too big. | 月亮的尺寸正合适: 不大不小,正好。[09:25] |
| A "Goldilocks" moon around a "Goldilocks" planet -- a barrier perhaps. | 一颗 “刚刚好的” 月球环绕着 一颗 “刚刚好的” 行星—— 也许这也是障碍之一。[09:30] |
| You can imagine more barriers. | 你可以想象更多的障碍。[09:35] |
| **For instance**, simple cells came into being billions of years ago ... | 例如, 简单的细胞是数十亿年前形成的.....[09:36] |
| but perhaps the development of complex life needed a series of unlikely events. | 但也许复杂生命的孕育和发展 需要一系列的不可能事件为前提。[09:42] |
| Once life on Earth had access to **multicellularity** and sophisticated genetic structures, and sex, new opportunities opened up: animals became possible. | 一旦地球上的生命发展为多细胞生物、 复杂的遗传结构, 和性别, 新的机会就出现了: 动物就会诞生。[09:48] |
| But maybe it's the fate of many planets for life to settle at the | 但是,可能许多行星的命运是 只有简单细胞级别的 |

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| level of simple cells. | 生命存在。[09:58] |
| Purely for the purposes of illustration, let me suggest four more barriers to add to the four that people said blocked the path to communicative civilization. | 纯粹为了说明的目的, 让我再加四个障碍, 基于人们所说的阻碍了 文明交流渠道的四个障碍。[10:06] |
| **axis:** n.轴；轴线；轴心国 **chaotically:** adv.混乱地 **For instance:** 例如 **multicellularity:** n.多细胞 | |
| Again, purely for the purposes of illustration, suppose there's a one-in-a-thousand chance of making it across each of the barriers. | 强调一下,纯粹为了解释清楚, 我假设跨越每一个障碍的 几率是千分之一。[10:17] |
| Of course there might be different ways of **navigating** the barriers, and some chances will be better than **one in a thousand**. | 当然,可能会有不同的方法 来克服这些障碍, 有些机会可能不止千分之一。[10:25] |
| Equally, there might be more barriers and some chances might be one in a million. | 同样,也可能有另一些障碍, 它们的机会只有百万分之一。[10:31] |
| Let's just see what happens in this picture. | 那么,就按这假设来看看会发生什么。[10:35] |
| If the galaxy contains a trillion planets, how many will host a civilization capable of contemplating like us projects such as Breakthrough Starshot? | 如果银河系里有一万亿颗行星, 那么有多少个行星上存在 像我们这样的文明, 能计划出 “突破摄星” 项目的文明? [10:38] |
| Habitability -- right sort of planet around the right sort of star -- the trillion becomes a billion. | 适居性—— 合适的行星围绕着合适的恒星—— 一万亿里面有十亿个。[10:50] |
| Stability -- a climate that stays **benign** for **eons** -- the billion becomes a million. | 稳定性—— 永远保持良性的气候—— 十亿里面有一百万个。[10:56] |
| Life must start -- the million becomes a thousand. | 必须孕育生命—— 百万里面有一千个。[11:03] |
| Complex life forms must arise -- the thousand becomes one. | 拥有复杂的生命形式—— 一千里面只有一个。[11:07] |
| **navigating:** v.航行,操纵(navigate的现在分词形式)/adj.航行的,航行中 **one in a thousand:** 杰出的;稀有的;百里挑一 **benign:** adj.良性的；和蔼的，亲切的；吉利的/ **eons:** n.万古;永世(eon的复数) | |
| Sophisticated tool use must develop -- that's one planet in a thousand galaxies. | 必须开发出精密的工具—— 上千个星系中只有一颗行星能做到。[11:12] |
| To understand the universe, they'll have to develop the techniques of science and mathematics -- that's one planet in a million galaxies. | 为了了解宇宙, 必须发展科技和数学—— 百万个星系中只有一颗行星能做到。[11:17] |
| To reach the stars, they'll have to be social creatures, capable of discussing abstract **concepts** with each other using complex grammar -- one planet in a billion galaxies. | 要接触其他恒星, 必须有社会性的生物, 能够用复杂的语法 相互讨论抽象概念—— 十亿个星系中只有一颗行星能做到。[11:24] |
| And they have to avoid disaster -- not just **self-inflicted** but from the skies, too. | 而且它们必须避开灾难—— 不只是人祸,还有天灾。[11:34] |
| That planet around Proxima Centauri, last year it got **blasted** by a **flare**. | 围绕比邻星的那颗行星, 去年被一个耀斑烤焦了。[11:40] |
| One planet in a trillion galaxies, just as in the visible universe. | 所以,一万亿星系中 只有一颗行星能做到, 可见的宇宙就是如此。[11:47] |
| I think we're alone. | 我想我们是孤单的。[11:54] |
| Those colleagues of mine who agree we're alone often see a barrier ahead -- bioterror, global warming, war. | 我的同事们,那些同意 人类是孤单存在着的同事们, 常会看到摆在我们面前的障碍—— 生物恐怖主义、 全球变暖、战争。[11:57] |
| A universe that's silent because technology itself forms the barrier to the development of a truly advanced civilization. | 宇宙是沉默的, 因为科学技术本身会形成障碍, 让真正先进的文明无法发展。[12:06] |
| **concepts:** n.概念,观念;思想(concept复数形式) **self-inflicted:** adj.自己造成的;加于自身的 **blasted:** adj.枯萎的;被害的;被咒的 **flare:** vt.使闪耀;使张开;用发光信号发出;使外倾/vi.闪耀,闪光;燃烧;突然发怒/n.闪光,闪耀;耀斑;爆发;照明弹 | |
| **Depressing**, right? | 听起来令人沮丧,是吧? [12:16] |
| I'm arguing the exact opposite. | 而我的观点恰恰相反。[12:19] |
| I grew up watching "Star **Trek**" and "Forbidden Planet," | 我是看《星际迷航》和《禁星》长大的,[12:22] |
| and I saw a UFO once, so this idea of cosmic loneliness I certainly find slightly **wistful**. | 并且我亲眼见过一次不明飞行物, 所以,这种宇宙独有的概念 肯定让我有些伤感。[12:24] |
| But for me, the silence of the universe is shouting, "We're the creatures who got lucky." | 但对我来说, 宇宙的沉默是在呼喊, “我们是幸运的生物。” [12:34] |
| All barriers are behind us. | 我们跨越了所有障碍。[12:40] |
| We're the only species that's cleared them -- the only species capable of **determining** its own destiny. | 我们是唯一扫清所有障碍的物种—— 唯一能够决定自己命运的物种。[12:42] |
| And if we learn to appreciate how special our planet is, how important it is to look after our home and to find others, how incredibly fortunate we all are simply to be **aware** of the universe, **humanity** might survive for a while. | 如果我们意识到这个星球的特殊性, 意识到:照顾好我们的家园 和找到其他生命的重要性; 意识到:我们十分幸运地 了解了宇宙的存在, 那么人类可能会存活得更长。[12:49] |
| And all those amazing things we dreamed aliens might have | 所有那些不可思议的事情, 我们幻想外星人曾经做 |

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| done in the past, that could be our future. | 过的事, 也许就是我们的未来。[13:04] |
| **Depressing:** adj.压抑的;使人沮丧的 **Trek:** n.艰苦跋涉/vt.(牛)拉(货车);搬运/vi.艰苦跋涉 **wistful:** adj.渴望的;沉思的,默想的;引起怀念的;不满足似的 **determining:** v.决定(determine的ing形式) **aware:** adj.意识到的；知道的；有...方面知识的；懂世故的/ **humanity:** n.人类；人道；仁慈；人文学科 | |
| Thank you very much. | 非常感谢。[13:11] |
| (Applause) | （掌声）[13:12] |