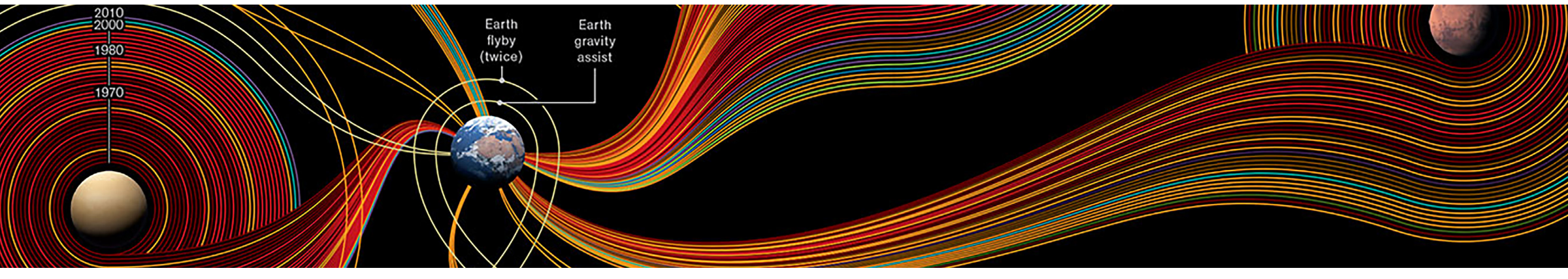
Cosmic Journeys:
50 Years of Exploration

c22097586
original image available at 5W Graphics

When reading the literature on what makes a good visualisation, or on why so many visualisations fail at presenting their data in an engaging way, you can usually expect to see one idea pop up in one of various forms:

KEEP IT SIMPLE.
LESS IS MORE.
Don't rely on CHARTJUNK(1).

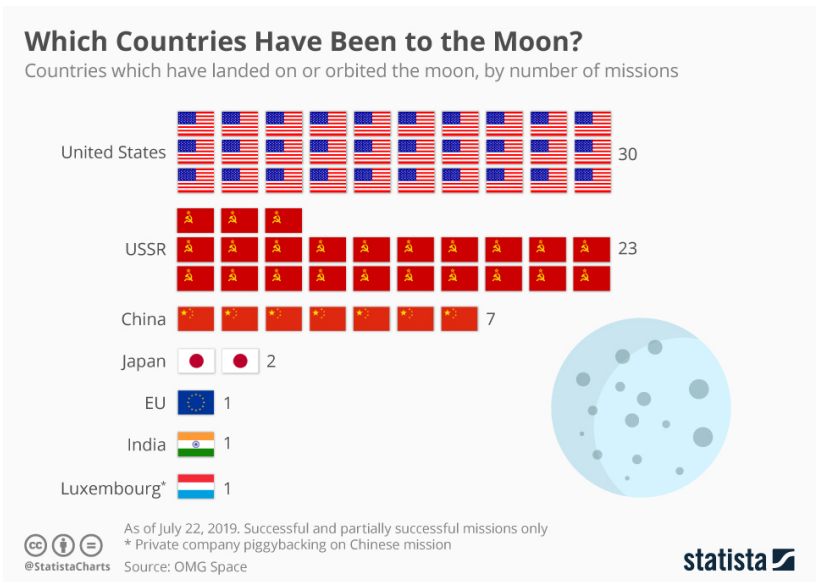
I chose to explore a visualisation that appears to flagrantly break this rule. There is stuff going on everywhere. A lot of the text is unreadable without zooming in. Somehow, though, it conveys its intended message simply and instantly. It has won awards for its data presentation(2), and people to whom I've showed it were amazed at how quickly they grasped the data it conveys.



Cosmic Journeys(3) was designed by 5W Infographics to be displayed in print as a fold-out feature in National Geographic magazine (4). In a series of delicate lines, spreading out from Earth and forming concentric circles around nearby celestial bodies, *Cosmic Journeys* records every single mission attempted by the various space agencies of Earth in the last 50 years.

This subject matter has all the potential makings of a bad or boring data visualisation:

- Homogeneous data. 6 space agencies sending rockets toward the same clutch of planets/moons.
- The subject matter is hard to grasp, full of jargon like 'fly-bys', 'soft landings', 'gravity assists'.
- Outer space is massive and fundamentally unknowable. So, if Voyager 2 approached Neptune in 1989, so what?



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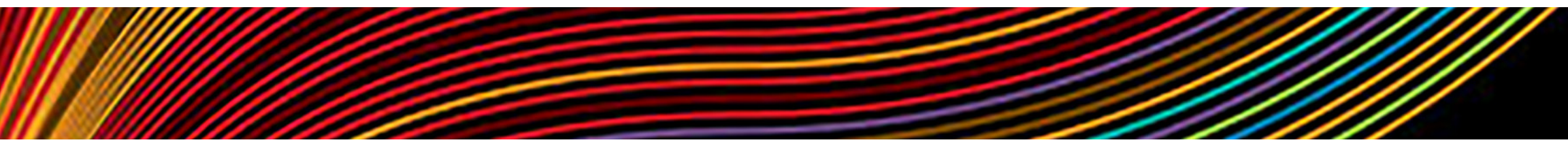
More conventional ways to display this data would be as either a bar chart that informs but tells comparatively very little about the history of spaceflight (5), or another jumble of tables and definitions more suited to a reference book.

So, how does ***Cosmic Journeys*** succeed as such a striking infographic?

A visual language

As I see it, the genius of this visualisation is that it 'translates' its data into ways in which we can more easily process engage with the content.

It's hard for our minds to understand space, therefore more or less impossible for us to visualise. The designers aid us with their deft usage of spatial and temporal manipulation of the data.
The Solar System is converted from a vast 3-dimensional space into a left-to-right map, allowing us to read the Earth as a starting point.
Firstly, an accurate scale is sacrificed (arguably necessarily in this case)(6) in favour of visual clarity, and the creator's desire to display the relative popularity of space destinations.

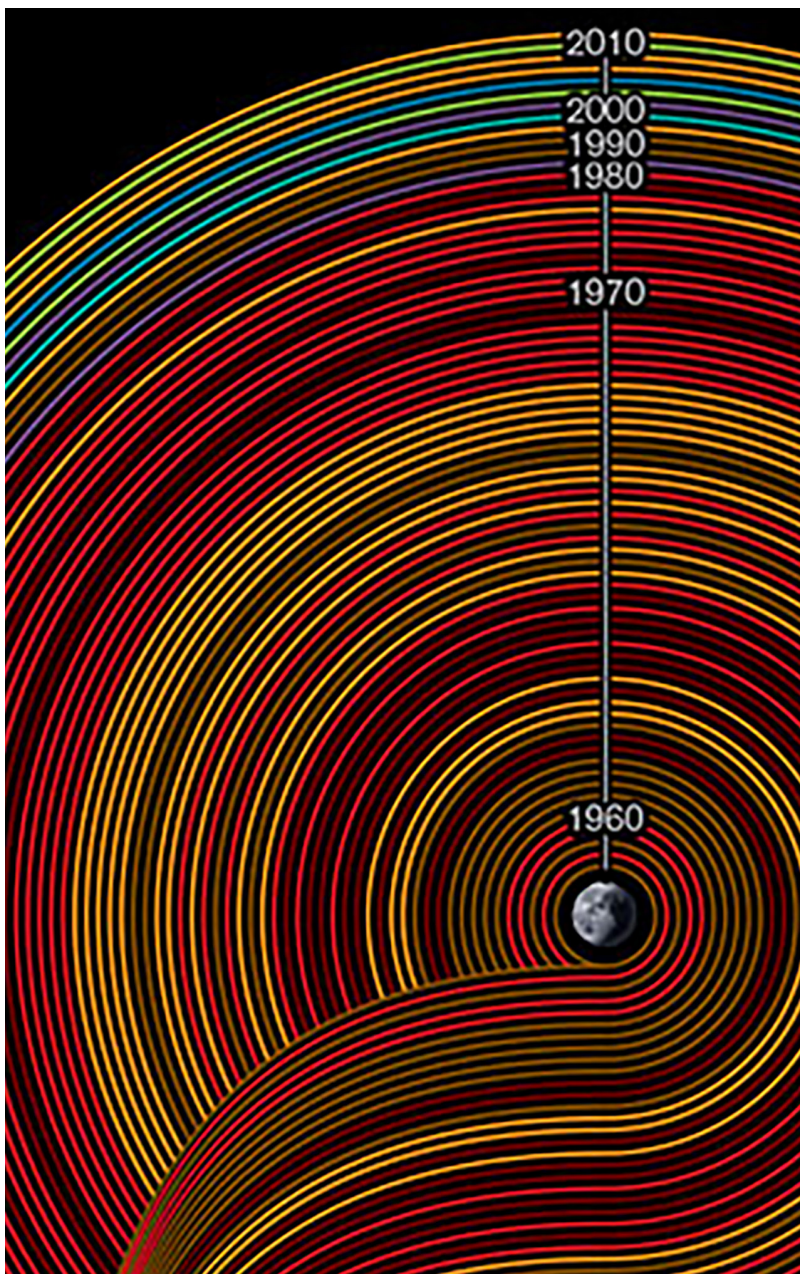


Attention is paid to the use of sensible, beautiful colour choices.

Primary colours, reds and yellows contrast with the darkness of space. Warm colours draw the viewer's eye in, they make us want to keep looking. Context is given to the colours by way of a small legend: colours correspond to countries, with varying luminance indicating successful and failed missions. I see these purposes as extra to the main use of colour here, as an aesthetic tool to guide the viewer's eye into and around the graphic (7).

Flattening time

From there, ***Cosmic Journeys*** 'flattens' time and adds an element of spatial-temporal flow to the map (8).
Flow allows us to follow these missions as they travel into space. We learn not only of ongoing missions, but of past exploration, and the popularity of various routes. The elegance of flow maps and their ability to marry time, distance and other discrete data into one graphic will be familiar to anyone who has studied Minard's seminal flow map of Napoleon's Russian campaign (9).



By following the delicate lines of *Cosmic Journeys*, we can join rockets and probes along their odysseys, immediately grasping concepts of 'gravity assist' along the way.

Perhaps most beautifully, where multiple lines converge on one planet, they become a series of concentric circles.
We look for circles and other natural shapes in everything we see(10). We understand them; to us their form indicates a completion, a natural cycle. The circles of missions orbiting their planets here are reminiscent of the rings of a tree, with larger rings indicating the latest missions.

Cosmic Journeys uses a language that we already understand - we can count the circles and see the 'age' of our planet's interest in the Moon and the planets.

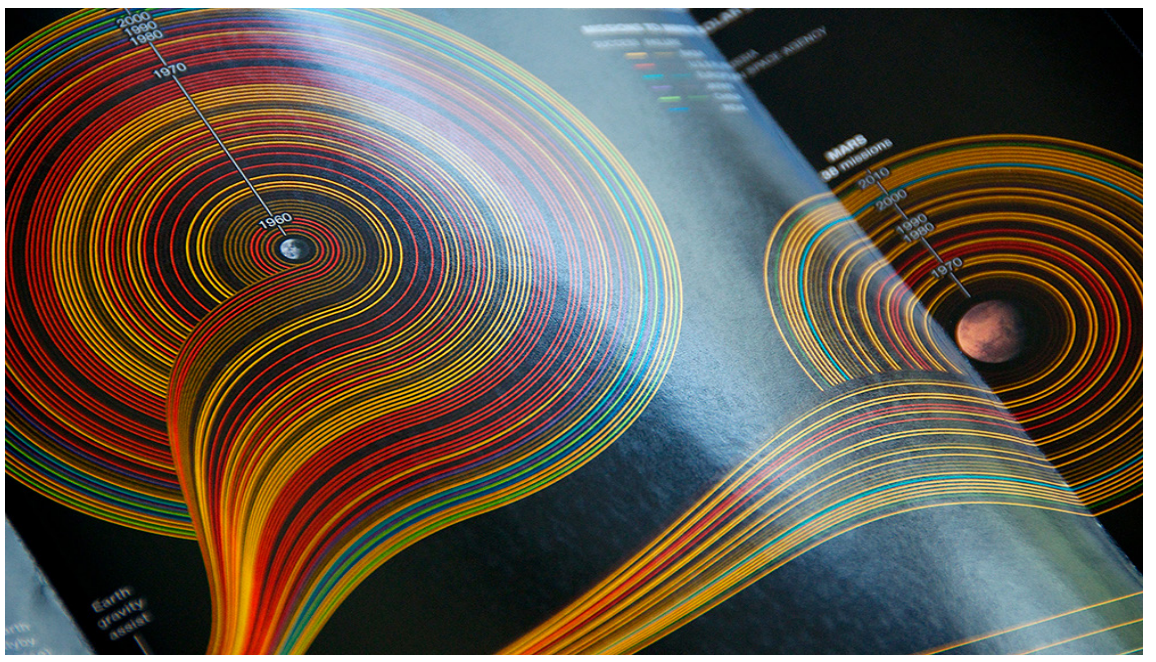
Text is included to give timelines and context to the data, but it only augments the visualisation. A relative scale and in-line text boxes provide dates and information to those interested, but they are supplementary. The genius of the designers is that underneath all the information, ***Cosmic Journeys*** is completely understandable with minimal labelling.

Considering improvements

Cosmic Journeys contains a vast amount of information and presents it in style. Rather than over-simplifying space travel, this graphic seems to reveal its data in stages. Multiple viewings are necessary to take it all in.

But is this really a good visualisation of data?

Giorgia Lupi, known for creating beautiful, ethereal visualisations, deems it impractical to avoid complexity when conveying data in a complex world (10).
Multiple, slower viewings of a visualisation allow an audience to feel their way around a topic and consider what is going on. ***Cosmic Journeys***, a graphic designed specifically for large format print media, certainly benefits from this philosophy of 'slow consumption'.



photographs: Behance

The sad reality is, however, that the majority of people no longer buy the magazine. Most of this graphic's audience will view it on a screen, maybe even in a portrait aspect ratio.
I will most likely never see it printed out. Rather than zooming into a huge, detailed image, a typical user may skim the image and move on.

No interactive or digital edition of *Cosmic Journeys* exists. On a small screen, the text in this visualisation is largely unreadable, and part of its visual power is undoubtedly lost. By not producing a digital version, a huge audience is not being acknowledged or catered for. This is a dilemma that all modern designers of visualisations must grapple with.

> *Cosmic Journeys* is certainly beautiful, but it achieves this within the restrictions in which it finds itself. It breaks some rules of simplicity, but it has ample room to do so. It knows its audience has the time to unpack more and more data, but this perhaps comes at the cost of a concise message.
>
> It is meant to look great hanging on a wall, or to be pored over at a coffee table. The true challenge for the creators would be to migrate their design into an interactive, responsive digital format. The design is scalable; more rings and even new planets could be added as private corporations continue their quest to escape Earth.
>
> Would it be possible to digitise, to add even more features and layers to this graphic, without losing a part of what makes *Cosmic Journeys* so striking? Is there enough space?

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