

Tiny flying box: A study of upper sky things very close and very far away from each other.

Alexa Halford¹, Jeffrey Klenzing¹, Sarah Jones², and Ryan Davidson³

¹NASA Goddard Space Flight Center

²Goddard Space Flight Center

³Utah State University

November 23, 2022

Abstract

A few friends from the big US space place, and two places where people get lots of learning, have started putting together a tiny flying box. This box will look at the tiny bits we can not see in the upper sky. We hope to learn why we see places where the tiny bits of the sky come together in large numbers and other places where the tiny bits try to get as far away from each other as possible. But before we can learn how and why parts of the sky come close together and sometimes far away from each other, we need to finish building our tiny flying box. Then our tiny box will go on a bit up goer to visit where people live in the sky. It will sit there until they have time to push it out and send it on its way around the world. We hope that our tiny flying box will stay working in the sky for at least 6 months. While this is not a long time, our short-lived tiny flying box will help us better understand the upper parts of our sky.



Tiny flying box: A study of upper sky things very close
and very far away from each other.

By Me and the tiny flying box friends



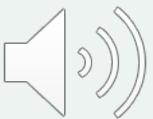


Here at the big
meeting many of
us come together
who are all from
different places.





Using simple words
and pictures can help
us understand each
other.

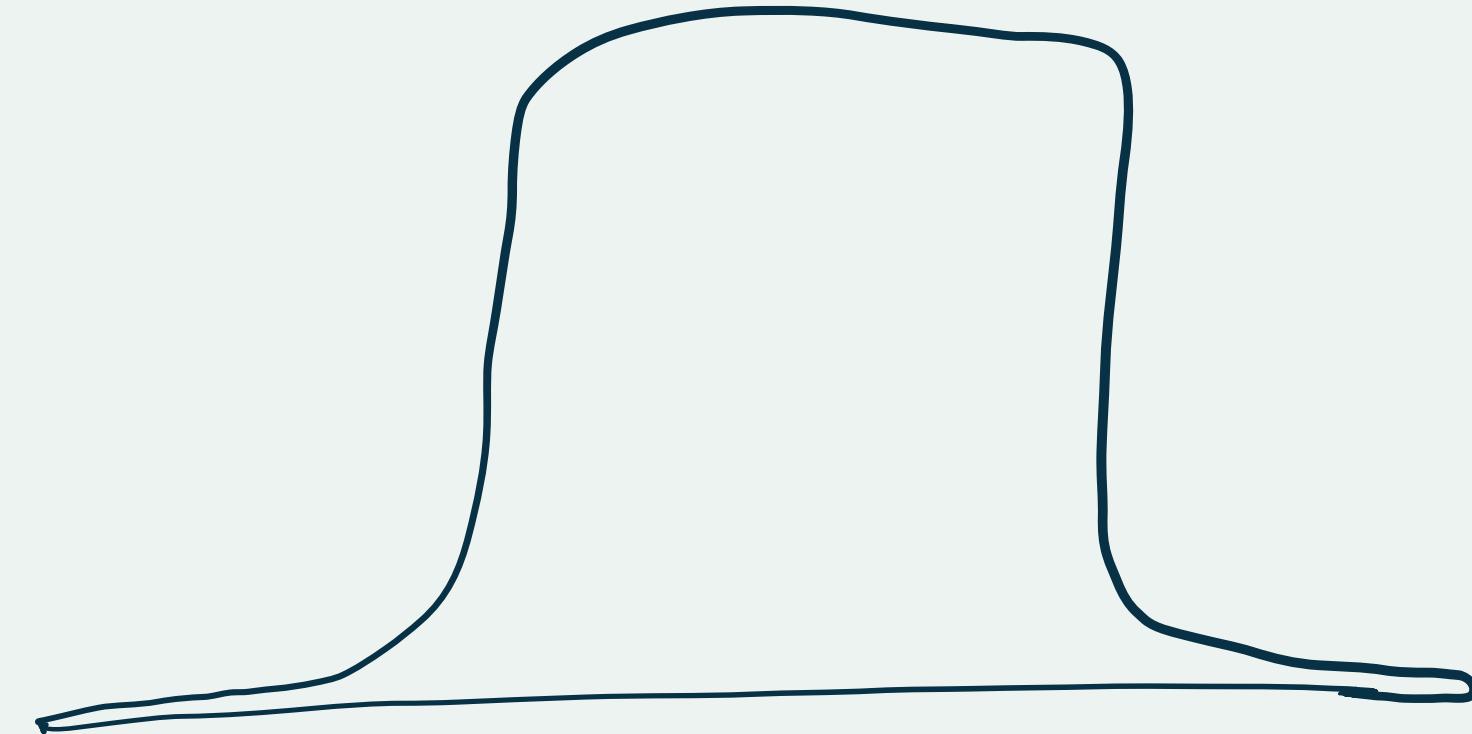




But sometimes we all see different things when we show pictures. I may see something to brush hair, but you may see a part of a building.

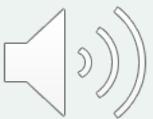


If I show you this
picture, what do you
see?

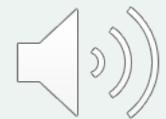
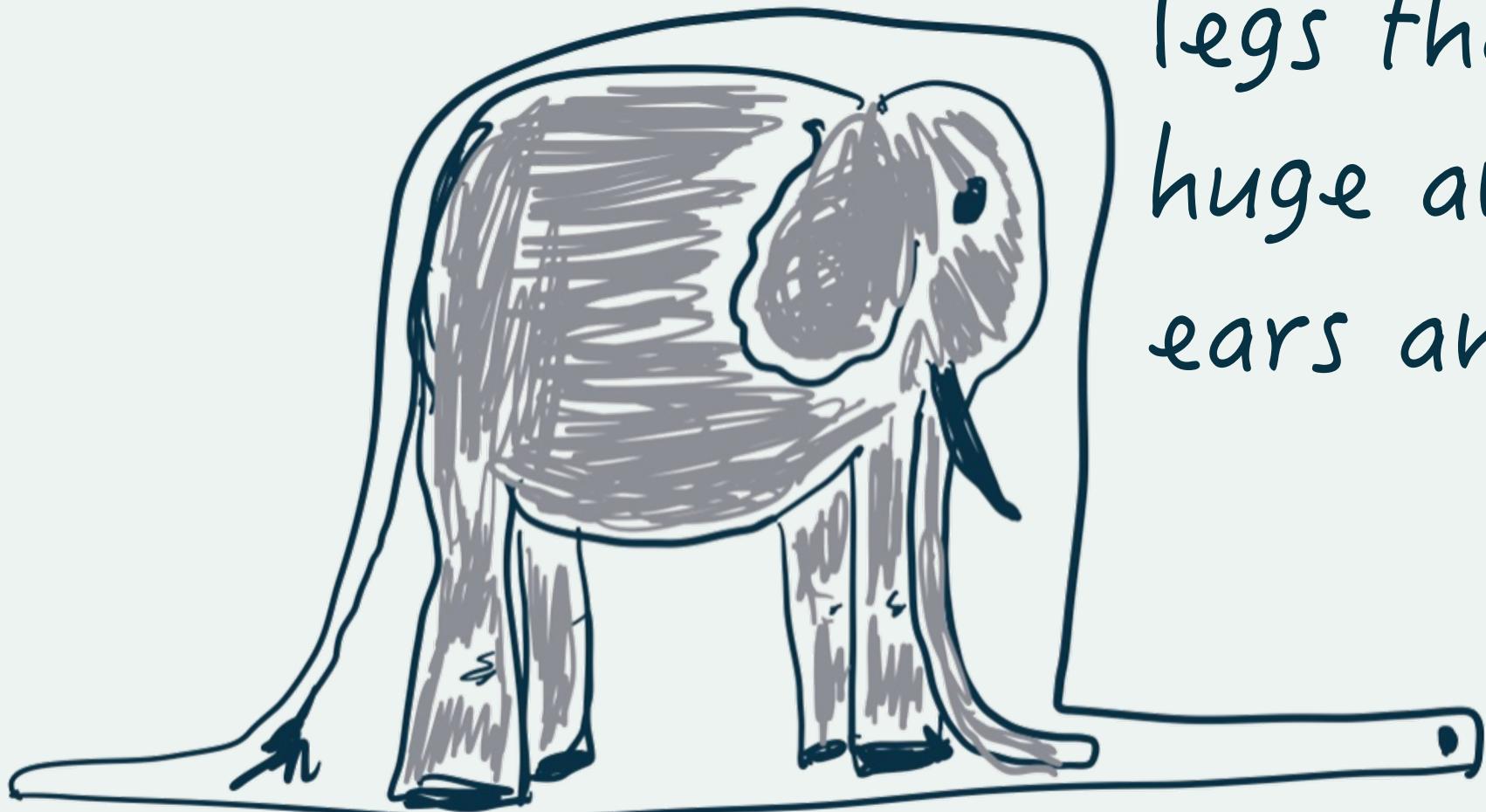




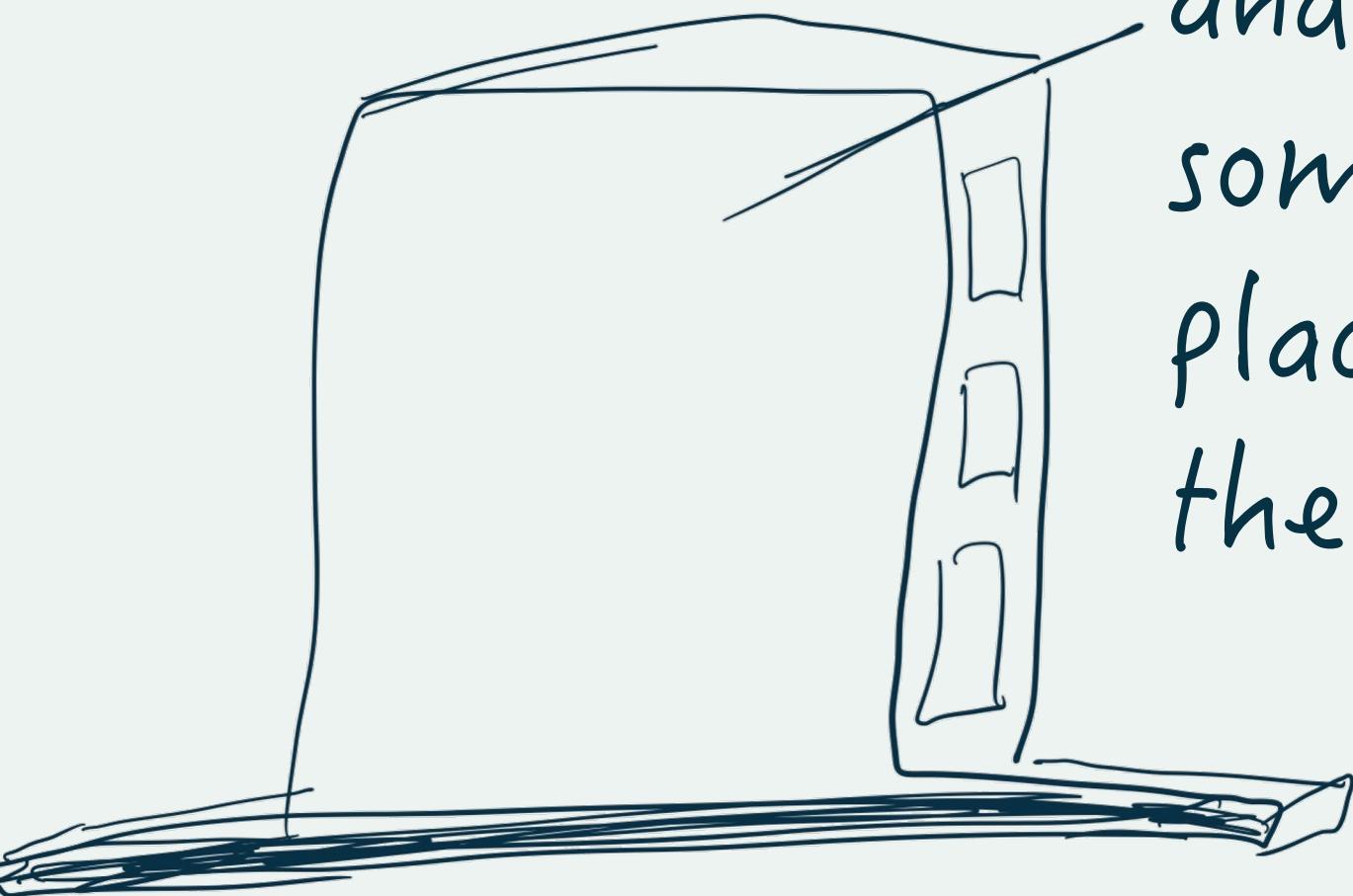
Do you see a
thing that sits on
your head?

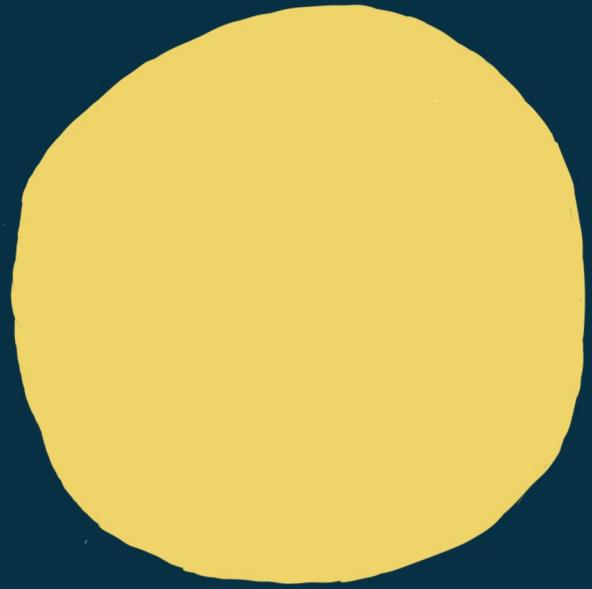


Or, perhaps you see
an animal without
legs that ate another
huge animal with big
ears and a long nose.



I see a tiny box that
will help us fly through
and learn about a
sometimes-forgotten
place that sits between
the sky and space.



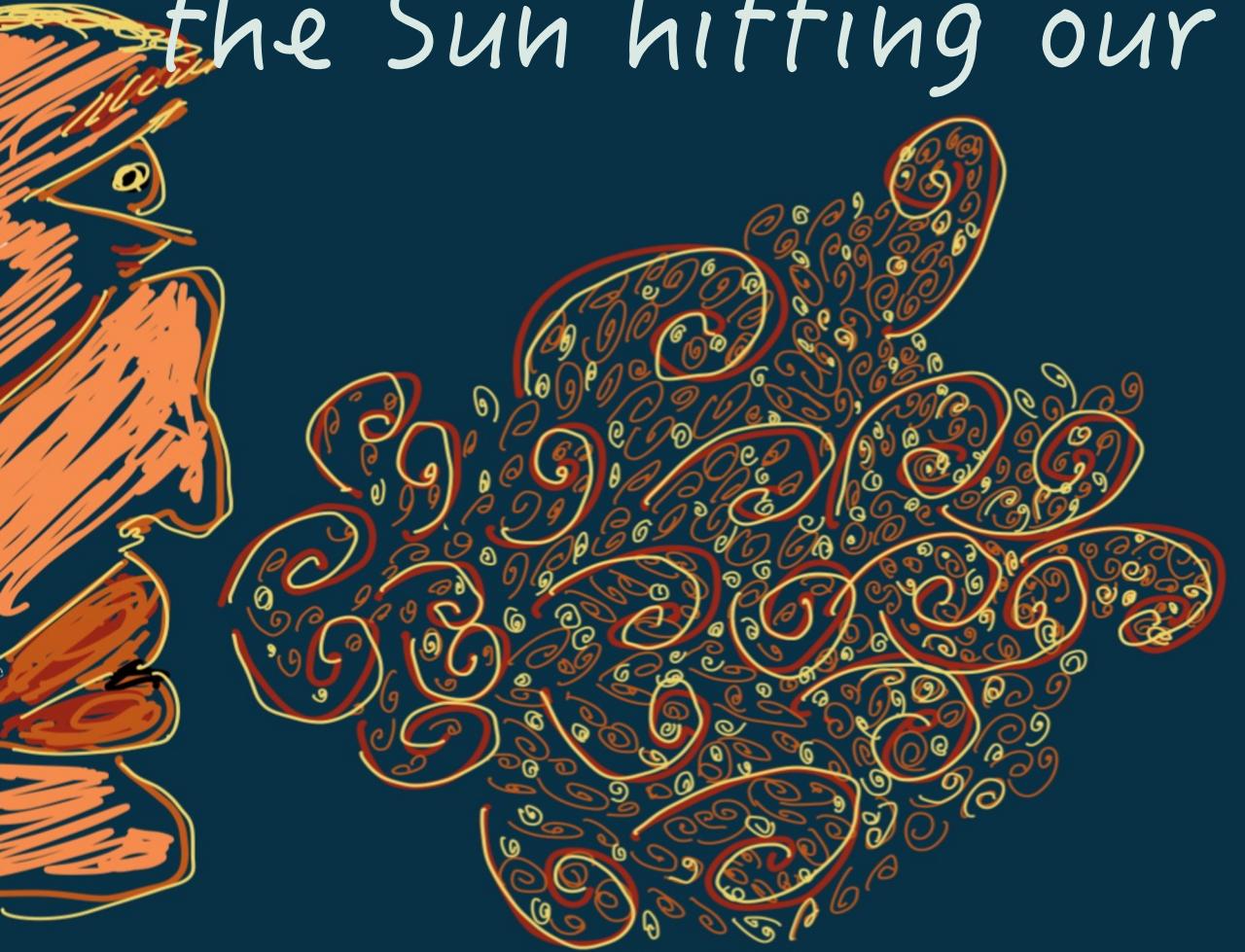


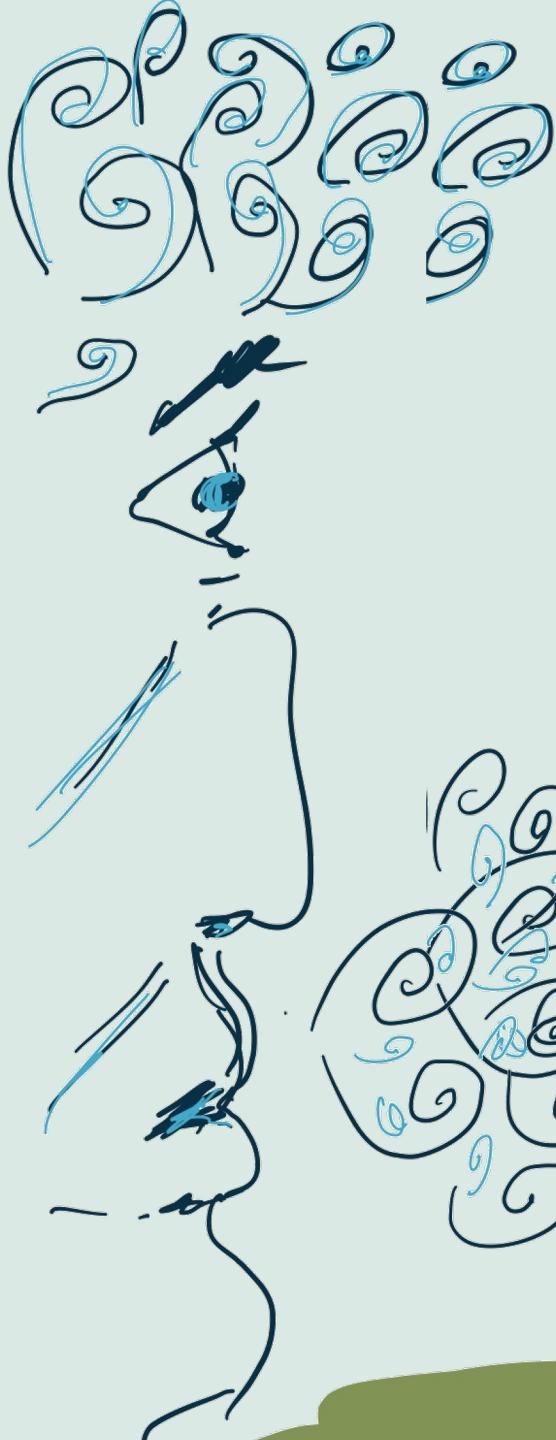
*not to scale

This is a story of a little flying box that is about to catch a ride and look at this place where the sky and space meet.



Our world has fields that go out into space and help stop lots of bits from the Sun hitting our sky.





Closer to the ground we have
the sky that has lots of wind.

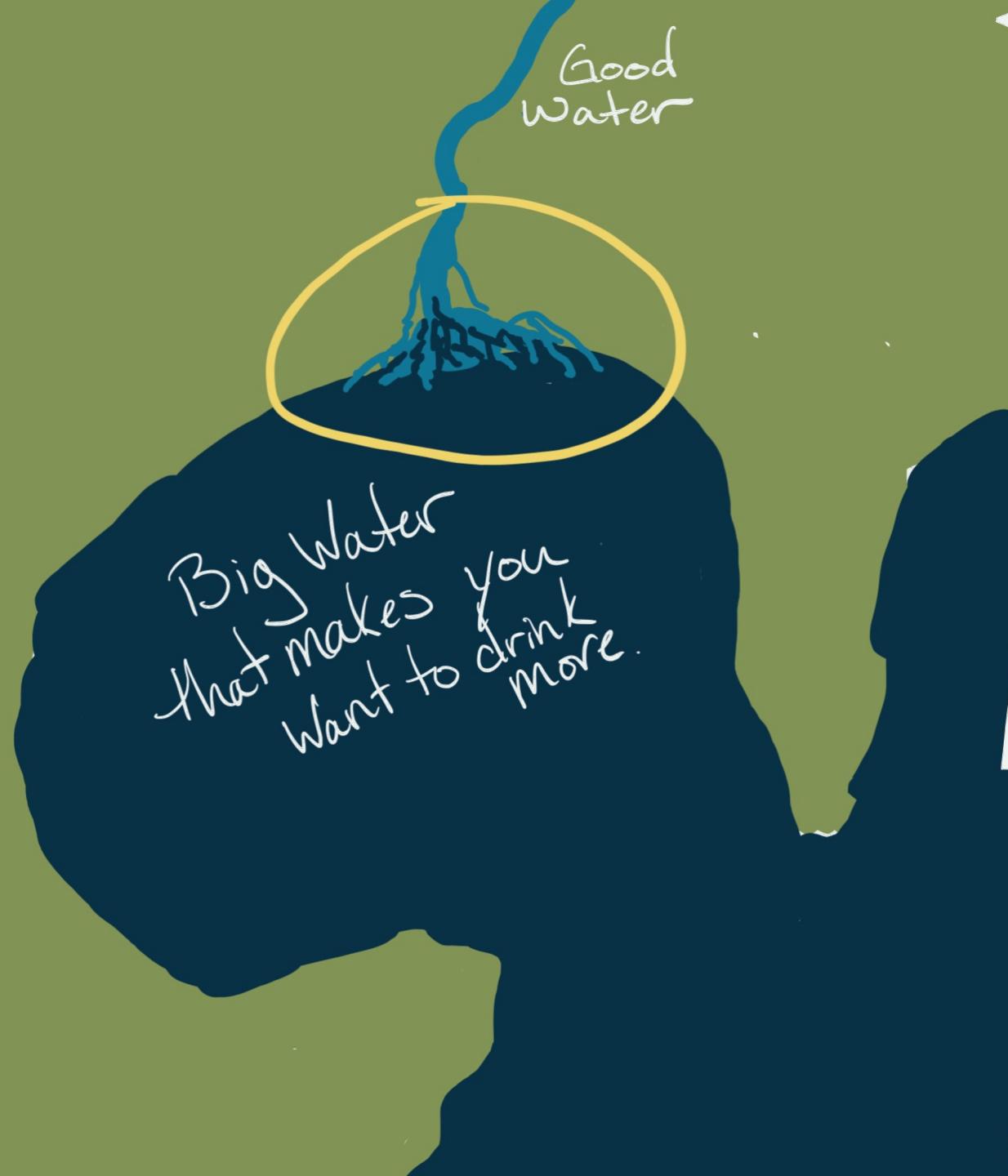




Where the sky and space meet is called the I-on-no-ball (?).

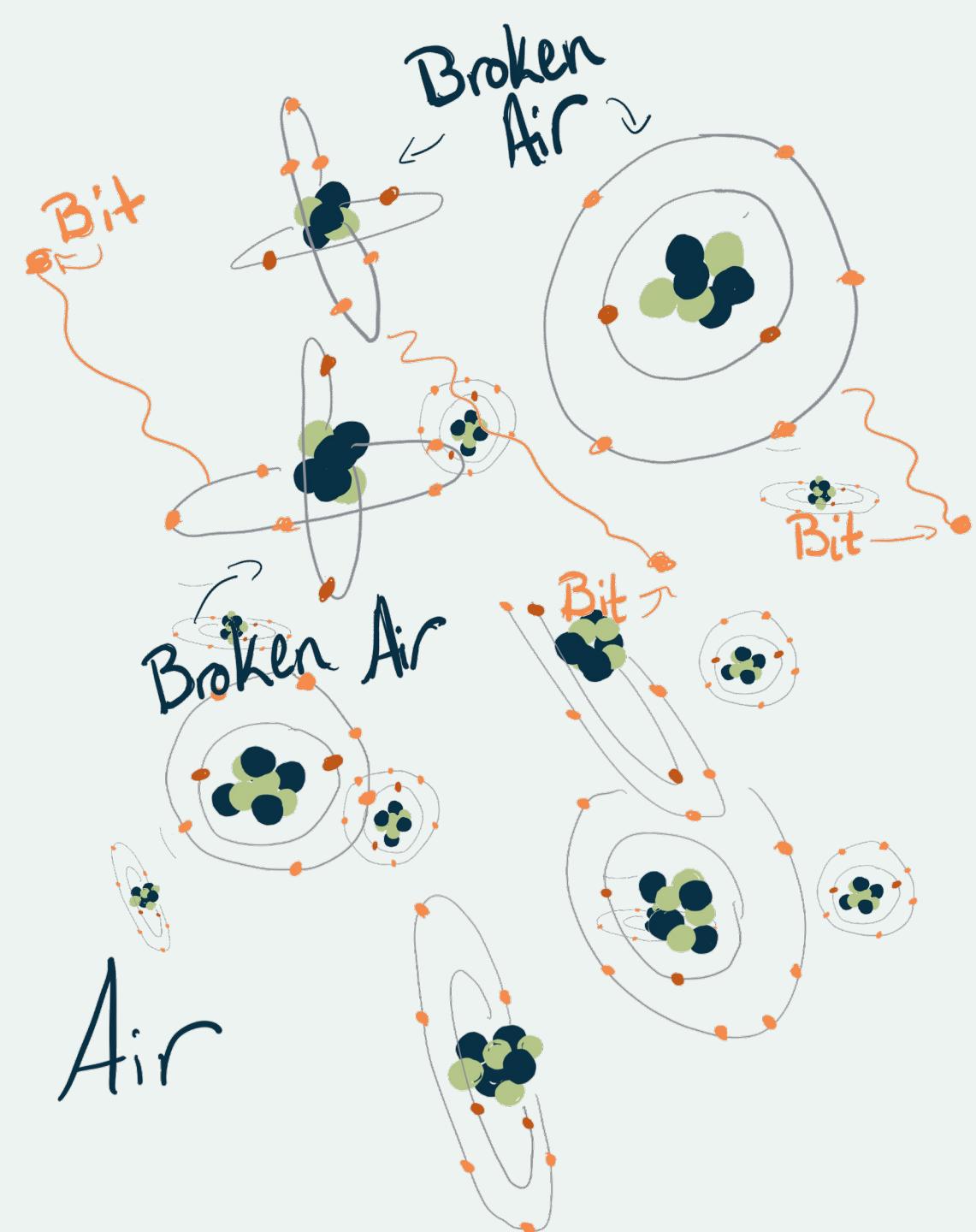
This place between sky and space ...





... is like where land water, water that is safe (sometimes) to drink, meets the big water that is not good to drink, and their waters come together.

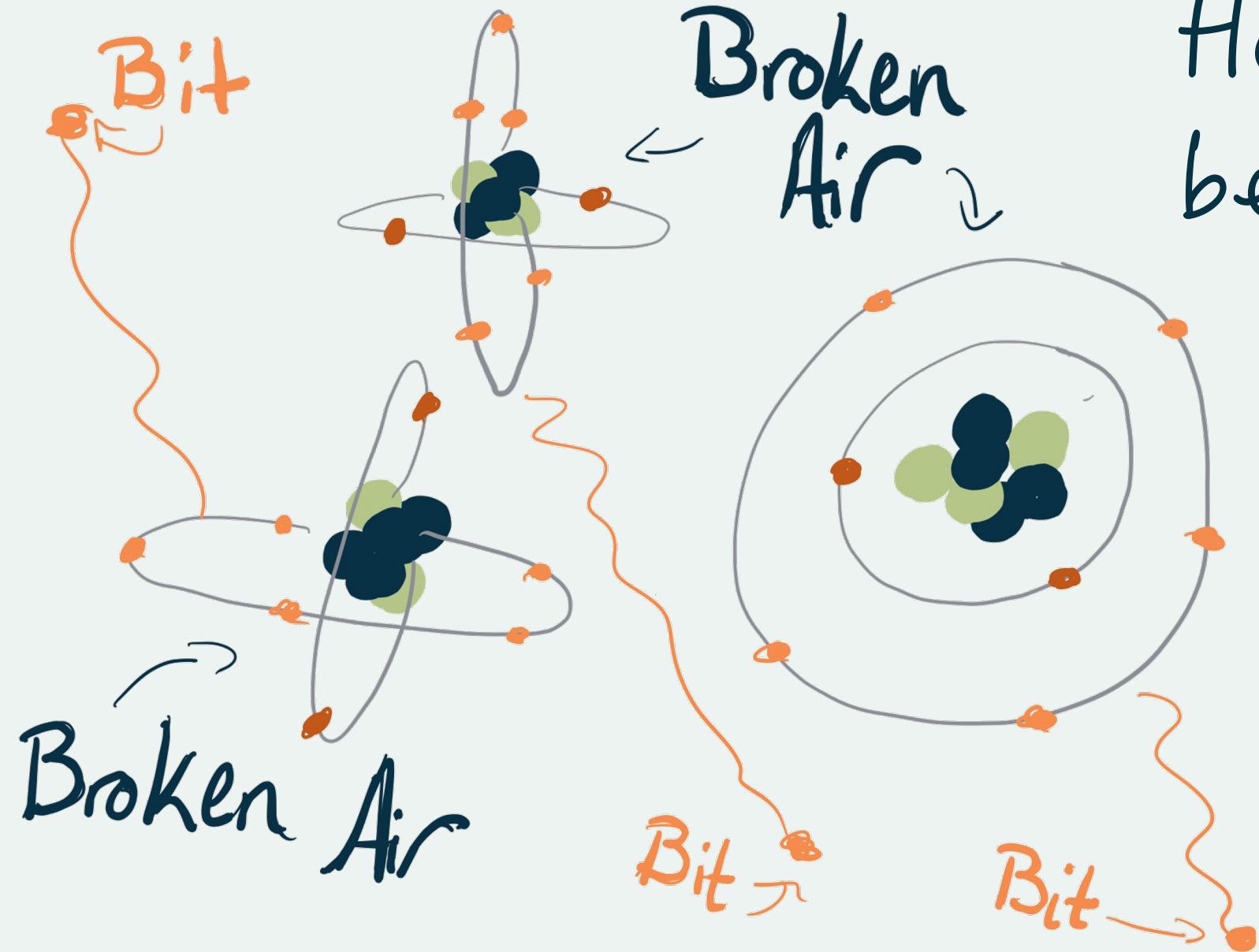


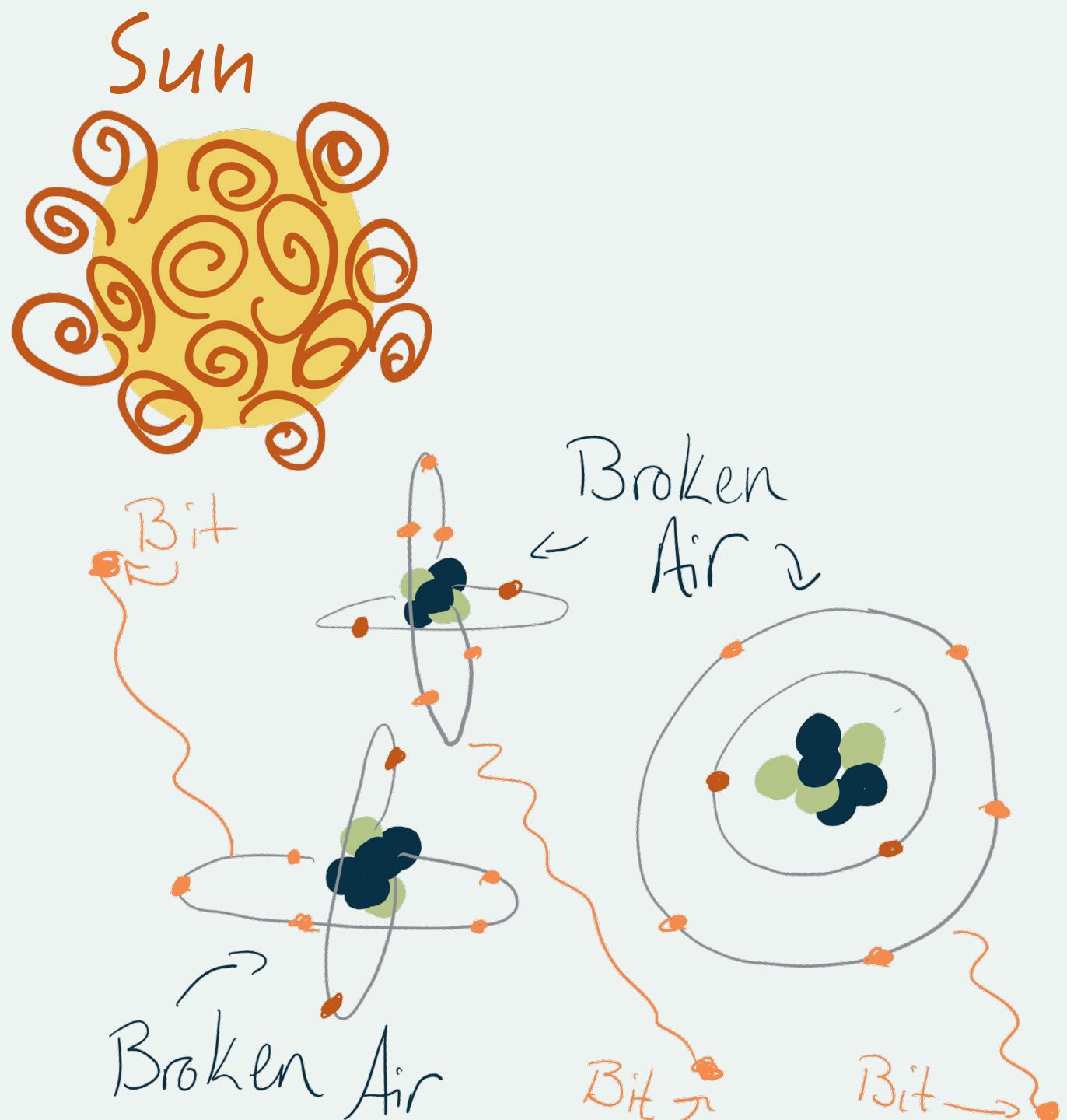


Where the sky and
space meet you
have air, broken
air, and little bits
from the air and
from space.



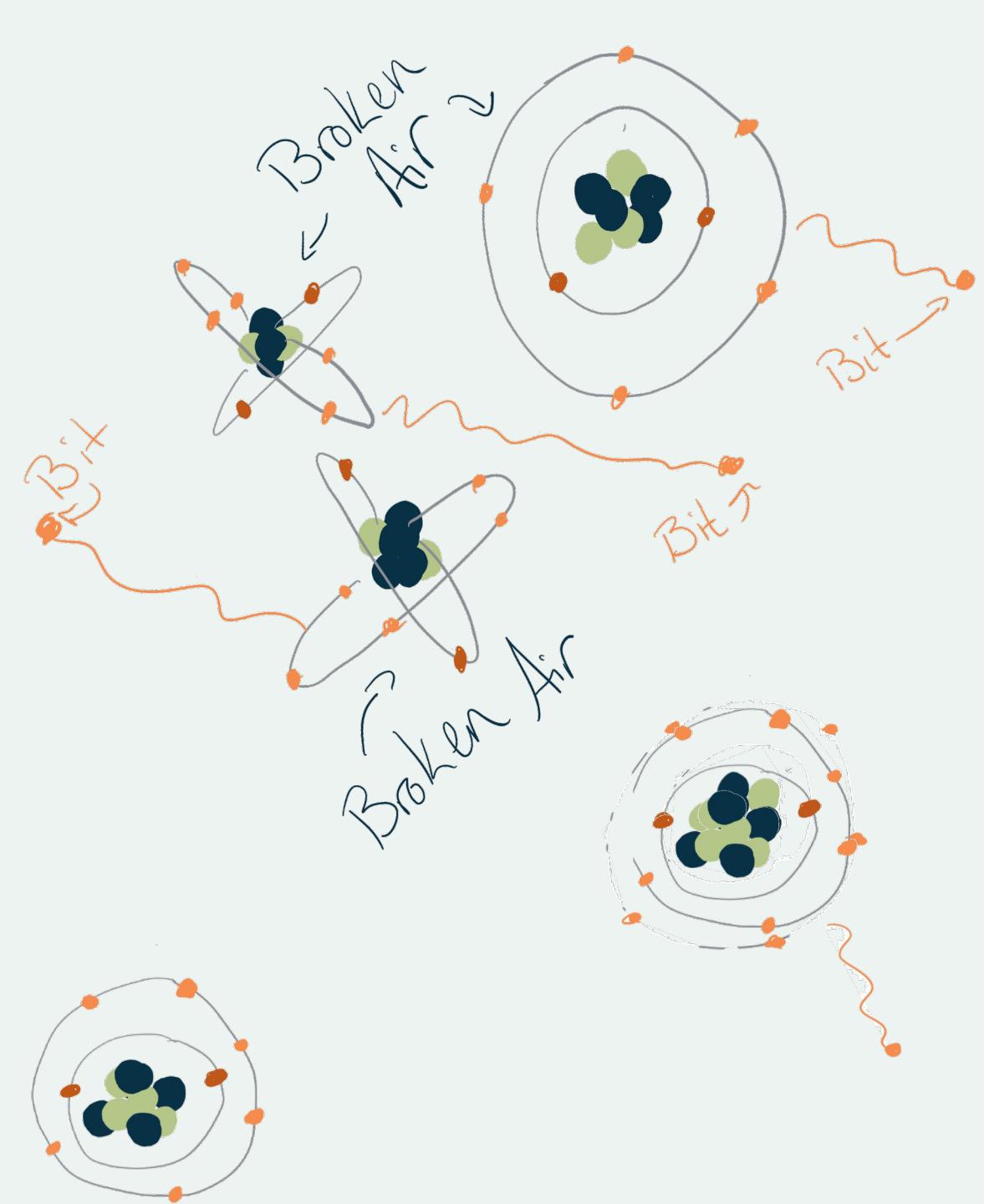
How does the air
become broken?





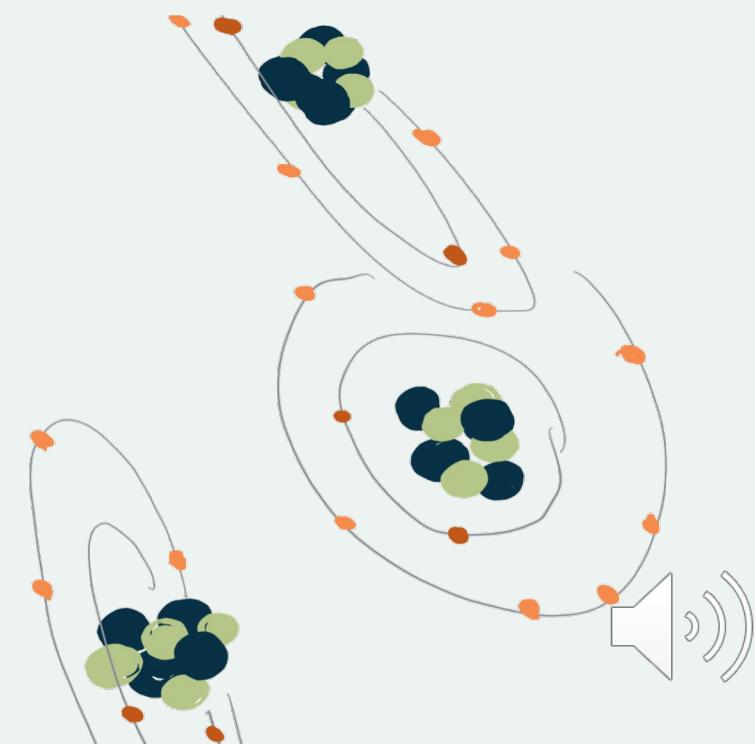
Little bits can come off kind of easily. Sometimes all it takes is for the air to see the Sun.

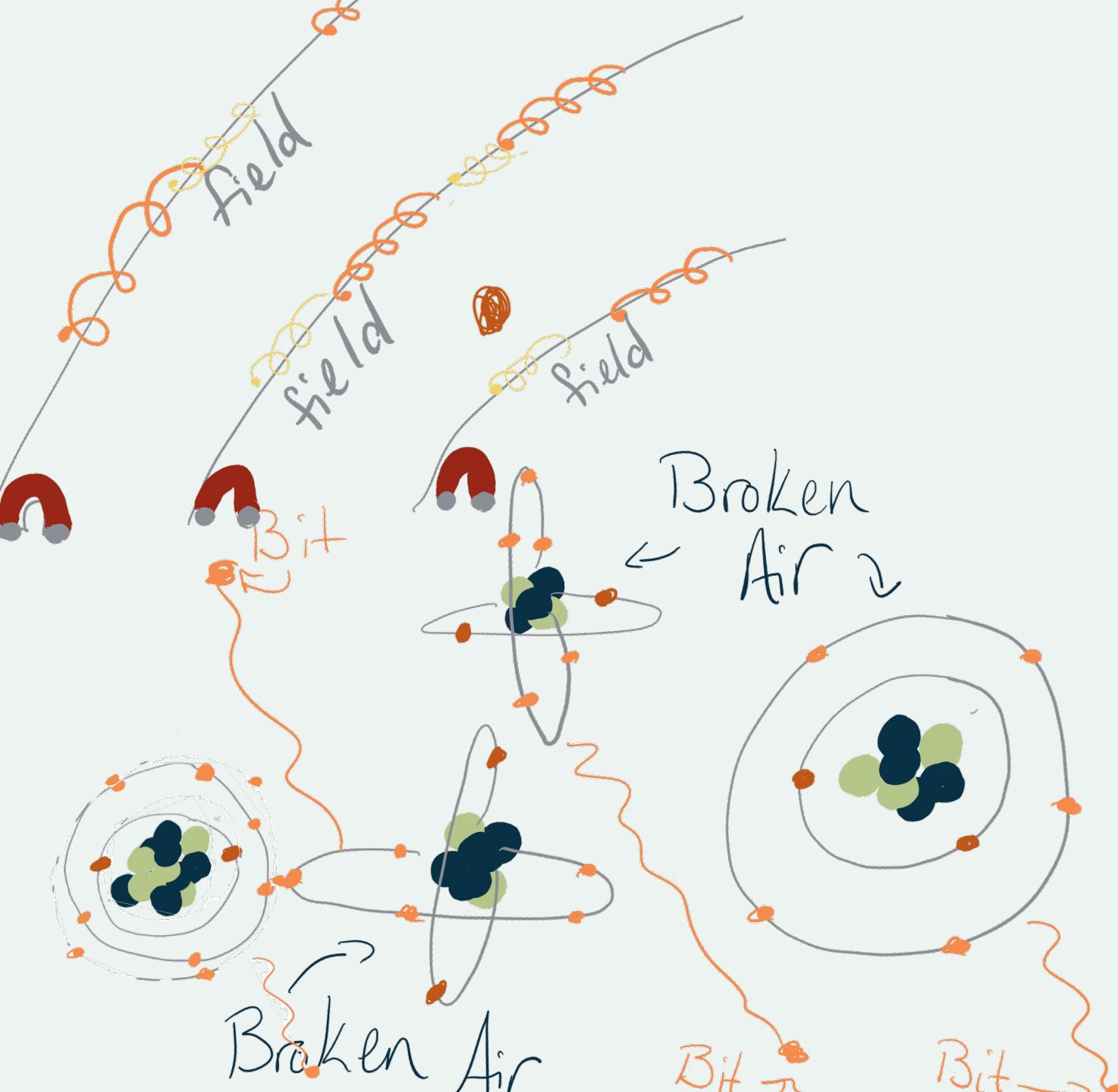




Air

The air, bits, and broken air are close enough to hit and break each other.





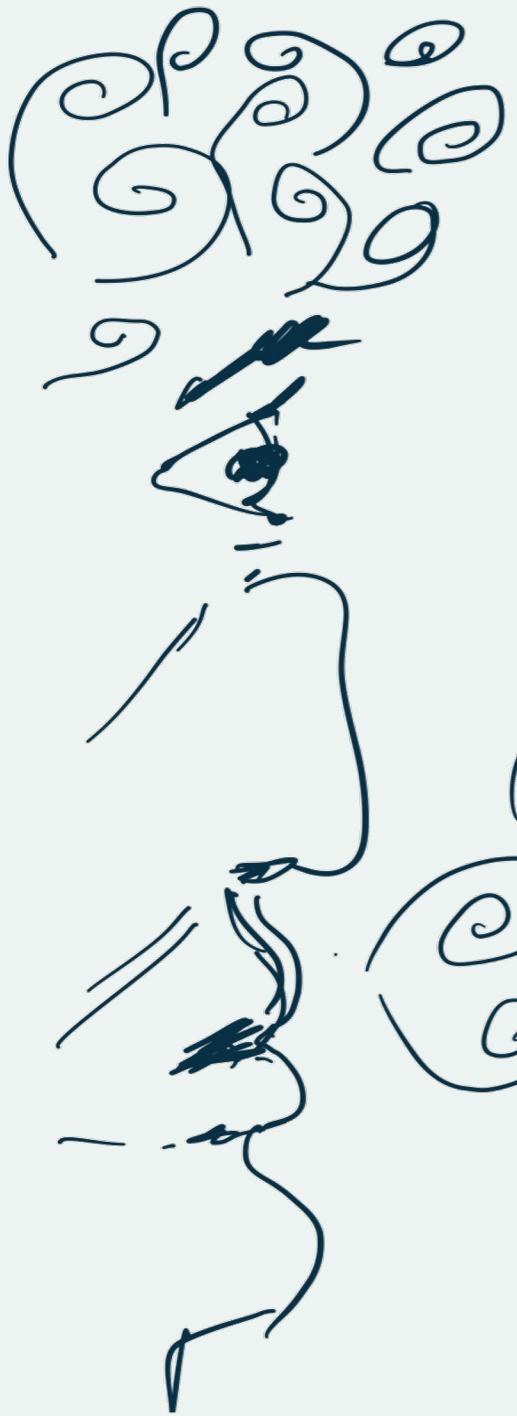
Other times you
need falling bits
from space to
break the air.





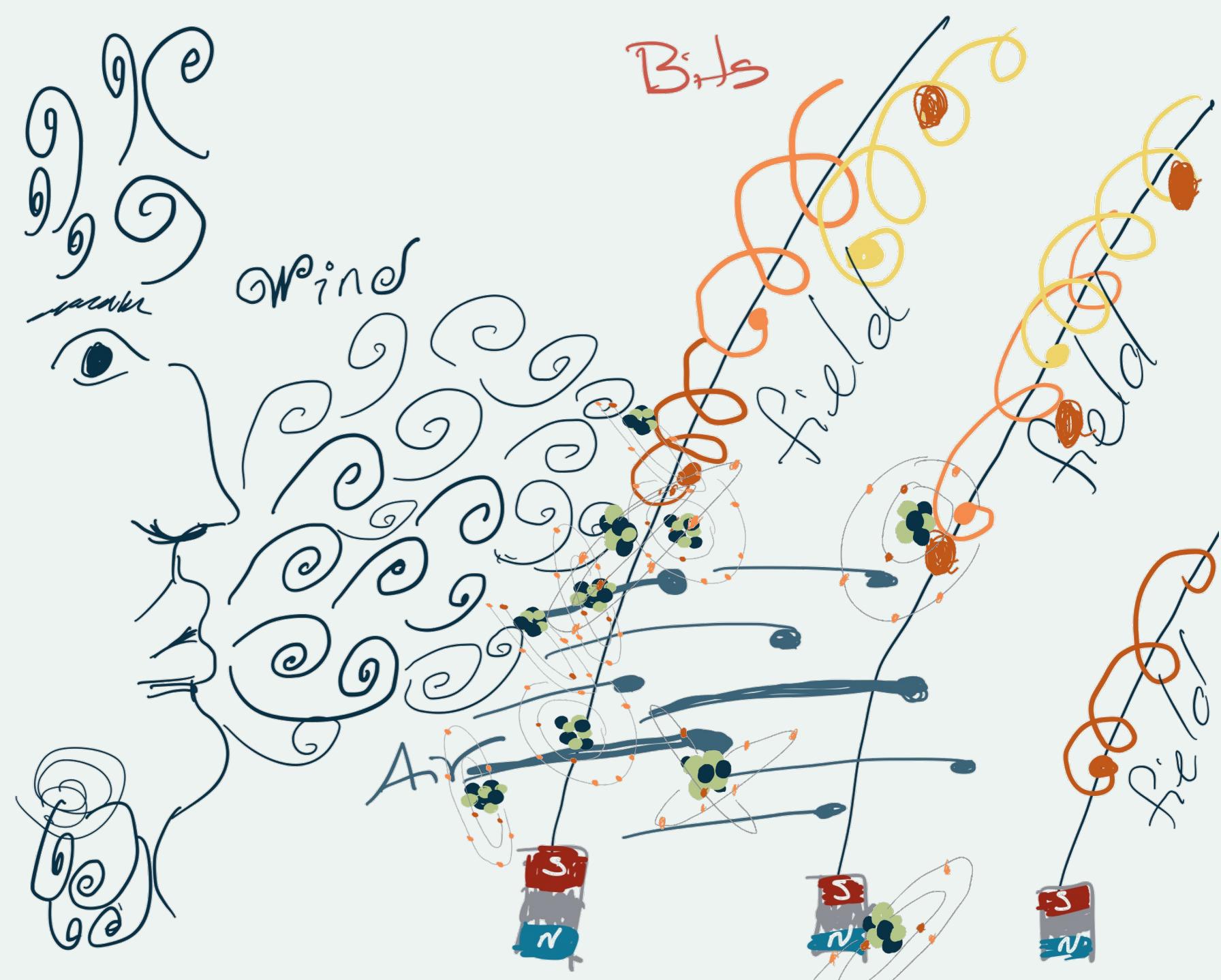
The bits from space and from the sky want to follow the fields, and the broken air also feels the pull along these lines.





The air that is not
missing bits like to follow
the sky winds.





Everything moving around can make it hard to figure out where the broken air will go.





This is what our tiny flying box (The TFB) will look at. The TFB will see what happens to make the broken air go in different directions.



SPACE

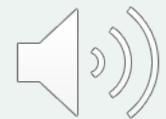


With only one TFB it can be hard to know why the broken air moves the way it does.





The TFB may only see a part of the area where all the broken air comes together or goes a part.

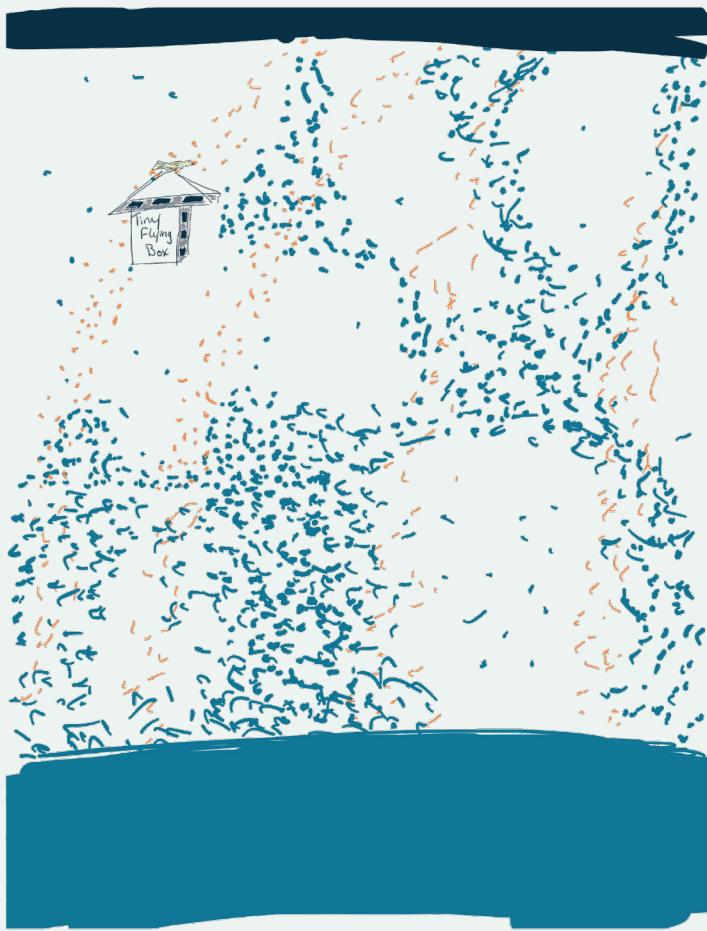


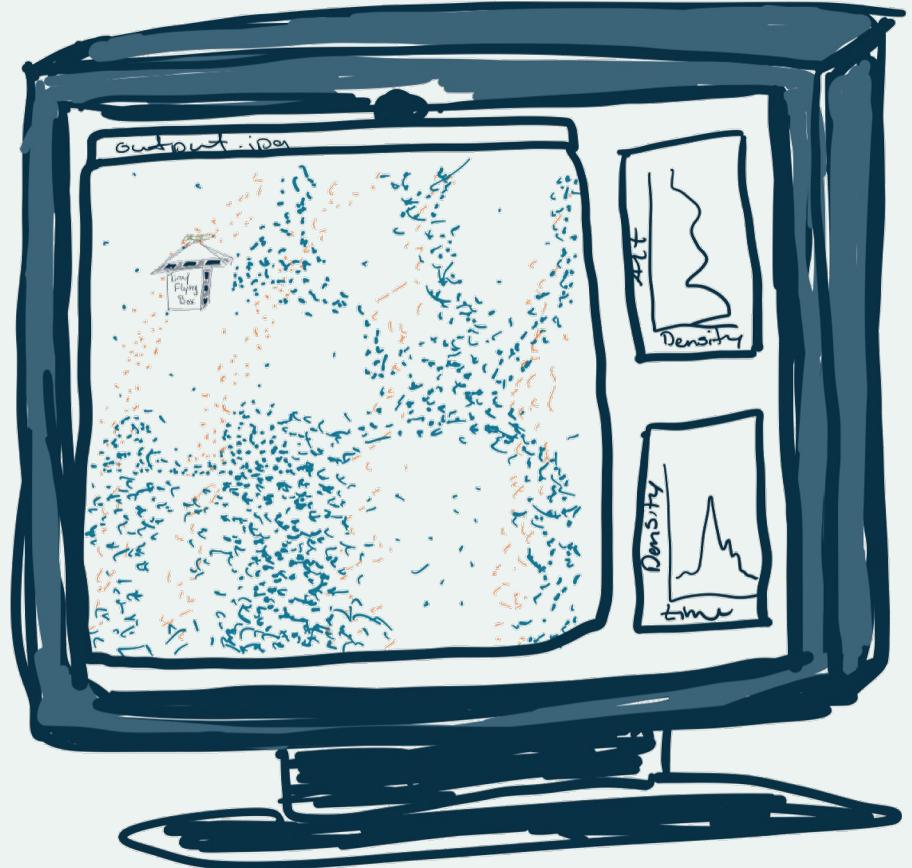


Like the pictures at the start of the talk, it can be hard to know what it shows.



Some may see
a strange area
of broken air.
Others may
see waves in
the broken air.





So we work with people who imagine the sky and space on computers.





What the TFB sees
will help them
imagine the world
better.





Before we can learn why parts of the sky come close together and sometimes far away from each other, we need to finish building the TFB.





The TFB will then
go on a big up goer
to visit where people
live in the sky.



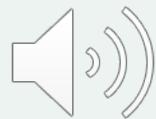


It will sit there until
they have time to
push it out and send
it on its way around
the world.





We hope that the
TFB will stay
working in the sky
for at least 6
months.



SPACE



Sky

While this is not a long time, our short-lived TFB will help us better understand the upper parts of our sky.



Thank
You



Thank you for learning about our tiny flying box, and make sure to wave when we hope to fly over your head at next - next year's big meeting.





Thank you to all the tiny
flying box friends:

Jeff Klenzing
Sarah Jones
Ryan Davidson

