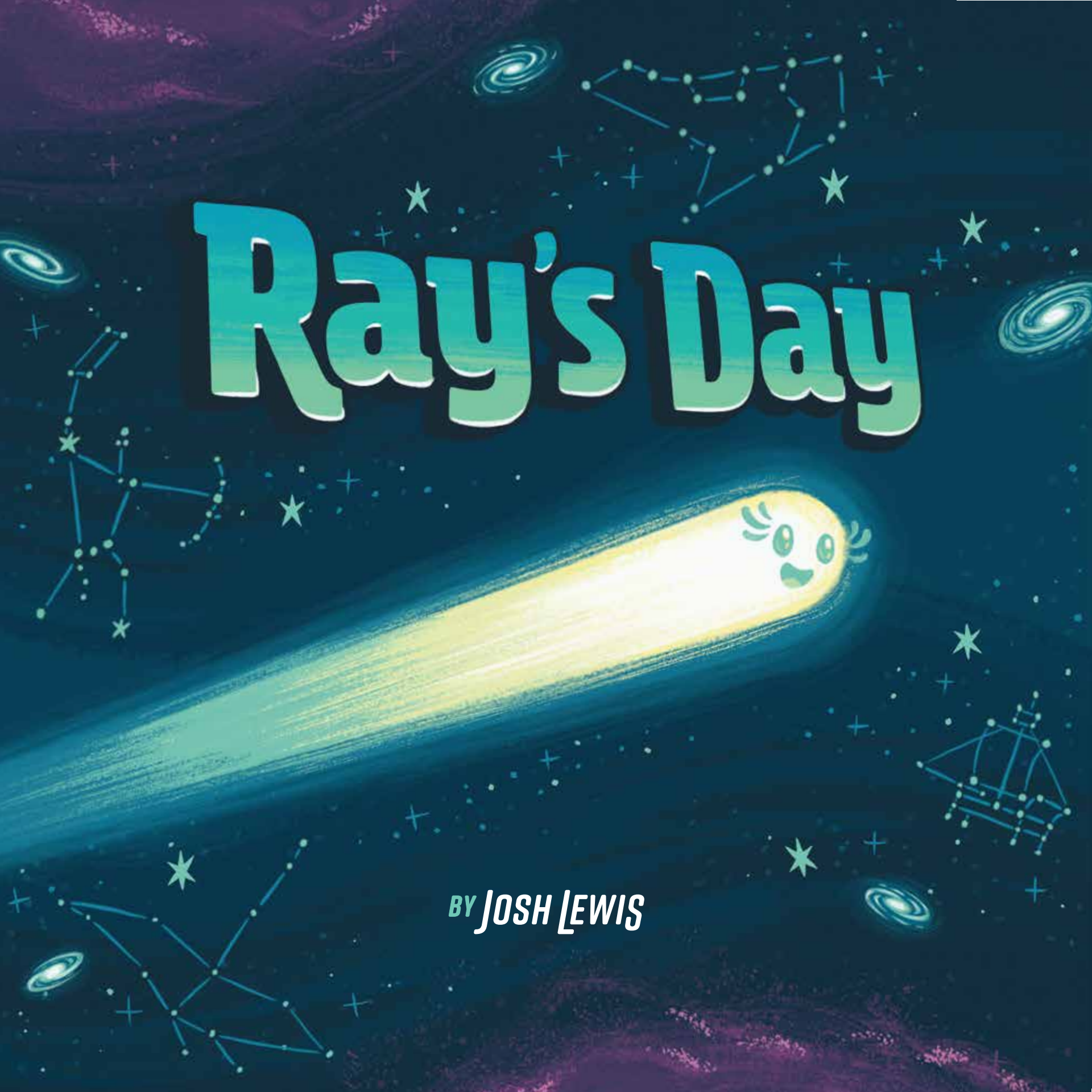
Ray's Day
BY JOSH LEWIS


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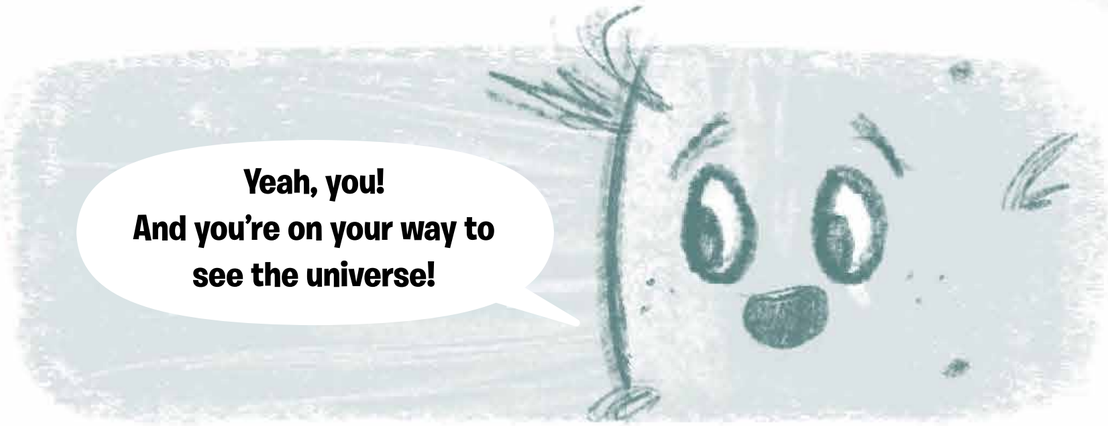
PUBLISHER


In a sudden flash, Ray was born.
Wha...
What am I?


Welcome little one!
You're a ray of light.
And light is the fastest thing there is!
Who, me?!


Yeah, you!
And you're on your way to
see the universe!


I don't see much of anything yet.
Don't worry, Ray! You're
going to see lots of planets,
moons, asteroids, comets,
and so much more!
COOL!
I need to see them all!

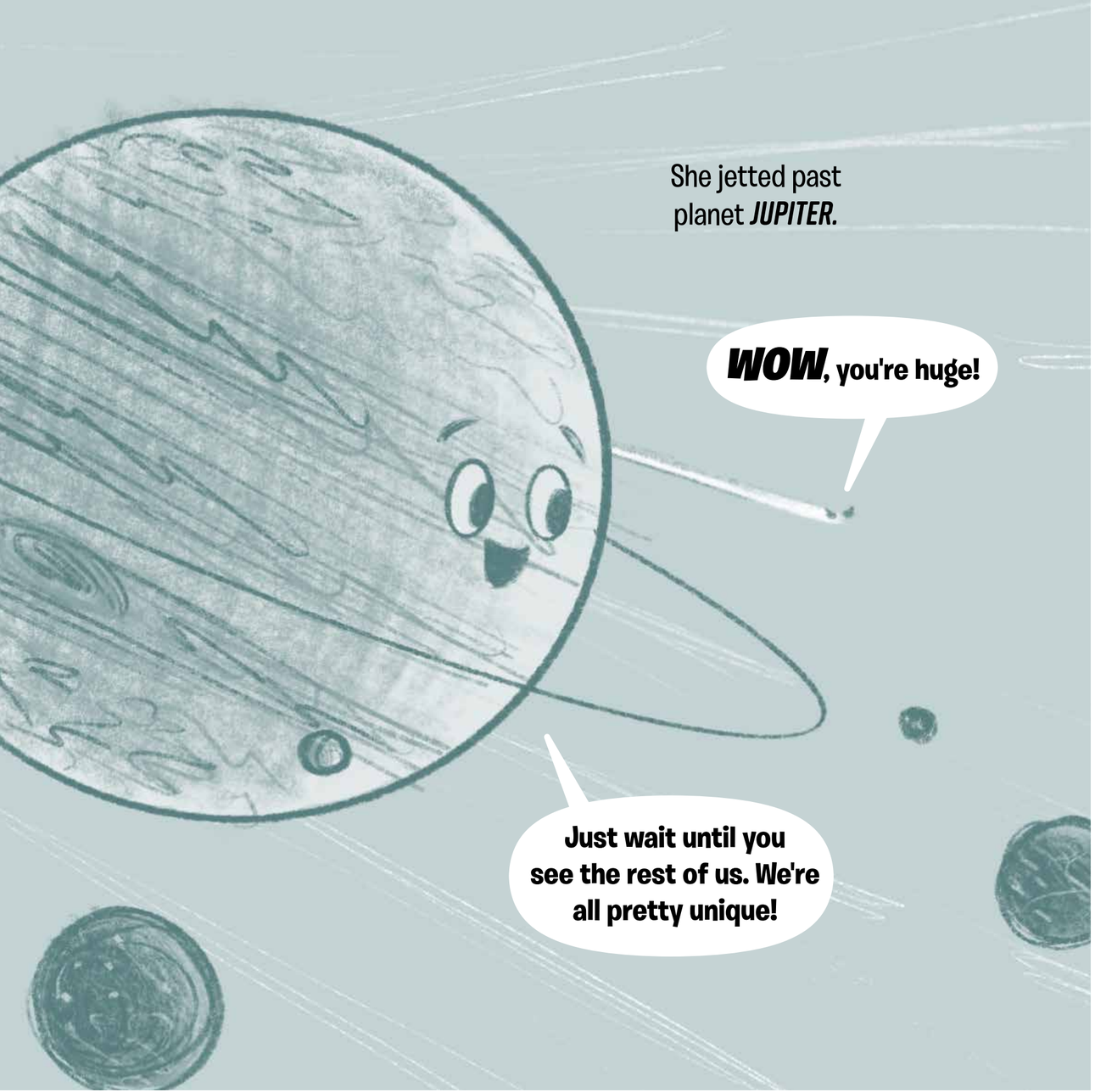

Ray zoomed past the planets
MERCURY, *VENUS*, *EARTH*, and *MARS*
–all in just minutes.
Hi, Ray!
Bye, Ray.
We didn't get...
...time to talk!
AMAZING!
With so many planets, I'll never get bored! Where's the next one?

Ray zipped by thousands of asteroids in the ***ASTEROID BELT***.
She brightened up when she saw dwarf planet ***CERES***.

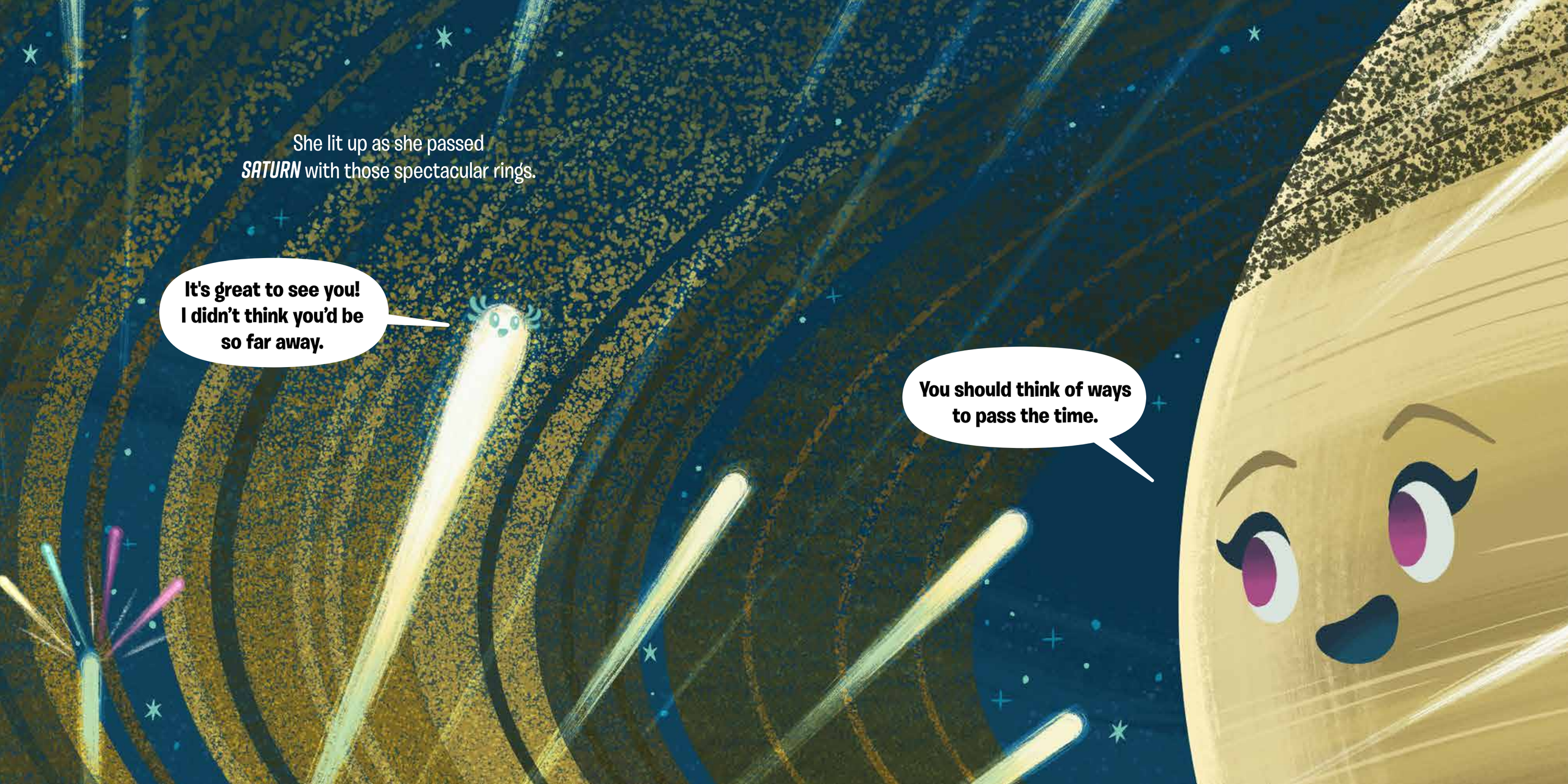
But then Ray found herself alone. For over ten minutes, Ray searched everywhere she could see...

but no new planets could be found.

She kept speeding along until...



As Ray sped off, she couldn't wait to see the next world!
But she was quickly disappointed.

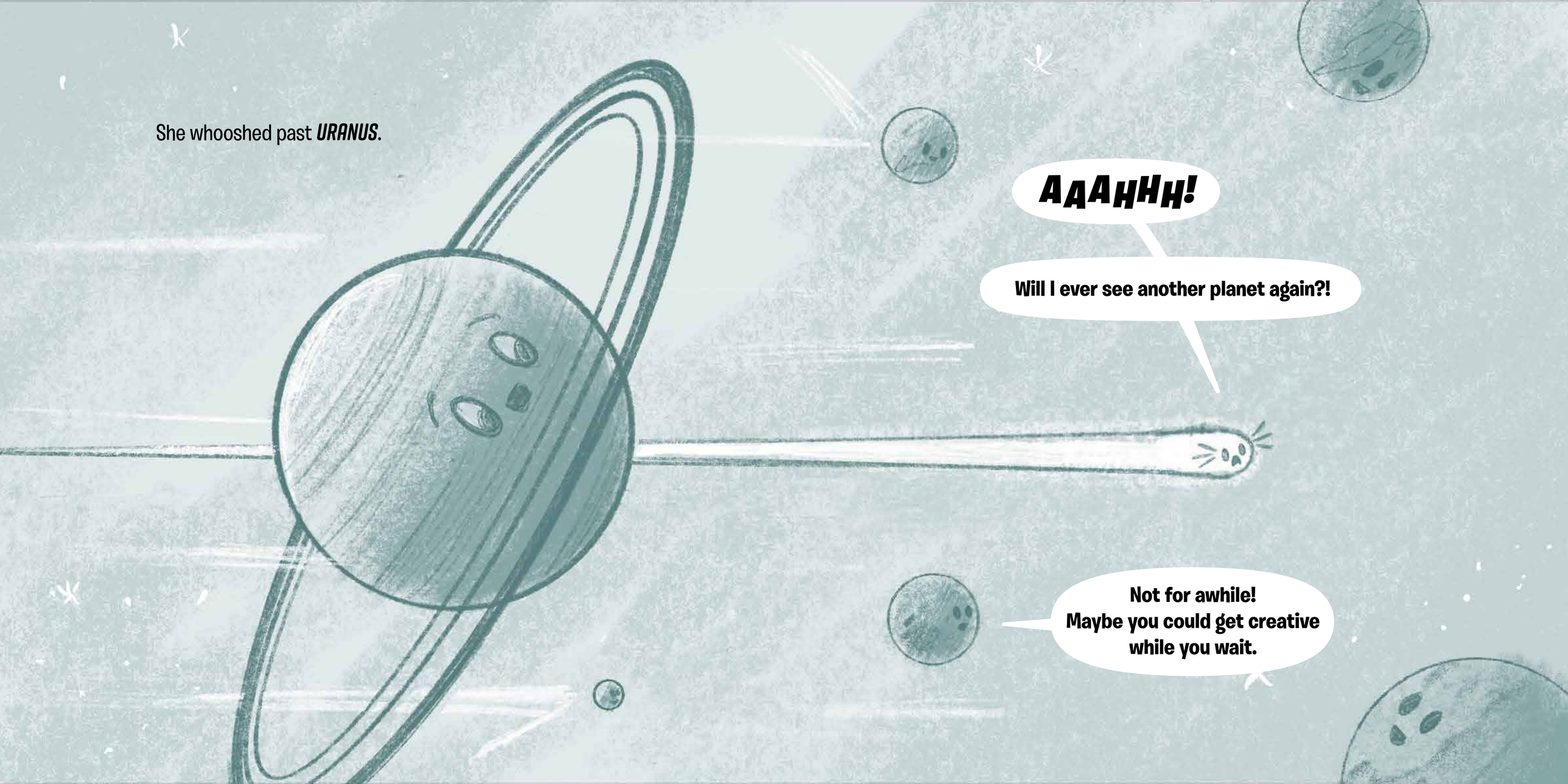

She lit up as she passed
SATURN with those spectacular rings.
It's great to see you! I didn't think you'd be so far away.
You should think of ways to pass the time.

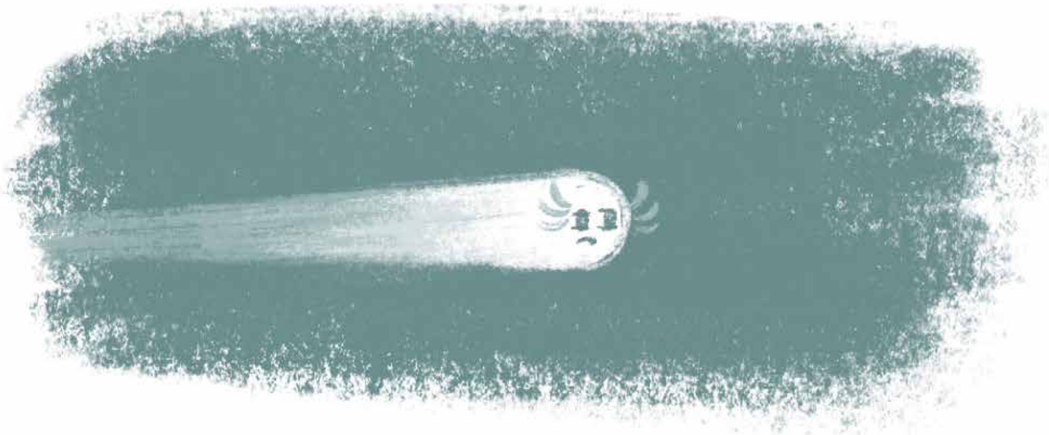
Ray thought for a second, but quickly gave up.
She was bored...really, really bored.

So much emptiness!!

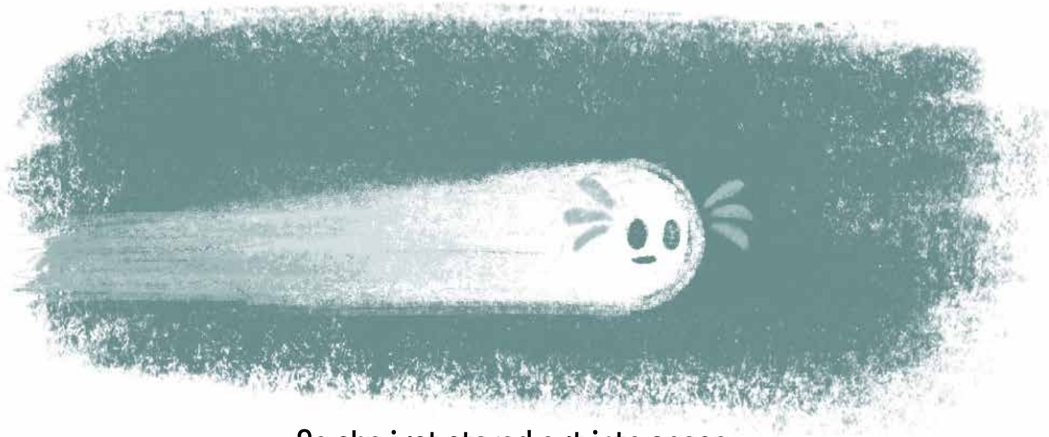
WHY?!

Ray drifted for over an hour through
the darkness of space until...


She whooshed past *URANUS*.
AAAHHH!
Will I ever see another planet again?!
Not for awhile!
Maybe you could get creative
while you wait.



Ray tried thinking of something–anything–to do!
But she couldn't.

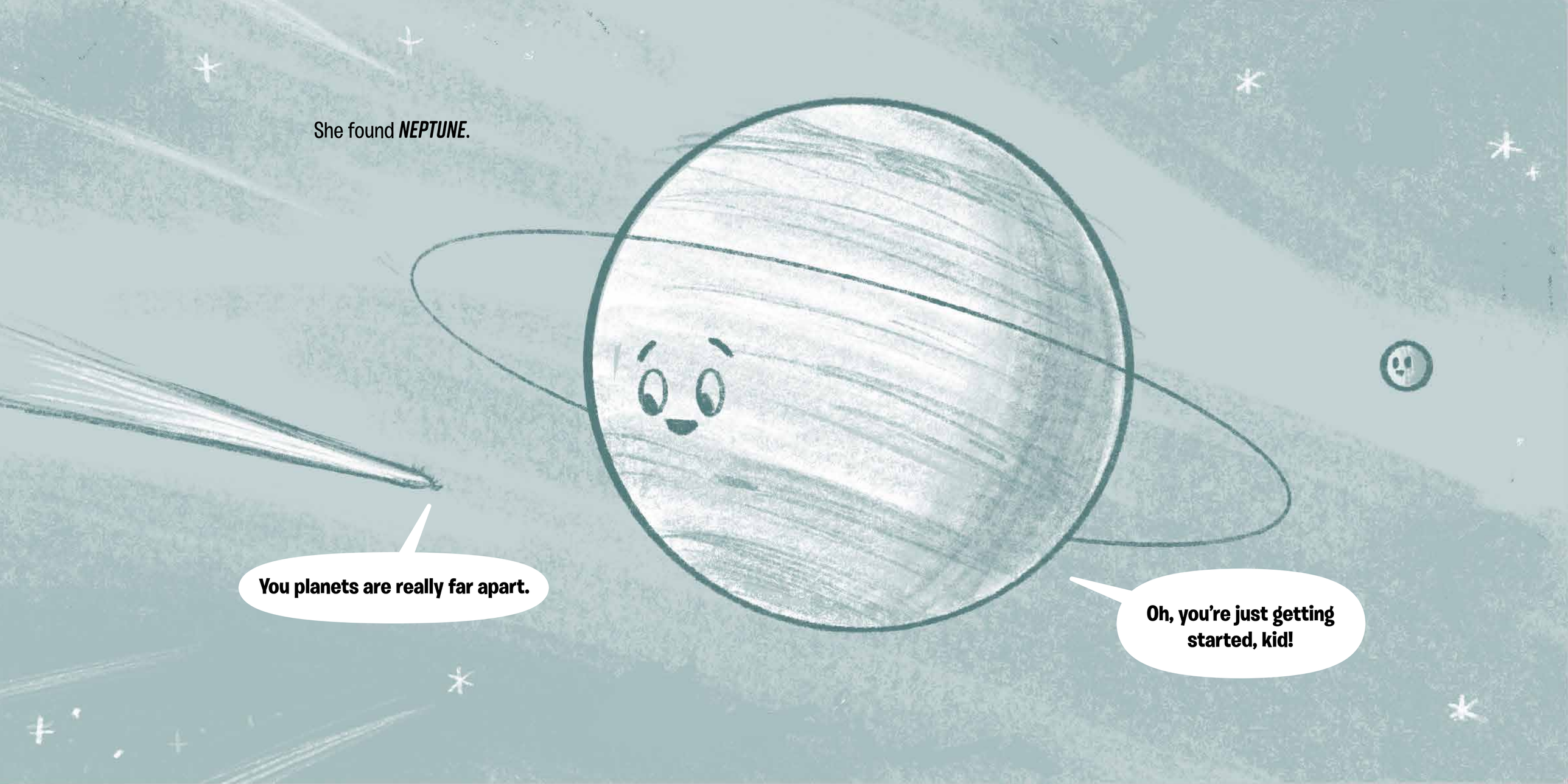


So she just stared out into space.

Then, she noticed she was
surrounded by twinkling stars.

There must be a jillion of them!

For a couple of hours,
Ray enjoyed her new view.
And then...

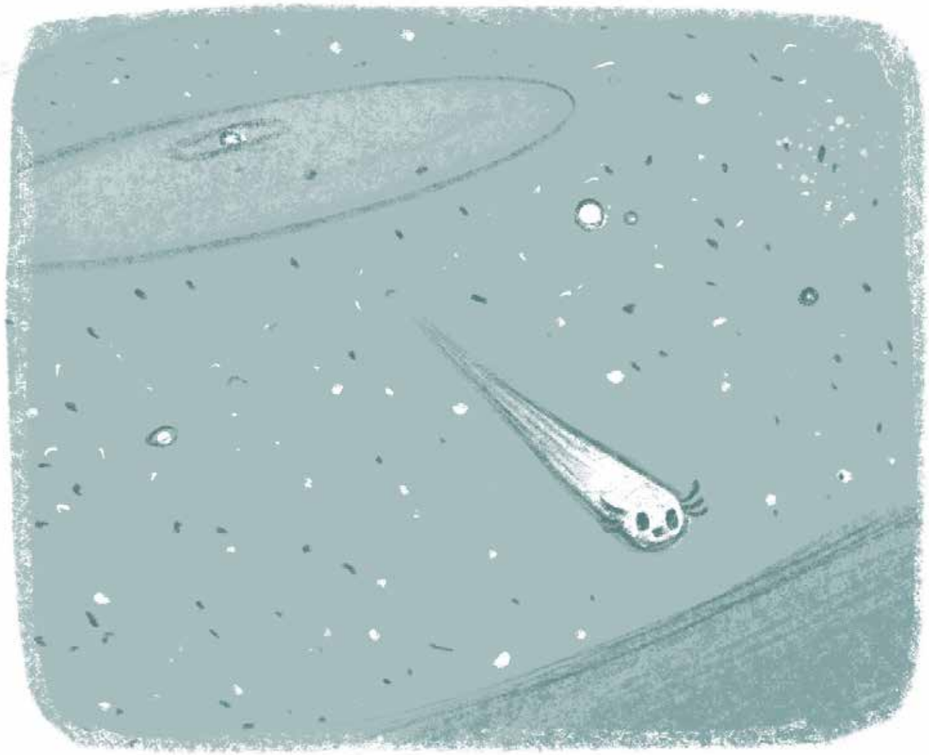

She found *NEPTUNE*.
You planets are really far apart.
Oh, you're just getting started, kid!

In almost no time, Ray reached the ***KUIPER BELT***.

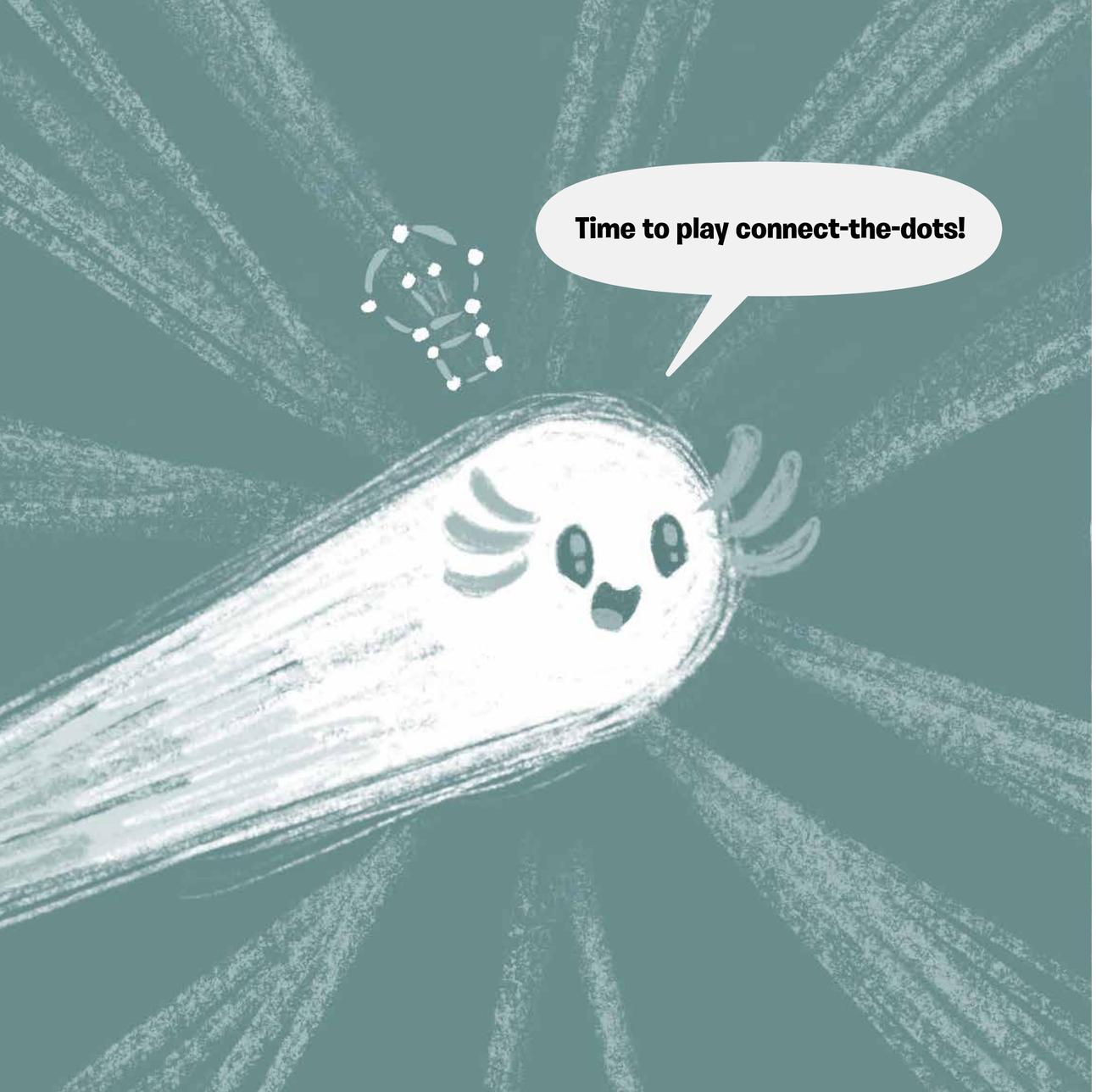
HEY, RAY!

She was greeted by thousands of comets and by dwarf planets ***PLUTO***, ***HAUMEA***, and ***MAKEMAKE***.

For a couple of hours, Ray talked with every comet and dwarf planet that she could.

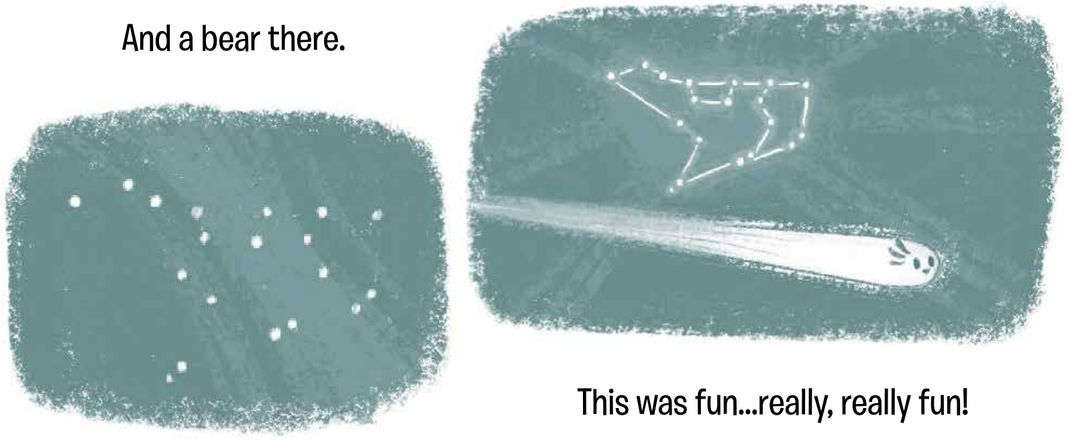


As she left the belt, the stars caught her eyes again. A bright idea came to her!

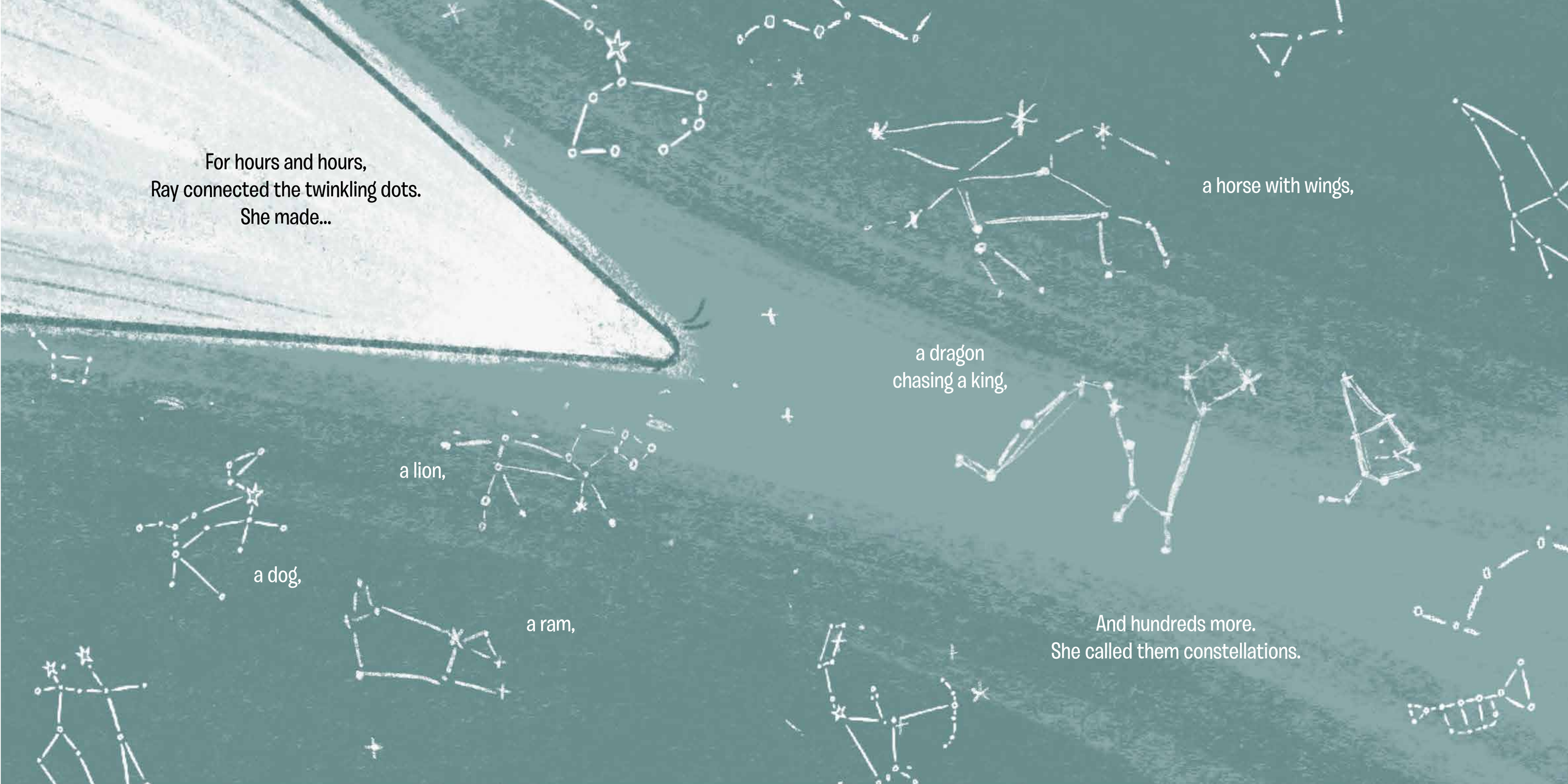


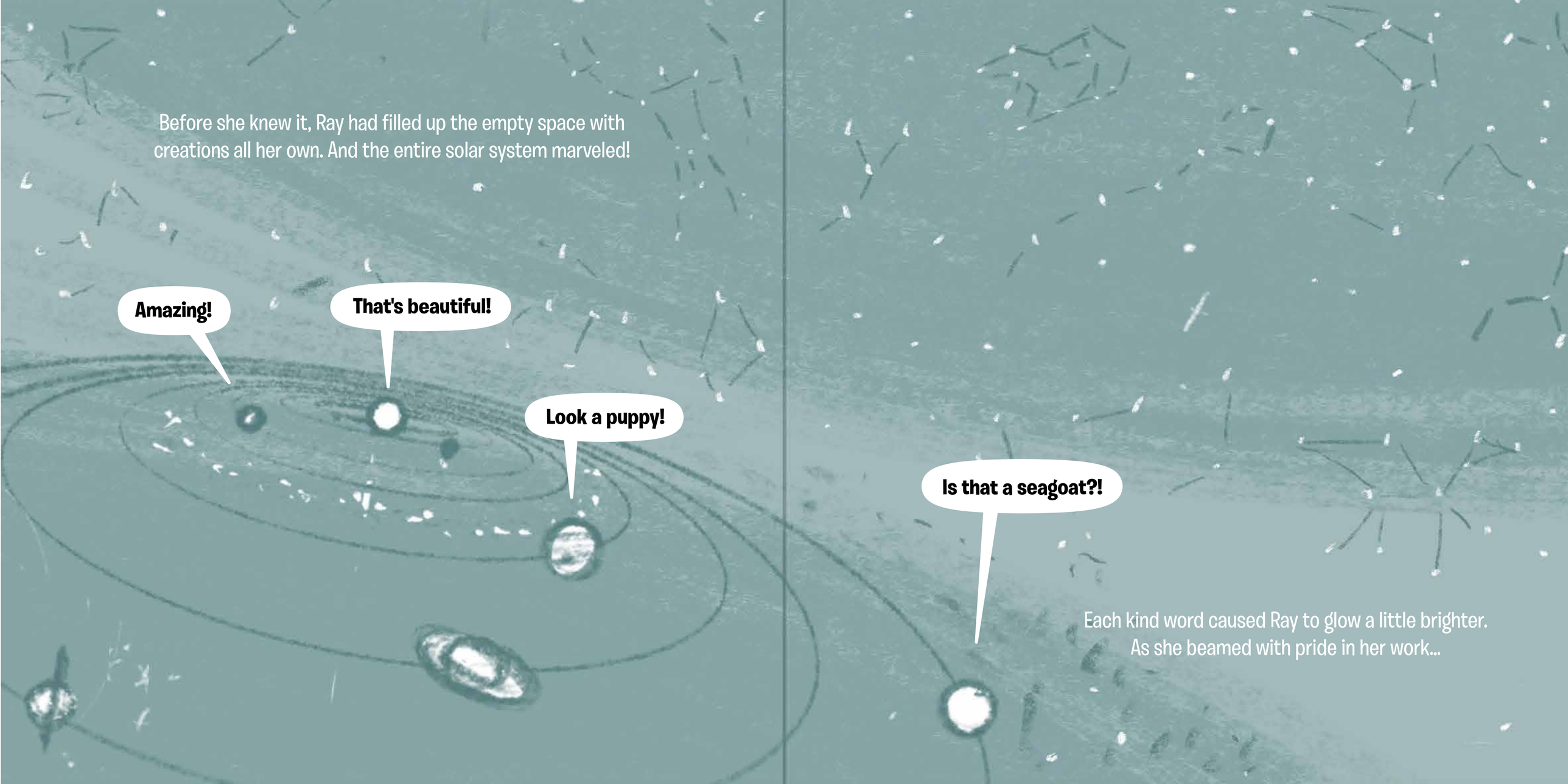
Ray drew a little dipper here...

And a bear there.



This was fun...really, really fun!


For hours and hours,
Ray connected the twinkling dots.
She made...
a horse with wings,
a dragon
chasing a king,
a lion,
a dog,
a ram,
And hundreds more.
She called them constellations.


Before she knew it, Ray had filled up the empty space with creations all her own. And the entire solar system marveled!
Amazing!
That's beautiful!
Look a puppy!
Is that a seagoat?!
Each kind word caused Ray to glow a little brighter. As she beamed with pride in her work...

She reached dwarf planet ***ERIS***
and its sidekick moon.

I didn't think anything else was out here. Are you all that's left?

WHY HEAVENS NO!
There are countless planets, stars, galaxies, black holes, and so much more to explore.

REALLY?!
That gives me so many possibilities!

With a shine on her face,
Ray zoomed off to illuminate
the cosmos.

AT THE SPEED OF LIGHT

THE FACTS OF RAY'S DAY

Stars, like our sun, create lots and lots of little Rays every second. Even though light is faster than everything we know, light takes a very long time to travel through the vast expanse of space. Light travels at about:

186,000 MILES per second | **300,000** KM per second

THE FASTEST THING THERE IS

See how Ray's speed compares to these vehicles. It's not even close!

LIGHT Ray

670,616,629 MPH | **1,079,252,848** KPH

ROCKET Falcon Heavy

24,610 MPH | **39,606** KPH

JET NASA X43A

7,366 MPH | **11,854** KPH

AIRPLANE Boeing 747-8

659 MPH | **1,060** KPH

CAR driving at the speed limit

75 MPH | **120** KPH

Ray could travel around the Earth 7.5 times in 1 second.

ARE WE THERE YET?

Time from the Sun · Average distance from the Sun

See how much time it took Ray to reach each of her planet friends.

ROCKY PLANETS

Orbiting closest to the sun, these planets are all made of rocky materials.

MERCURY
3 MIN 13 SEC
36,000,000 miles

VENUS
6 MIN
67,000,000 miles

EARTH
8 MIN 19 SEC
93,000,000 miles

MARS
12 MIN 40 SEC
142,000,000 miles

DWARF PLANET
CERES (Seer-eez)
22 MIN 58 SEC
257,000,000 miles

GAS GIANTS

You can't stand on these super big planets made of clouds. Each one has a ring system and lots of moons!

JUPITER
43 MIN 17 SEC
484,000,000 miles
778,000,000 km

SATURN
1 HR 19 MIN
886,000,000 miles
1,427,000,000 km

URANUS
2 HRS 39 MIN
1,784,000,000 miles
2,871,000,000 km

NEPTUNE
4 HRS 10 MIN
2,795,000,000 miles
4,498,000,000 km

DWARF PLANETS

All of these tiny planets are smaller than Earth's moon and have low gravity.

PLUTO
5 HRS 28 MIN
3,670,000,000 miles
5,906,000,000 km

HAUMEA (Haw-me-uh)
5 HRS 59 MIN
3,997,000,000 miles
6,452,000,000 km

MAKEMAKE (Maw-kee-maw-kee)
6 HRS 17 MIN
4,215,000,000 miles
6,847,000,000 km

ERIS (Air-es)
9 HRS 26 MIN
6,326,000,000 miles
10,125,000,000 km

BEYOND NEPTUNE

Orbiting our Sun in the Kuiper Belt and beyond, there are at least 46 potential dwarf planets. Astronomers need to learn more about each object before making any of them official.

MERCURY · VENUS · EARTH · MARS · CERES · JUPITER · SATURN · URANUS · NEPTUNE · PLUTO · HAUMEA · MAKEMAKE · ERIS

ROCKY WORLDS · ASTEROID BELT · GAS GIANTS · KUIPER BELT

PLANET DISTANCES

Our solar system covers billions of miles of space! It is extremely hard to show its true scale. These distances are shown to scale.

PROXIMA CENTAURI

(Prox-ee-ma Sen-tar-ee)

How long would it take Ray to get to the closest star outside our solar system?

4 YEARS 2 MONTHS 26 DAYS
18 HOURS 24 MINUTES

It's just 25 trillion miles away!

LIGHT-YEAR Space is so vast that we use light to measure huge distances. One light year is the length light travels in one year.

1 YEAR
4.88 trillion miles / 9.46 trillion km

Thanks for joining me today!

PUBLISHER

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