

E11 - Shining Star Challenge!

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[00:01] Endou

Manaka, it looked like you chased
after us in the heat of the moment.

[00:06] ---

Don't tell me you came
without telling anyone.

[00:08] Ao

No, I asked my parents
and got their permission.

[00:12] Ao

I also asked Suzu-san for
an advance on my wages,

[00:15] Ao

and Monroe-senpai and Sakura-senpai
helped me book the flight.

[00:20] Mira

That was audacious of you.

[00:23] Ao

I was surprised at myself, too.

[00:25] Ao

But I regretted not doing anything
myself when my father was transferred.

[00:31] Mira

Why did you keep it a secret, though?

[00:33] Ao

That was Suzu-san's suggestion.

[00:36] Ao

She said Sensei would
definitely oppose the idea,

[00:38] ---

and if I'd told you, you would've told her.

[00:42] Mira

That was good advice.

[00:45] Endou

You're all so young.

[00:47] Endou

Though, if you had actually
asked me beforehand,

[00:50] ---

you could have accompanied
us as an observer.

[00:53] Endou

You'd still have to pay for
accommodation yourself,

[00:56] ---

but it was in the application notes.

[00:59] Endou

Well, you're here now, so you should
try asking as nicely as you can.

[01:03] Endou

I'll support you as best I can, too.

[01:06] Ao

Thank you—Ow!

[01:09] Mira

Are you okay?!

[01:10] Mira

*I really should read
important notes more.*

[01:13] Mira

I feel so much better with Ao here, though.

[01:16] Mira

*I wonder what the other
participants are like.*

SIGN Ishigaki Youth Center

SIGN 11. Shining Star Challenge!

SIGN Ishigaki Youth Center

SIGN Today's Educational Groups

SIGN Welcome

SIGN Shining Star Challenge

SIGN Ishigaki Island Star Festival

SIGN Amane Neon

[03:03] Horiguchi

Once you finish checking in,
please wait in the training room.

[03:08] Mira

Ao.

[03:08] Ao

Yeah.

[03:10] Ao

Excuse me.

[03:11] Guide

Yes?

[03:12] Ao

I-I'm Manaka.

[03:15] Ao

I failed the written screening,

[03:18] ---

but would it be possible to at least observe?

SIGN My Feelings About Space and the Stars

[03:22] Guide

What's this?

[03:23] Ao

I organized the portion that wouldn't fit in my written application.

[03:28] Guide

That's heavy!

[03:29] Endou

Sorry about my student.

[03:31] Endou

Is the organizer around?

[03:33] Guide

Yes, over there.

[03:35] Endou

Hirose-san! It's been a long time.

[03:38] Hirose

Hey.

[03:39] Ao

Huh?

[03:40] Endou

Hirose-san has been organizing this event since I attended.

SIGN Konohata Mira

SIGN Makita Shiho

[03:52] Hirose

Oh, so this is her?

[03:54] ---

The handful you mentioned on the phone.

[03:57] Ao

The handful?

[03:58] Makita

The handful?

[04:00] Ao

I'm sorry for being unreasonable.

[04:02] Hirose

No, I'm just surprised. I've never seen a student as gutsy as her before.

[04:08] Hirose

Well, I can't send you packing after you came this far.

[04:13] Hirose

Here.

[04:14] Mira

Huh? Then...

[04:16] Both

Thank you so much!

[04:18] Endou

Sorry about that.

[04:20] Hirose

Don't worry about it. It's our job
to help children pursue their dreams.

[04:26] Mira

I'm so glad!

[04:27] Ao

Yeah!

[04:30] Ino

She said she got permission to observe!

[04:33] Monroe

Good for her!

[04:35] Sakura

There's no way they'd send her back after
she went all the way to Ishigaki Island.

[04:39] Chikage

You were actually worried about her
the whole time. You're so cute.

[04:43] Sakura

Hey, Chikage!

[04:48] Sakura

It's been a whole year.

[04:50] Monroe

I'm happy I can come here with you again.

[04:53] Sakura

Wha... I'm just chaperoning
their summer camp as an alumnus.

[04:58] Sakura

We're not here to have fun.

[04:59] Monroe

Sure.

[05:01] Chikage

So this is a life-size artificial satellite?

[05:04] Ino

Yes! I was so impressed when I saw it

[05:07] ---

for the first time at our
summer camp last year!

[05:09] Ino

You and I may be part of the geology group,

[05:12] ---

but I think learning about astronomy like this is fun, too.

[05:15] Chikage

Yes.

[05:17] Monroe

Mira and Ao were so enthusiastic about asking everyone here about asteroids.

[05:22] Sakura

Yeah, they held up the guide and peppered her with questions.

[05:26] Chikage

They really love them, huh?

[05:28] Nanami

But going there without warning was too reckless.

[05:32] Chikage

You mean Ao-senpai?

[05:34] Nanami

She failed the screening, so she shouldn't be barging in.

[05:43] Ino

You may be right, Nana-san.

[05:45] Ino

What she did certainly doesn't merit praise.

[05:48] Nanami

Why did you all support her, then?

[05:52] Ino

Over the past year, those two have been making strides toward

[05:57] ---

their dream of discovering an asteroid.

[06:00] Ino

They gave it all they had, never accepting that it was beyond their reach.

[06:04] Ino

They even managed to move in together, which everyone thought was reckless,

[06:07] ---

and now they finally have this chance.

[06:10] (Flashback) Chikage

Isolation...

[06:11] (Flashback) Chikage

But they should take action and move forward.

[06:17] Ino

Seeing Ao-san refuse to give up makes me

want to do all I can right now, too.

[06:28] Nanami

All I can do right now...

SIGN Motivation

SIGN Courage

SIGN Guts

[06:31] Hanashima

Welcome to Ishigaki Island.

[06:33] Hanashima

I'm your counselor, Hanashima.

[06:36] Hanashima

Let's start by having everyone
introduce themselves.

[06:39] Hanashima

We'll start with you.

[06:42] Satou

I'm Satou, a third-year.

[06:43] Satou

I'm president of the science club.

[06:45] Satou

Nice to meet you all.

[06:47] Ao

*There are several people here who
aren't from earth science clubs.*

[06:50] Asuka

I'm Tomori Asuka, a second-year!
Astronomy club!

[06:53] Asuka

I came here from Honto. I love idols!

[06:56] Ao

Huh?

[06:58] Makita

I'm Makita Shiho, and I'm from Kyushu.

[07:02] Makita

I like people.

[07:05] Ao

Huh?

[07:07] Mira

I'm Konohata Mira, a second-year!

[07:09] Mira

I'm vice president of our earth sciences
club, and I like Saturn and Cetus!

[07:13] Ao

They make Mira seem normal.

SIGN Shining Star

Challenge

[07:16] Mira

*The Shining Star Challenge,
or Shiny Challenge, would take three days.*

[07:21] Mira

*There would be lectures,
tours of the observatory,*

[07:23] ---

*observations, presentations
of our results, and much more!*

[07:28] Asuka

Oh, hey, is that the
limited-edition Kanto one?

[07:31] Mira

Yeah. I brought it with me so I wouldn't
get sleepy during observation,

[07:36] Mira

but I'm so nervous, I haven't slept much.

[07:38] Mira

Would you like one, Tomorin?

[07:40] Asuka

Tomorin? I like that nickname.

[07:44] Asuka

Thanks for the coffee!

[07:46] Asuka

Whoa, it's sweet!

[07:48] Asuka

Miracchi, do you have a sweet tooth?

[07:49] Mira

Huh? No, not really.

[07:49] Ao

She's making friends already.

[07:51] Asuka

You sure?

[07:51] Ao

Wow.

[07:53] Makita

Um, do you have a moment?

[07:56] Ao

It's the girl who likes people.

[07:58] Makita

I heard your exchange at the check-in desk.

[08:00] Makita

You're here even though
you failed the screening?

[08:03] Ao

Yes. I couldn't just give up on it,
so I followed in secret.

[08:07] Makita

Wow. You seem so docile,
but you're pretty bold.

[08:11] Makita

I bet your brain is interesting.

[08:14] Ao

My brain?

[08:15] Teacher

We're heading out for the tour.

[08:18] Makita

Tell me the details later, okay?

[08:21] Ao

What is she going to do to me?

[08:24] Teacher

This is the VERA Ishigaki Station.

[08:27] Asuka

Wow, it's huge!

[08:30] Mira

The one used by the Geospatial
Information Authority of Japan?

[08:32] Teacher

You sure know your stuff.

[08:34] Teacher

It's a similar antenna to the
one that used to be in Tsukuba.

[08:38] Teacher

There are four of these antennas
located throughout Japan,

SIGN Mizusawa

SIGN Iriki

SIGN Ogasawara

SIGN Ishigaki Island

[08:41] Teacher

and together, they create a radio telescope
that's 2,300 kilometers in diameter.

[08:46] Azusa

This is a telescope?

[08:48] Azusa

Where do you look into it?

[08:50] Makita

You don't look with your eyes.

[08:51] ---

You use radio signals and look at the data.

[08:54] Asuka

Huh? And you can see stars that way?

[08:57] Asuka

Makita-chan, are you a space case?

[09:00] Makita

I do get called that sometimes, but I'm not.

[09:02] Hirose

The VERA mainly observes maser bodies that emit strong electromagnetic signals,

[09:07] Hirose

to try and create a 3-D map of the Milky Way.

[09:10] Mira

A map?

SIGN Maser Source

SIGN Distance

SIGN Stellar Parallax

SIGN Relative VLBI

SIGN Earth

SIGN 1 AU

SIGN Sun

[09:11] Hirose

We triangulate the astral bodies in space using their

[09:15] ---

stellar parallax to determine their precise position and motion.

[09:19] Hirose

So this time, we're going to have

[09:21] ---

the electromagnetic group use VERA to try and pinpoint a new maser object.

[09:25] Mira

They can make maps of space, too.

[09:28] Ao

I should tell Ino-senpai about this.

[09:33] Mira

Wow, it's so big!

[09:36] Mira

And it's kind of cute!

[09:38] Hanashima

The Murikabushi Telescope has a 105-centimeter aperture.

[09:41] Hanashima

It's the largest reflecting telescope in Kyushu, Okinawa.

[09:45] Mira

Murky bush?

[09:47] Tomori

Murikabushi. It's the local name for the Pleiades.

[09:51] Hanashima

Here, we conduct observations

using visible and infrared light.

[09:55] Hanashima

If you're hunting for asteroids,
this is the one to use.

[09:59] Tomori

By "reflecting telescope," do they mean
it uses mirrors rather than lenses?

[10:03] Mira

Well, uh... the light reflects off the
primary mirror and the secondary mirror...

[10:08] Makita

Murikabushi is a Cassegrain
reflector telescope.

[10:12] Makita

It uses a primary concave mirror and a
secondary convex mirror to form the image.

[10:16] Makita

It has three focal lenses for
research and observation, too.

[10:19] Mira

You know a lot about telescopes!

[10:21] Makita

I've never seen the stars
through a telescope, though.

[10:26] Tomori

Huh?

SIGN Electromagnetic Group

SIGN Optical Group

[10:27] Hirose

Now that we're finished with the tour,

[10:29] ---

we'll be splitting into the electromagnetic
group and the optical group.

[10:33] Hirose

Each group will get to try searching
for celestial objects themselves.

[10:37] Mira

I hope we get along, Tomorin, Makki!

[10:39] Tomori

Me, too.

[10:41] Makita

Makki?

[10:43] Hirose

We'll begin our observations after dinner.

[10:45] Hirose

Make sure you eat up and give it your all.

[10:47] ---

Okay!

[10:50] Mira

Huh? Ao and Sensei are gone.

[10:52] Makita

Now that you mention it, so is my teacher.

[10:56] Mira

Oh, I got a message.

[10:58] Mira

They said they're grabbing dinner.

[11:00] Endou

They don't provide meals for us, after all.

[11:04] Endou

It's my treat tonight, so eat up.

[11:06] Ao

Thank you.

[11:08] Ao

*I need to eat quick,
since observation starts soon.*

[11:14] Hayakawa

Yuki-chan, sorry for the wait!

[11:16] Endou

Oh, over here!

[11:18] Ao

Oh, that's the lady from the hall...

[11:21] Ao

Makita's chaperone, Hayakawa.

[11:24] Endou

She was in my group when I took part in the Shiny Challenge.

[11:28] Endou

Man, to think we'd both end up becoming teachers.

[11:32] Endou

I never would have imagined it back then.

[11:35] Hayakawa

Me neither.

[11:37] Endou

It's kind of fun though, isn't it?

[11:39] Endou

Getting to eat hamburgers together here again.

[11:42] Hayakawa

I figured you'd be drinking root beer.

[11:45] Endou

How can I not drink it when I'm here?

[11:48] ---

True.

[11:50] Endou

Ah, that's good!

[11:51] Ao

This is going to take a while...

[11:52] Endou

Want one, Kayo?

[11:53] Hayakawa

I had some earlier.

[12:03] Mira

*Our optical group went to the observatory
to make our observations, but...*

[12:13] Tomori

That was rough, right after dinner.

[12:15] Mira

That was a really winding road.

[12:18] Hanashima

If you're not feeling well,
do want to lie down for a bit?

[12:20] Hanashima

We have a nap room here for the researchers.

[12:23] Ao

A researcher's bed!

[12:25] Ao

I wonder what it's like.

[12:26] Mira

I want to try it out!

[12:28] Makita

You girls are so excited.

[12:33] Hanashima

Now, where do you think the
asteroids we're after are located?

[12:38] Makita

The asteroid belt.

[12:38] mira

The asteroid belt!

[12:39] Tomori

Oh, a duet.

[12:41] Hanashima

That's right.

[12:42] Hanashima

So, what region of the sky
should we be observing, then?

[12:45] Both

The region in opposition!

[12:47] Tomori

This time they're in unison.

[12:48] Mira

That's the region where it's
closest to Earth, right?

[12:51] Hanashima

Right.

[12:53] Hanashima

Horiguchi-san, if you would.

[12:55] Horiguchi

Sure.

SIGN Sun Earth Opposition

[12:56] Horiguchi

As Konohata-san said,
this is the region in opposition.

[12:59] Horiguchi

Asteroids reflect the light from the sun,

[13:02] ---

so they're brightest when
they're in opposition.

[13:05] Tomori

So it's like when the idol
comes front and center

[13:08] ---

on the stage to bathe in the spotlight?

[13:11] Makita

What are you talking about?

[13:13] Hanashima

The observatories and space telescopes
throughout the world have already

[13:17] ---

discovered most of the bright objects
with their full sky surveys.

[13:19] Hanashima

Most of the undiscovered asteroids
are dimmer than magnitude 20-21.

SIGN Asteroid

SIGN Sun Earth Opposition

[13:24] Tomori

Survey?

[13:25] Makuita

Astronomical surveys.

[13:27] Tomori

Astronomical?

[13:28] Mira

They observe a wide region all at once.

[13:32] Tomori

Wow.

SIGN Astronomical

[13:33] Horiguchi

By the way, here's how it's written.

[13:35] Hanashima

Next, we'll explain how to
conduct your observations.

[13:37] Tomori

Wait, am I the only one getting
left behind here? Panic!

[13:43] Makita

What are you doing?

[13:45] Tomori

I want a partner, too!

[13:46] Tomori

Come with me!

[13:47] Ao

Huh?

[13:51] Ao

S-Sure!

[13:53] Hanashima

This time, we'll be marking each
0.2 view of angular diameter

[13:58] ---

as a single section of
the region in opposition.

[14:01] Ao

*The moon fills an angular
diameter of 0.5, so...*

SIGN 0.5 angular diameter

SIGN Moon

[14:05] Ao

it's about this big?

SIGN the order we'll observe in

[14:07] Hanashima

We'll be taking five shots per section

[14:09] ---

with a six-minute exposure time each,
so that's 30 minutes to photograph each one.

[14:13] Hanashima

We'll be conducting our observations
this way for as long as time permits.

[14:17] Mira

I-I'm just so happy to be learning
an astronomer's know-how in person!

[14:21] Mira

Until now, it's all been
through books or the Internet.

[14:24] Tomori

I know!

[14:26] Tomori

Going to see concerts live is the best!

[14:28] Ao

Their conversation actually meshed.

[14:30] Hanashima

Once we reduce the noise
from our photograph data,

[14:33] Hanashima

we analyze the photos with
our asteroid survey software.

[14:36] Hanashima

We create a continuous
display of those five images

[14:38] ---

by overlapping the fixed stars, and...

[14:43] Hanashima

The objects in motion are your asteroids.

[14:46] Mira

There are so many in a single section!

[14:48] Ao

There are a lot more than I imagined.

[14:50] Hanashima

The ones with red marks on them
are the currently known asteroids.

[14:54] Hanashima

Blue marks appear on the ones that are
potentially new, undiscovered asteroids.

[14:57] Tomori

Huh... looks pretty hard to find one.

[15:00] Makita

Not to mention, you need at least

[15:04] ---

two different observations of a
new asteroid, if I remember right.

[15:07] Mira

Huh?! Then you're saying we're completely
finished if we can't find one tonight?!

[15:12] Hanashima

I-if you do happen to find
a potential discovery,

[15:15] ---

I'll take charge of the
follow-up observation.

[15:17] Makita

There's another factor making
observation difficult.

[15:21] Ao

Oh, a weather monitor.

[15:24] Hanashima

I was worried about that. The cloud patterns definitely aren't looking good.

[15:28] Mira

Oh, no...

[15:29] Tomori

In that case, let's hurry up and get started!

[15:31] Tomori

It's better to have as many chances as possible!

[15:34] Mira

Yeah!

[15:36] Hanashima

All right. Let's start loading up the photo program.

[15:42] Ino

Thank you so much for taking such good care of us again.

[15:46] Grandfather

You're Yuki's precious students, after all.

[15:50] Grandfather

We're happy that you visited again.

[15:53] Nana

Does he love astronomy, too?

[15:55] Chika

Now that you mention it, he's been wearing that this whole time.

[15:58] Monroe

That was a souvenir our teacher bought for him at JAXA last year.

[16:04] Ino

Huh?

[16:06] Sakura

What? Is it from the girls?

[16:08] Ino

Yes. They said the weather is bad down there,

[16:11] ---

so their observation isn't going well.

[16:14] Chika

After they finally got this chance to realize their dream, too...

[16:22] Nana

Senpai, use these!

[16:24] Ino

Oh, you mean to make teruteru bouzu dolls?

[16:26] Nan

Yes! Let's make enough
to reach Ishigaki Island!

[16:31] Grandfather

Oh, I'll make some, too.

[16:46] Grandmother

Goodness, we sure did make a lot.

[16:49] Nana

It's not enough.

[16:50] Nana

We should make more!

[16:55] Mira

Our fourth observation...

[16:59] Tomori

They're all known objects.

[17:02] Makita

Hey, it looks like the
weather's getting worse.

[17:06] Mira

Go faster!

[17:07] Endou

Now, now.

[17:08] Mira

Sensei!

[17:09] Endou

Sometimes there's no point in panicking.

[17:13] Hayakawa

Let's have some tea
and wait for it to clear up.

[17:15] Mira

There are so many sweets!

[17:17] Makita

H-Having snacks this late?

[17:21] Hayakawa

The guilty pleasure only
makes them taste better!

[17:23] Hayakawa

Oh, we have cup noodles, too.

[17:26] Tomori

Wow. You're both former
participants in the Shiny Challenge?

[17:30] Endou

Yeah. The weather was like this then, too.

[17:33] Hayakawa

Yuki-chan was in such a panic,
determined to produce results.

[17:38] Endou

No, it wasn't that bad.

[17:42] Grandmother

Yuki-chan used to have
a very serious attitude.

[17:45] Grandmother

Like she was straining herself for something.

[17:47] Grandfather

This is how stiff her expression used to be.

[17:50] Sakura

You mean our Endou-sensei?

[17:53] Hanashima

I have photos of you
from back then right here.

[17:56] Endou

You, too?! I'm so embarrassed!

[17:59] Ao

She's so young.

[17:59] Mira

Sensei, your expression's so stiff!

[18:02] Makit

This is Hayakawa-sensei...

[18:05] Ao

Who's this?

[18:06] Endou

Oh, that's Nishina-chan.

[18:09] Endou

She's an astronomer overseas now.

[18:11] Tomori

Wow!

[18:12] Endou

She really was an incredible girl.

[18:14] Endou

She knew so much.

[18:16] Endou

Not just about astronomy,
but about history and literature, too.

[18:20] Hayaka

She just had so much fun learning new things.

[18:24] Endou

She's the one who got me into it, too.

[18:30] Mira

Wow.

[18:34] Endou

I didn't discover any asteroids in the end,

[18:38] Endou

but I got something even better out of it.

[18:42] Endou

Honestly, the interactions we have with others are so important.

[18:45] Endou

Those encounters can be enough to change a person's world.

[18:49] Mira

You kind of seem more mature than usual right now.

[18:52] Hanashima

She's truly a good teacher, huh?

[18:55] Endou

E-Enough about us! You should go interact with your peers!

[18:59] Endou

Hanashima-san, I'm borrowing the nap room!

[19:02] Hayakawa

She's just as cute as ever.

[19:05] Hayakawa

I'll be in the nap room, too.

[19:07] Makita

Hey, Manaka-san, I forgot to ask.

[19:09] ---

Why did you come all the way here?

[19:12] Tomori

You have a lot of guts to come observe us by yourself.

[19:16] Ao

I made a promise to Mira when we were children.

[19:19] Mira

We're going to discover an asteroid and name it after her.

[19:22] Ao

To make that happen, I need to gather a lot more knowledge and experience.

[19:26] Makita

Wow. What a big, romantic dream!

[19:30] Makita

I'm sad it wasn't because you heard voices from space.

[19:35] Ao

Why is she disappointed?

[19:37] Mira

Why are you participating, Makki?

[19:39] Makita

I came here to expand my horizons and meet all kinds of new people.

[19:44] Makita

It's not directly related to astronomy,
but I'm trying to become a counselor.

[19:48] Ao

That explains the comment about my brain.

[19:50] Tomori

I wanted to meet Neon!

[19:53] Mira

Neon?

[19:54] Tomori

The idol who loves astronomy, Amane Neon!

[19:56] Tomori

They hold a Star Festival after
the Shiny Challenge, right?

[19:59] Tomori

She's this year's guest!

[20:01] Tomori

I get to see Neon in person!

[20:02] Tomori

I might be able to get close to her!

[20:04] Mira

Everyone really is here
for different reasons.

[20:07] Hanashima

Sorry, everyone, but it doesn't look
like the weather will clear up tonight.

[20:12] Hanashima

Let's call it a night.

[20:13] Mira

What? But...

[20:15] Hanashima

Instead, why don't we practice looking
for them using past photo data?

[20:19] Mira

O-Okay!

[20:21] Hanashima

What would you like to do, Manaka-san?

[20:23] Hanashima

You could return to the dorms with
Endou-san and the others, if you'd like.

[20:27] Ao

No! Please let me observe until the very end!

[20:56] Ino

Looks like the weather cleared
up on Ishigaki Island!

[20:58] Sakura

Really?!

[20:59] Sakura

Th-That's good.

[21:02] Monroe

I wonder if we helped make that happen.

[21:06] Chika

Your feelings made it through, Nana-chan.

[21:09] Nana

Yeah.

[21:12] Ao

Here you go.

[21:13] Woman

Oh, are you heading out already?

[21:16] Ao

Yes.

[21:18] Satou

Hey.

[21:19] Satou

What are we doing about
the afternoon observation?

[21:21] Man

Yeah, let's figure that out now.

[21:22] Makita

Electromagnetic observation is nice,
since it's not affected by the time.

[21:26] Tomori

I guess we're all studying
during the day today.

[21:29] Tomori

I think I'll need to drink a lot of coffee.

SIGN Guava Juice

[21:33] Woman

Here. Stay hydrated.

[21:36] Ao

Thank you.

[21:38] Woman

Try not to push yourself too hard.

[21:40] Woman

It's going to be hot and sunny today.

[21:42] Ao

Sunny?

[21:43] Tomori

I'm not sleepy! I'm not sleepy!

[21:47] Makita

Are you okay? You're spacing out.

[21:49] Mira

Oh, yeah!

[21:53] Mira

It's okay.

[21:54] Mira

We still have a chance.

[21:58] Mira

Tonight, it'll happen.

[22:00] Ao

I'm sure!

SIGN 12. Connected Cosmos

[23:36] Mira

Next time, "Connected Cosmos."

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