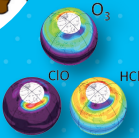


What is Humanosphere?

vol.1





What is Humanosphere?



This pamphlet is the first to collect our manga pieces that were issued on “Seizonken Dayori (Research Institute for Sustainable Humanosphere Newsletter)”, an informative magazine that we publish. This collaboration between Kyoto University’s Research Institute for Sustainable Humanosphere (RISH) and Kyoto Seika University’s Manga Department allows our research activities to be introduced in ways that are easily understood.

We hope that you read with ease, and that you understand a great deal more about the “Humanosphere Science.”

Ready? Let’s explore this Humanosphere together!



We’ll clear your “?”s
on Humanosphere
with manga!



Has everybody heard of the word “**Humanosphere**” before?

Living in the 21st century, we are facing many issues threatening our very survival such as global warming, the diminishing of resources and energy, etc.

Humanosphere is a word describing the area and space needed for the survival of us humans.

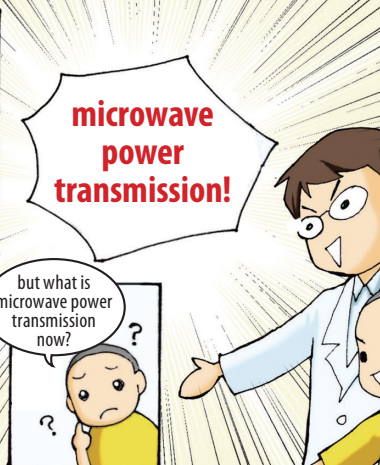
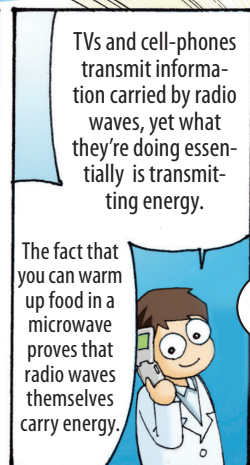
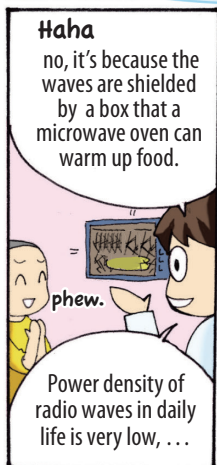
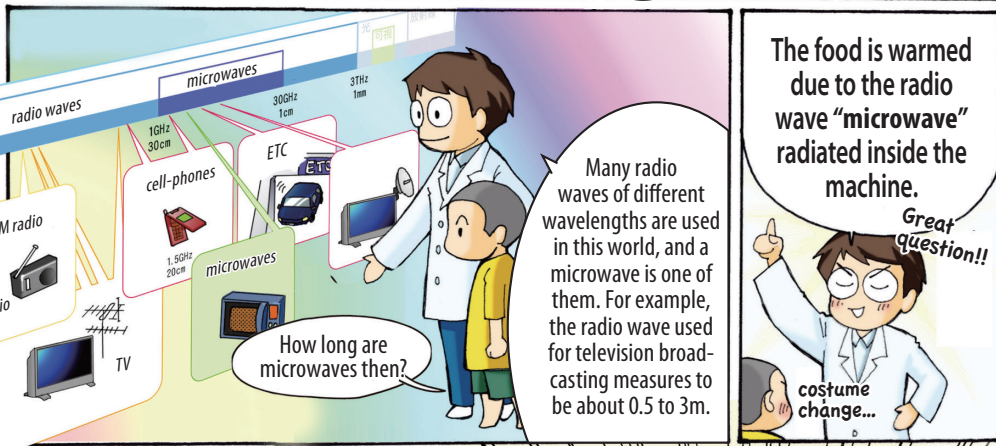
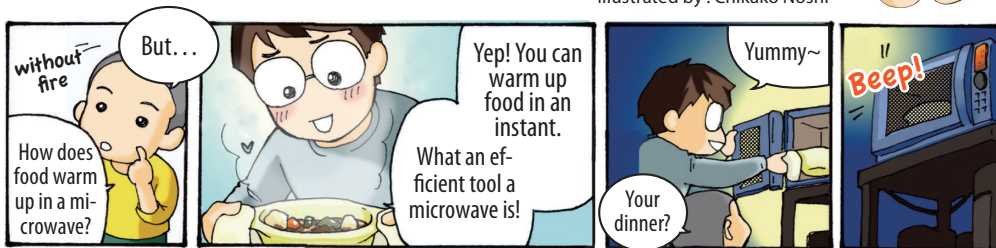
We also have **the human living environment** in which we live, **the atmosphere** that covers us all, in which **the forest sphere** that breaths its air, and **outer space** that connect us to the outside.

These spheres coexist in accordance with one another, and therefore a new school of thought needed to emerge in order to address the issues stretching across separations between many specialized fields. And that is the **“Humanosphere Science”**

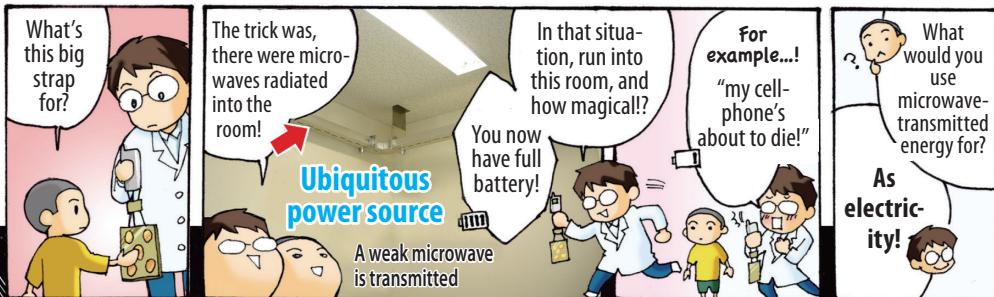
With **“Science for the sake of sustainable human development”** as a motto, a variety of researchers from the astronomical to the genetic study beyond disciplinary boundaries.

What is "Microwave Power Transmission!"

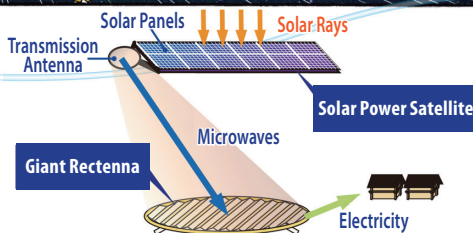
Written by : Tomohiko Mitani
Illustrated by : Chikako Noshi



What is Humanosphere?



But you couldn't connect several million km of electric wires all the way to outer space, so that's where microwave power transmission comes into application. You won't need electric wires if it's transmitted via radio waves.

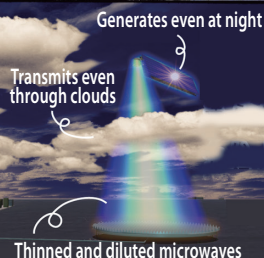


Solar Power Satellite is said to become the power plant of the future. You'd have a satellite full of solar panels, and the electricity generated will be sent to earth.



Of course the energy sent via radio waves are thinned and diluted not to affect you.

This is a groundbreaking power plant that generates clean solar electricity 24 hours a day, 365 days a year.

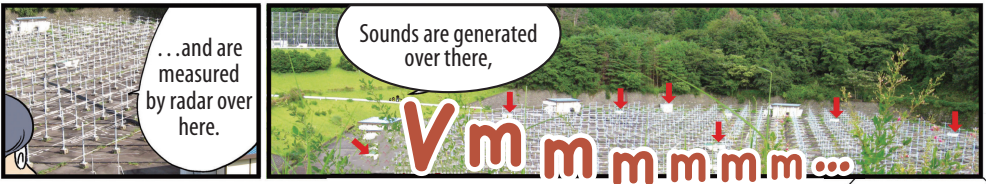
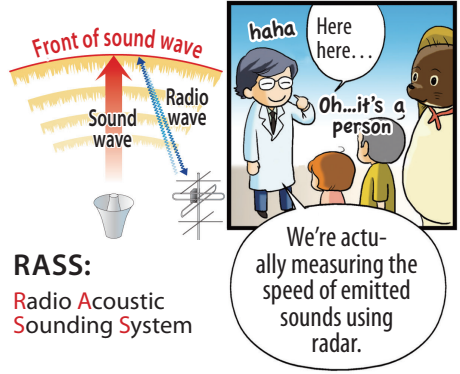
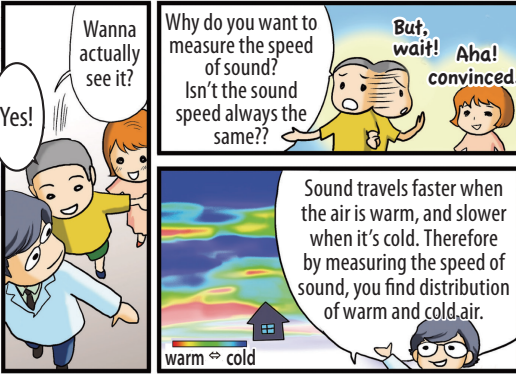
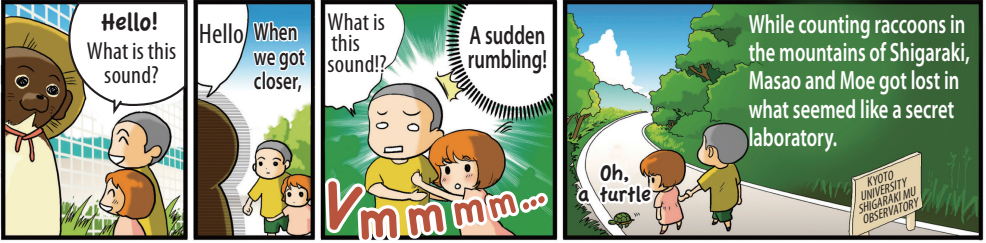


Check out this website for more details on Solar Power Satellite! >>> <http://space.rish.kyoto-u.ac.jp/sps-e.html>

Mom

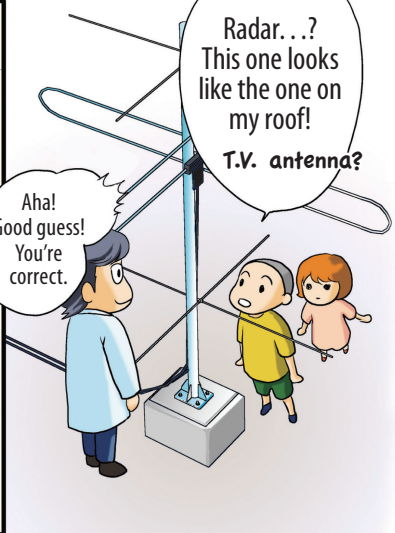
The End

What's "measure the atmosphere using radio waves and light"?



The Yagi antennas used here for our MU radar are the same as T.V. antennas. We connect 475 of them to work as one antenna. But unlike T.V. antennas they transmit as well as receive.

We use them to measure winds, too. Changing timing of wave transmission, The surface of observation can be slanted.
MU:
 Middle and Upper Atmosphere
 (10~100km) (100~500km or more)



What is Humanosphere?

Written by : Takeshi Horinouchi/
Masayuki Yamamoto
Illustrated by : Chikako Noshi

We can measure air temperature, water vapor, wind, clouds and even yellow sand. Another lidar can detect the amount of CO₂!

That's a long stick of light...

This is called a "lidar". Instead of using radio waves like radar, lidar uses laser light to observe. Like radar, lidar does detect faint reflections bounced back from the atmosphere. But we use telescopes instead of antennas.

Lidar:
Light Detection and Ranging
Radar:
Radio Detection and Ranging

Let's eat!!

After dinner...

Huh!

What's that?

and outside

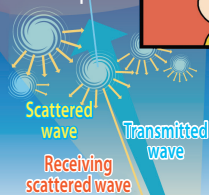
How can we know that the atmosphere reflects radio waves and light?

Wait wait!

Aha! convinced.

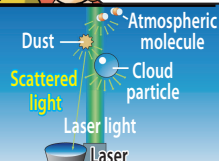
Radio wave reflects at fluctuations of air temperature or water vapor, and light does the same when it comes across molecules in the air (such as Nitrogen and Oxygen), dust, or clouds. We can measure the atmosphere by the reflected radio wave and light.

Fluctuations of the atmosphere



Radar

How can you measure the atmosphere using light or radio waves...?



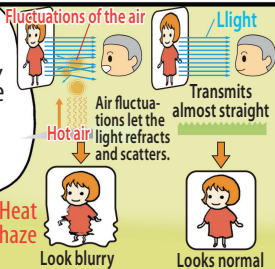
Lidar

ah! Stars...

hmm

umm

As we know the nature of light and radio waves, we can use it to measure many things.



Heat haze seen near the ground on hot summer days, too.

People in the past were puzzled, and they found out why from studies.

That's right.

Stars shimmer when the air density fluctuates.

It definitely looked like a secret lab.

zzzz...

Truly

I would've loved to tell them about observing the atmosphere using GPS...

bye bye

see you

That's amazing mom, how did you know we were here?

I handed you the cell-phone this morning. It has GPS.

no problem

Thank you so much, it got so late...

Oh, it's mom's car!

The End

What's Bioethanol!?



Written by : Yuichi Setokawa/ Takashi Watanabe
Illustrated by : Chikako Noshi

Sorya
sorya



By the way
Do you know that corns are used for purposes other than food?

For what?

So sweet and yummy!

isn't it

Hey you guys, wanna eat those?

Com

The drums speak to my heart.

They're so cool...!

But once they're used, they aren't so reusable

Fuel used to always come from buried matter such as oil and gas...

oil

natural gas

methane hydrate

coal

uranium

fossil fuel

underground resources

CO₂

I've heard of that, "renewable energy" right?

aha

For fuel!

For producing bioethanol.

Hey, what's "renewable energy"?

no idea...

Yes, therefore even if we use bioethanol made from plants, we're only emitting CO₂ that was once in the atmosphere. The CO₂ in the air doesn't increase.

Plants bathe in sunlight and create sugar and oxygen out of carbon dioxide and water.

photosynthesis

CO₂

oxygen

sunlight

sugar

water

You learned about photosynthesis in class?

So that's where the corn comes in.

umm...

The recent global warming is said to have been caused by the great amounts of CO₂ emitted from burning fuel like oil.

Shock!

But if you make bioethanol from corn, there'd be none left for us to eat...

nooooo...

The recent diminishing of fossil fuel is making the development of renewable resources an immediate goal.

fossil fuel

continuous decrease

Hence "renewable resources" huh?

Let's make bioethanol from uneatable "trees and grass"!

Yep, and that's why we decided.

At current stages, bioethanol is created mainly from food people eat, like corn and sugarcane.

This leads to an increase in food, making people's lives more difficult in developing countries.

Can anything be done?!

How brilliant! My lovely wife has a unique perspective.

but before that, you need an important step known as saccharification.

Saccharification?

Ethanol is created through a process known as fermentation, using yeast,

If you could, they won't be using corn in the first place, huh?

Right.

But how?

we can also create things that we used to make from oil such as plastic and synthetic fabric.

Furthermore! From trees and grass,

The only thing is, unlike "starch" contained in corn, the sugar in trees and grass—cellulose—is surrounded by stiff structures called lignin, making it difficult to saccharify if not broken down.

Saccharification is the breaking down of sugar so that the yeast can ferment.

enzyme chop chop! Have a feast, yeast!

monosaccharide

We have to plant more if we cut them.

Yes, growing them is the first step!

But we won't have trees in our forest if we use 'em up!

So here at Research Institute for Sustainable Humansphere, we're studying the ways we can break lignin down using mushrooms and microwaves.

microwave

mushrooms

slice slice

hemicellulose

cellulose

sugar (polysaccharide)

lignin

rip

Let's all try to come up with ways our whole entire planet and communities stay wealthy.

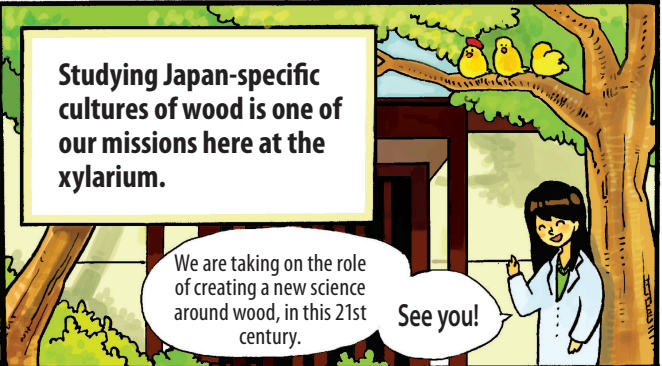
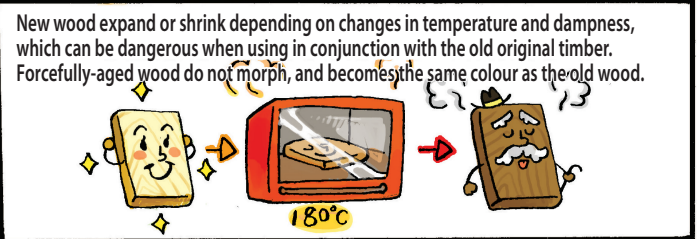
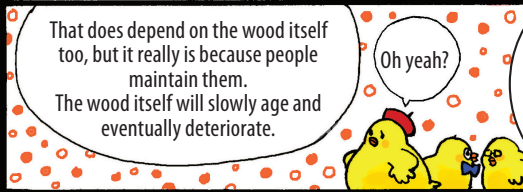
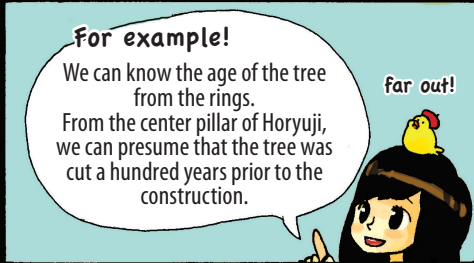
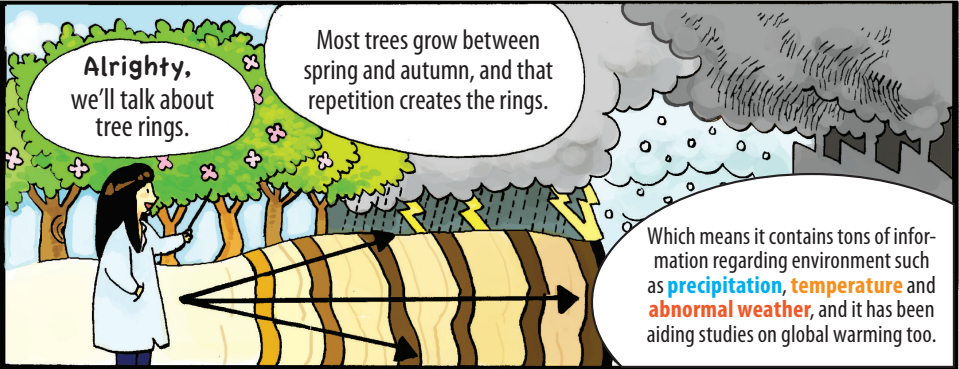
We must construct a human society that is in harmony with the rhythms of nature.

They're pretty at night too!

sorry...

I didn't realize so much time passed...

The End



The Xylarium Story

The Xylarium was officially registered as a facility for International Xylarium Index in 1978, and the current station was founded in 1980.

Written by : Junji Sugiyama
Manga Production by :
Kyoto Seika University Graduate School of Art
Illustrated by : Kim Unhi
Edited by : Haduki Ishida

Whoa, so this is where the xylarium exists!

Wow, what a woody fragrance!

rattle rattle

Welcome to our Xylarium

Feels like we're in a forest...

Sugi floor, huh...

We are the children of wood-culture. In the Japanese mythology, the thread of beard that Susano-no Mikoto pulled out became the Sugi (cedar) tree. We have been planting trees to sustain our lives for as long as we can remember.

It has 350 annual rings! This is the real thing, right here.

Even the Horyuji is Hinoki built. Do you know about the centre pillar?

Wow, tell me!

Long-living trees last long too! Hinoki has been used for building structures.

The use of wood varies by type. You know the old saying, "correct wood for the correct use"?



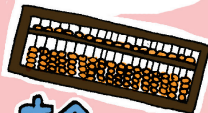
松
Cypress wood

Lasting strong for a 1,000 years, white cedar is used for large construction such as the Horyuji temple.. They're used for building baths too, for their fragrance and water resilience



桐
Paulownia wood

Geta; our wooden clogs



柁
Abacus beads
Holly wood

These are some of the unique ways wood are used.

Objective is to learn and hand down "Japanese wood culture"!!!

What else do you find out?



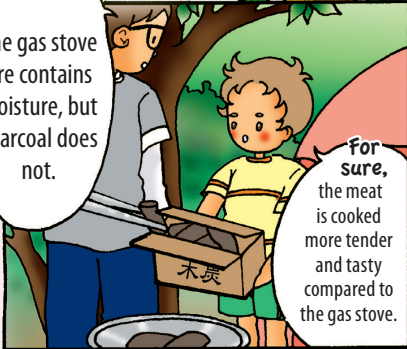
What's Charcoal!?

What is
Humanosphere?

Written by : Toshimitsu Hata
Manga Production by :
Kyoto Seika University Graduate School of Art
Illustrated by : An Hijiyun
Edited by : Haduki Ishida



The gas stove fire contains moisture, but charcoal does not.



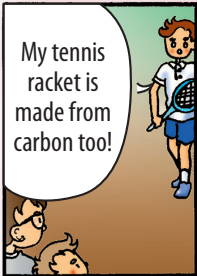
For sure, the meat is cooked more tender and tasty compared to the gas stove.

Charcoal barbecued meat is tasteful and also perfect with beer...

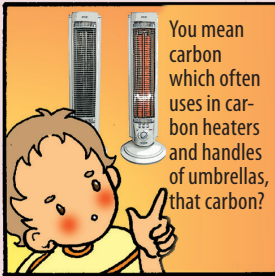


Hey papa, charcoal barbecue is the best!

My tennis racket is made from carbon too!



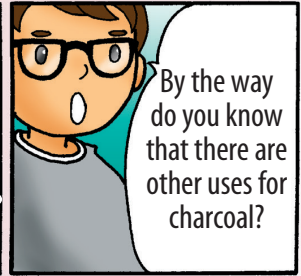
You mean carbon which often uses in carbon heaters and handles of umbrellas, that carbon?



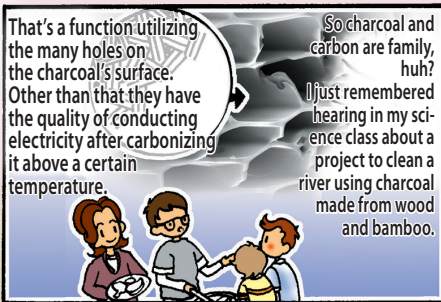
Have you heard of "carbon"?



By the way do you know that there are other uses for charcoal?

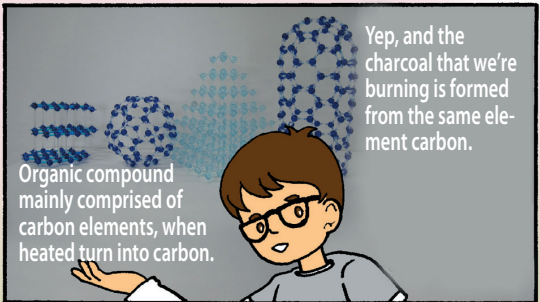


That's a function utilizing the many holes on the charcoal's surface. Other than that they have the quality of conducting electricity after carbonizing it above a certain temperature.



So charcoal and carbon are family, huh? I just remembered hearing in my science class about a project to clean a river using charcoal made from wood and bamboo.

Organic compound mainly comprised of carbon elements, when heated turn into carbon. Yep, and the charcoal that we're burning is formed from the same element carbon.



Come on!

It suddenly begins to conduct electricity!

After burning it to around 600°C...

But

Prior to burning, a wood is an electrical insulator

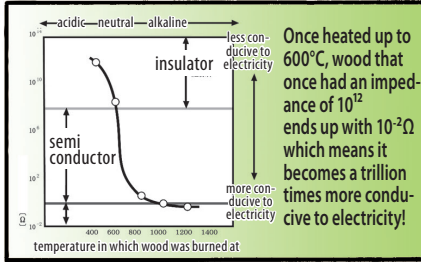
What?

I thought wood didn't conduct electricity.

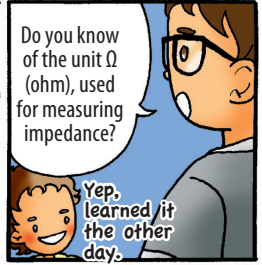




Whoa!
How does it
do that all of
a sudden?



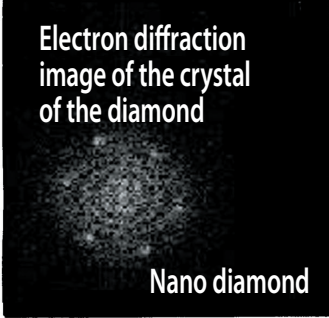
Once heated up to 600°C, wood that once had an impedance of 10^{12} ends up with $10^{-2}\Omega$ which means it becomes a trillion times more conductive to electricity!



Do you know of the unit Ω (ohm), used for measuring impedance?

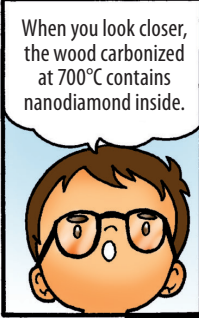


Yep, learned it the other day.

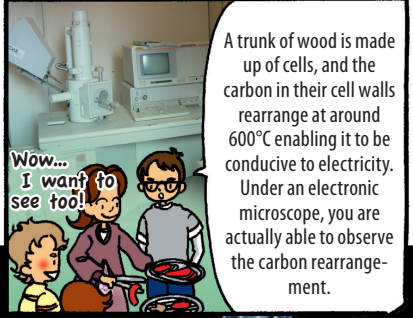


Electron diffraction image of the crystal of the diamond

Nano diamond



When you look closer, the wood carbonized at 700°C contains nanodiamond inside.



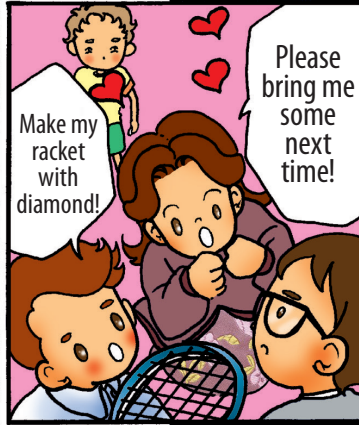
Wow... I want to see too!

A trunk of wood is made up of cells, and the carbon in their cell walls rearrange at around 600°C enabling it to be conductive to electricity. Under an electronic microscope, you are actually able to observe the carbon rearrangement.



Hahaha

Well it is a diamond but the size of 10^{-6} mm. So, you cannot see with naked eyes. It might cost more to observe this tiny diamond than its worth.



Make my racket with diamond!

Please bring me some next time!



DIAMOND!



Diamonds!
Diamonds!!

Ahahahaha



Aaahh,
it
burned!

Ah, our meal also turned into charcoal!

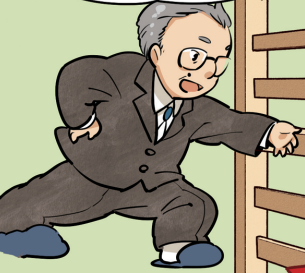


Can anybody smell something?



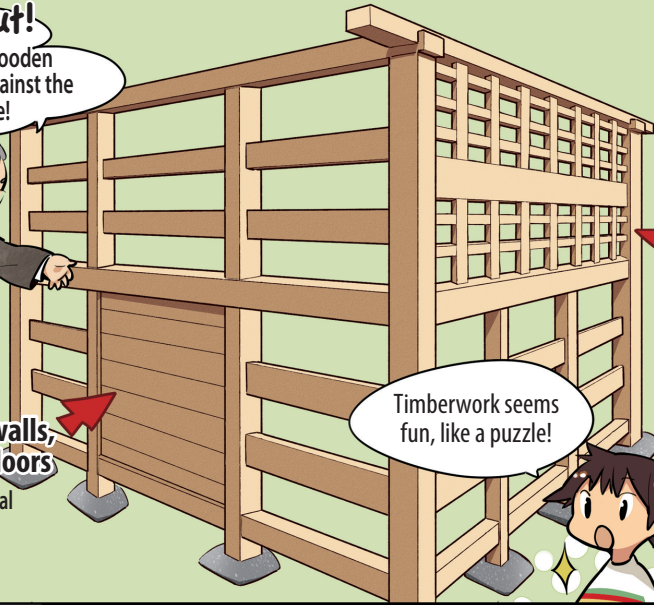
Look out!

Here comes a wooden house, tougher against the earthquake!



Thick plank walls, thick plank floors

Focused as practical use of the wood



Lattice wall by Half-lapped joints

Bring in light and air, yet very ductile

Timberwork seems fun, like a puzzle!



Do you know what the world's oldest remaining wooden structure is?



I learned it, it's Horyuji temple!

Yep, Japan had the structural techniques of timber building to last a thousand years.

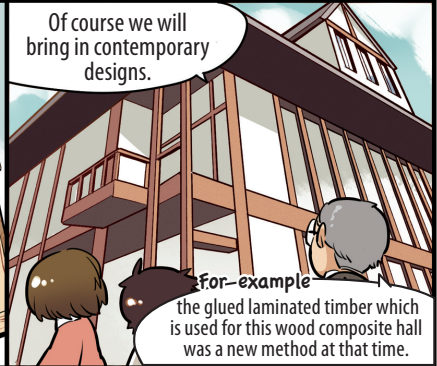
Evaluation of strength performance of traditional wooden joint

We are studying these methods to be able to safely use today by re-evaluation



Re-evaluation of mud walls in seismic resisting performance.

Of course we will bring in contemporary designs.



For-example the glued laminated timber which is used for this wood composite hall was a new method at that time.

This massive thing is "glued laminated timber"?!?



Yep, we are now capable of building large spaces using wood by the advancement of technologies and materials.



large finger joint

These are large, too!

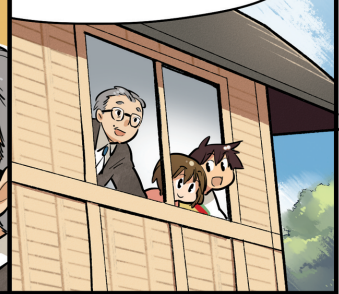
lagscrewbolt

So, will we see wood-en high-rise buildings in the future?



Haha, it's possible!

We wish wooden buildings are able to help humans live well with our environment.



The End

Possibilities of Timber Structure!

Written by:
Akihisa Kitamori/Takuro Mori
Manga production:
Kyoto Seika University,
Graduate School of Manga
Illustrated by: Tamao Nukina



Today, we have come to view the [natural material house] known as the [eco-house].

Whoa, smells so nice!

Wooden houses have such a warm feel!

Welcome to the [Eco-House]!

Teacher!

Wood is more and more important for housing material in the future. Study it well!

Yes!

Wood, despite the light weight, has a structure that is stronger in a longitudinal direction.

This is a cross-section of a cedar, seen through an electronic microscope. You can see those hollow parts?

Wood is strong in the direction of the fibre, and weaker from the side, yet flexible.

If used well, wood can build robust and ductile houses.

It must be good for the environment as well!

Certainly!

Because wood is a resource that is grown by the solar energy,

Using wood for structure functions to capture and decrease the CO₂ in the atmosphere.

But mustn't we preserve our forest?

Sure we must. But a planted forest require thinning for its trees to grow, and they won't absorb as much CO₂ without it. There must be effective methods of utilizing the trees that we do cut.

Hmmm... but wooden houses seem more susceptible to earthquake damage, and concrete or steel structures seem better...

Ping!

mwahaha...

That's why we researchers are here!

If we can merge the traditional architecture and modern-day science...

Radio waves that come from the Sun and planets are made by taking energy from plasma particles. They can be received and heard as sounds on the Earth.

radio waves
high-energy particles

11

There are 3 kinds of these radio waves depending on what they sound like. What's known as "dawn chorus" that sounds like birds singing is one of them too.

12

I've never heard it. . .

Me neither. How can we hear it?

13

Dawn chorus can be heard around dawn when the Earth's magnetic field is disturbed.

14

A pattern of rising frequencies repeats itself rapidly within a second.

15

...and when you plug that into an audio amp...!

click

chirp chirp...

Whoa! Amazing, it sounds just like a bird singing!

16

These chorus waves also exist at other planets with magnetic fields such as Jupiter and Saturn, but none with the clear sound like we hear on Earth!

ahem

17

Wow, what a special planet we live on!

Amazing!

Yep, it's true.

18

These chorus waves are attracting new interest recently because of their role in forming auroras, and also the radiation belts that are obstacle to our making use of space.

19

50 to 100 years from now, we may be able to create artificial chorus, or even control the environment around the radiation belt.

click

click

20

Nanuk! The Sun is rising!

21

Feels like we can hear the chorus right now.

22

The End

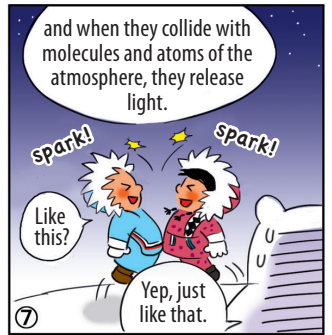
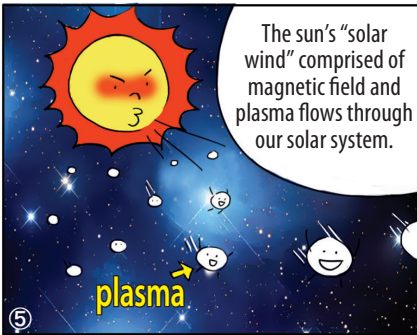
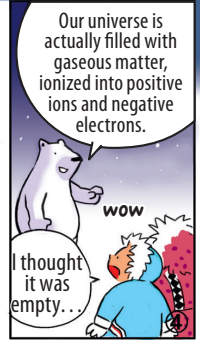
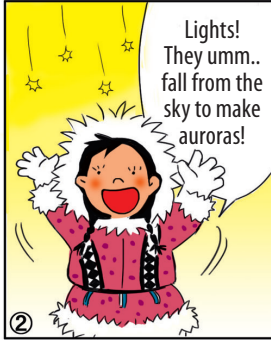
Wow...

What an unbelievably beautiful aurora!!

Singing Melodies from Outer-space

Written by : Yoshiharu Omura
Manga production :
Kyoto Seika University Manga Department
Illustrated by : Kim Jihyon
Edited by : Haduki Ishida

What is
Humanosphere?



First, we measure the amounts of such trace gases using laser spectroscopy techniques.

Wow, so many types of apparatus!

Yep, these observations run throughout the year.

You mean all year around?

Right. Whether it's boiling or freezing.

summer Zap!

winter

That's tough...

Fairbanks, Alaska

Ground-based measurements using laser-based instruments

Exploring atmospheric reaction processes by laboratory experiments

And we do not only watch the Earth's health from land, but from outer-space as well!

Really!?

But how?

The sensor on the satellite detects radio wave that ozone emits.

Then you get this!

Boom!

O_3

Amazing! I see it so clearly!

©JAXA

©NASA

Superconducting Submillimeter-Wave Limb Emission Sounder: SMILES

This allows us to clearly observe changes not only in ozone but for other gases too!

Wow, the difference is so apparent!

These research allows us to diagnose the Earth's environment.

clup

I see!

So you examine locally from land, and globally from space!

O_3

ClO

HCl

Even if we can't cure her now, the diagnosis will help the future of the planet.

These observations are important for all of us!

Surely. We must continue to "see her" with care.

Future

Will do!

Who's the Doctor of the Atmosphere?

What is
Humanosphere?

Originally written by:
Masato Shiotani / Kenshi Takahashi
Manga production :
Kyoto Seika University
Manga Department
Illustrated by : Mika Ikeda
Edited by : Haduki Ishida

How beautiful...

I wonder what's above those clouds?

The ozone layer!

The ozone layer absorbs harmful ultraviolet from the Sun.

But,

Over Antarctica, a significant loss of ozone has been observed, that is called "ozone hole".

The ozone layer...?

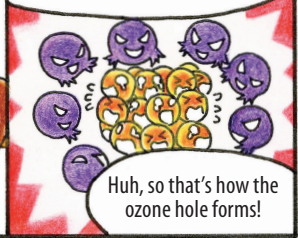
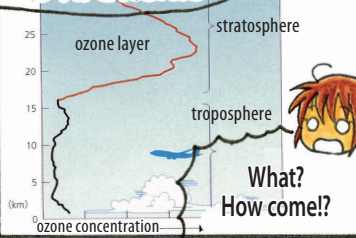
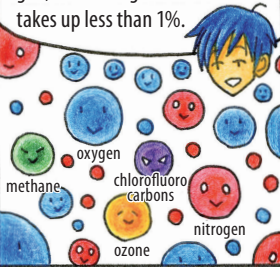
Wow, really!?

Ozone hole!?

The Earth's atmosphere mostly consists of oxygen and nitrogen, and trace gases like ozone takes up less than 1%.

But if the composition changes even slightly, the Earth's environment could be endangered.

For example, as chloro-fluorocarbons increased, they contributed to destroy the ozone.



What? How come!?

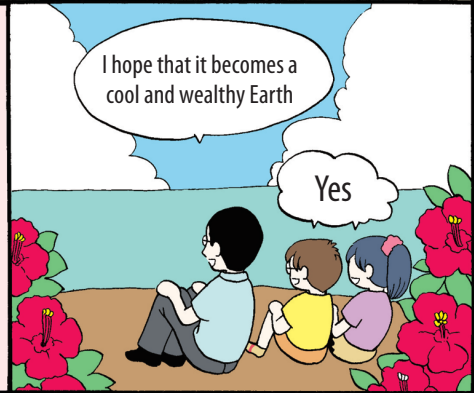
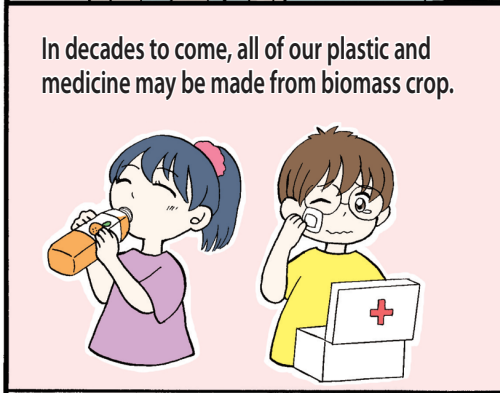
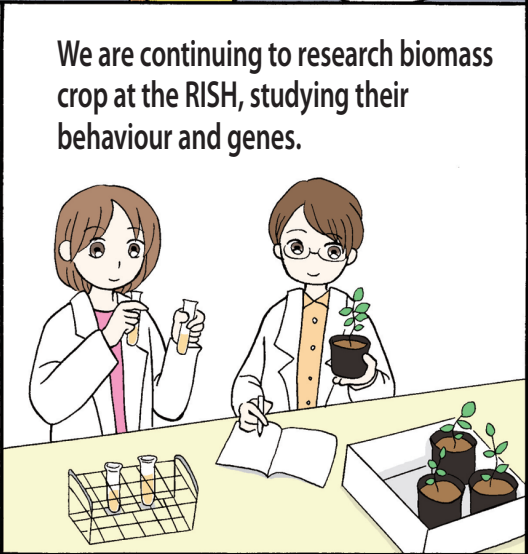
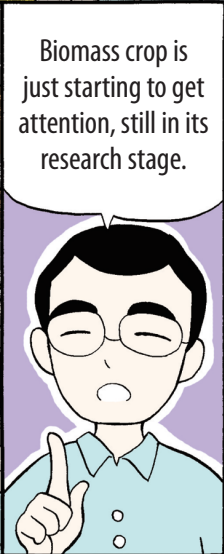
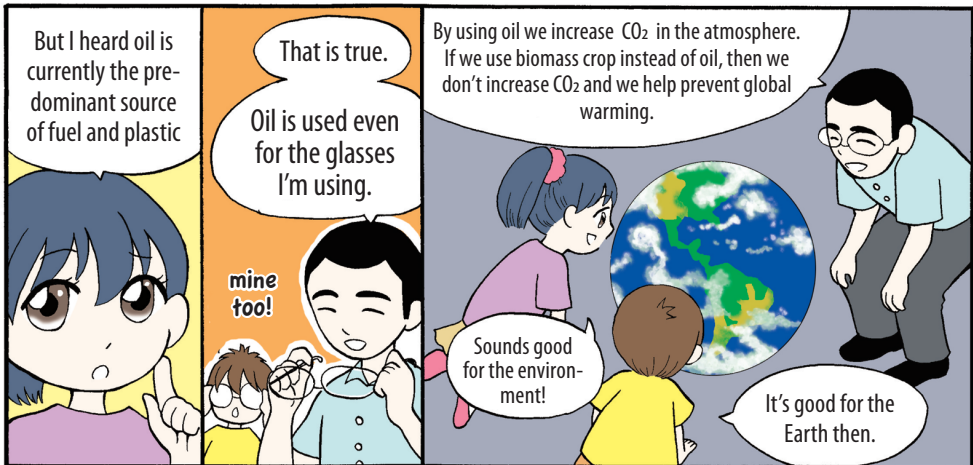
Huh, so that's how the ozone hole forms!

Furthermore, the global warming caused by greenhouse gases such as CO₂ and methane is also a serious issue.

That's why we "diagnose" the Earth's environment using ground-based and satellite measurements!

Oh no!
The Earth's going to be sick!

"Diagnose" ?



What's Biomass Crop?

Originally written by : Shirou Suzuki
Manga production :
Kyoto Seika University Graduate School of Manga
Illustrated by : Ayayuki Kimiya

Delicious!

Why's sugarcane so sweet?

Well, it's sweet when you chew because it stores sugar in its stem!

pop **Wha!**

The sugarcane family is under much attention these days as being biomass crop.

Biomass Crop?

Plants that grow renewable organic resources, such as these four.

Erianthus
relative to sugarcane

Jatropha

Miscanthus
relative to a Susuki (a Japanese silver grass)

Poplar

What can you do with biomass crop?

After harvesting the plant,

① you can burn or generate electricity with it as an alternative to oil or coal

② or you can break it down to form material for chemical products such as plastic
So many uses!

So many uses!

And that isn't all!

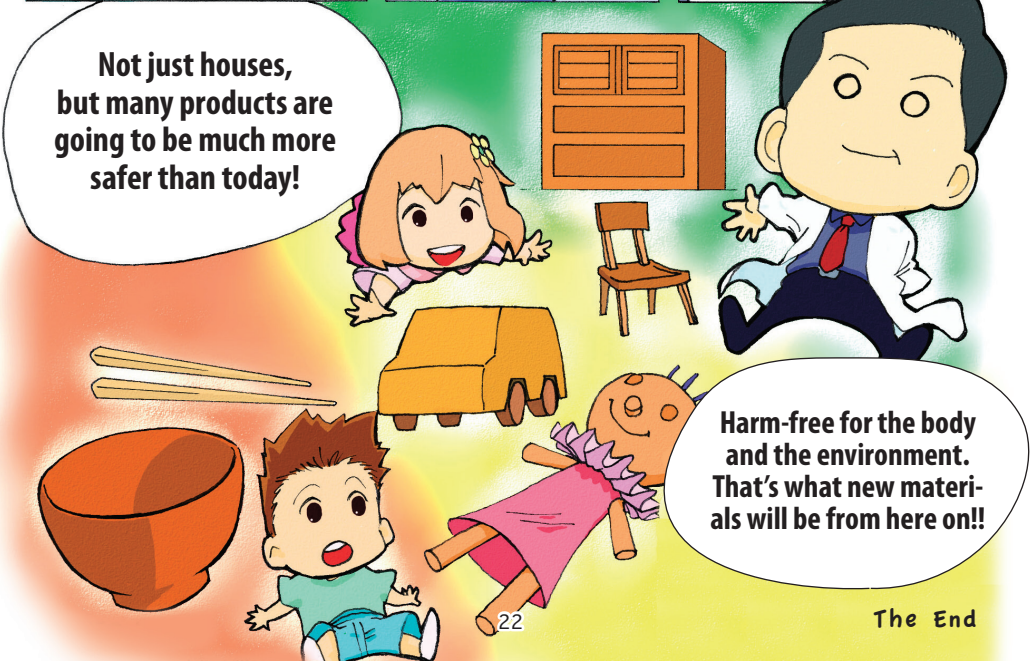
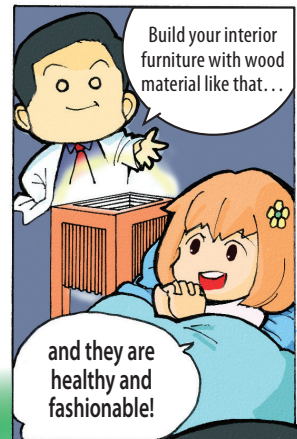
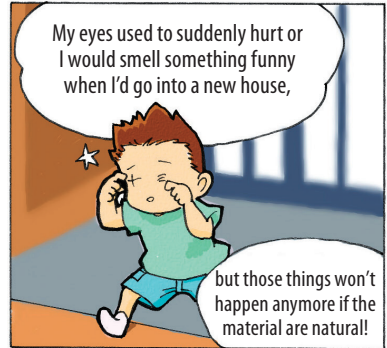
zoom!

Biomass crop is known for having a resilient characteristic, absorbing lots of CO₂,

You can grow me anywhere

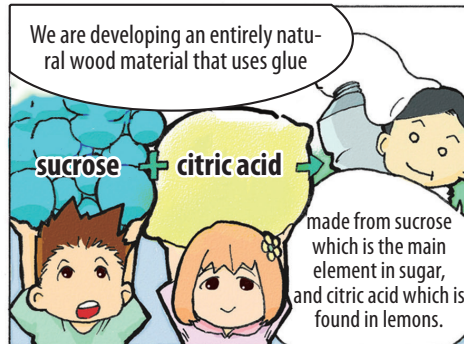
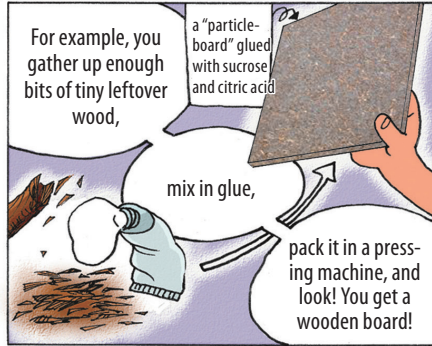
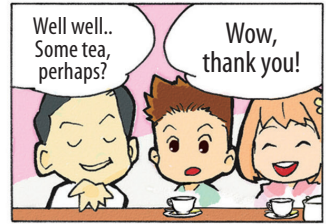
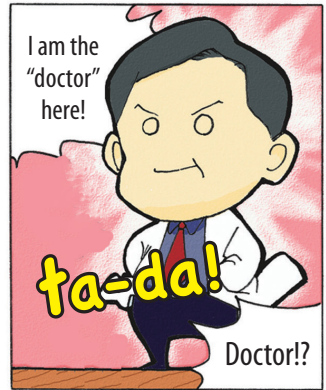
and they grow well despite poor soil or small amounts of fertilizer.

Therefore plans are to plant them on land that cannot grow food crops, to grow material for fuel and plastic.

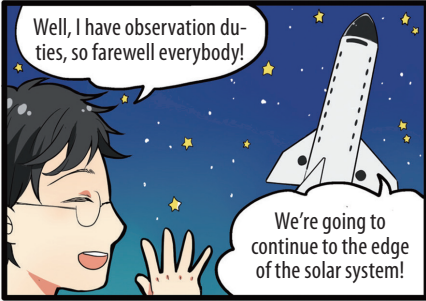


Development of Environmentally and Body

Friendly Wood-based Material

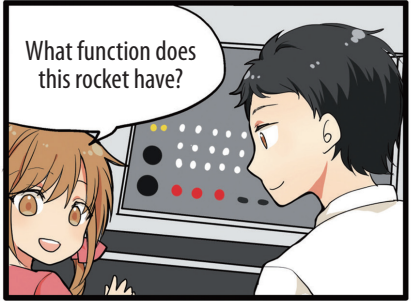


* Industrially, citric acid are produced from starch and sugar.

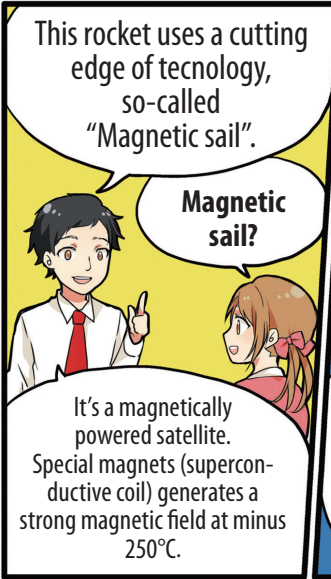


Well, I have observation duties, so farewell everybody!

We're going to continue to the edge of the solar system!



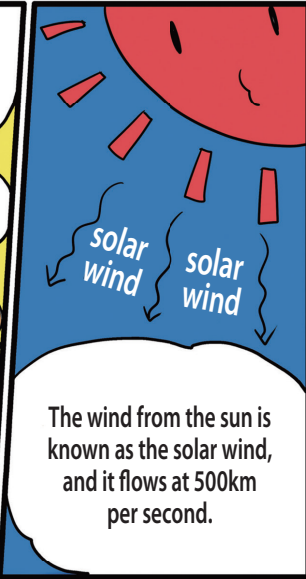
What function does this rocket have?



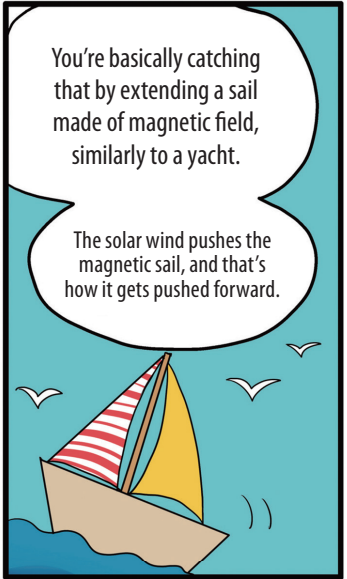
This rocket uses a cutting edge of technology, so-called "Magnetic sail".

Magnetic sail?

It's a magnetically powered satellite. Special magnets (superconductive coil) generates a strong magnetic field at minus 250°C.

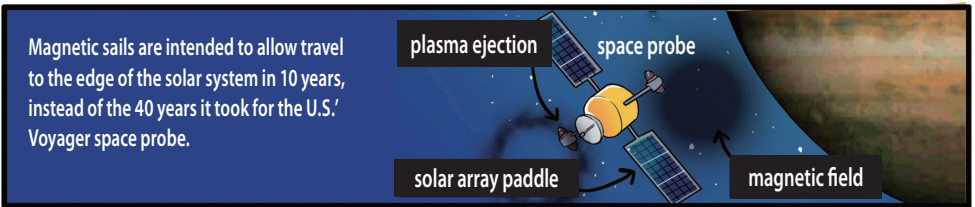


The wind from the sun is known as the solar wind, and it flows at 500km per second.

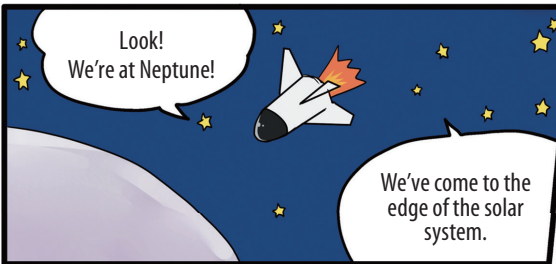


You're basically catching that by extending a sail made of magnetic field, similarly to a yacht.

The solar wind pushes the magnetic sail, and that's how it gets pushed forward.



Magnetic sails are intended to allow travel to the edge of the solar system in 10 years, instead of the 40 years it took for the U.S.' Voyager space probe.



Look! We're at Neptune!

We've come to the edge of the solar system.



Hmm... how must we go back?

What!?

Space Environment and Utilization

—Developing new flight plans, propulsion, and measuring technologies

Written by : Yoshikatu Ueda
Manga production :
Kyoto Seika University Graduate School of Manga
Illustrated by : Sonoko Fukushima

Let's take a trip to space on this rocket!

I'm so excited!

Dr. Yamakawa

Dr. Kojima

I will accompany you to the ISS.

ISS?

It's an international space station located 400km overhead.

Really?

What's this?

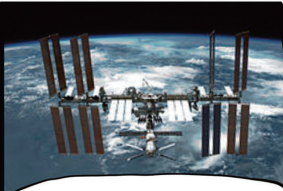
A small plasma wave sensor probe.

Space is filled with plasmas. Their turbulence can cause interference in radio waves, and it can even cause astronauts to be exposed to high energy particles. Plasma waves play a key role in turbulence of plasmas.

That's why we need to resolve these issues in relation to the plasma wave.

MSEE :
Monitor system for Space Electromagnetic Environments

What's currently being suggested as a new use of the small plasma wave sensor probe is a system called **MSEE**.



The **MSEE system** has the capability in detecting the time and spatial variations of space plasmas which are caused by artificial structures such as a space station.

Suggestion and development of a new system utilizing chip-sized plasma wave receivers

Detecting turbulence in space through miniaturized sensor probes scattered randomly in space



The space sensor network

-Measurement of plasma waves at high spatial and temporal resolutions that science satellites cannot reach.

Target

- Artificial turbulence near artificial structures (environmental assessment)
- Separation of time and spatial variations in natural phenomena

Thud!

Guess we've arrived at ISS!

So using GPS for weather...??

Let me explain

umm...

The radio waves sent from the GPS satellite delays when passing through an "egg of a cloud". We can analyze these delays and predict "precipitable water vapor"* in real-time.

Huh! So we can detect rainclouds before they form!

GPS satellites

Weather sensor

GPS receiver

egg of a cloud

Antenna

Using this system, dangers of torrential rainfall can be quickly communicated to people.

Warning to people

Incredible!

WOW

Antennas set up in approximately 2km intervals

Data collection server

Local governments, firefighters, etc.

If we utilize the Japanese GPS satellites that will start operation,

we can expect improved accuracy and...

If GPS receivers are set together with current cellphone antennas, we won't need extra infrastructures. Quite realistic isn't it?

Let's start setting it up right away!

We're currently running tests in Indonesia... hum?

Rain?

whoosh

Ahhh!! Please, shall we use the umbrella?

Oh this? It was broken a moment ago...

Gushhhhhhhhhhh

WHAAT!?

* Precipitable water vapor : Total amount of water vapor in the column atmosphere measured as water depth if all fall as rain.

Surprising technique GPS Meteorology!!

—Now-cast torrential rain clouds

Noooo!
A torrential rainfall!
Was it just cloudy expected today!?



This is going to cause serious problems!



huh!? ... and it's gone!

Can't this random weather be predicted...?

Thud

Poke

You wanna know if it's predictable or not, huh?

Oh, hello Ms. senior!

Shocked!

Actually torrential rainfall is caused by large cumulonimbus clouds that form within minutes, which is difficult to find using current observations that only detect rain drops

Mechanism of torrential rainfall

Expands rapidly from an "egg of a cloud" to a cumulonimbus cloud, causing sudden rainfall.

What!?

That's all current technologies can do!?

Therefore ...

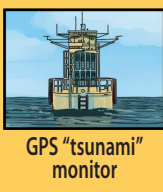
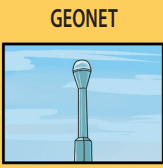
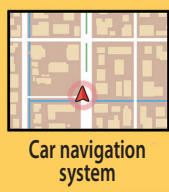
Have you heard of "GPS meteorology"?

Of course!

It's in my phone!

No,
I'm talking about meteorology.

GPS, used for many services, is a global positioning system which uses approximately 30 satellites that orbit the Earth.

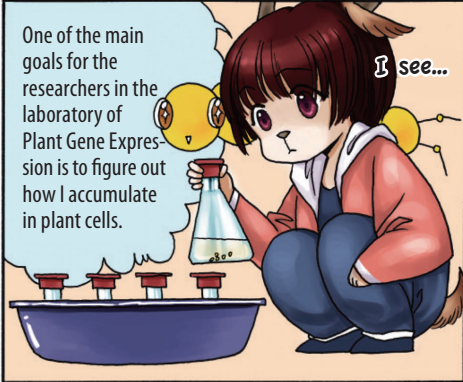


A groundbreaking method of meteorology based on GPS is currently being developed.

That's "GPS meteorology"!

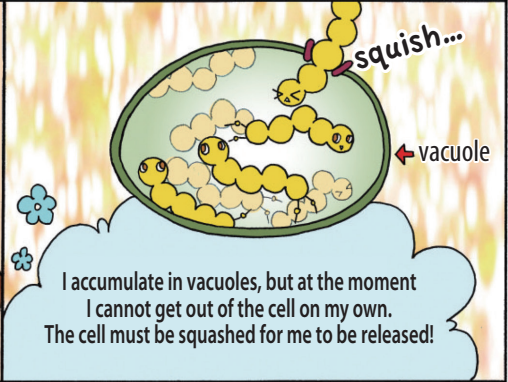


GPS=Global Positioning System



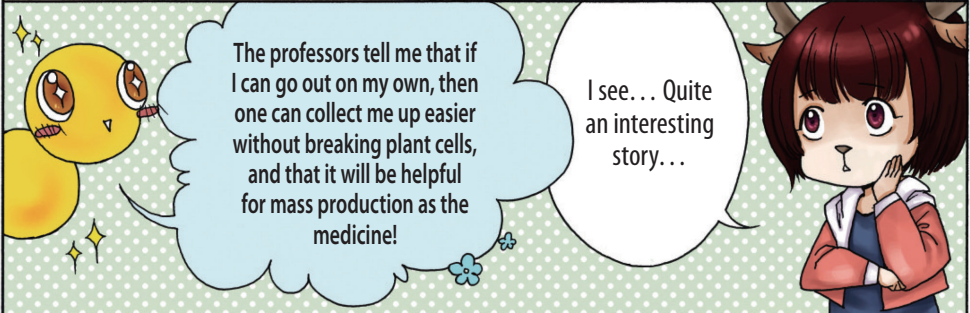
One of the main goals for the researchers in the laboratory of Plant Gene Expression is to figure out how I accumulate in plant cells.

I see...



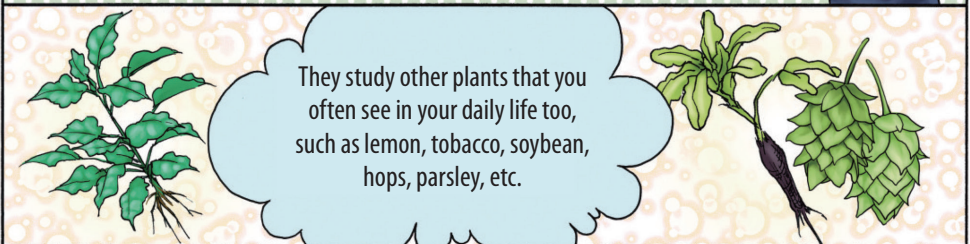
← vacuole

I accumulate in vacuoles, but at the moment I cannot get out of the cell on my own. The cell must be squashed for me to be released!

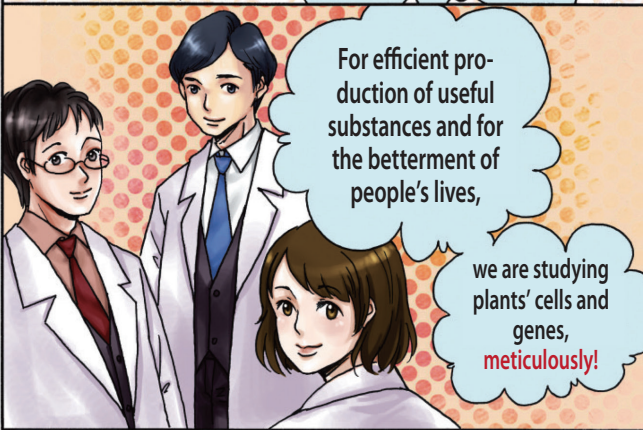


The professors tell me that if I can go out on my own, then one can collect me up easier without breaking plant cells, and that it will be helpful for mass production as the medicine!

I see... Quite an interesting story...



They study other plants that you often see in your daily life too, such as lemon, tobacco, soybean, hops, parsley, etc.



For efficient production of useful substances and for the betterment of people's lives,

we are studying plants' cells and genes, meticulously!



Your stomach must be hurting... now eat this!

BITTER!!

Well, it's good for you...! Later...!

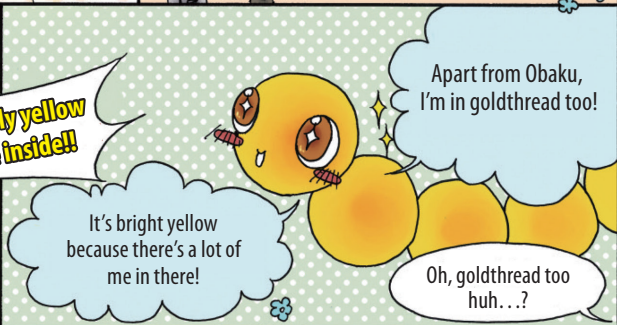
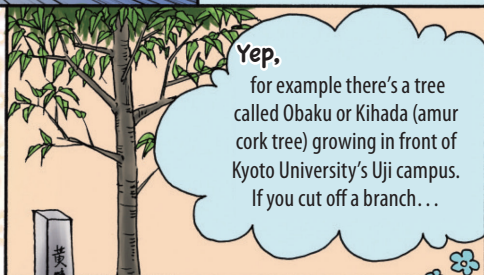
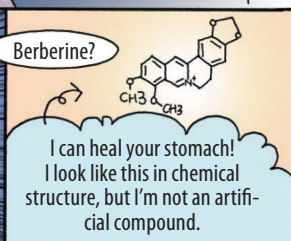
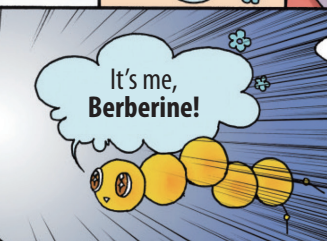
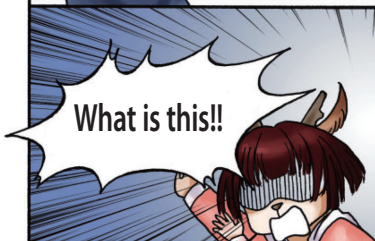
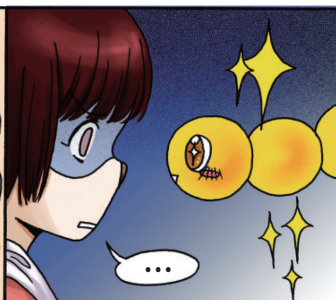
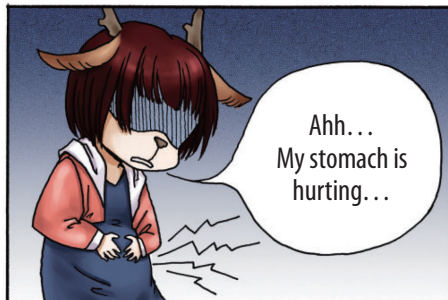
The End



Medicine from the Hills!

— Defeating sickness with plants

Written by : Kojiro Takanashi
Manga production : Kyoto Seika University Graduate School of Manga
Illustrated by : Sen Shika





What is Humansphere?

Issued by : Research Institute for Sustainable
Humansphere(RISH) Kyoto University
Planned/Produced by : Research Institute for
Sustainable Humansphere(RISH) Kyoto University
Edited by: Kyoto Seika University
Illustrated by:
Episodes 1-3 by: Chikako Noshi
Episodes 4 and beyond by : Kyoto Seika University

Here at the Research Institute for Sustainable Humanosphere (RISH), we unify the human living environment, the forest sphere, the atmosphere and outer space as the Humanosphere. Our goal is to understand the great range of phenomena that occur here, and at the same time to contribute to society through advancing basic scientific technologies vital to the construction of a sustainable humanosphere.

We are tackling the below four missions, which we consider as some of the most important topics to explore.

Mission
1

Assessment and Remediation of the Humanosphere

This mission is based on the reorganization and incorporation of different research field such as observations of the atmosphere, biochemical research on genetics of woody plants, and effective utilization of forest resources. The aim of the mission is to create foundations that permit sustainable ways of using forest resources while maintaining well being environment. This will be made possible by understanding the current conditions and the fluctuations of Humanosphere as accurately as possible.

Mission
2

Development of Science and Technology through Biomass and Solar Satellite Research toward a Solar Energy Society

The aim of this mission is to create sustainable societies relying more on renewable energy such as solar and biomass energy. The research on solar power station/satellite (SPS), microwave power transmission, and the conversion of wood biomass to fuels, chemicals and advanced carbon materials are conducted.

Mission
3

Study of the Space Environment and its Utilization

The ultimate goal of this mission is to build research foundations for expanding the Humanosphere into space for the future generations. The scope of the research on space plasmas and cosmic rays are now expanded to include this objective. The investigation of the space environment surrounding the Earth, development of new technologies for exploring of the space, quantitative evaluation of artificially perturbed environments around spacecrafts as well as the evaluation of natural space plasmas are conducted. The possible utilization of new wood materials in space environment is also investigated.

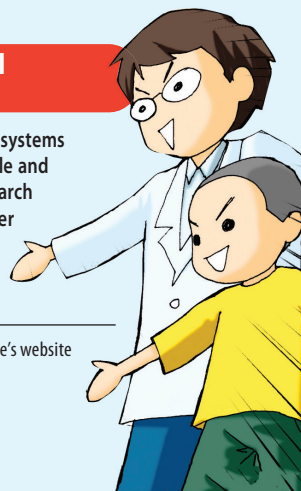
Mission
4

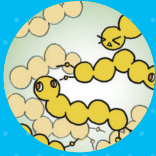
Development of Technology and Materials for Cyclical Utilization of Bio-based Resources

This mission aims to realize sustainable societies by building resource cycling systems of forest resources. Among bio-based resources, forest resources are renewable and have a possible capacity of a large scale production. Through conducting research on forest resources, the development of fundamental technologies with lower environmental impacts on every phase of the biomaterial life cycle involving production, processing, utilization, disposal and reuse is achieved.

For more information, please visit Kyoto University Research Institute for Sustainable Humanosphere's website

<http://www.rish.kyoto-u.ac.jp>





Research Institute for
Sustainable Humanosphere (RISH)
Kyoto University

