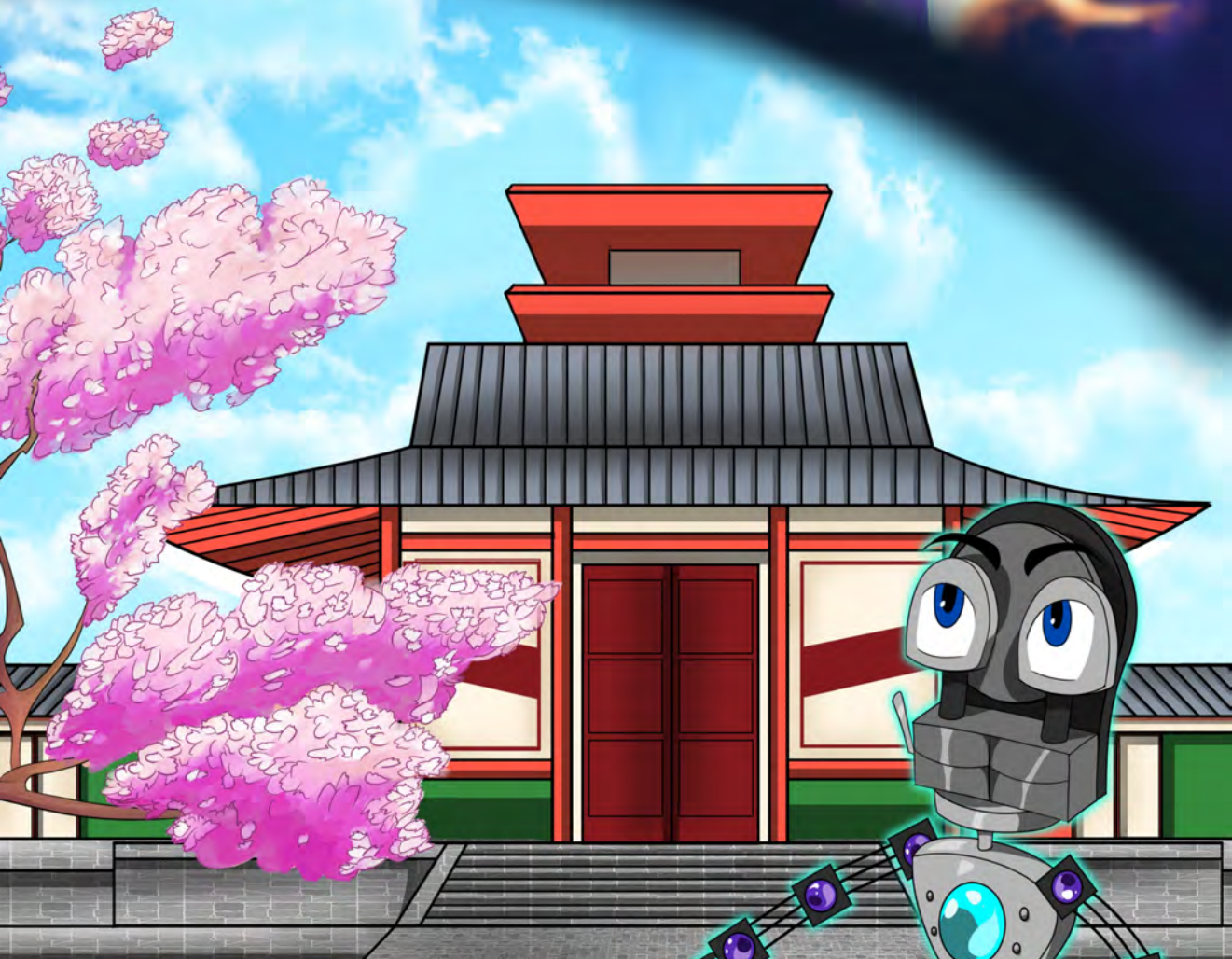
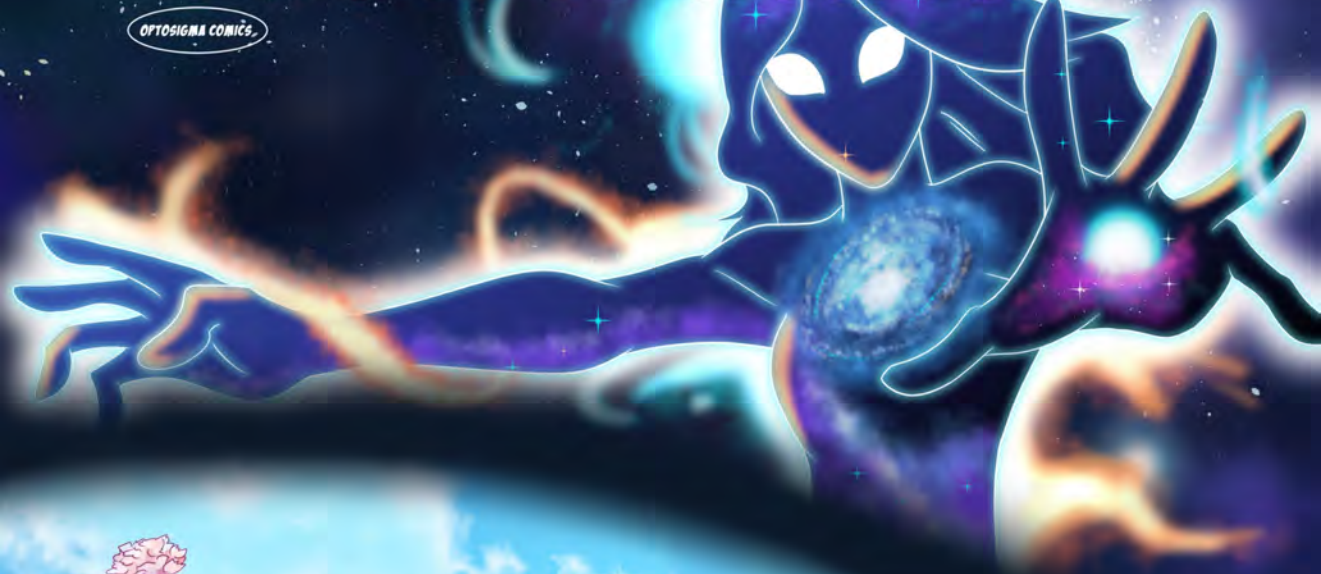


PROJECT AVATAR

OPTOSIGMA COMICS



VOL. 5 DISSOLUTION OF SUBSTANCE

Shiori - leader of the Tanken, realized that in the ethereal state there was no direct way to manipulate matter to escape their self-created prison. They were trapped. "Matter...Energy...there must be a way! Could energy be modulated to manipulate matter? Perhaps! How can we cross the dimensional divide??? Can I impose my will on a Gamma ray? Yes! That's it! I can encode a Gamma ray...and when it interacts with matter it will assemble into an Avatar that can open the gate from the material world..."



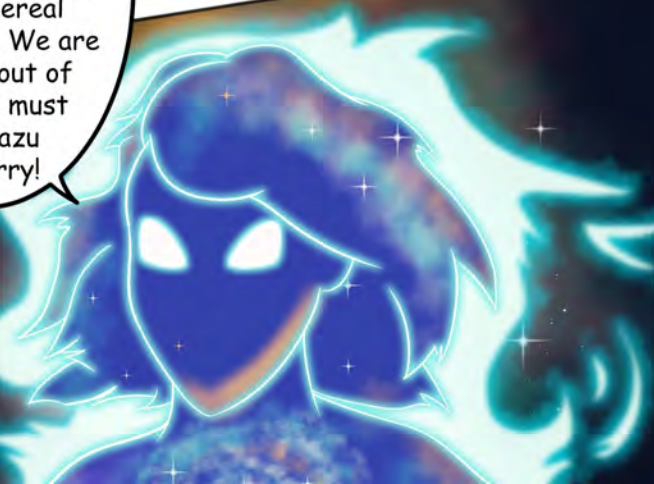
Nomi, whats wrong?

For hundreds of years Shiori encoded Gamma Rays creating Avatars on many worlds, but none had intelligent life who could help - Until a chance mistake changed the fate of the Tanken Race. A glancing blow to the Hubble Space Telescope redirected an encoded Gamma beam toward earth... Human technology was rudimentary at best...but it offered a thread of hope to the desperate Tanken. "We must defy our prime directive and advance Human Technology - it is our only hope!"

Shiori, no worry! Anxious Nomi is.

Kaji No! Anxious and overreacting no!!! Something wrong, yes! Me fading I feel...

Nomi, let me look at you... Oh! No! You look cold. You must be losing your essence to the entropy* of the ethereal dimension. We are running out of time!!! I must tell Kazu to hurry!



*Entropy - the measurement of the degree of disorder in a system. Entropy always increases over time as a system devolves into a more chaotic state. This is one of the second laws of thermodynamics.



Hofbräuhaus
Munich, Germany

Jeff

Kent

Peter

Hey everyone!
Meet Peter, Kent
and Jeff from
SPIE!

Kazu - You need to hurry! We are in trouble. Nomi is starting to fade. We need to accelerate the Human technological development and build the Gate Ring or it will be too late.

CEO Scott, CEO Guy... Shiori says something is wrong!

Kazu, who is Shiori?

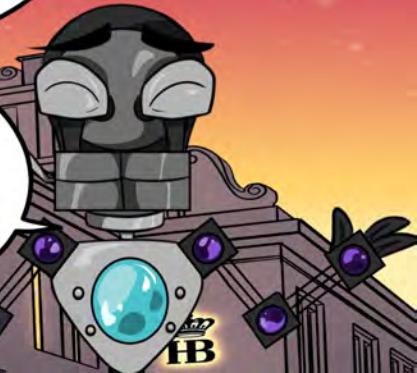
No worry Shiori I am here with people who can help.

CEO Guy, Shiori is wisest of all of the Tanken. She is Technical leader. They are trapped and need help.



Tanken?
Trapped

Yes! The Tanken are my people. They opened wormhole to ethereal dimension. It closed they are trapped. We need to build a Gate Ring to get out.



HB



CEO Scott,
Shiori says Tanken in
trouble! We need to build
Gate Ring faster or the
Tanken will fade.
We need to accelerate
Human technology.

OK Kazu!
Can we tell SPIE*
about your problem?
They know many scientists and
researchers. We can
rally them all to the cause and
accelerate development of
the Gate Ring...

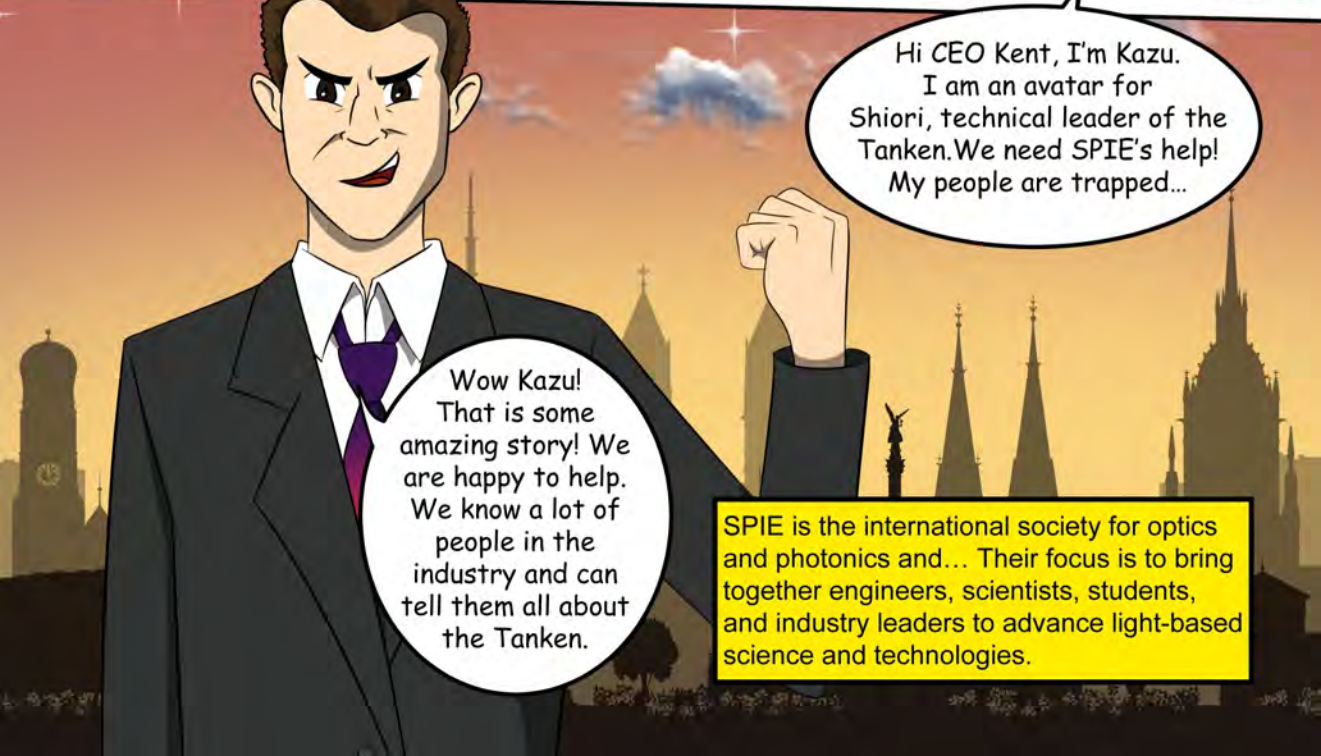


Holy Cow!

Waaah!!!

COOL!

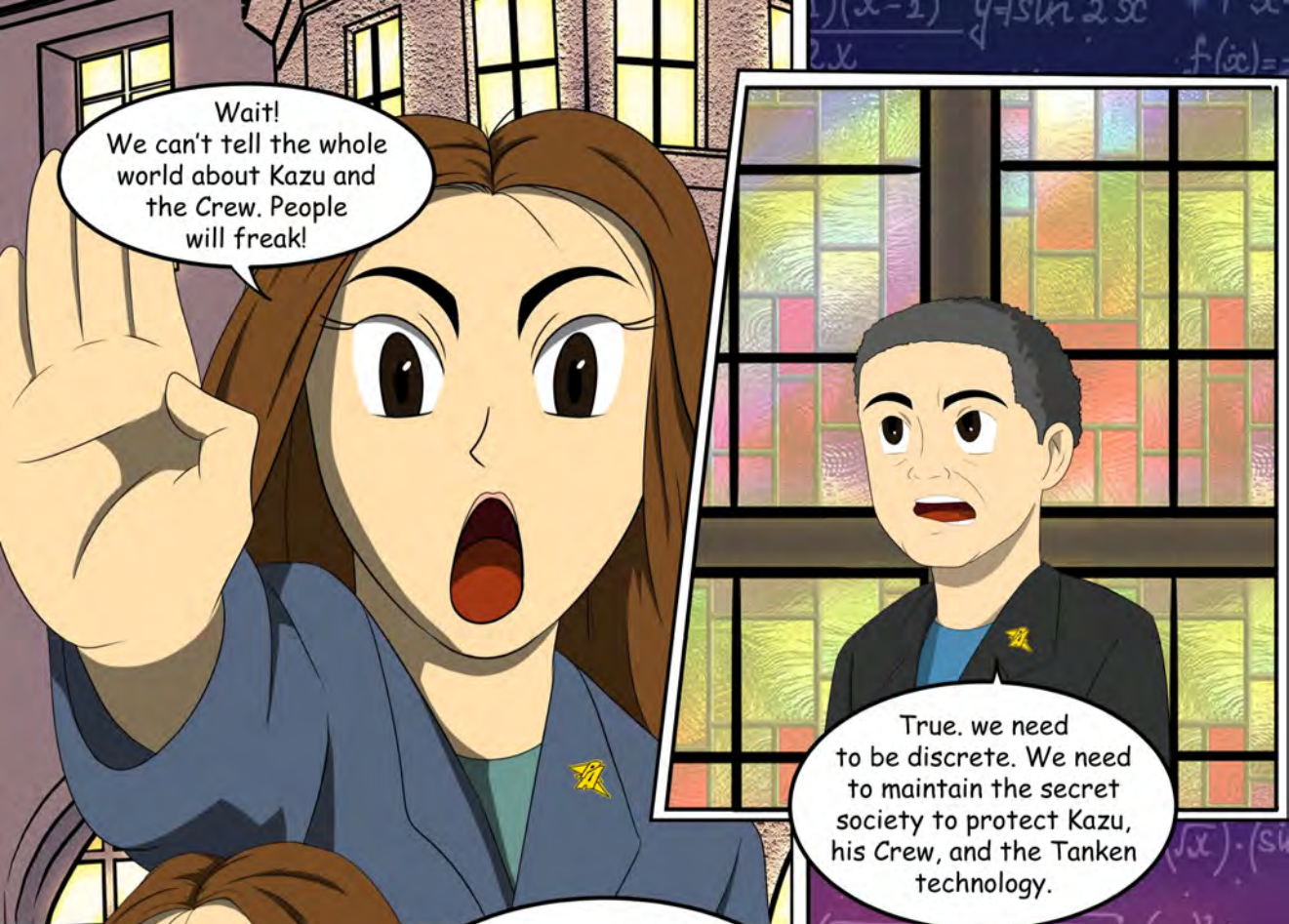
OptoSigma
technology is
AMAZING!!! Your
robots are alive!




Hi CEO Kent, I'm Kazu.
I am an avatar for
Shiori, technical leader of the
Tanken. We need SPIE's help!
My people are trapped...

Wow Kazu!
That is some
amazing story! We
are happy to help.
We know a lot of
people in the
industry and can
tell them all about
the Tanken.


SPIE is the international society for optics and photonics and... Their focus is to bring together engineers, scientists, students, and industry leaders to advance light-based science and technologies.




Wait!
We can't tell the whole
world about Kazu and
the Crew. People
will freak!



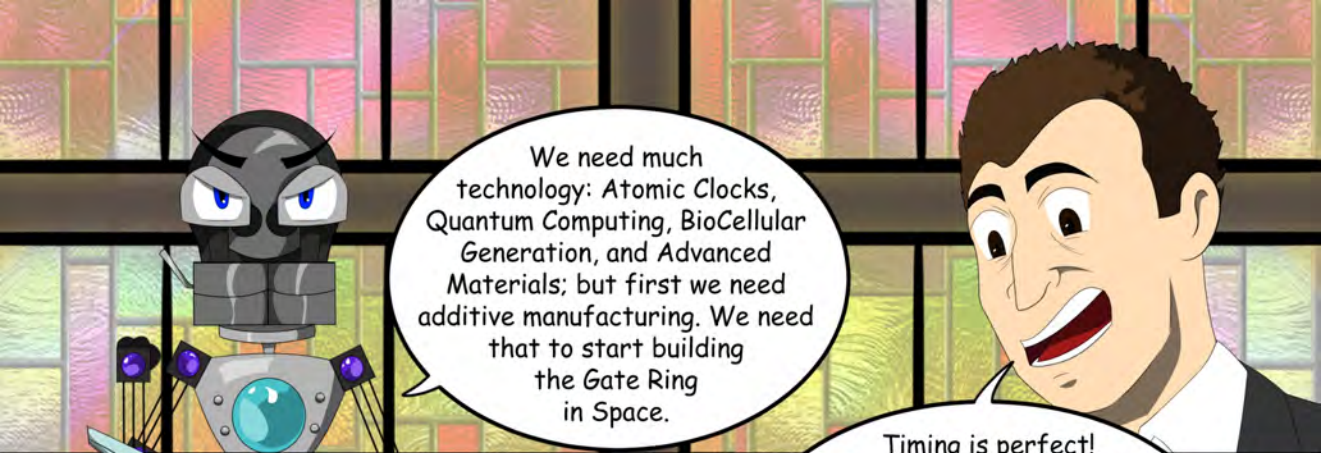
True. we need
to be discrete. We need
to maintain the secret
society to protect Kazu,
his Crew, and the Tanken
technology.



Yeah, we should keep
using the Project Avatar pins.
Here! Wear these and give
them to the researchers you
speak with. Swear them all
to secrecy!!!



OK Kazu, it
sounds like we have
a LOT of work to do...
Where should we start
first?



We need much technology: Atomic Clocks, Quantum Computing, BioCellular Generation, and Advanced Materials; but first we need additive manufacturing. We need that to start building the Gate Ring in Space.

Timing is perfect! I just met Kondo-san from Sigma Koki in Japan. He introduced me to Professor Tsukamoto-san from Osaka University. He's working on 3D printing copper. I'll introduce you.

Lets go!



12h 20m - MUC to NRT



Tokyo, Japan

SIGMAKOKI
President
Yosuke Kondo

**KNOCK
KNOCK**

Konnichiwa
Kondo-san!
This is Kazu.

Awesome! Excellent
robot technology
Peter! Look at my
new invention, I have
brain scan helmet.

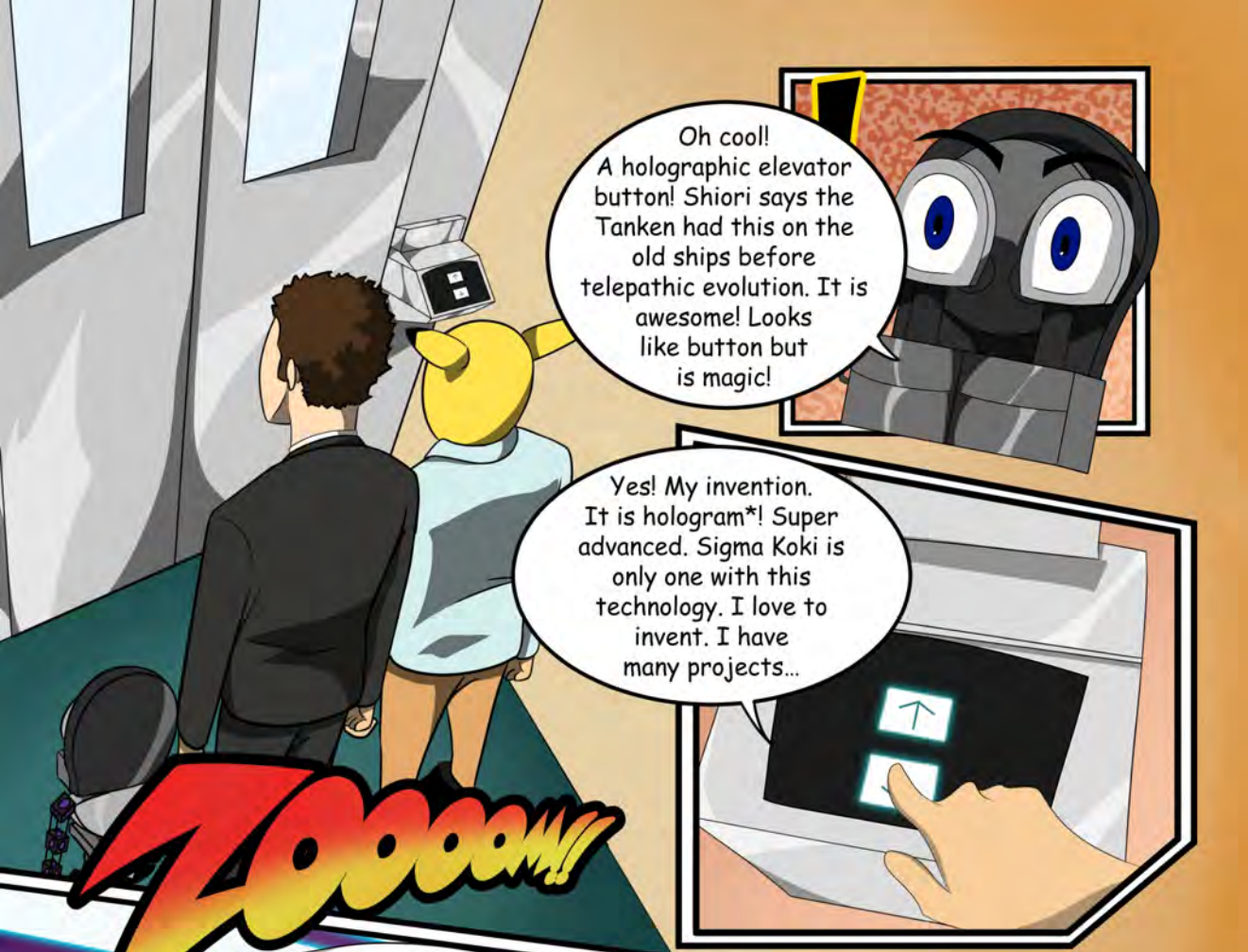
Wow!
Kondo-san
what does
it do?

Nothing!
It is broken.
I'm fixing it! But
very stylish
right?!

Absolutely!

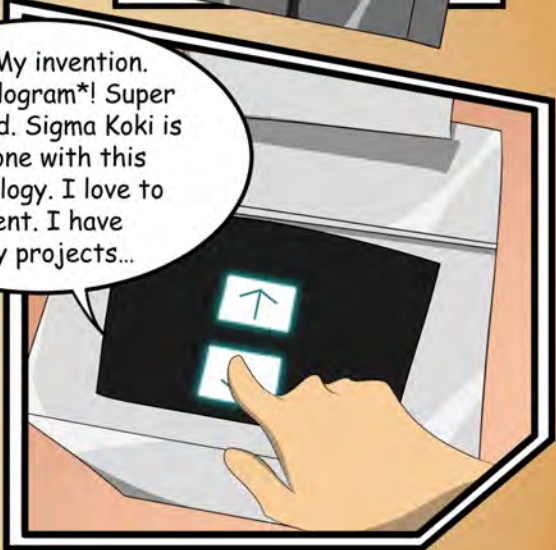
President Kondo-san...we
need your help. Kazu needs
to talk to the professor you
told me about. The one
working on 3D printing
copper.

Oh yes. My good friend.
Professor Tsukamoto-san from
Osaka University. I will take you
there. We will take Shinkansen
bullet train! It is fast!!!
You will like!



Oh cool!
A holographic elevator
button! Shiori says the
Tanken had this on the
old ships before
telepathic evolution. It is
awesome! Looks
like button but
is magic!

Yes! My invention.
It is hologram*! Super
advanced. Sigma Koki is
only one with this
technology. I love to
invent. I have
many projects...



*Holograms are three dimensional images that are formed by interfering coherent beams of light from a laser or other coherent light source. A photographic plate is generally used to record the interference pattern generated by an object illuminated by two coherent laser beams. When the photographic plate is re-illuminated by the reference beam used to create the initial interference pattern, a 3-D image of the original object is projected into free space where the object once stood. A white light Hologram (also known as a rainbow or Benton hologram) was invented in 1968 by Dr. Steven Benton. White Light Holograms are designed to be illuminated by non-coherent white light rather than a laser.

Osaka University Senri Gate of Suita Campus

So, Kazu...
why you need to
3D print metal?
You make superalloy?
Or giant
Gundam robot?

No president Kondo.
Not so fun as that. We must
build giant station in space -
called Gate Ring - to save
my people. It is hard to lift
materials so far...and hard
to shape and assemble in
space...So we will mine
asteroids for metal, grind
into powder and then 3-D
print the
Gate Ring station.*

Wow! Now it is
all starting to
make sense...

*A significant challenge with building large structures in space relates to the difficulty in transporting parts from Earth to the destination. Historically, we have relied upon lightweight materials and creative Origami inspired folding designs to pack critical building components into rockets and ferry them into space for assembly. This is very expensive and requires many launches. Recently scientists have been proposing 3D printing as a solution. Asteroids are known to have vast amounts of precious materials (gold, iron, molybdenum, etc.). With 3D printing, we hope to build large and complex shapes and structures in space at significantly lower cost than traditional methods.

Aaah. So cool!
Great idea!
We can make giant
Gundam robot
after Gate Ring is
finished...

Professor
Tsukamoto-san! Hello
my friend! I see you
have new student!

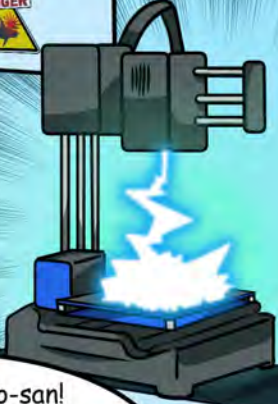
Kondo-san!
My old friend!
So nice to see you.
Yes this is Sato-san, my PhD
student. He is helping refine
the 3D metal powder printer.
We are adding another laser
so we can mix metals and
make an alloy.



$E=MC^2$
You Must
Unless you multiply
yourself by C^2
then you Energy!
- Albert was here

レーザー作動中

危険!
レーザーシャークに注意!
DANGER



President Kondo-san!
It is an honor to meet you!
Professor Tsukamoto-san says
that you are a great inventor!
Who is your tall friend?

Wow! Is this Robot your invention!?

This is Kazu! He is an Avatar. He is not my invention...but this brain scan helmet is!!!

Professor Tsukamoto-san, Sato-san...This is Peter Hallet. He is with SPIE. They help connect researchers & scientists around the world with companies to grow technology.

Hi Professor, Hi Sato-san. It is an honor to meet you. I brought Kazu here from Munich. He needs your help!!! His people are stuck in deep space and they need your 3D metal printing technology so that they can build a giant Gate Ring in space!

We are happy to help, but at the moment, we can only print copper. I'd imagine that you need special alloys to build something as complex as a Gate Ring!

Konnichiwa! Professor. Yes, we need to print many metals and alloys. I help you adjust machine! It is simple! Secret is absorption.

But Kazu, we want to deposit material, not absorb it!*

No Sato-san... Not absorb metal. Have metal absorb laser beam. We need to pick correct laser!*

*LASER stands for Light Amplification by Stimulated Emission of Radiation. LASERs have become commonplace in manufacturing, sensing, and many other areas since they can deliver extremely high power density beams of light. In other words – they have high “Brightness” or étendue.

*Materials absorb wavelengths of light differently. Since 3D metal printing relies upon melting metal powders as they are deposited onto a surface, it is critical that the correct wavelength of light be used to heat efficiently. Copper presents a particular challenge in that it dissipates heat rapidly and becomes highly reflective when melted. Copper powder absorbs best at shorter wavelengths and it is therefore printed using blue or green lasers in the 405 nm - 532 nm wavelength range. Other metals such as steel or aluminum absorb well in the near-IR wavelength range and are generally deposited using fiber lasers operating at 1070 nm. Using multiple wavelengths for additive manufacturing offers the possibility for selective printing without disturbing adjacent materials. It also enables the possibility of manufacturing very creative alloys and material structures.



And by mixing the lasers and adjusting the spectrum we can probably create new metal alloys.



Aaah! Yes of course! Every material will absorb light differently and by combining a full spectrum of lasers we can deposit different metals!

Yes! You can make very strong alloy this way. Can even embed nanoparticles to reinforce and change properties of the material.

Fantastic! Let's get to work. Sato, get the fiber laser and the other diode lasers from the other lab. We will go get different metal powders and test the system.

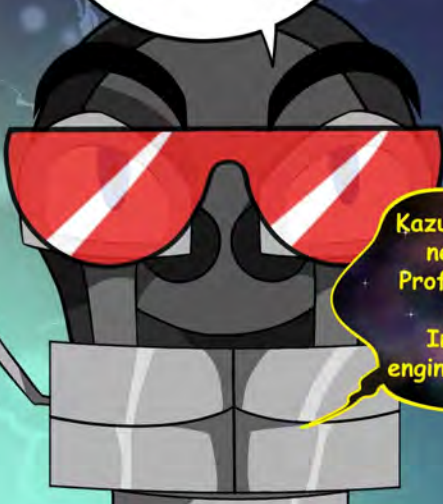


Wow! Looks just like section of Gate Ring!



Kazu, you mean that the Gate Ring will look like the Borg?

No Peter, Gate Ring has 8 sections like this in a circle. They are connected by synchronized light.



Kazu, you have done a great job. Now we need to build a larger version of the Professor's 3D Printer, get it into space, and start printing the Gate Ring. In the meantime, you need to recruit engineers and scientists to come into space to help.



Wow! That's going to be so cool!

To be Continued...



FOLLOW ALONG AS THE ADVENTURE CONTINUES IN VOLUME 6 WITH THE ESTABLISHMENT OF THE G.R.E.A.T. ASSOCIATION (GATE RING ENGINEERING ADVANCED TECHNOLOGY ASSOCIATION) AND CONSTRUCTION OF THE GATE RING IN DEEP SPACE.