MICRO ALGAE

BEYOND EARTH

MICROALGAE 3. BEYOND EARTH.
A Coruña, 2023

PUBLISHED BY: ANFACO-CECOPESCA
Number of pages: 110
17 x 24 cm

Legal deposit:
C 1393-2023 (Spanish)
C 1394-2023 (Galician)

ISBN:
978-84-09-54091-4 (Spanish)
978-84-09-54092-1 (Galician)

Thema: YNUC | PDZ | PSPA | RNK | RNP | FLW
IBIC: PS | RB | RN

Published as part of the Enhance Microalgae Project
(<https://www.enhancemicroalgae.eu>)
PROJECT CODE: EAPA 338/2016:
'High added-value industrial opportunities for microalgae in the Atlantic Area – Enhance Microalgae',
Interreg Atlantic Area Transnational Cooperation Programme

Scientific consultant: Borja Tosar, José M. L. Vilariño and the Enhance Microalgae consortium research team.

Acknowledgements: Thanks to Borja Tosar, for his help in the development of this comic, and Conchi Lillo for her expertise.

Translation and proofreading (English): Gonzalo Illán , Claudio Fuentes Grunewald, Iria Castiñeiras Pérez

COVER ILLUSTRATION: Xulia Pisón
SCRIPT: Xulia Pisón
ARTWORK: Xulia Pisón
FLATS: Xulia Pisón, Anabel Colazo, Pau Millán
DESIGN AND LAYOUT: Xulia Pisón

PRINTED BY: Lugami Artes Gráficas

MICRO ALGAE

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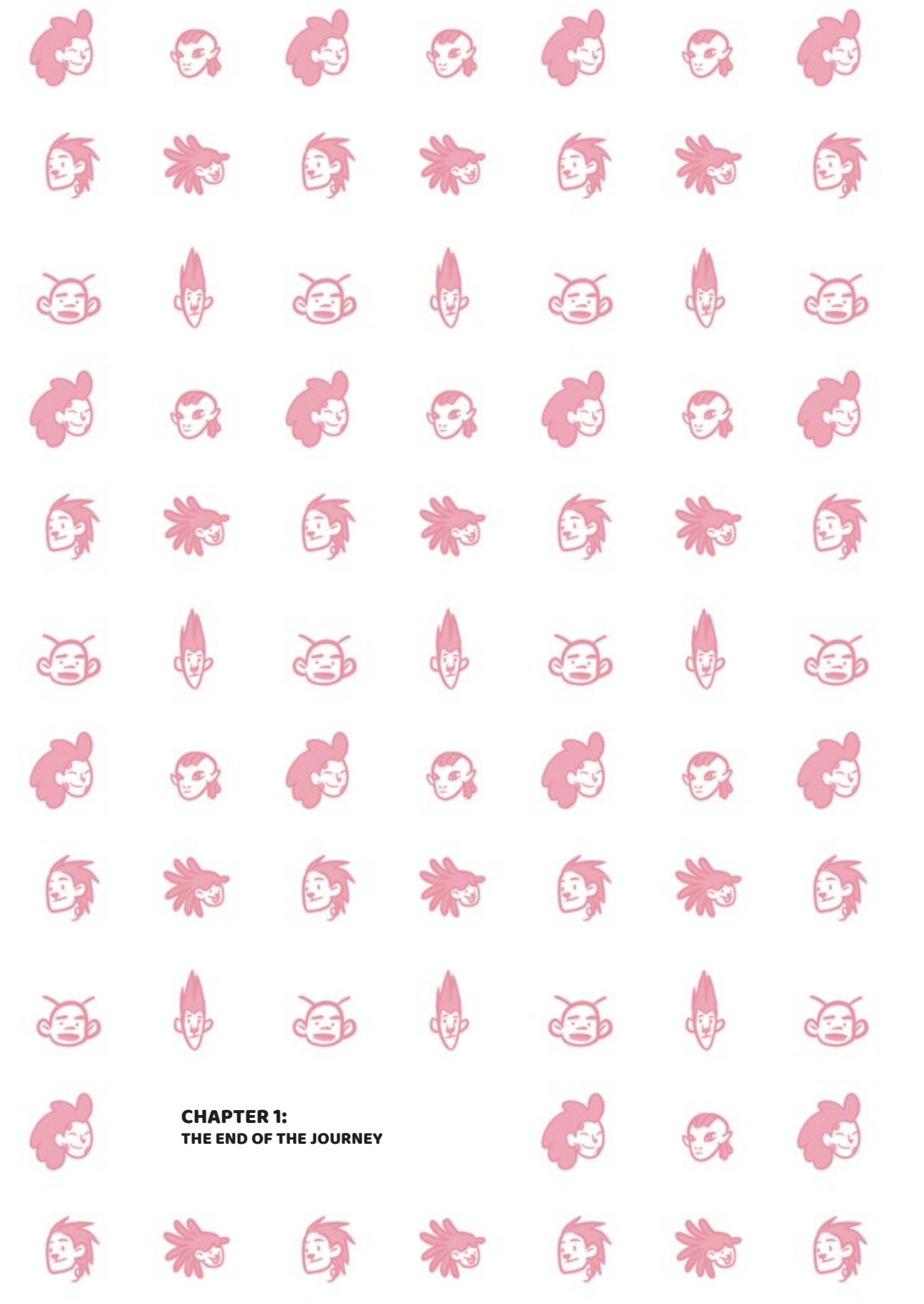
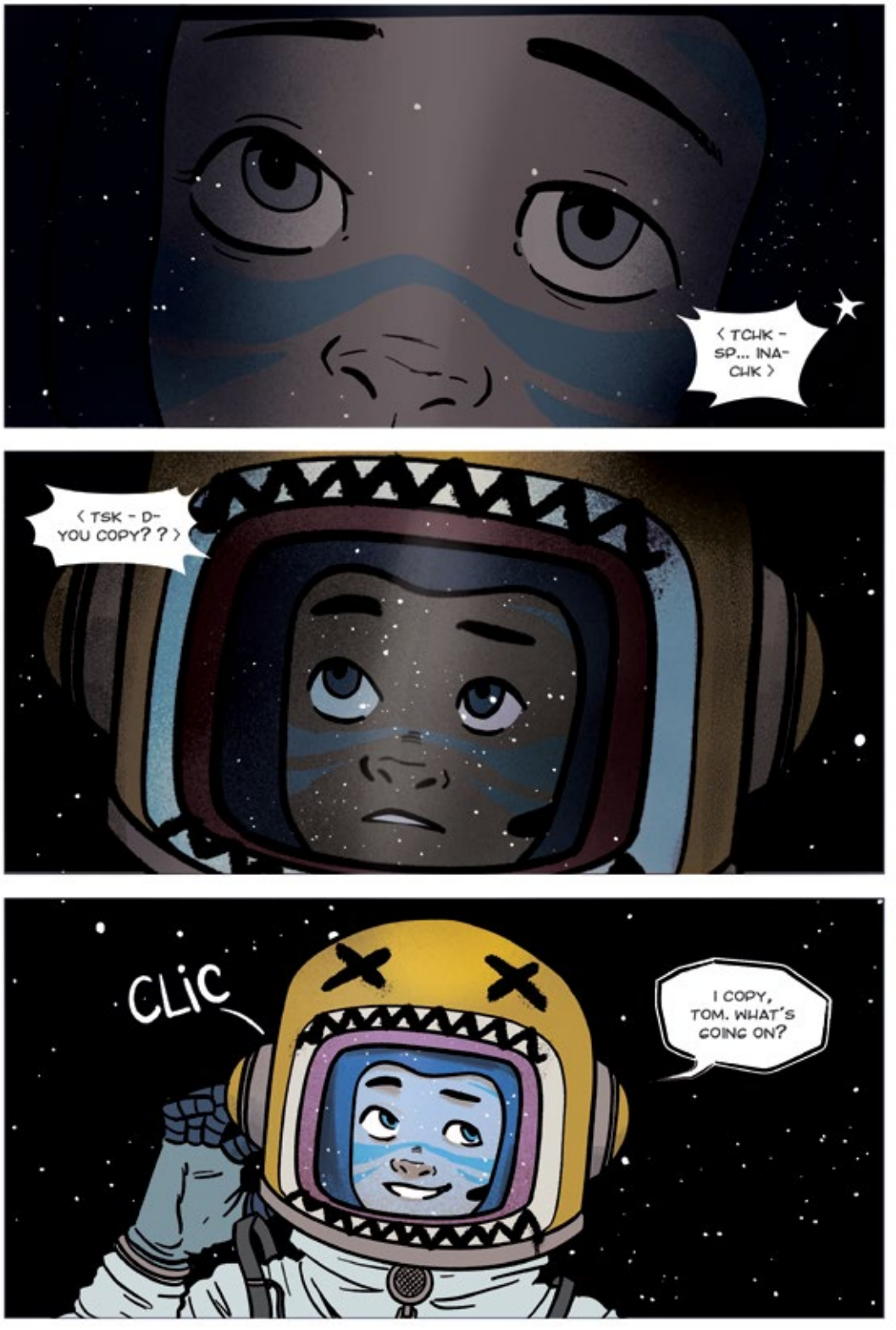


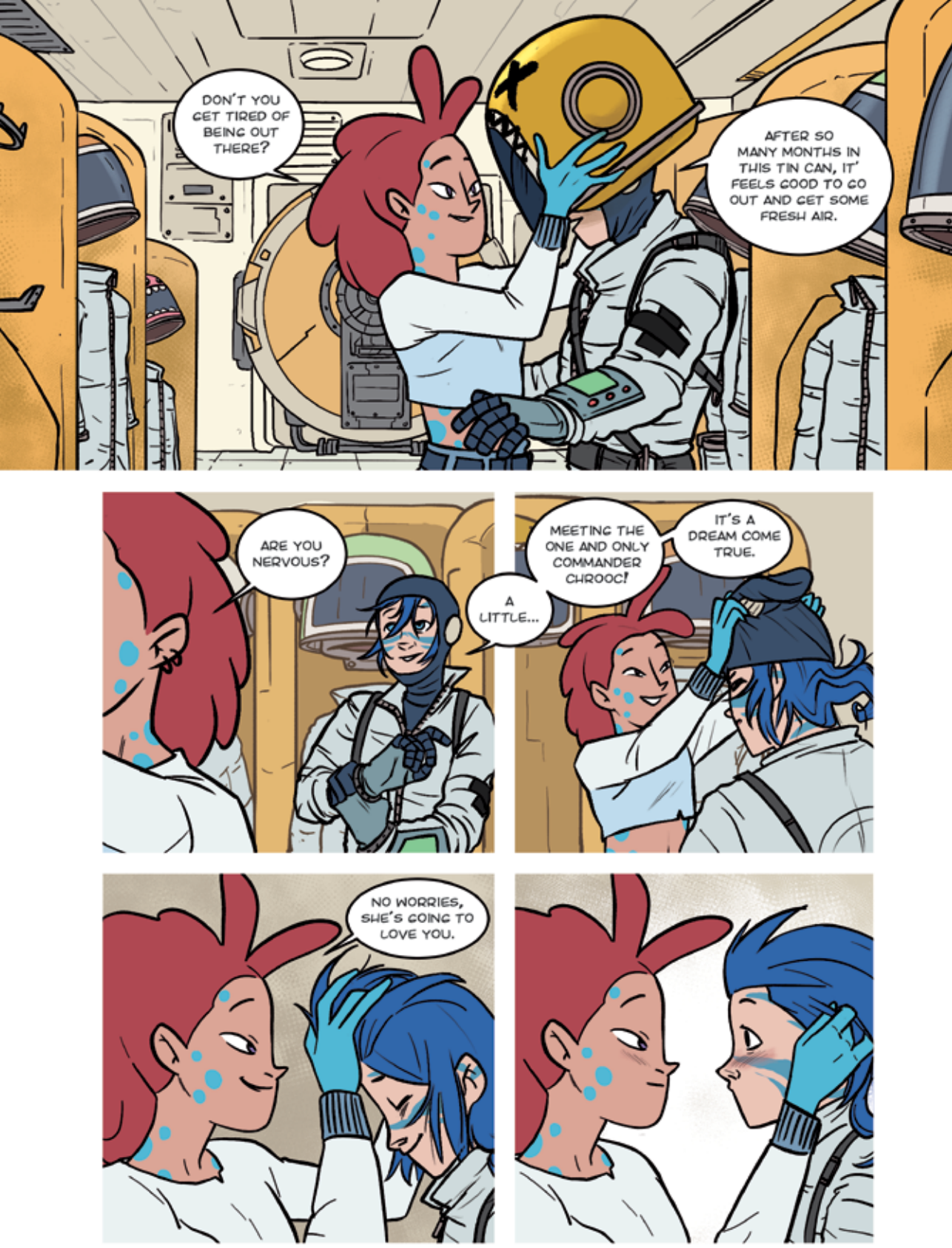
CHAPTER 1:
THE END OF THE JOURNEY


〈TCHK - S -
NA... - CHK〉

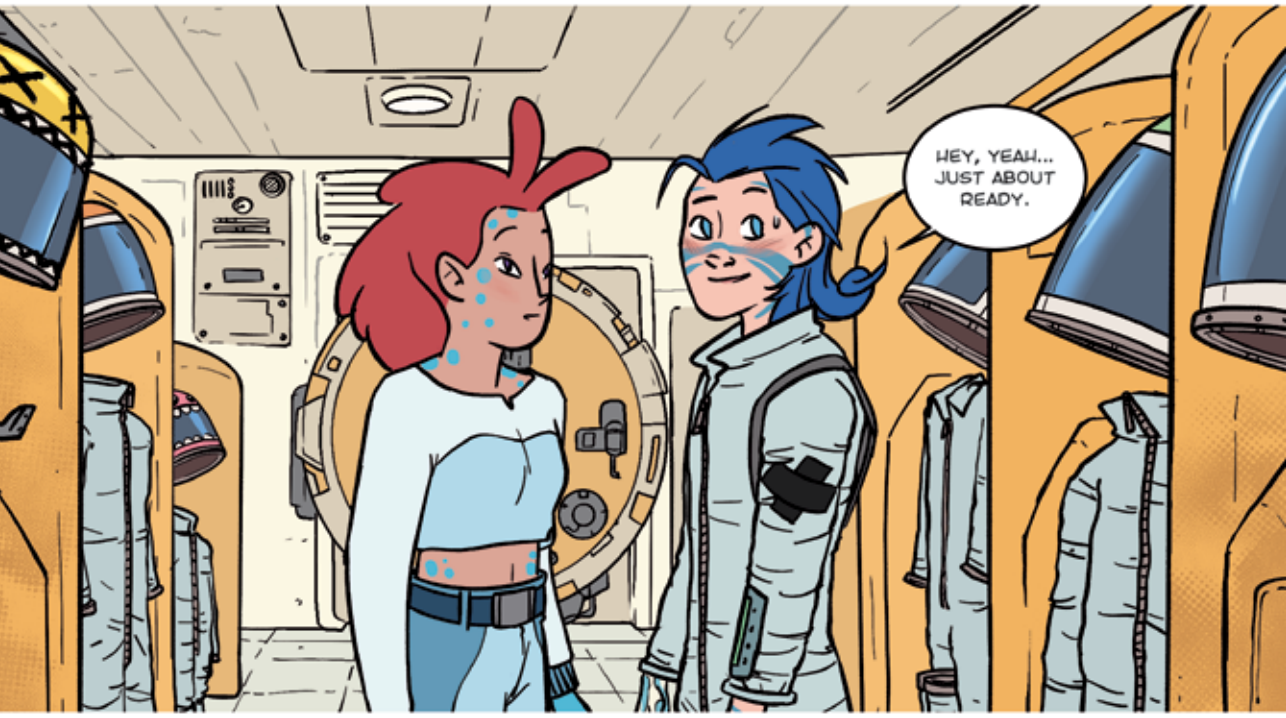

〈 TCHK - SP... INA- CHK 〉
〈 TSK - D- YOU COPY? ? 〉
CLIC
I COPY, TOM. WHAT'S GOING ON?


< I JUST WANTED TO KNOW IF YOU WERE STILL WITH US.....>

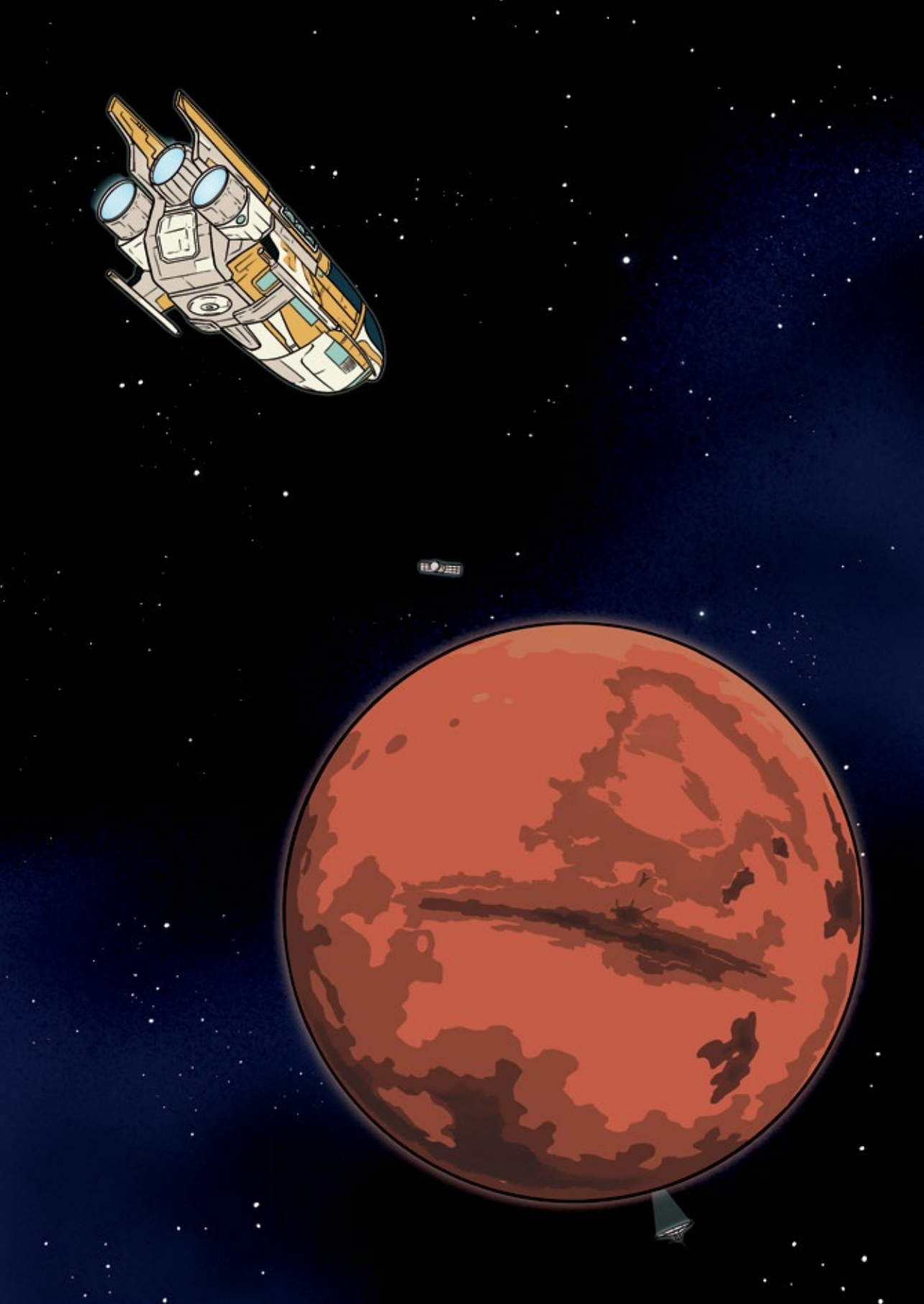

ENJOY WHILE YOU CAN, WE'RE ALMOST THERE.
DO YOU KNOW WHERE SPIRULINA IS?
WHAT DO YOU THINK?
THE USUAL PLACE.
HEY, SPACE-WALKER!
IT'S TIME TO COME BACK TO THE "ELLIE".
COMING!
I'LL HELP YOU WITH THE SPACESUIT.


DON'T YOU GET TIRED OF BEING OUT THERE?
AFTER SO MANY MONTHS IN THIS TIN CAN, IT' FEELS GOOD TO GO OUT AND GET SOME FRESH AIR.
ARE YOU NERVOUS?
A LITTLE...
MEETING THE ONE AND ONLY COMMANDER CHROOC!
IT'S A DREAM COME TRUE.
NO WORRIES, SHE'S GOING TO LOVE YOU.


WELL, WHAT'S NEW AROUND HERE?
I'VE GOT EVERYTHING READY, HOW ABOUT YOU?


HEY, YEAH... JUST ABOUT READY.

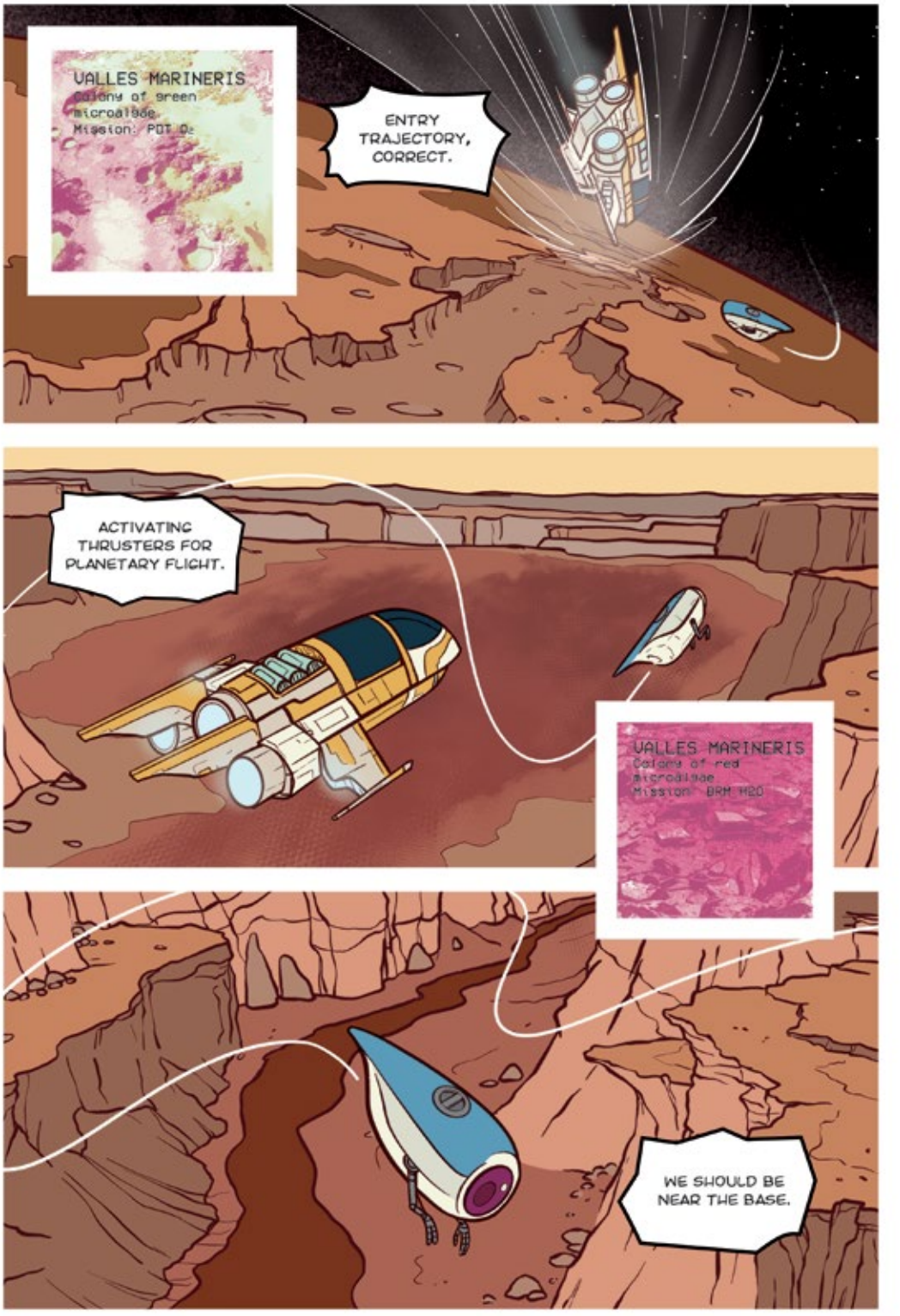

OK, EVERYONE. ACTION STATIONS!
STARTING THE APPROACH PROTOCOL.

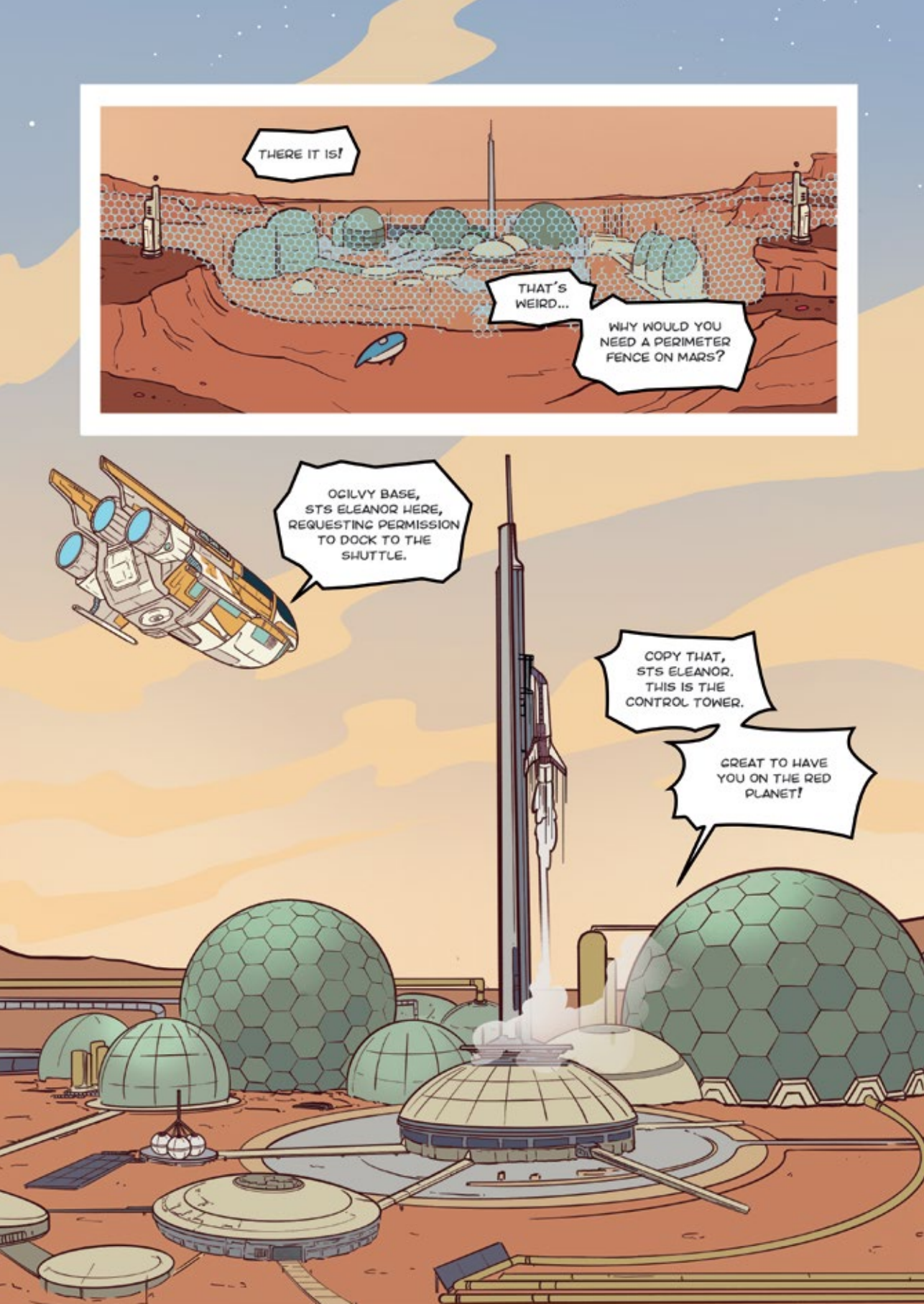



WOW!
WASTO, WHAT CAN YOU TELL US?
HERE WE GO...
DEPLOYING THE DRONE.

WOW,
IT'S CROWDED
OUT THERE.

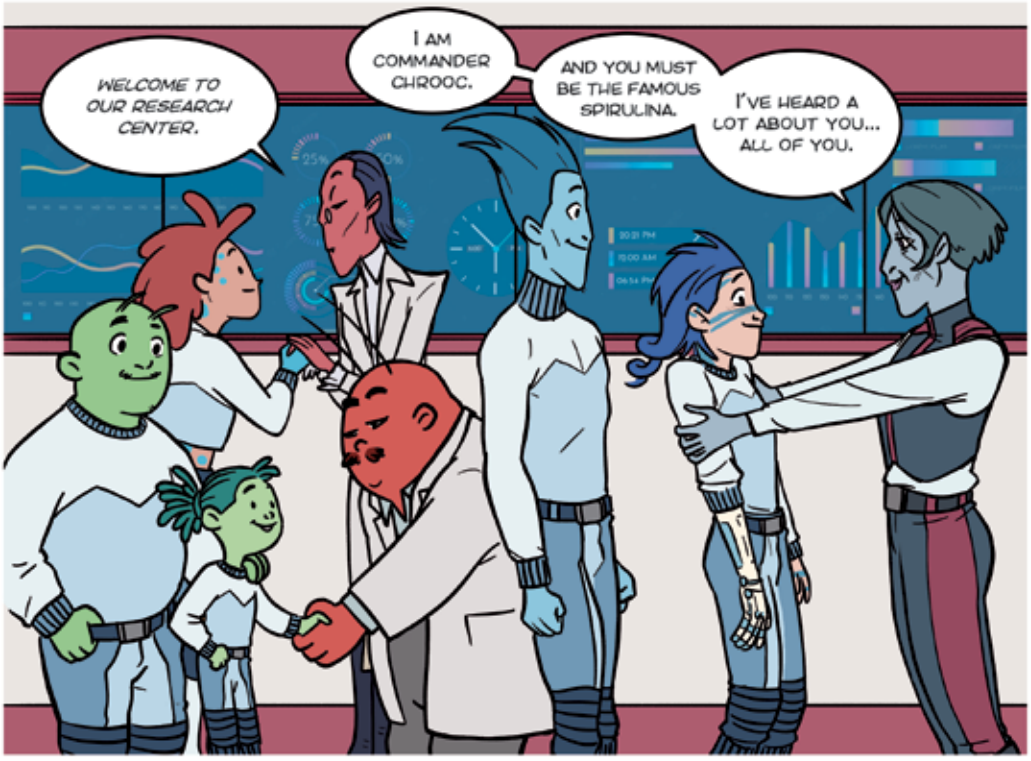

TRANSMITTING
Deimos
ORBITAL SATELLITE
CONSTRUCTION UNIT
SAT-eLITE
VALLES MARINERIS
4500 km long
200 km wide
11 km max deep
Phobos
ORBITAL MIRROR SAT
Ice-cap heating
ATM DRONE


VALLES MARINERIS
colony of green microalgae
Mission: PDT 0e
ENTRY TRAJECTORY, CORRECT.
ACTIVATING THRUSTERS FOR PLANETARY FLIGHT.
VALLES MARINERIS
Colony of red microalgae
Mission: BRM M20
WE SHOULD BE NEAR THE BASE.


THERE IT IS!
THAT'S WEIRD...
WHY WOULD YOU NEED A PERIMETER FENCE ON MARS?
OCILVY BASE, STS ELEANOR HERE, REQUESTING PERMISSION TO DOCK TO THE SHUTTLE.
COPY THAT, STS ELEANOR. THIS IS THE CONTROL TOWER.
GREAT TO HAVE YOU ON THE RED PLANET!


PERMISSION TO LAND ON MARS GRANTED.
EASY NOW, AND...
BR
RRR
SHUTTING DOWN ALL SYSTEMS.
...
PHEW! GOOD GIRL, "ELLIE".
T-CLACK!
OH MY GOD!
I CAN'T BELIEVE WE'RE FINALLY ON MARS!
I THINK IT'S THIS WAY.


DING
HERE THEY ARE!
WELCOME!


WELCOME TO OUR RESEARCH CENTER.
I AM COMMANDER CHROOC.
AND YOU MUST BE THE FAMOUS SPIRULINA.
I'VE HEARD A LOT ABOUT YOU... ALL OF YOU.


THIS IS A VERY BUSY TERRAFORMING BASE.
THERE IS SO MUCH TO SEE.
BUT FIRST, YOU SHOULD REST.
IT HAS BEEN A LONG JOURNEY.

MARS

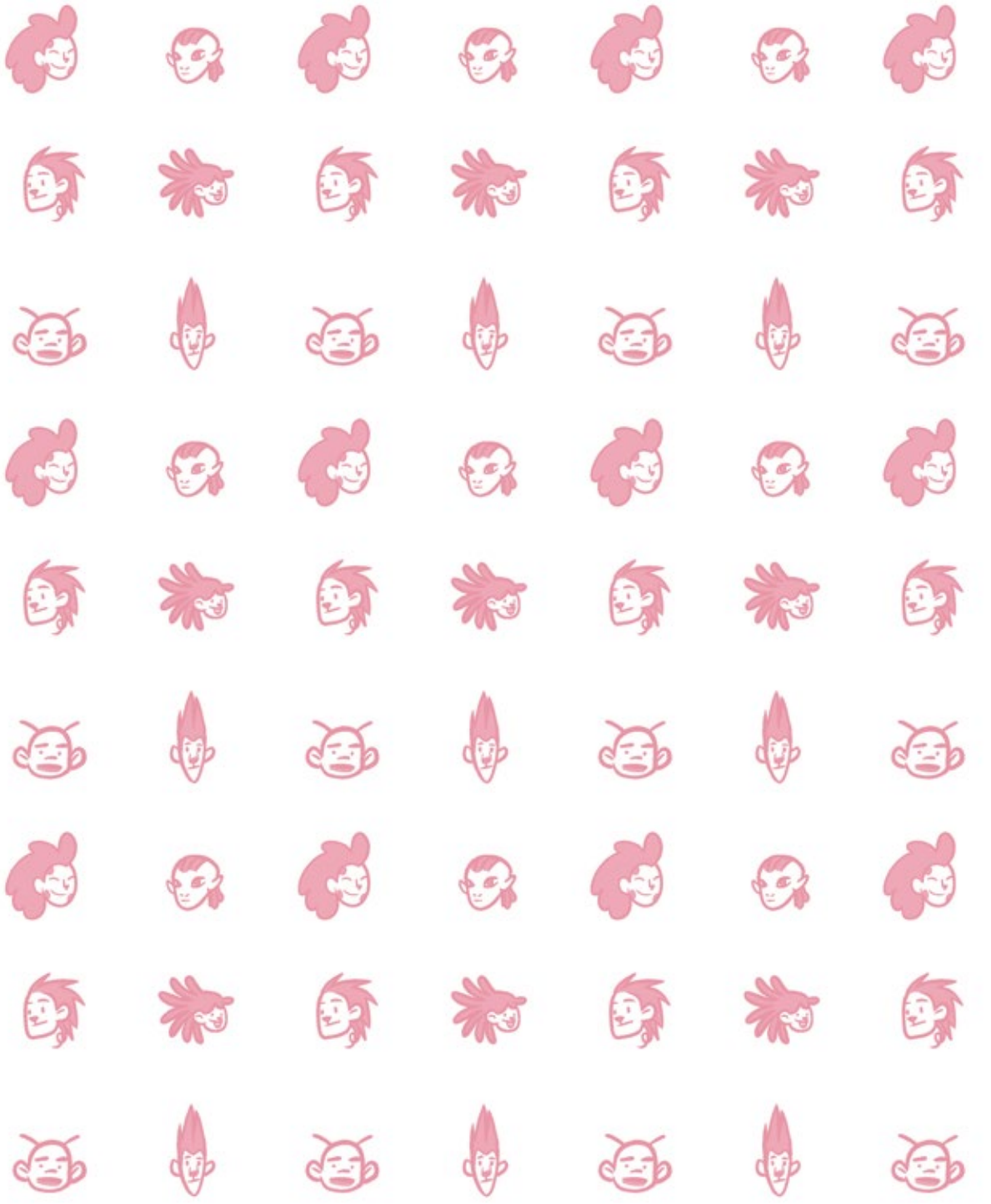
Out of all the known planets, both in the Solar System and other planetary systems, Mars is the most Earth-like. However, it is a hostile world.

Its atmosphere lacks oxygen, which is essential for breathing. Without a spacesuit, survival is as long as you can hold your breath. With it, the situation improves, depending on its autonomy, but it must also protect you from the intense cold. The average temperature is -20 °C dropping below -100 °C in some places.

There is no liquid water, only ice or vapor. The Martian atmosphere is very thin, wich doesn't allow the water to remain a liquid for long. All life we know on earth depends on liquid water, from the smallest microalgae to the most complex living organism, and therefore no living organism as we know it could inhabit the Martian surface.

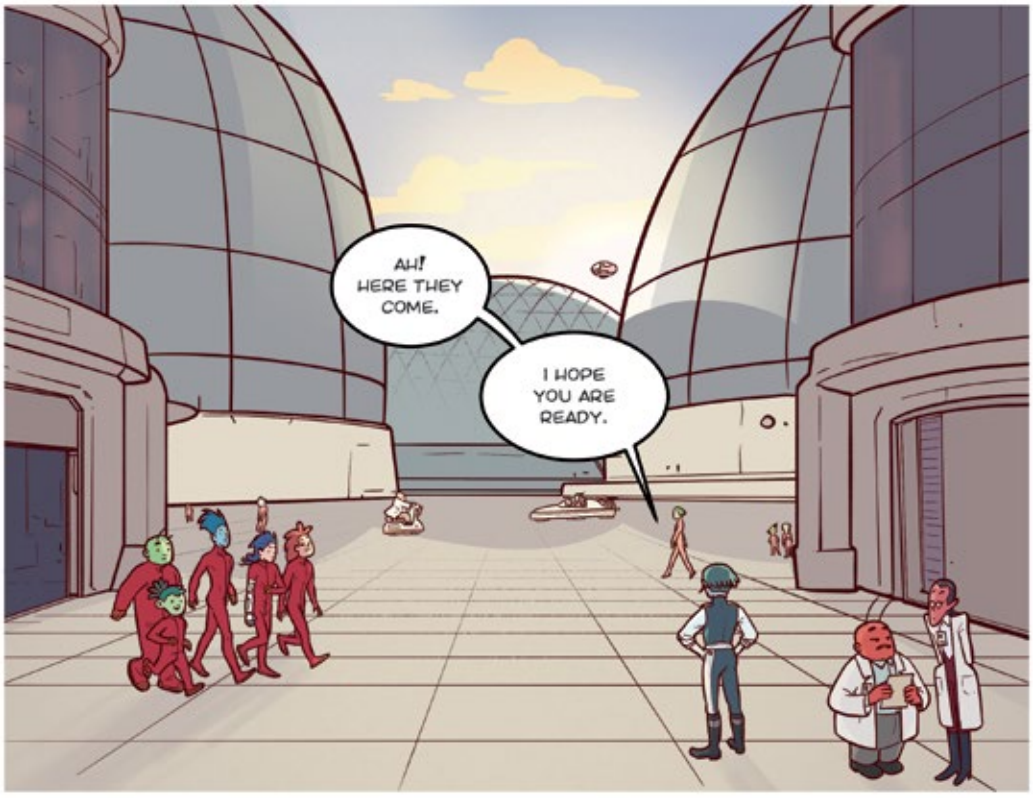
Since there is no food, your long-term survival will depend on what you can carry in your backpack or get in vitro cultures. As if that were not enough, the lack of a magnetic field and the thin atmosphere allows the passage of solar radiation, scorching Mars surface. Still, out of the 5,510 known planets, Mars is the planet most similar to ours.

A curious thing happens on Mars due to its atmosphere, in which long wavelengths predominate (the red spectrum). Eyes that are blue on Earth appear red on Mars! This transformation occurs because blue eyes aren't actually blue. Since they lack a pigment that gives eyes their color, they simply reflect the dominant light in their surroundings, which is blue on Earth but red on Mars.



CHAPTER 2:
TERRAFORMATION


EM... DOES ANYONE ELSE THINK THIS IS TOO TIGHT?
NOPE, IT'S PERFECT FOR ME!
THAT'S BECAUSE YOU LOVE GOING TIGHT.

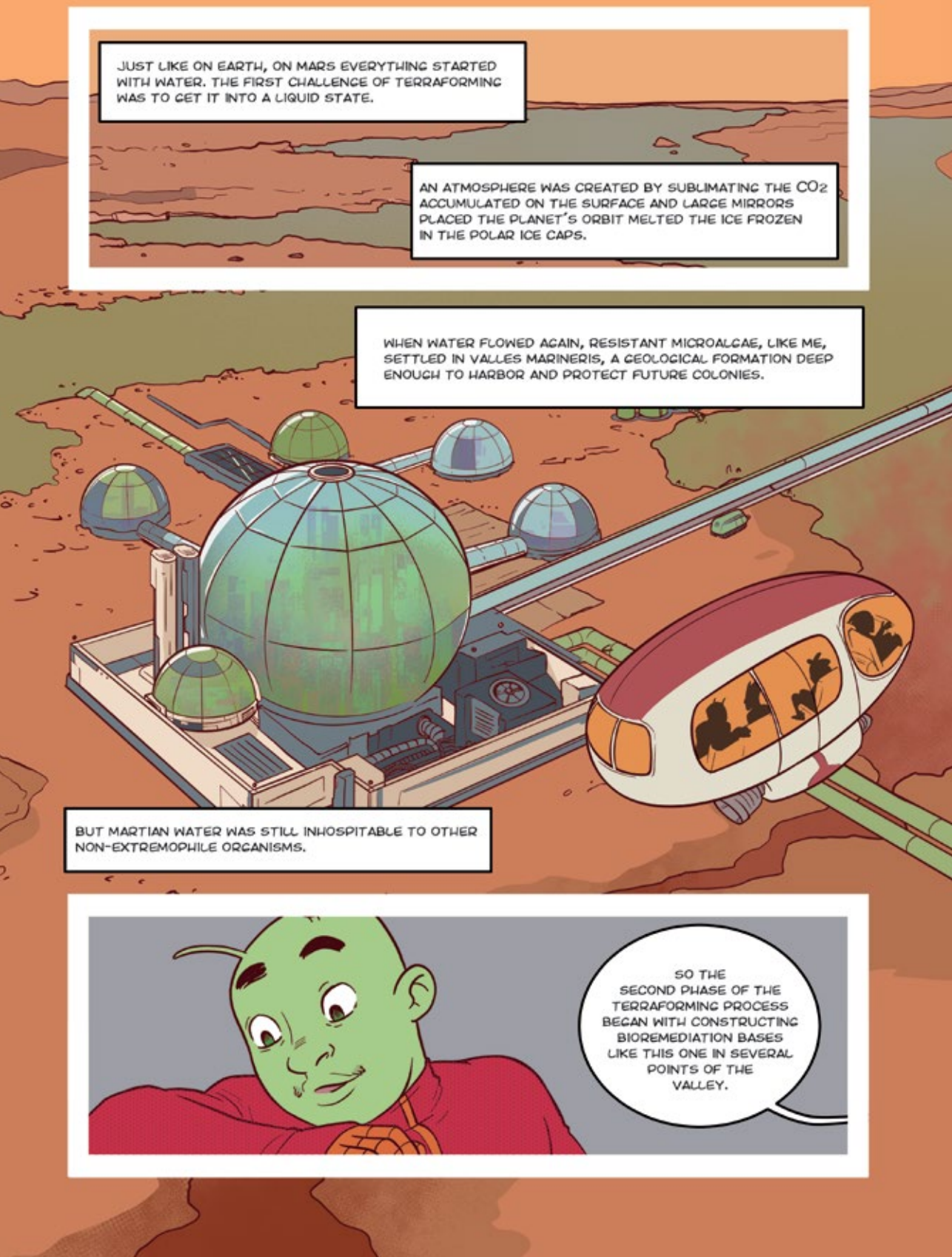

AH! HERE THEY COME.
I HOPE YOU ARE READY.


THIS MORNING WE WILL TAKE A SHORT TOUR OF OUR FACILITIES.
YOU ALREADY KNOW DR. HAEMATOCOCCUS AND DR. PORFIRIDIUM.


OUR EXPERTS IN ANTI-RADIATION SAFETY.
AND THOSE RESPONSIBLE FOR YOUR OUTFITS.


AS YOU KNOW, UNLIKE EARTH, MARS LACKS AN ELECTROMAGNETIC FIELD AND AN OZONE LAYER THAT ACTS AS A NATURAL SHIELD AGAINST SOLAR RADIATION.
SO TO PROTECT THE LESS RESISTANT MICROORGANISMS, WE DEVELOPED THESE PROTECTIVE SUITS.

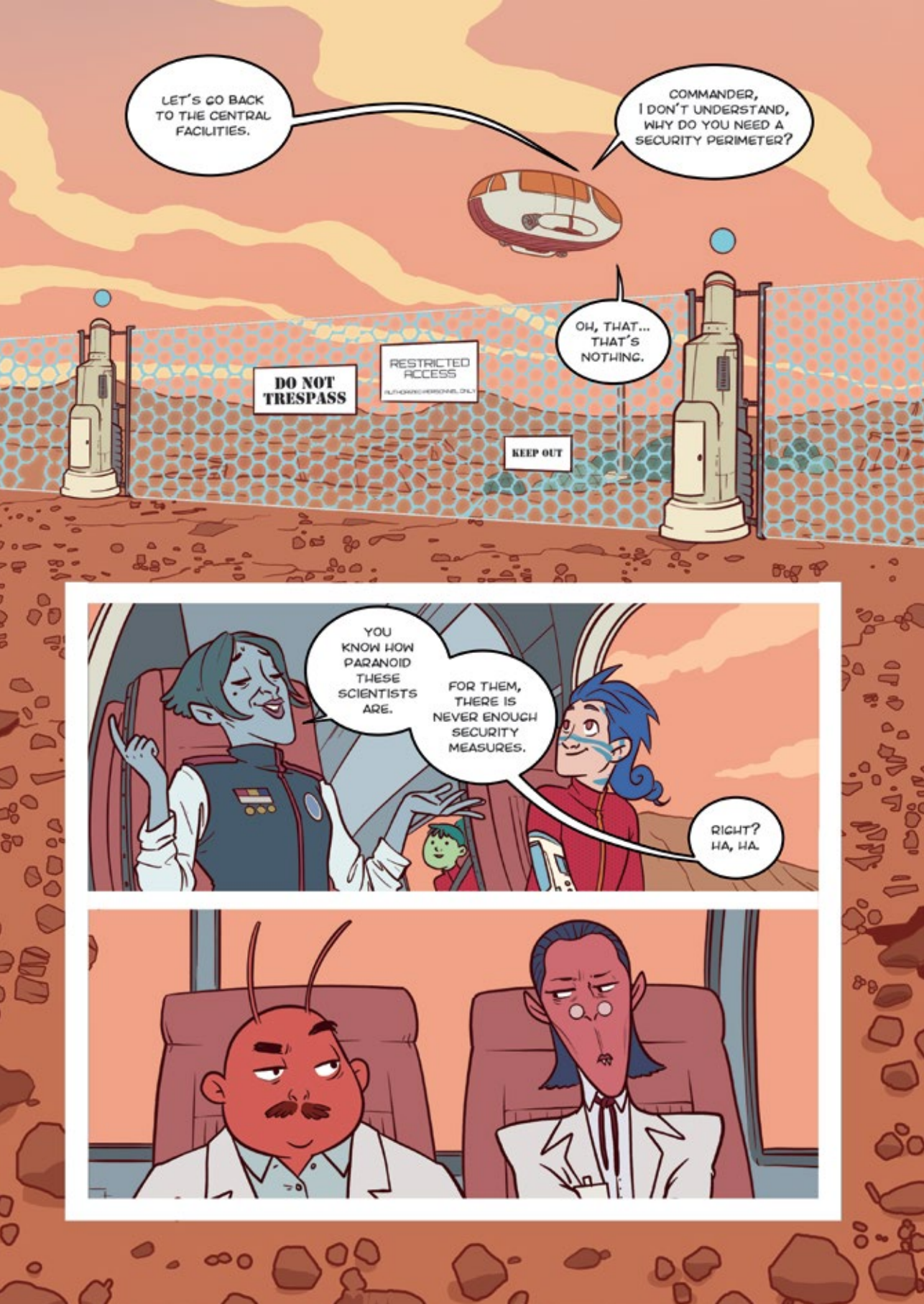

UNDER NO CIRCUMSTANCES MUST YOU GO OFF BASE WITHOUT THEM .
READY?
HERE WE GO.

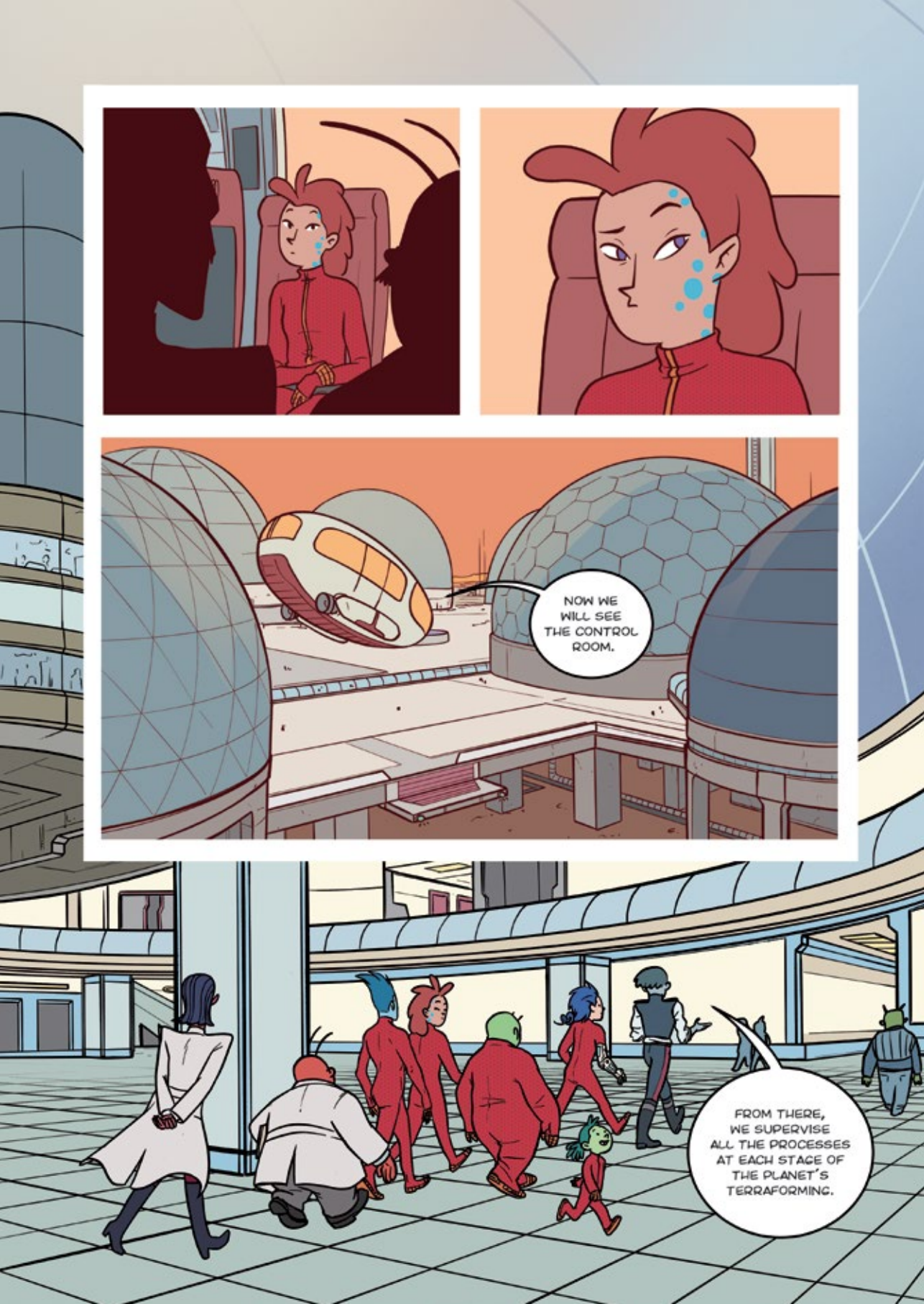

JUST LIKE ON EARTH, ON MARS EVERYTHING STARTED WITH WATER. THE FIRST CHALLENGE OF TERRAFORMING WAS TO GET IT INTO A LIQUID STATE.
AN ATMOSPHERE WAS CREATED BY SUBLIMATING THE CO_2 ACCUMULATED ON THE SURFACE AND LARGE MIRRORS PLACED THE PLANET'S ORBIT MELTED THE ICE FROZEN IN THE POLAR ICE CAPS.
WHEN WATER FLOWED AGAIN, RESISTANT MICROALGAE, LIKE ME, SETTLED IN VALLES MARINERIS, A GEOLOGICAL FORMATION DEEP ENOUGH TO HARBOR AND PROTECT FUTURE COLONIES.
BUT MARTIAN WATER WAS STILL INHOSPITABLE TO OTHER NON-EXTREMOPHILE ORGANISMS.
SO THE SECOND PHASE OF THE TERRAFORMING PROCESS BEGAN WITH CONSTRUCTING BIOREMEDIATION BASES LIKE THIS ONE IN SEVERAL POINTS OF THE VALLEY.

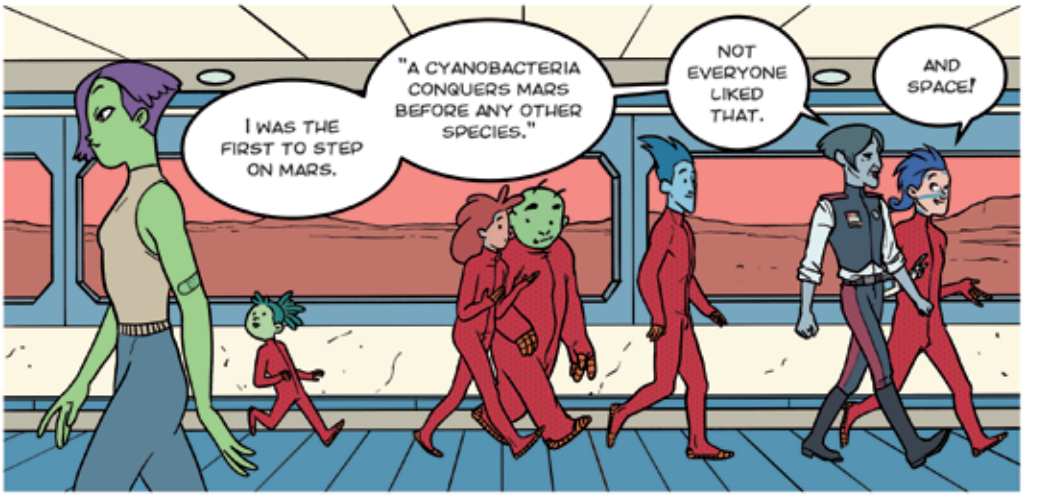

MICROALGAE CAPABLE OF ASSIMILATING AND PROCESSING HEAVY ELEMENTS WORK IN THESE BASES.
CREATING A SUITABLE ENVIRONMENT FOR THE REST OF THE MICROORGANISMS.
IT SEEMS LIKE A TOUGH JOB.
IT IS, BUT HERE WE MUST ALL MAKE SACRIFICES.
NO MATTER HOW HARD.
THE MISSION ALWAYS COMES FIRST.


THESE ARE PHOTOBIOREACTORS FOR THE MASS CULTIVATION OF OXYGEN-PRODUCING MICROALGAE.
HERE, THE NEW GENERATIONS OF GREEN MICROALGAE, NANNOCHLOROPSIS AND CHLORELLA ARE GROWN.
THEY ARE RESPONSIBLE FOR GENERATING A BREATHABLE ATMOSPHERE SIMILAR TO EARTH'S. ALLOWING FOR A GREATER GROWTH OF OUR COLONY.

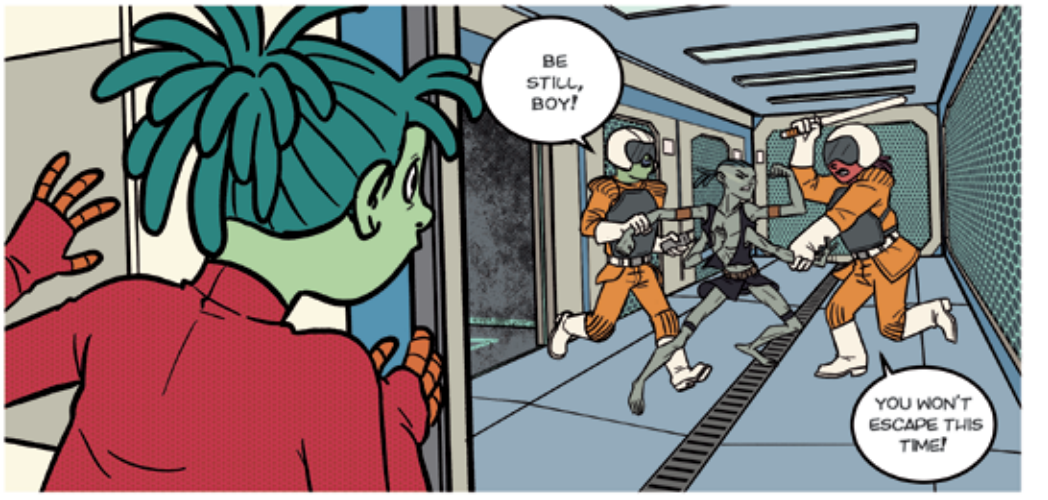

AND THE ARRIVAL OF OTHER MORE COMPLEX ORGANISMS FROM THE EARTH?
OH YES, OF COURSE... THAT TOO.


LET'S GO BACK TO THE CENTRAL FACILITIES.
COMMANDER, I DON'T UNDERSTAND, WHY DO YOU NEED A SECURITY PERIMETER?
OH, THAT... THAT'S NOTHING.
DO NOT TRESPASS
RESTRICTED ACCESS
KEEP OUT
YOU KNOW HOW PARANOID THESE SCIENTISTS ARE.
FOR THEM, THERE IS NEVER ENOUCH SECURITY MEASURES.
RIGHT? HA, HA.


NOW WE WILL SEE THE CONTROL ROOM.
FROM THERE, WE SUPERVISE ALL THE PROCESSES AT EACH STAGE OF THE PLANET'S TERRAFORMING.


I WAS THE FIRST TO STEP ON MARS.
"A CYANOBACTERIA CONQUERS MARS BEFORE ANY OTHER SPECIES."
NOT EVERYONE LIKED THAT.
AND SPACE!

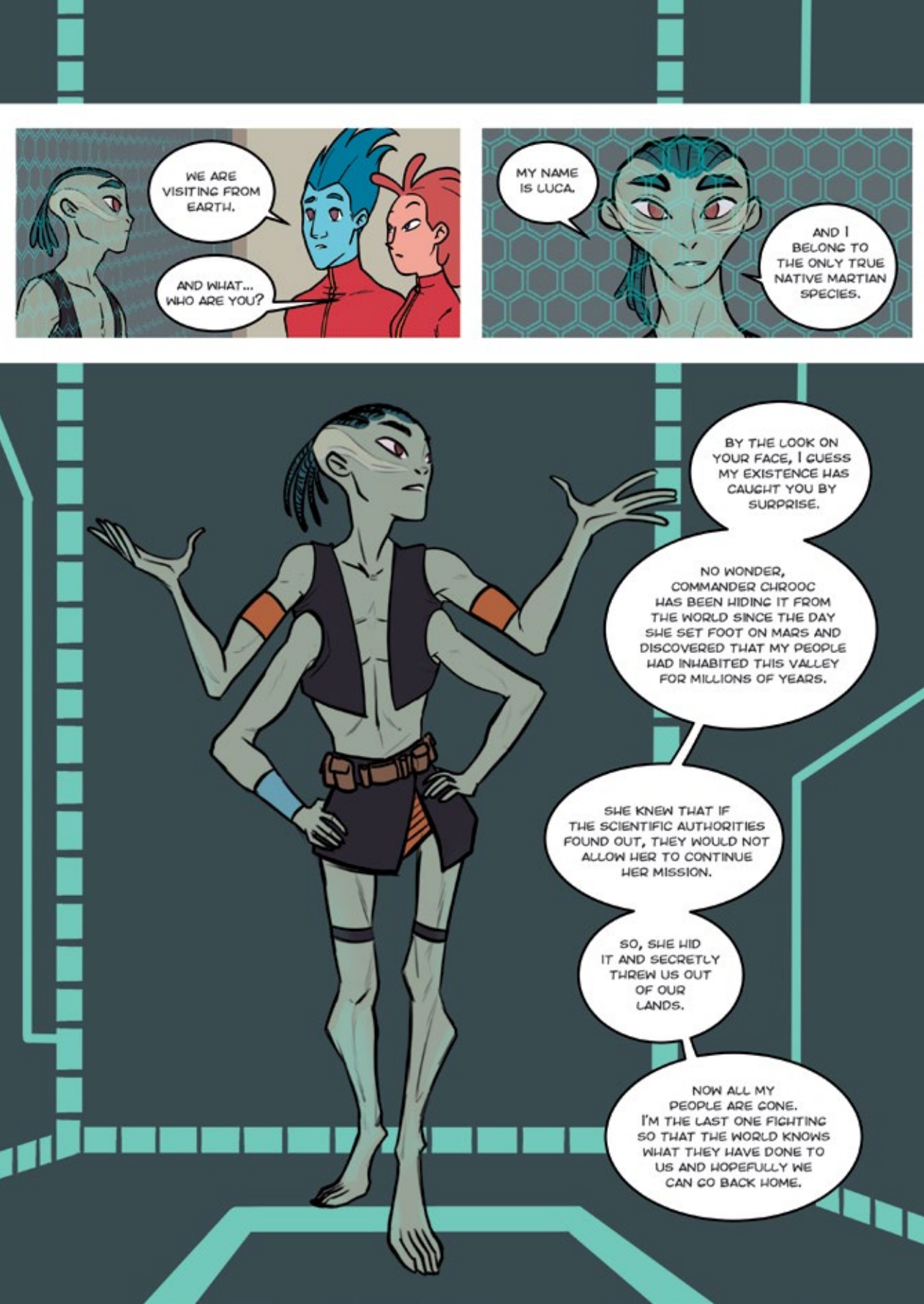

OH, IT WAS SO LONG AGO I BARELY REMEMBER IT.
LOOK HOW FAR WE'VE GOT.
YOU MUST BE PROUD OF WHO YOU ARE.
!
NO! LET ME GO!


BE STILL, BOY!
YOU WON'T ESCAPE THIS TIME!


THUGH
CLANK
GUYS! YOU HAVE TO SEE THIS.
SOMETHING BAD IS HAPPENING...
QUICK! COME SEE!
WAIT, WE SHOULD WARN SPIRU...
...LINA.


GET IN THERE!


HE'S JUST A KID...
I TOLD YOU!
ARE YOU OKAY?
MEH. I AM USED TO IT.
THIS IS HOW THINGS WORK ON THIS BASE.
AND YOU ARE?
BECAUSE IT'S CLEAR TO ME THAT YOU AREN'T FROM AROUND HERE...


WE ARE VISITING FROM EARTH.
AND WHAT... WHO ARE YOU?
MY NAME IS LUCA.
AND I BELONG TO THE ONLY TRUE NATIVE MARTIAN SPECIES.
BY THE LOOK ON YOUR FACE, I GUESS MY EXISTENCE HAS CAUGHT YOU BY SURPRISE.
NO WONDER, COMMANDER CHROOC HAS BEEN HIDING IT FROM THE WORLD SINCE THE DAY SHE SET FOOT ON MARS AND DISCOVERED THAT MY PEOPLE HAD INHABITED THIS VALLEY FOR MILLIONS OF YEARS.
SHE KNEW THAT IF THE SCIENTIFIC AUTHORITIES FOUND OUT, THEY WOULD NOT ALLOW HER TO CONTINUE HER MISSION.
SO, SHE HID IT AND SECRETLY THREW US OUT OF OUR LANDS.
NOW ALL MY PEOPLE ARE GONE. I'M THE LAST ONE FIGHTING SO THAT THE WORLD KNOWS WHAT THEY HAVE DONE TO US AND HOPEFULLY WE CAN GO BACK HOME.


THAT CAN'T BE TRUE.
THE RULES OF RESPECT FOR THE ECOSYSTEM IN CASE OF FINDINGS OF LOCAL LIFE ARE VERY CLEAR IN THIS REGARD.
I AM AFRAID THAT MEANS NOTHING TO CHROOC.
I KNEW SOMETHING WAS OFF WITH THIS PLACE!
WE HAVE TO CONFRONT THE COMMANDER AND FORCE HER TO FACE THE WORLD MICROALGAE ORGANIZATION.
I THINK YOU DO NOT KNOW CHROOC VERY WELL.
SHE'S NOT THE KIND OF LEADER YOU CAN TALK TO...

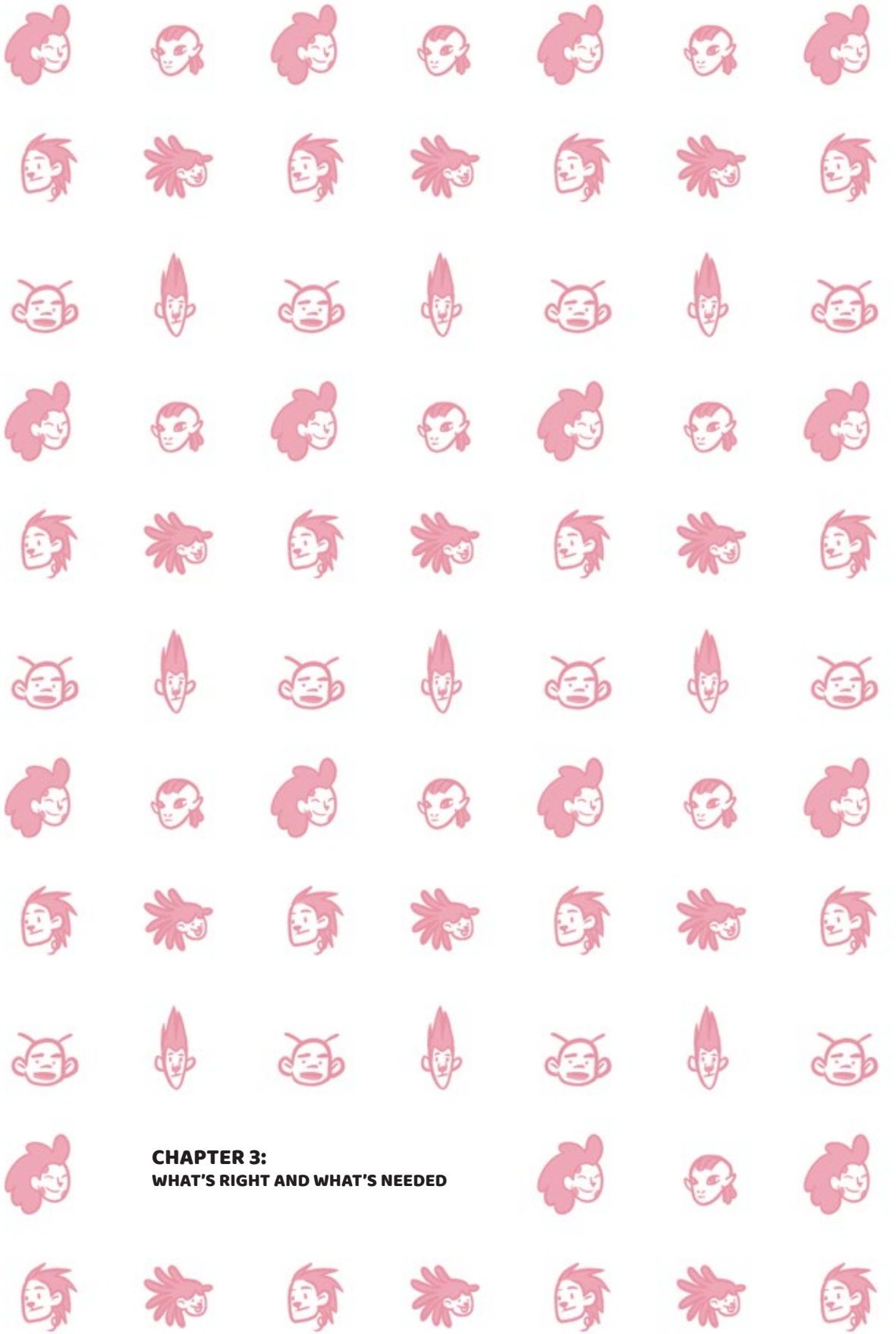

THEN YOU'LL HAVE TO COME WITH US.
NANNO...
I'M ON IT!
THANK YOU VERY MUCH.
CAN SOMEONE TELL ME...
...WHAT'S GOING ON HERE?

LUCA

LUCA is the acronym for the "Last Universal Common Ancestor".

According to Darwin's theory of evolution, if we went back in time, we would be able to see the origin of all species up to the the first division. It is at this time when LUCA evolved into bacteria and archaea, both of which are very primitive prokaryotic organisms (cells without nucleus) that have survived and evolved to the present day.

LUCA's biological characteristics give us a clue of what life forms on other planets can look like. Therefore, when looking for living things in space, it can't be ruled out that organisms like the primitive terrestrial LUCA can be found, although, probably adapted to the characteristics of its habitat.



CHAPTER 3:
WHAT'S RIGHT AND WHAT'S NEEDED

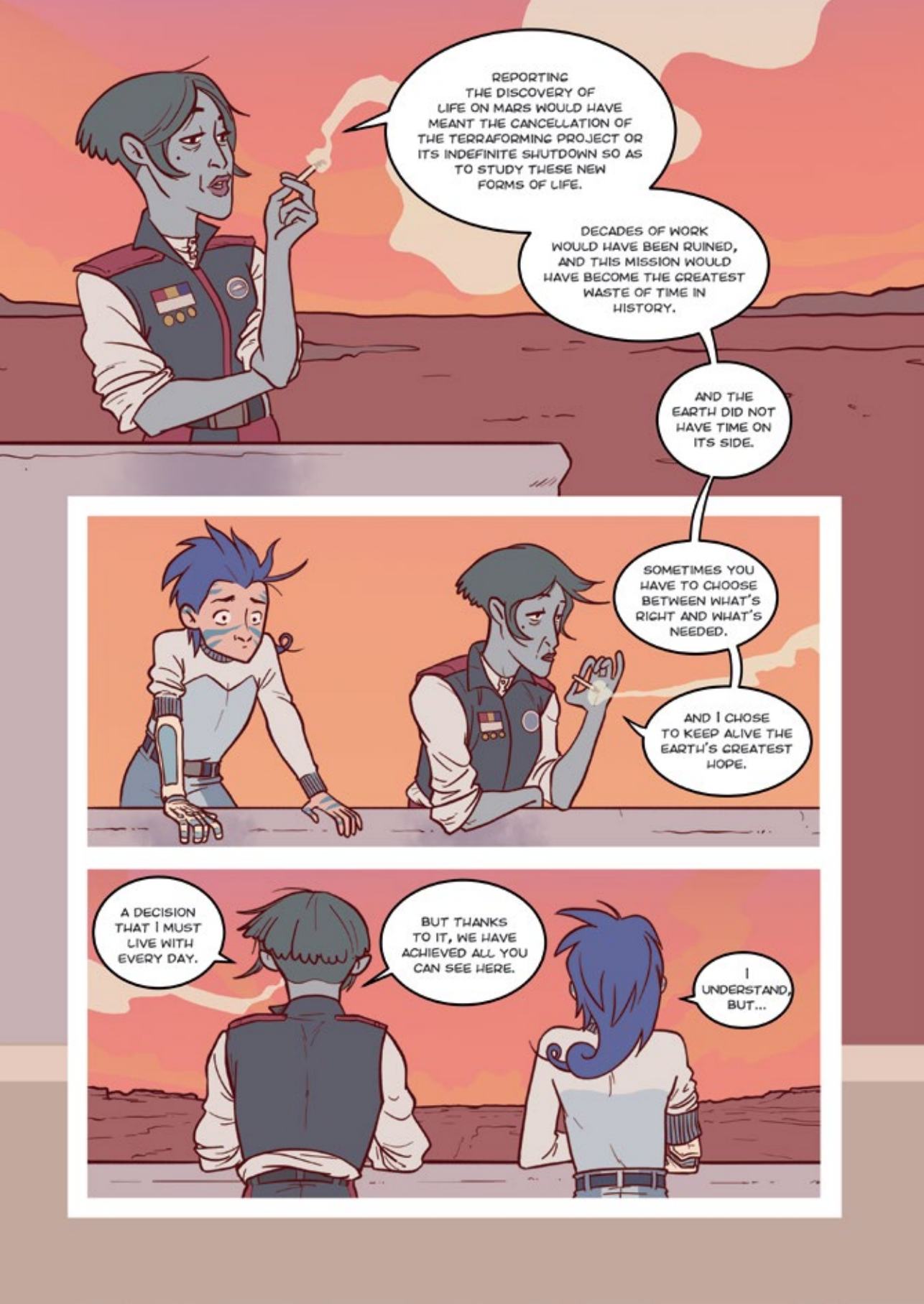

I CAN'T BELIEVE IT. WHAT WERE YOU THINKING?
SPIRULINA, YOU'VE HEARD HIS STORY.
HE IS A PRISONER!
HE WOULD SAY ANYTHING TO GET RELEASED.
COME ON! LOOK AT HIM! CLEARLY HE'S NOT FROM EARTH.
IF YOU DON'T BELIEVE ME, ASK THE COMMANDER.
YEAH, LETS DO THAT!
GREAT, IT WILL BE YOUR FAULT IF SHE KICKS US OUT.
WELL, I'VE ONLY BEEN DREAMING ABOUT THIS MY WHOLE LIFE...

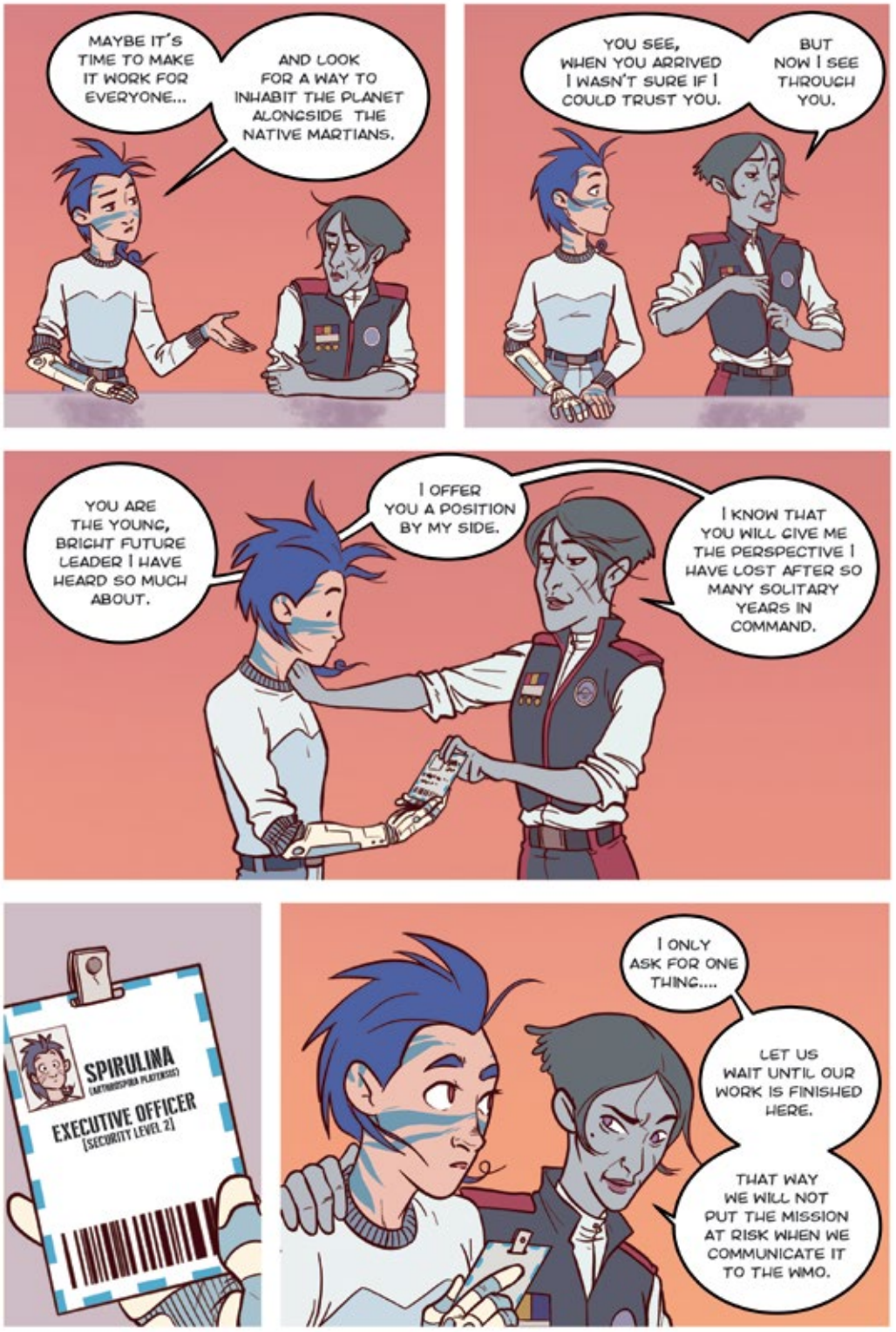

COMMANDER, CAN WE TALK...
IN PRIVATE?
SURE, WHAT IS IT?

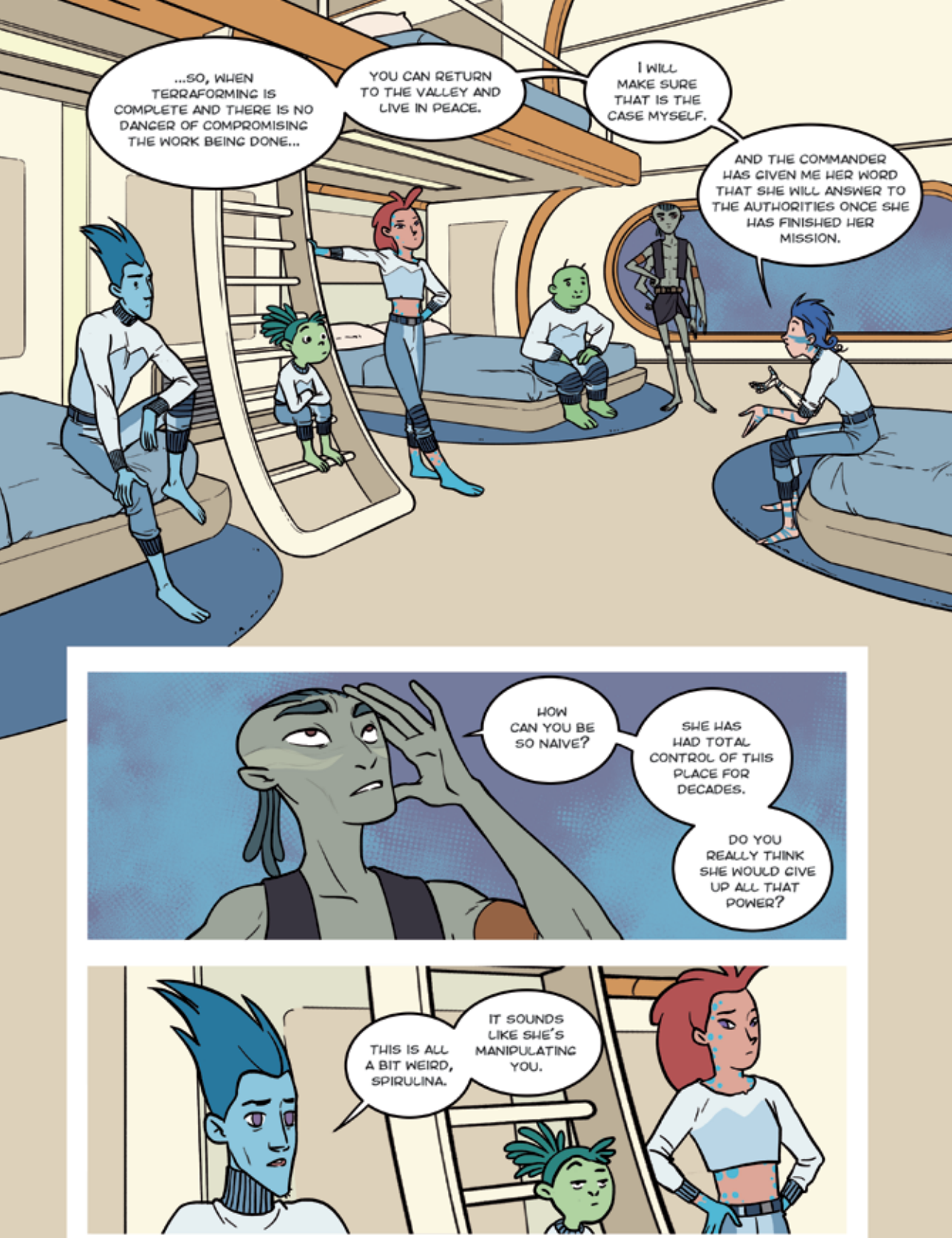

...AND I DON'T DOUBT THAT YOU'RE TELLING THE TRUTH.
- NO, THANK YOU.-
BUT LUCA'S STORY IS CONVINCING ENOUGH TO TO MAKE MY FRIENDS DOUBT.
SO I CAME BECAUSE I WANT TO KNOW YOUR SIDE OF THE STORY.
I SEE.


LOOK, SPIRULINA I'M AFRAID...
THAT LUCA'S STORY IS PARTIALLY TRUE.

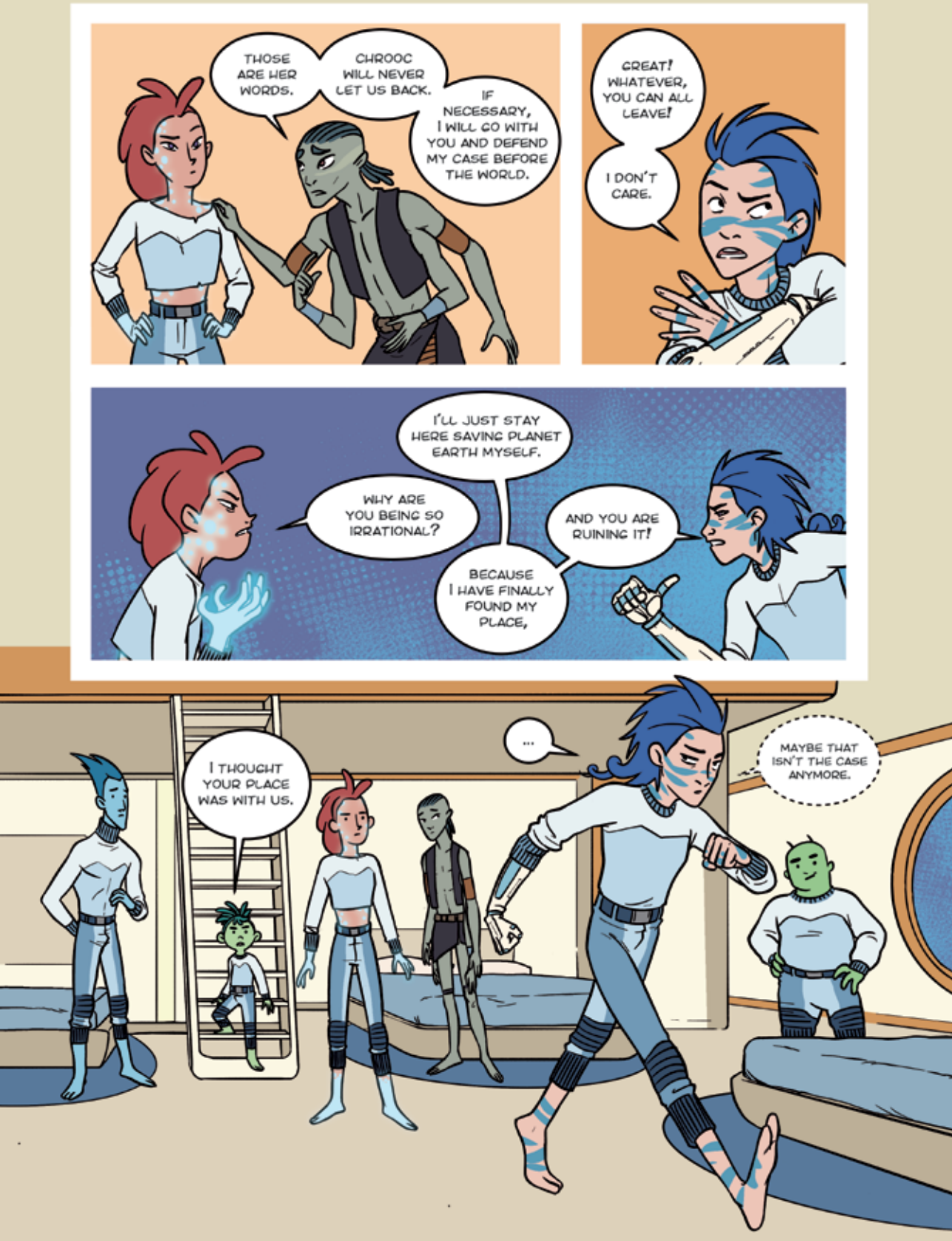
* WORLD MICROORGANISMS ORGANIZATION

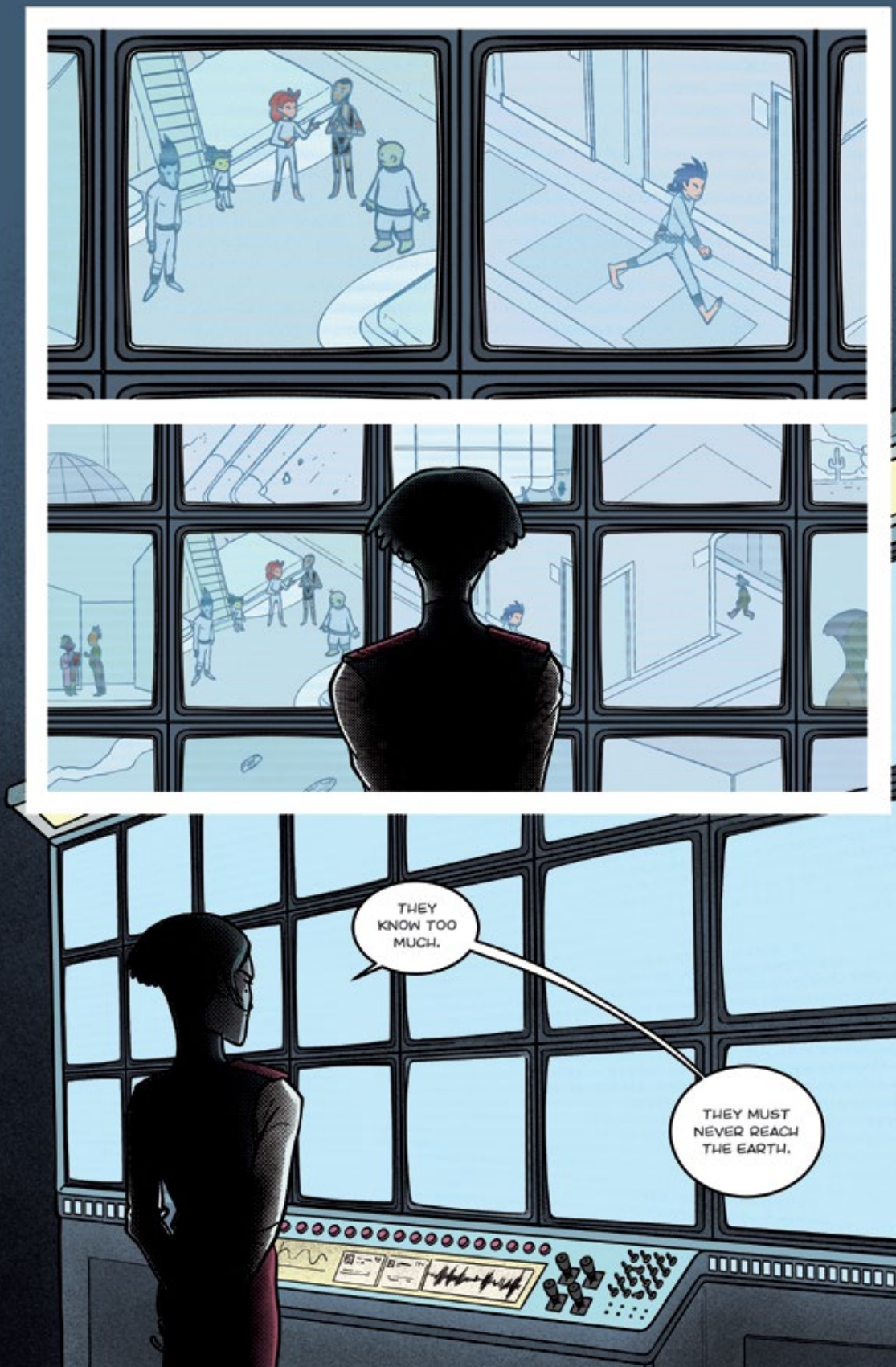

REPORTING THE DISCOVERY OF LIFE ON MARS WOULD HAVE MEANT THE CANCELLATION OF THE TERRAFORMING PROJECT OR ITS INDEFINITE SHUTDOWN SO AS TO STUDY THESE NEW FORMS OF LIFE.
DECADES OF WORK WOULD HAVE BEEN RUINED, AND THIS MISSION WOULD HAVE BECOME THE GREATEST WASTE OF TIME IN HISTORY.
AND THE EARTH DID NOT HAVE TIME ON ITS SIDE.
SOMETIMES YOU HAVE TO CHOOSE BETWEEN WHAT'S RIGHT AND WHAT'S NEEDED.
AND I CHOSE TO KEEP ALIVE THE EARTH'S GREATEST HOPE.
A DECISION THAT I MUST LIVE WITH EVERY DAY.
BUT THANKS TO IT, WE HAVE ACHIEVED ALL YOU CAN SEE HERE.
I UNDERSTAND, BUT...


MAYBE IT'S TIME TO MAKE IT WORK FOR EVERYONE...
AND LOOK FOR A WAY TO INHABIT THE PLANET ALONGSIDE THE NATIVE MARTIANS.
YOU SEE, WHEN YOU ARRIVED I WASN'T SURE IF I COULD TRUST YOU.
BUT NOW I SEE THROUGH YOU.
YOU ARE THE YOUNG, BRIGHT FUTURE LEADER I HAVE HEARD SO MUCH ABOUT.
I OFFER YOU A POSITION BY MY SIDE.
I KNOW THAT YOU WILL GIVE ME THE PERSPECTIVE I HAVE LOST AFTER SO MANY SOLITARY YEARS IN COMMAND.
SPIRULINA
(ARTHROSPIRA PLATENSIS)
EXECUTIVE OFFICER
(SECURITY LEVEL 2)
I ONLY ASK FOR ONE THING....
LET US WAIT UNTIL OUR WORK IS FINISHED HERE.
THAT WAY WE WILL NOT PUT THE MISSION AT RISK WHEN WE COMMUNICATE IT TO THE WMO.


...SO, WHEN TERRAFORMING IS COMPLETE AND THERE IS NO DANGER OF COMPROMISING THE WORK BEING DONE...
YOU CAN RETURN TO THE VALLEY AND LIVE IN PEACE.
I WILL MAKE SURE THAT IS THE CASE MYSELF.
AND THE COMMANDER HAS GIVEN ME HER WORD THAT SHE WILL ANSWER TO THE AUTHORITIES ONCE SHE HAS FINISHED HER MISSION.
HOW CAN YOU BE SO NAIVE?
SHE HAS HAD TOTAL CONTROL OF THIS PLACE FOR DECADES.
DO YOU REALLY THINK SHE WOULD GIVE UP ALL THAT POWER?
THIS IS ALL A BIT WEIRD, SPIRULINA.
IT SOUNDS LIKE SHE'S MANIPULATING YOU.

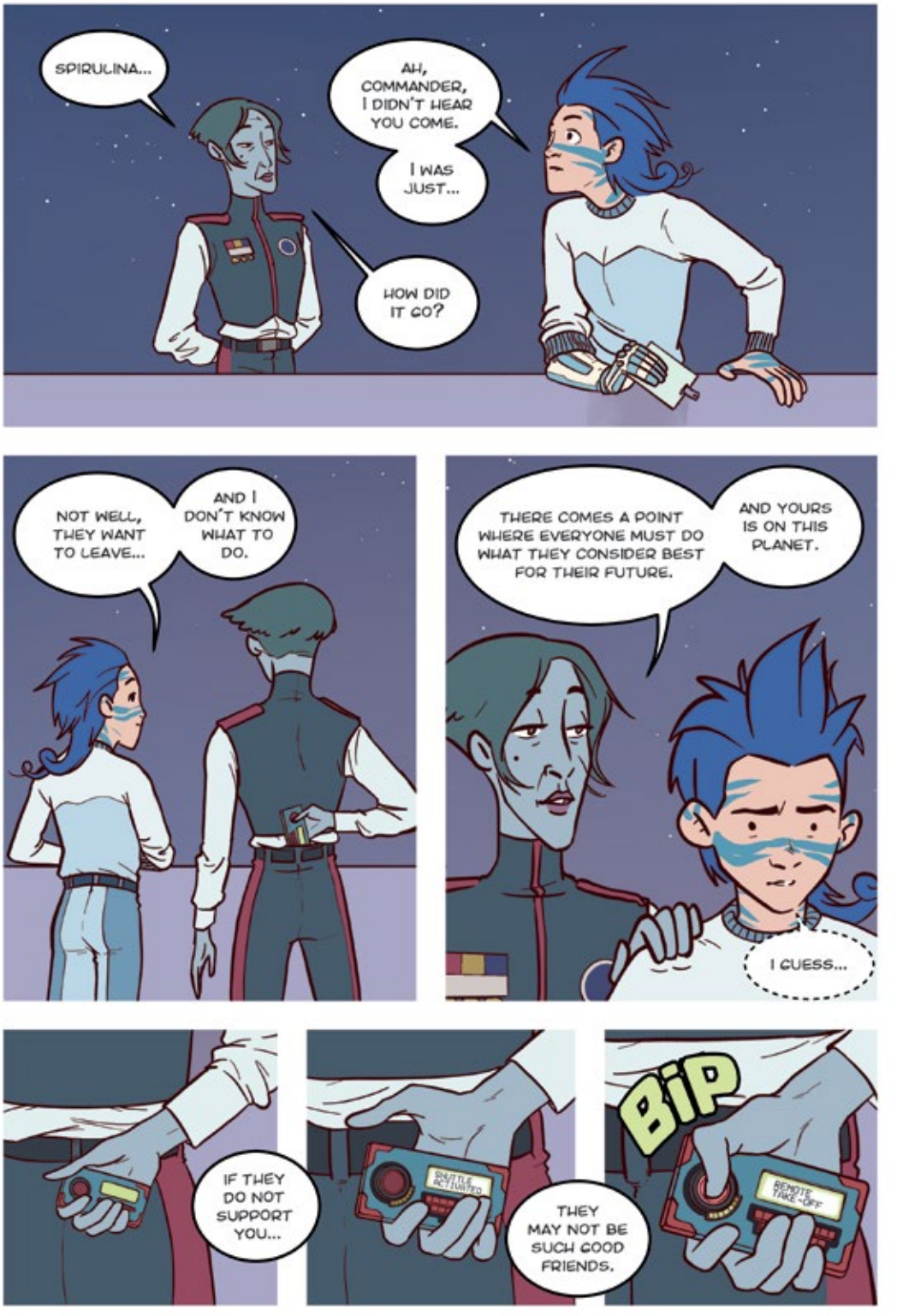

SHE ISN'T MANIPULATING ME!
BUT SHE IS RIGHT, WE CAN'T RISK HARMING THE MISSION AT THIS POINT. NOT WHEN WE'RE SO CLOSE!
IT'S ONLY A MATTER OF TIME.
WHY DON'T YOU TRUST ME?
OF COURSE WE TRUST YOU.
IT IS COMMANDER CHROOC WHO DOESN'T SEEM TRUSTWORTHY.
WE HAVE TO GO HOME AND REPORT WHAT IS GOING ON HERE.
YOU KNOW IT'S THE RIGHT THING TO DO.
SOMETIMES, WHAT'S RIGHT AND WHAT'S NEEDED ARE NOT THE SAME THING.


THOSE ARE HER WORDS.
CHROOC WILL NEVER LET US BACK.
IF NECESSARY, I WILL GO WITH YOU AND DEFEND MY CASE BEFORE THE WORLD.
GREAT! WHATEVER, YOU CAN ALL LEAVE!
I DON'T CARE.
I'LL JUST STAY HERE SAVING PLANET EARTH MYSELF.
WHY ARE YOU BEING SO IRRATIONAL?
AND YOU ARE RUINING IT!
BECAUSE I HAVE FINALLY FOUND MY PLACE,
I THOUGHT YOUR PLACE WAS WITH US.
...
MAYBE THAT ISN'T THE CASE ANYMORE.

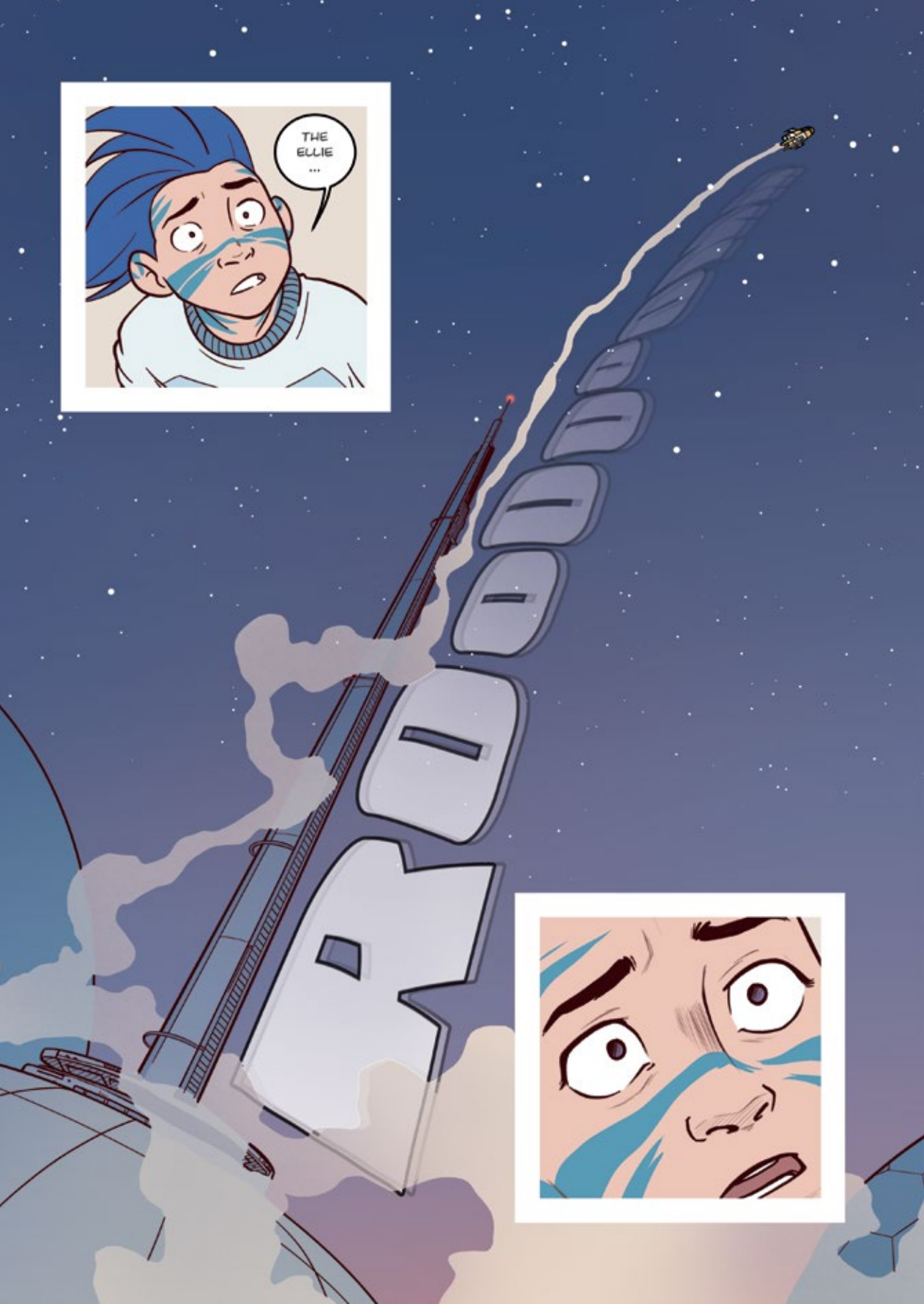

THEY KNOW TOO MUCH.
THEY MUST NEVER REACH THE EARTH.


YOU KNOW WHAT NEEDS TO BE DONE.
TAKE CARE OF IT.
BUT LEAVE SPIRULINA TO ME.


TAP
TAP
TAP
TAP


SPIRULINA...
AH, COMMANDER, I DIDN'T HEAR YOU COME.
I WAS JUST...
HOW DID IT GO?
NOT WELL, THEY WANT TO LEAVE...
AND I DON'T KNOW WHAT TO DO.
THERE COMES A POINT WHERE EVERYONE MUST DO WHAT THEY CONSIDER BEST FOR THEIR FUTURE.
AND YOURS IS ON THIS PLANET.
I GUESS...
IF THEY DO NOT SUPPORT YOU...
SHUTTLE RETURNED
THEY MAY NOT BE SUCH GOOD FRIENDS.
BIP
REMOTE TAKE-OFF


REMOTE TAKE-OFF STARTED.
PROPULSION TOWER ON HOLD
AUTOPILOT ON.
IGNITION AND ENGINE
SYNCHRONIZED.
LAUNCH IN 3, 2, 1...
BRROOOOOM
THAT
SOUNDS
LIKE...

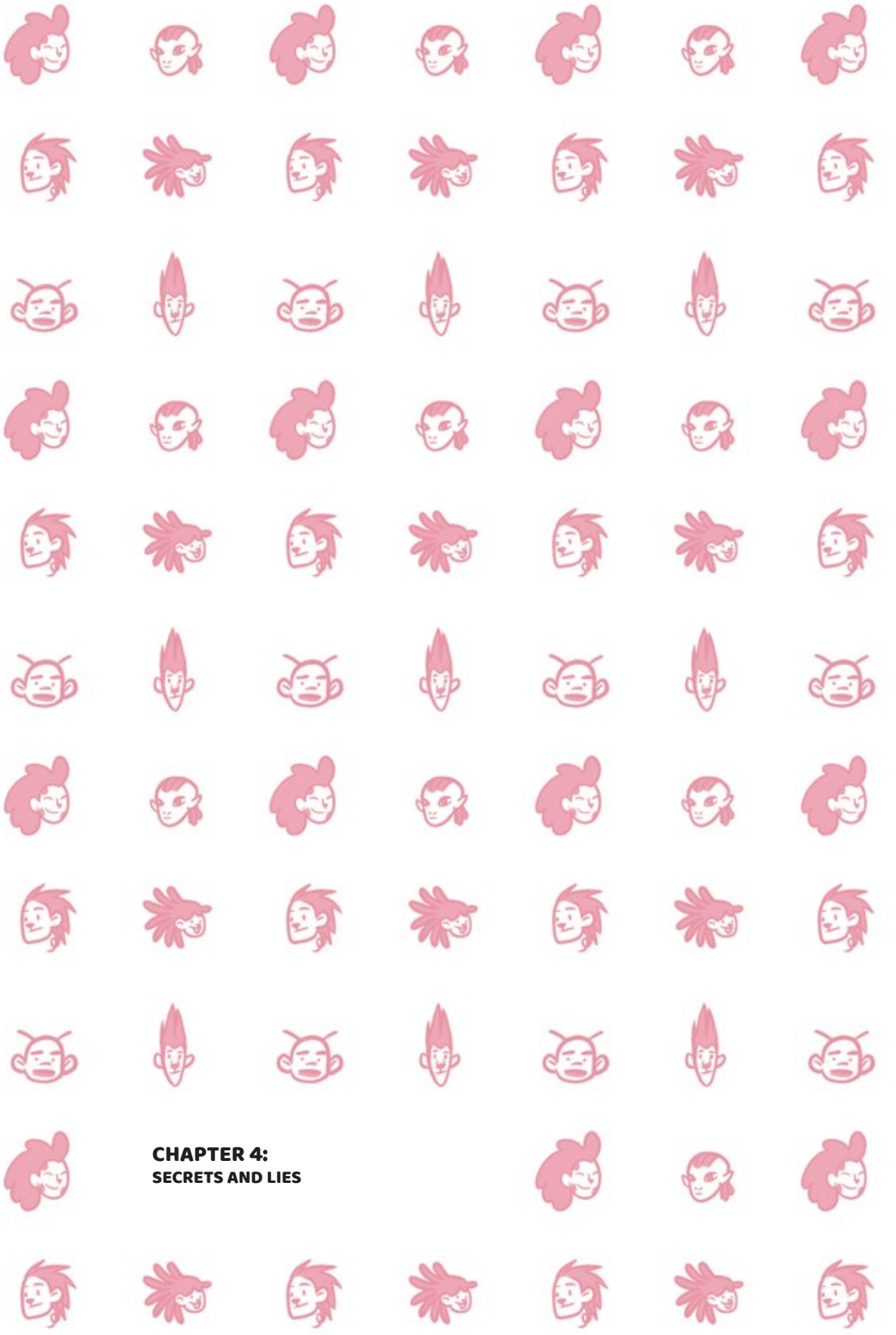

THE ELLIE ...

CHROOCOCCIDIOPSIS

Chroococcidiopsis is a cyanobacteria classified as extremophile, as it can survive in harsh conditions not suitable for other life forms. That is why this cyanobacteria it has been found in the most harsh environments on earth, such as many deserts or in Antarctica.

This resilience capacity has made this cyanobacteria the main candidate to provide Mars with organic matter and has therefore been used for different space experiments during the last two decades. Studies carried out, both in laboratories and in different space expeditions, have demonstrated its ability to cope extreme temperatures, acidity, and salinity, as well as the vacuum and ionizing radiation levels usually founds in space.

Thus, in most of the proposals for terraforming Mars, a first shipment of Chroococcidiopsis is proposed, which through the process of photosynthesis would start to generate oxygen and organic matter. Subsequently, in a second phase, we could send a greater number of species that, in a less aggressive environment, would be able to survive.



CHAPTER 4:
SECRETS AND LIES


HUH?
THEY ARE WAKING UP.
WHAT...?
WHAT ARE YOU DOING?
SHHH, STAY CALM..
YOU HAVE BEEN POKING YOUR NOSE INTO DELICATE MATTERS, WHICH IS NOT A GOOD IDEA ON THIS PLANET.
THIS IS WHERE WE HIDE OUT THE DISSIDENTS THAT COMMANDER ORDERS TO ELIMINATE.
FORTUNATELY, WE WERE ABLE TO GET YOU OUT OF THE BASE UNNOTICED.
YOU WILL BE SAFE HERE.
WHEN THE WORST HAS PASSED, YOU WILL RETURN HOME HIDDEN IN A CARGO SHIP.


IF YOU KNOW THAT CHROOC IS EVIL...
WHY DON'T YOU DO SOMETHING?
WE DO OUR PART TO HELP FROM WITHIN.
REBELLING AGAINST THE COMMANDER AND HER SUBORDINATES WOULD MEAN EXILE...
THAT OR DEATH, ALTHOUGH ON THIS PLANET IT'S THE SAME.
WHAT HAPPENED TO LUCA AND SPIRULINA?
LUCA IS A SURVIVOR. HE HAS BEEN EVADING THE COMMANDER FOR YEARS. HE DOESN'T GET CAPTURED SO EASILY.
NO OFFENSE.
WHATEVER HAPPENS TO SPIRULINA, I AM AFRAID IT IS NOT IN OUR HANDS.

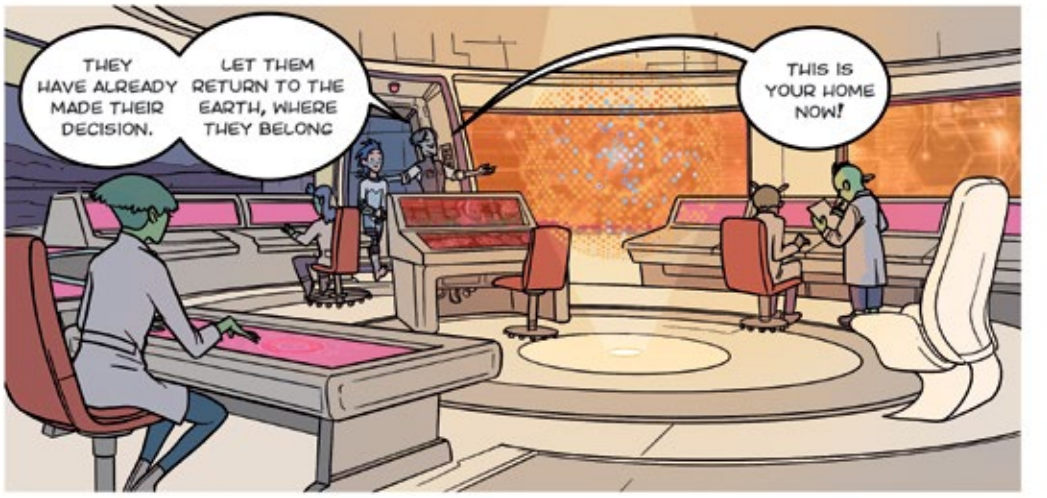

REMEMBER, THIS REMOTE WAREHOUSE IS NOT ON THE MAPS, SO YOU WILL BE OUT OF REACH HERE.

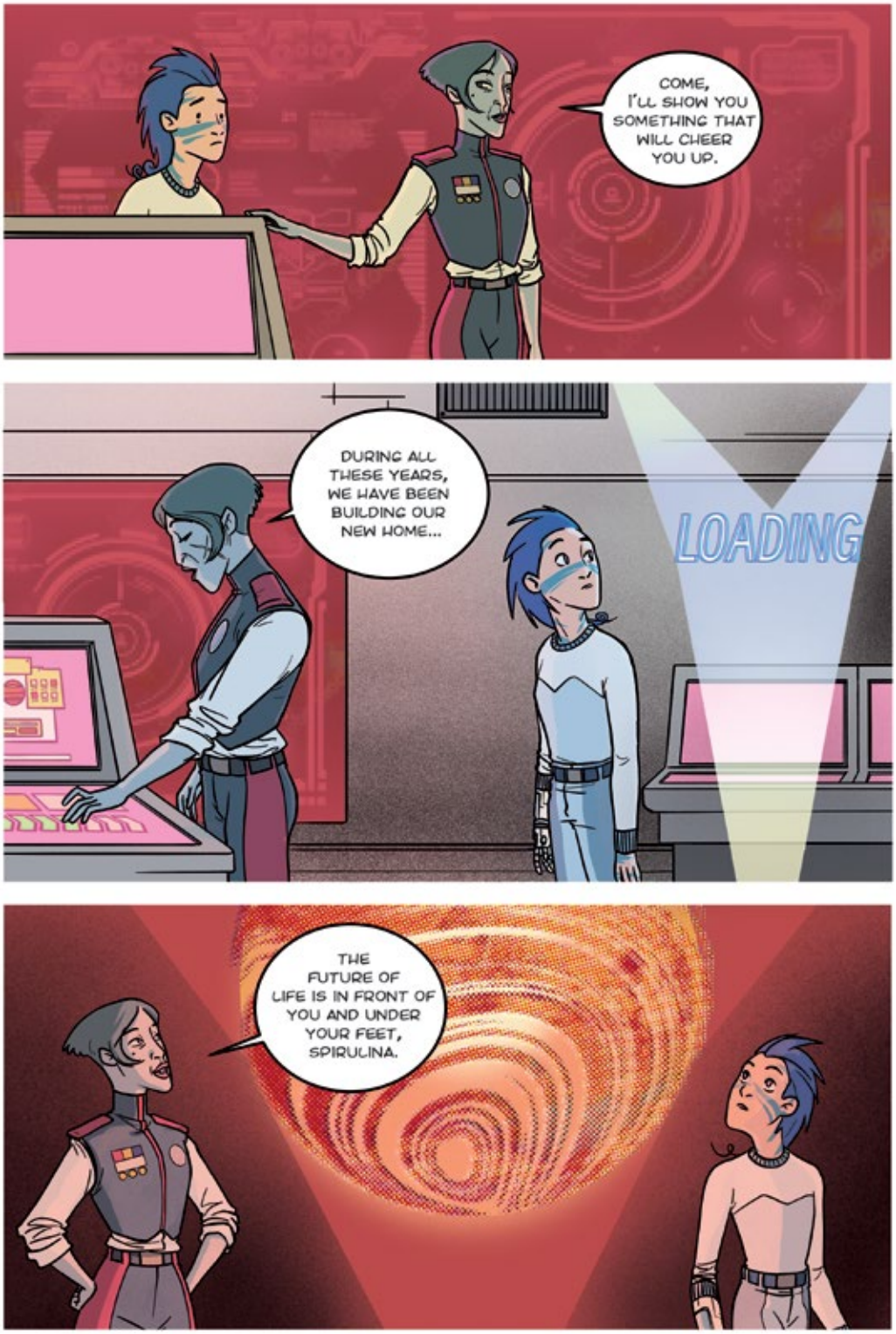

THERE ARE BEDS, FOOD AND WATER. SOON WE WILL RETURN WITH MORE SUPPLIES.
TRYING TO CROSS THIS DESERT WITHOUT PROTECTION WOULD BE A SUICIDE.
MAR-3


RADIATION WOULD KILL YOU BEFORE YOU SET FOOT IN MARINERIS VALLEY.


I CAN'T BELIEVE IT.
HOW COULD THEY LEAVE WITHOUT ME?
I KNOW I SAID SOME HORRIBLE THINGS, BUT...

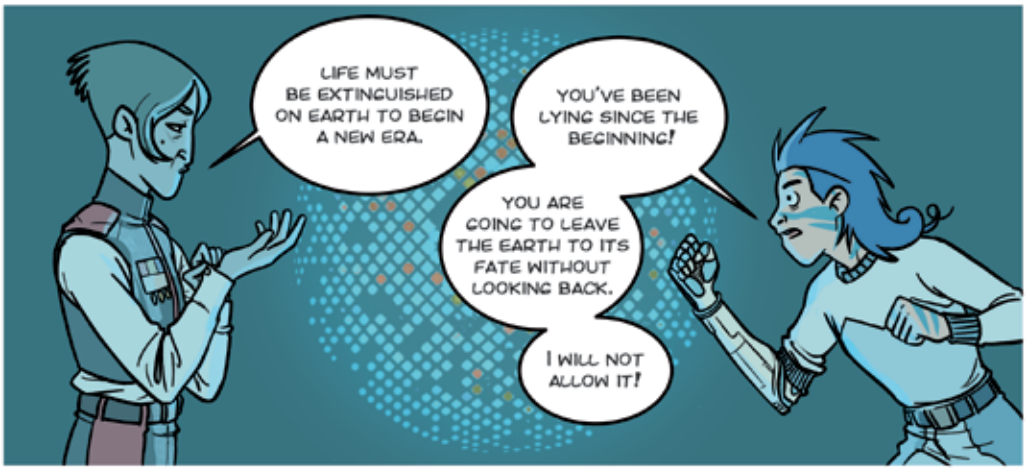

FORGET IT, SPIRULINA.
IT IS CLEAR THAT THEY DO NOT CARE ABOUT YOU...
OR THE IMPORTANCE OF THIS MISSION.


THEY HAVE ALREADY MADE THEIR DECISION.
LET THEM RETURN TO THE EARTH, WHERE THEY BELONG
THIS IS YOUR HOME NOW!


COME, I'LL SHOW YOU SOMETHING THAT WILL CHEER YOU UP.
DURING ALL THESE YEARS, WE HAVE BEEN BUILDING OUR NEW HOME...
LOADING
THE FUTURE OF LIFE IS IN FRONT OF YOU AND UNDER YOUR FEET, SPIRULINA.


MARS IS A NEW BEGINNING FOR THOSE WHO ARE LIKE YOU AND ME. WE DON'T NEED ANYONE ELSE.
IN THIS PLANET, WE GOT RID OF OTHER ANNOYING... SPECIES.
AND WE CAN FINALLY THRIVE.
BUT WHAT ABOUT THE EARTH AND ITS PEOPLE?
EARTH!
A DECREPIT PLANET FULL OF SPECIES LIVING IN BORROWED TIME.
DO YOU REALLY THINK THEY DESERVE THE EFFORTS WE PUT INTO SAVING THEM?


WHAT HAVE THEY DONE ON EARTH TO SAVE THEMSELVES?
NOTHING!
AS WE GAVE OUR LIVES TO THIS MISSION,
WORLD LEADERS CONTINUED TO MAKE MEDIOCRE DECISIONS AND TAKE INSUFFICIENT MEASURES TO ENABLE THEM TO CONTINUE WITH THEIR OUTDATED LIFESTYLES.
IT IS TIME TO ACCEPT THAT THE EARTH'S AND ITS INHABITANT'S TIME IS OVER.
IT IS NOT WORTH CONTINUING TO FIGHT FOR A SICK PLANET THAT DOES NOT TAKE CARE OF ITSELF.
NO!
WHAT WE LEARNED FROM TERRAFORMING WAS SUPPOSED TO BE USED TO REVERSE CLIMATE CHANGE ON EARTH.
TO SAVE WHOM? THE MINORITY THAT DESTROYS THE PLANET OR THE MAJORITY THAT ALLOWS THEIR HOME TO BE DESTROYED?
IF THEY COME HERE, THEY WILL BRING THEIR GREED WITH THEM.
I WILL NOT ALLOW THEM TO DESTROY ALL THAT I HAVE CREATED.


LIFE MUST BE EXTINGUISHED ON EARTH TO BEGIN A NEW ERA.
YOU'VE BEEN LYING SINCE THE BEGINNING!
YOU ARE GOING TO LEAVE THE EARTH TO ITS FATE WITHOUT LOOKING BACK.
I WILL NOT ALLOW IT!


IT'S A SHAME YOU THINK THAT WAY, SPIRULINA.


W...?

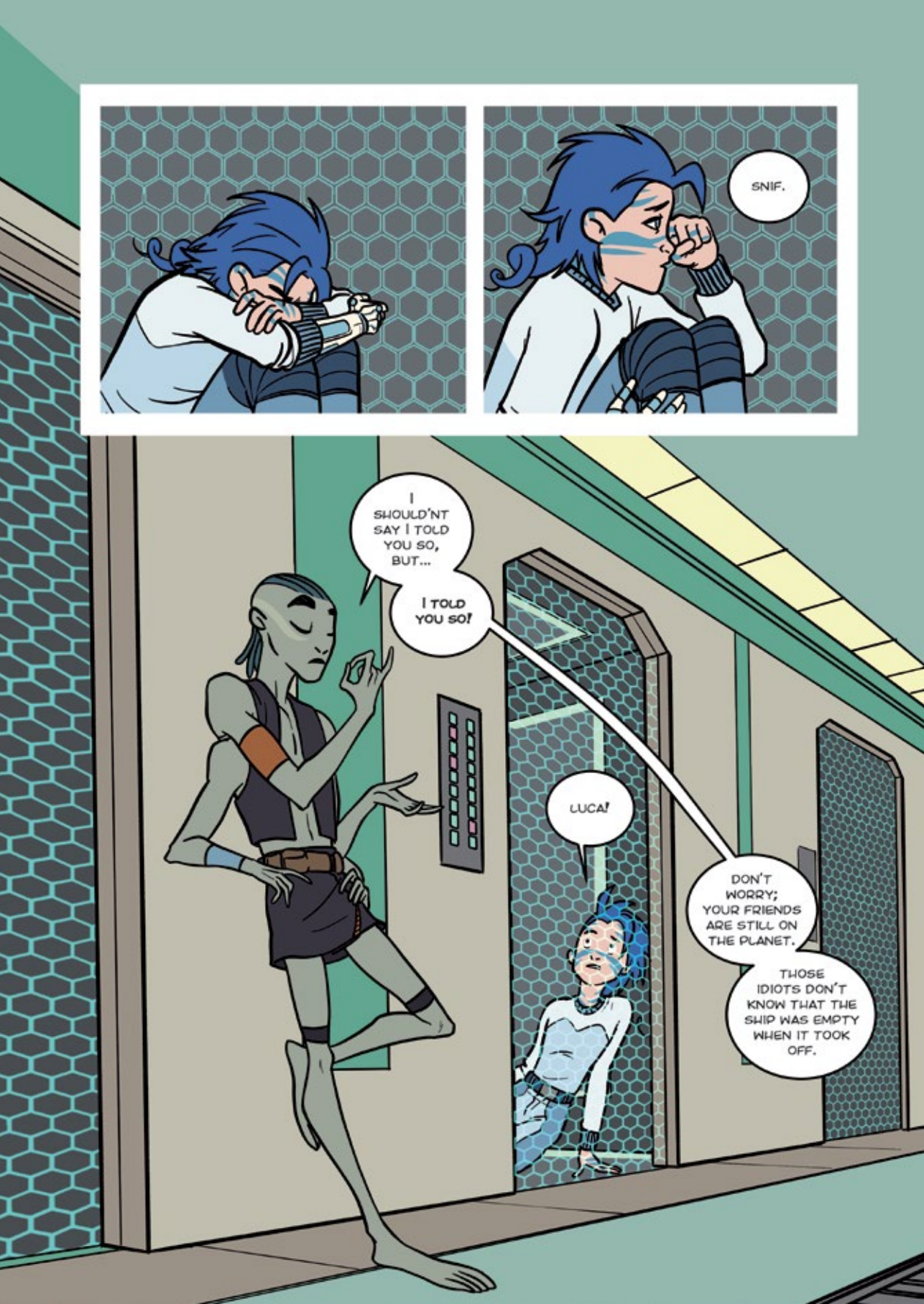

LET ME GO!
MARS IS A FREE PLANET!
MARS IS MINE.


I AM CONFIDENT THAT HAVING TIME TO THINK WILL GIVE YOU THE RIGHT PERSPECTIVE ON THIS MATTER.
FOR YOUR OWN GOOD.

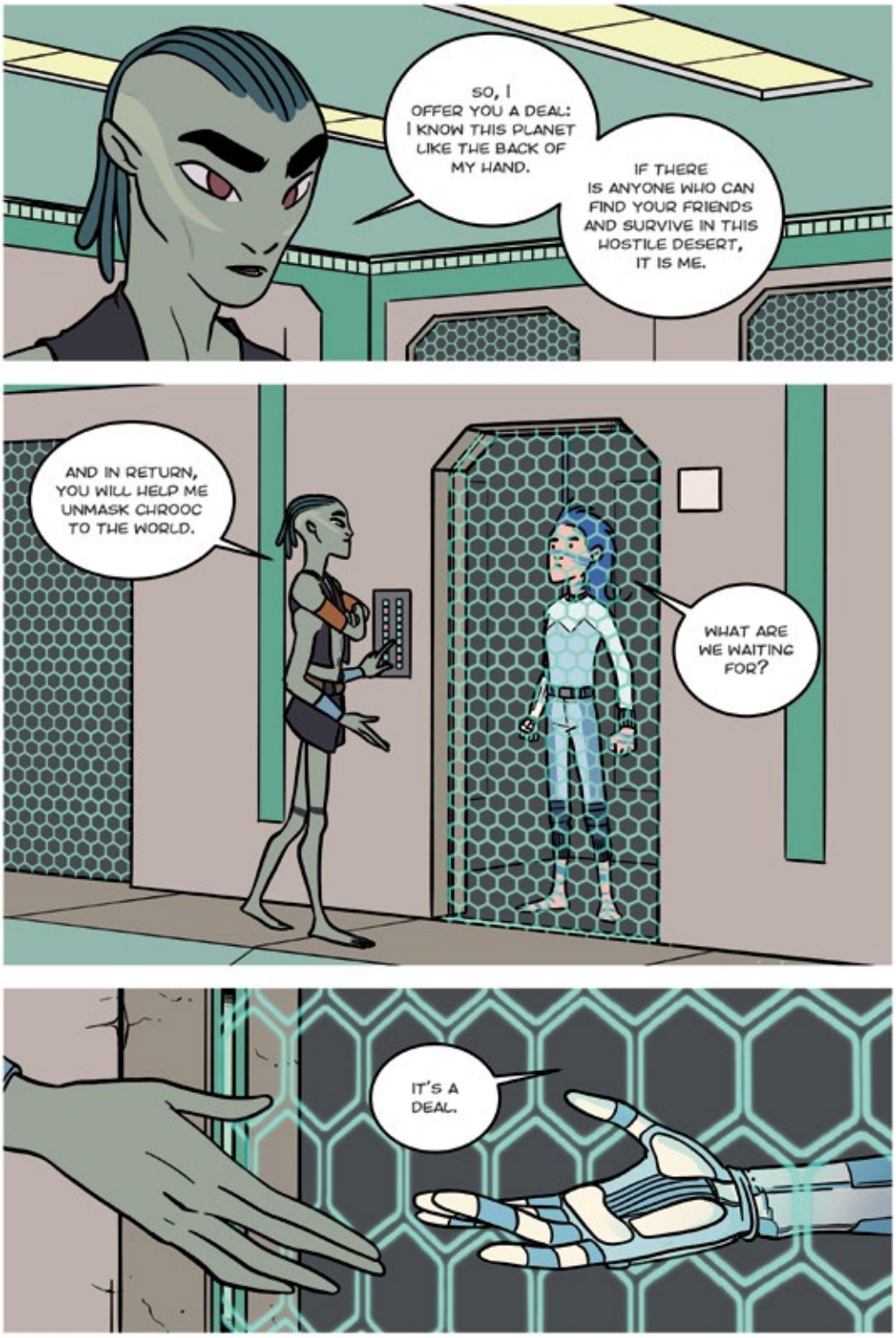

MY FRIENDS WERE RIGHT ABOUT YOU!
TRAITOR!

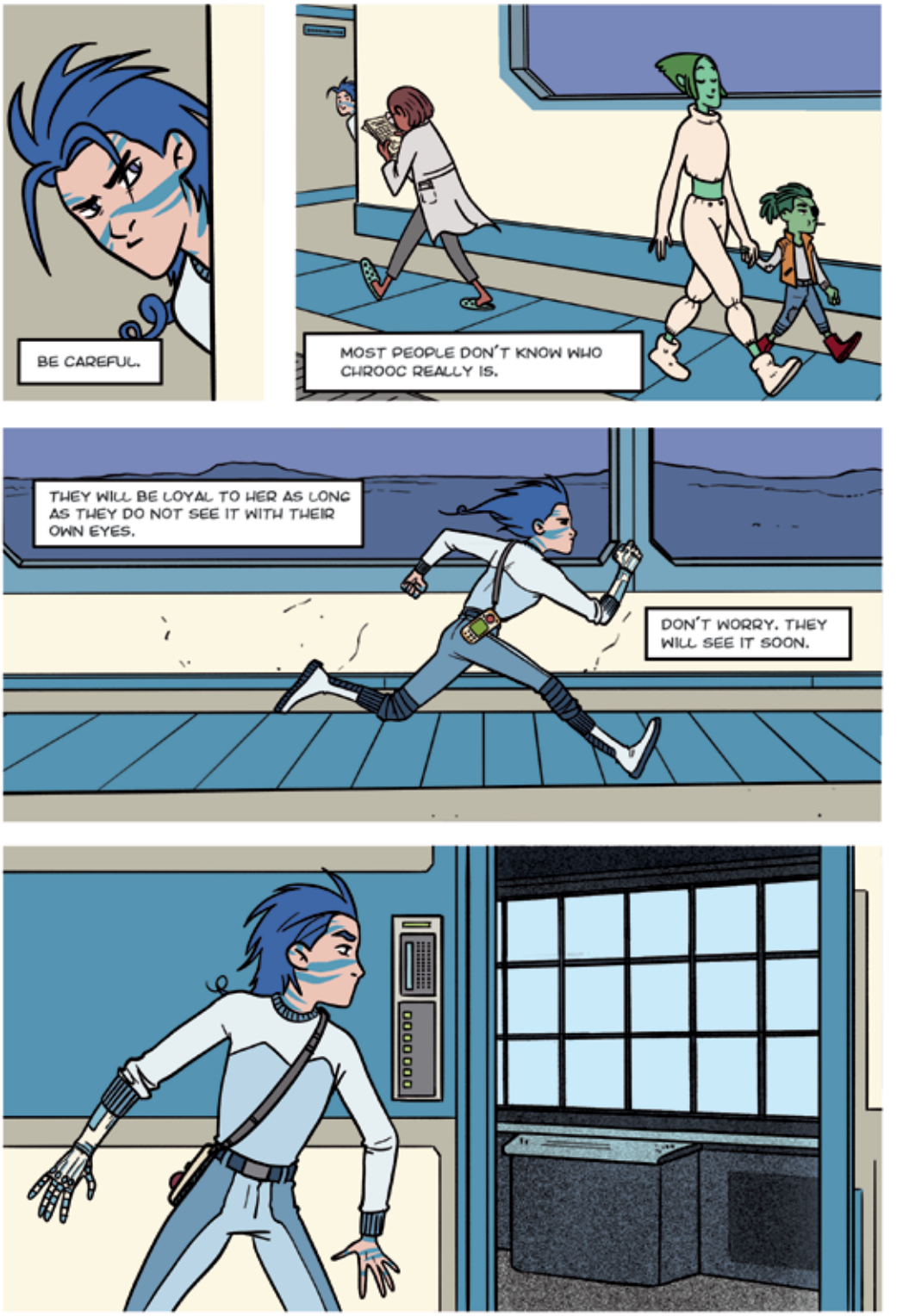

THE TRUTH WILL COME OUT SOONER OR LATER!
THEY WILL COME BACK FOR ME!
THEY WHO? YOUR FRIENDS? HA HA.
THEY'LL BE ROASTING IN THE SUN PRETTY SOON.
HA HA

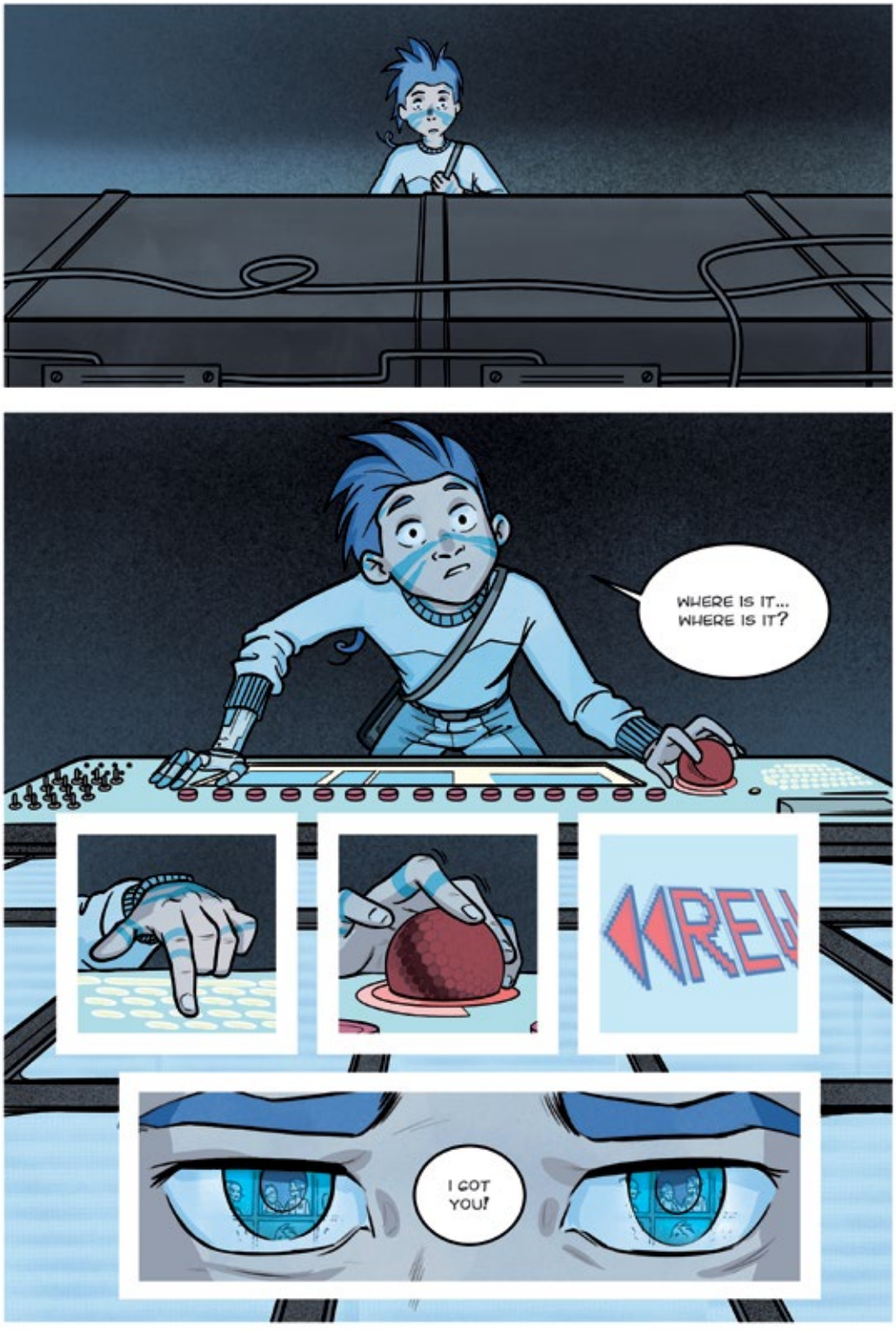

NO!
WHAT HAVE I DONE...?


SNIF.
I SHOULDN'T SAY I TOLD YOU SO, BUT...
I TOLD YOU SO!
LUCA!
DON'T WORRY; YOUR FRIENDS ARE STILL ON THE PLANET.
THOSE IDIOTS DON'T KNOW THAT THE SHIP WAS EMPTY WHEN IT TOOK OFF.

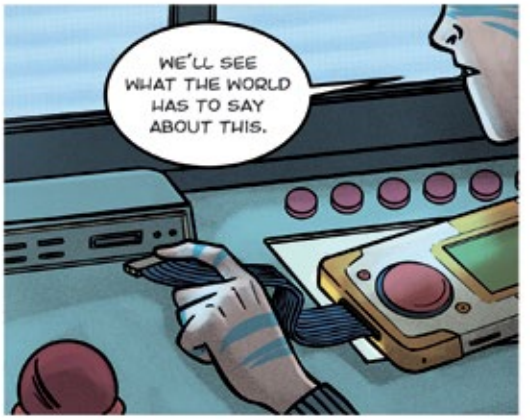

THE NERDY SCIENTISTS HAVE SECRETLY TAKEN THEM TO A SUBSTATION HIDDEN IN THE DESERT.
THEY ARE ALIVE!
HEY, I'M SORRY FOR WHAT HAPPENED. I'LL MAKE IT UP TO YOU.
BUT NOW PLEASE GET ME OUT OF HERE SO I CAN GO GET MY FRIENDS.
SORRY, BUT THAT'S NOT POSSIBLE
YOU COULD NOT REACH THEM EVEN IF YOU KNEW WHERE THEY WERE.
RADIATION OUTSIDE THE VALLEY IS SO HIGH THAT YOU WOULD NOT GET CLOSE TO WHERE THEY ARE HELD BEFORE COLLAPSING AND DYING.

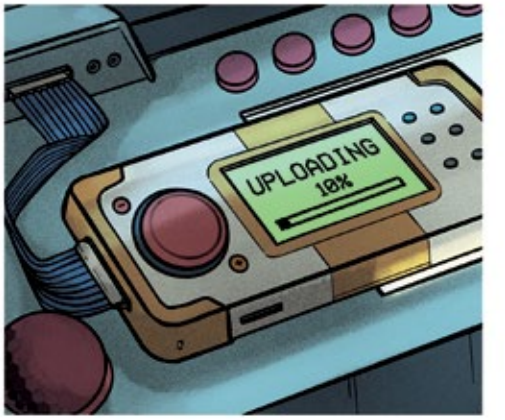

SO, I OFFER YOU A DEAL: I KNOW THIS PLANET LIKE THE BACK OF MY HAND.
IF THERE IS ANYONE WHO CAN FIND YOUR FRIENDS AND SURVIVE IN THIS HOSTILE DESERT, IT IS ME.
AND IN RETURN, YOU WILL HELP ME UNMASK CHROOC TO THE WORLD.
WHAT ARE WE WAITING FOR?
IT'S A DEAL.


BE CAREFUL.
MOST PEOPLE DON'T KNOW WHO CHROOC REALLY IS.
THEY WILL BE LOYAL TO HER AS LONG AS THEY DO NOT SEE IT WITH THEIR OWN EYES.
DON'T WORRY. THEY WILL SEE IT SOON.


WHERE IS IT...
WHERE IS IT?
I GOT YOU!


PLAY
MARS IS A NEW BEGINNING FOR THOSE OF US WHO ARE LIKE YOU AND ME. WE DON'T NEED ANYONE ELSE.
ON THIS PLANET, WE HAVE GOT RID OF OTHER ANNOYING... SPECIES.
AND WE CAN FINALLY THRIVE.


WE'LL SEE WHAT THE WORLD HAS TO SAY ABOUT THIS.


UPLOADING
10%


WELL, WELL, WELL.
LOOK WHAT THE CAT DRAGGED IN...

HAEMATOCOCCUS & PORFIRIDIUM

Haematococcus is a green unicellular freshwater microalgae belonging to the phylum Chlorophyta. It has an ovoid to rounded shape, with two flagella.

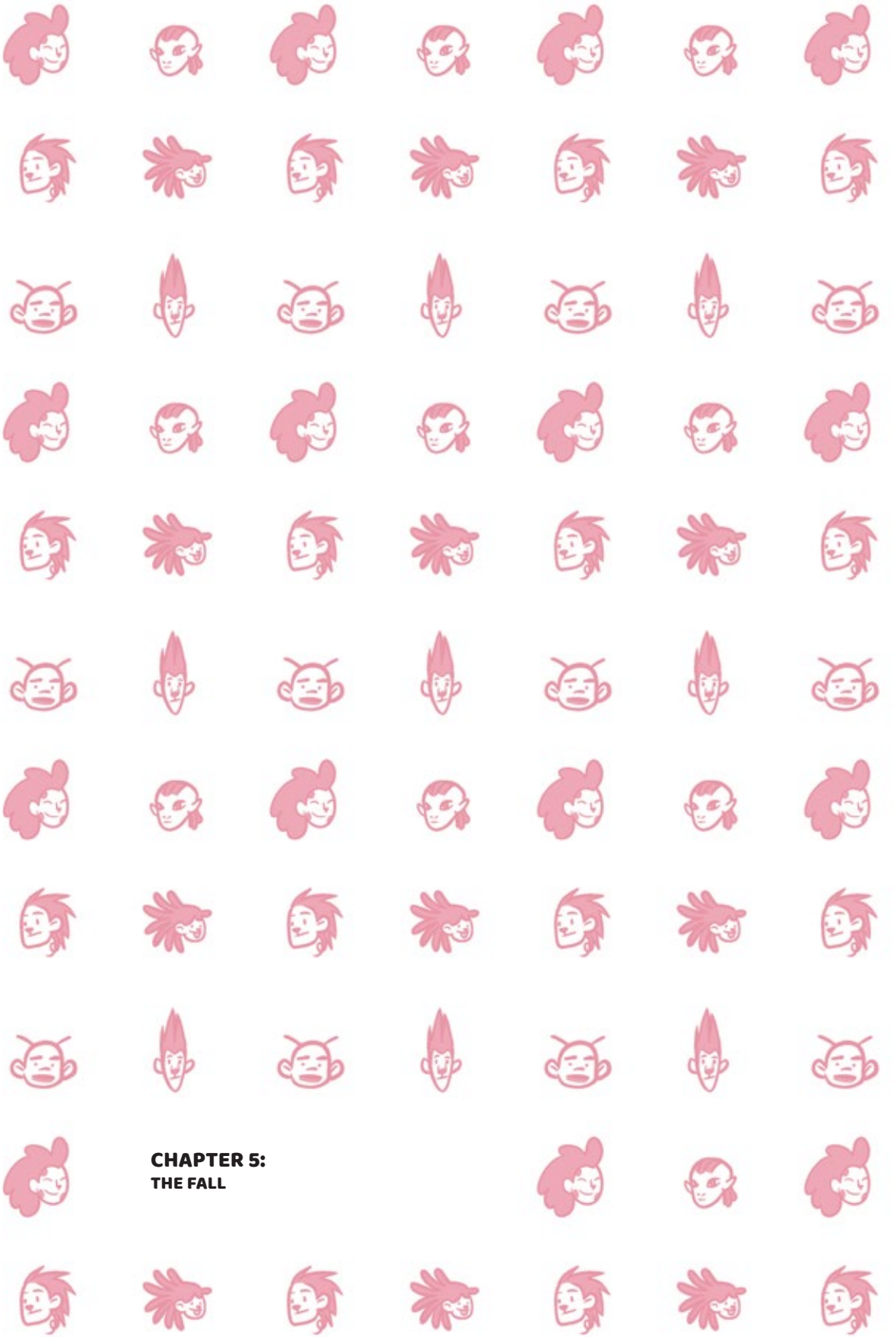
It can survive in unfavourable environments, under extreme conditions of light, temperature and salinity. When it is stressed, it synthesizes a huge amount of reddish-orange pigment known as astaxanthin, a "super antioxidant" photoprotector against UV light that is used in a wide range of applications.

It is also used in aquaculture to provide the reddish-pink colouring of salmon and trout flesh and is responsible for the pinkish colour of flamingo plumage.

Porphyridium is a unicellular marine microalga belonging to the rhodophyte phylum. Its characteristic reddish-pink colour is due to the presence of a pigment called phycoerythrins, which have an antioxidant properties capable of absorbing light energy.

When it is stressed this microalgae releases high molecular weight biopolymers which has antioxidant, anti-inflammatory, and antiviral properties, among others. Another bioactive compound is zeaxanthin, a carotenoid which plays a fundamental role in protecting the skin against light-induced damage.

There are already marketed creams and sunscreens with Porphyridium extract that help prevent cell damage.



CHAPTER 5:
THE FALL


WHOOM


HMMPFF
UFF...
IMPOSSIBLE.
I'M TELLING YOU, THIS DOOR WON'T OPEN.
CRACK
OOPS


HUH?
SO... TAKING A NAP?
L
U
C
A
THE LONGER WE TAKE, THE HIGHER THE RISK FOR SPIRULINA.
PUT ON YOUR ANTI-RADIATION SUITS.
AND LET'S GET ON THE SPEEDER AS SOON AS POSSIBLE.
HMM... IS THAT SPEEDER CONNECTED TO THE ORBITAL NETWORK?

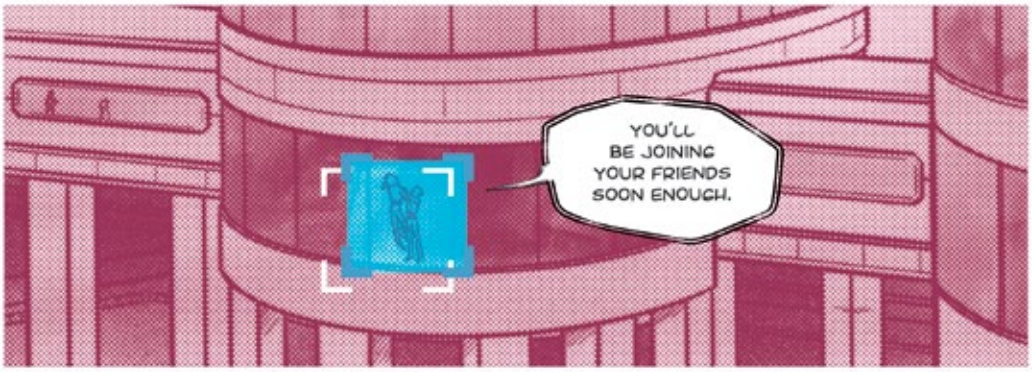

WHAT ARE YOU DOING HERE?
UPLOADING 1.9%
YOU WILL IMMEDIATELY RETURN TO YOUR CELL.
I DO NOT ACCEPT ORDERS FROM A TRAITOR.
PLAFF

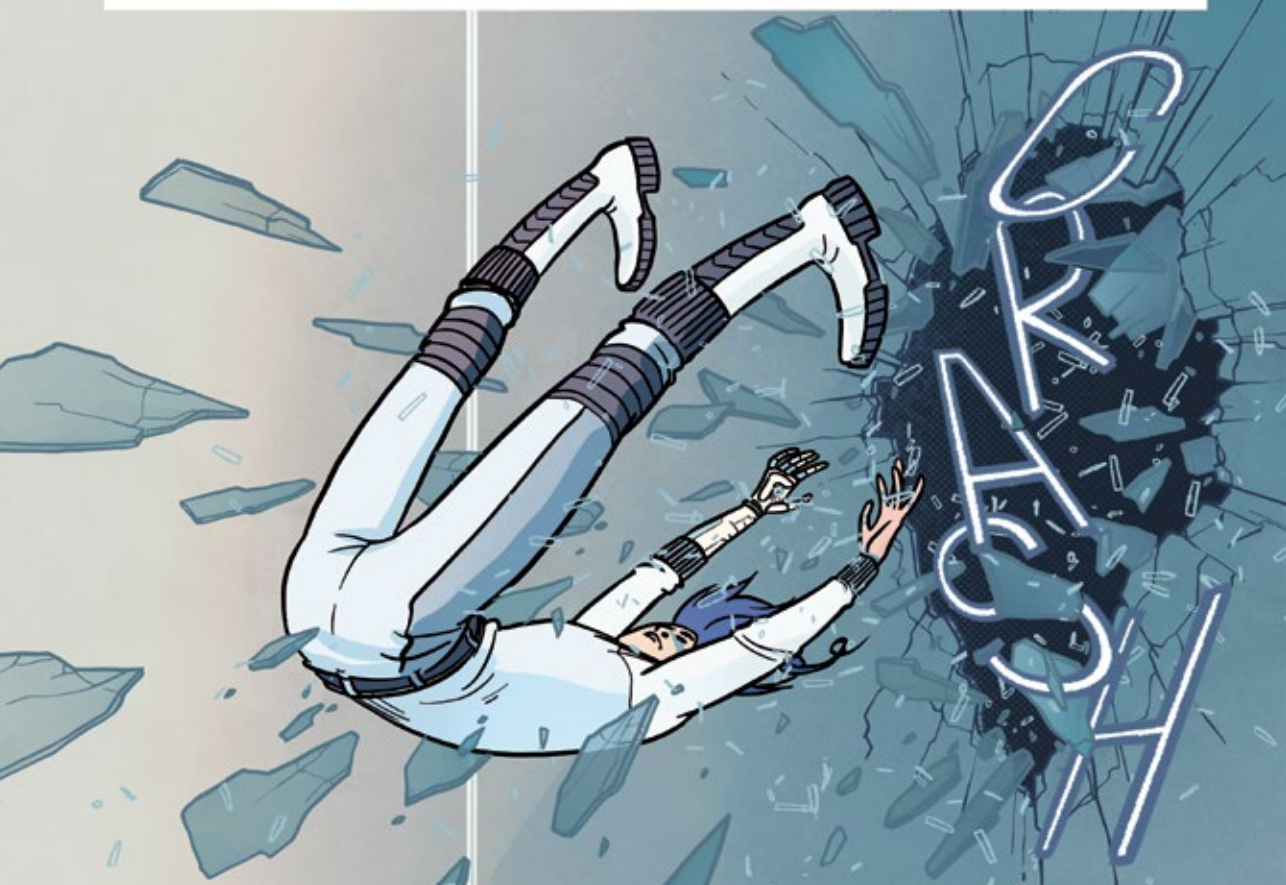

AISH
PUH
GIVE UP, CHROOC.
FINALLY, SOME CUTS!


AAW!
BUT THAT'S NOT ENOUGH TO END ME!
POW
UPLOADING 26%
slam
UPLOADING 27%
AAIEEEC!


I GAVE YOU A CHANCE, AND YOU ARE CHOOSING TO FACE ME?!

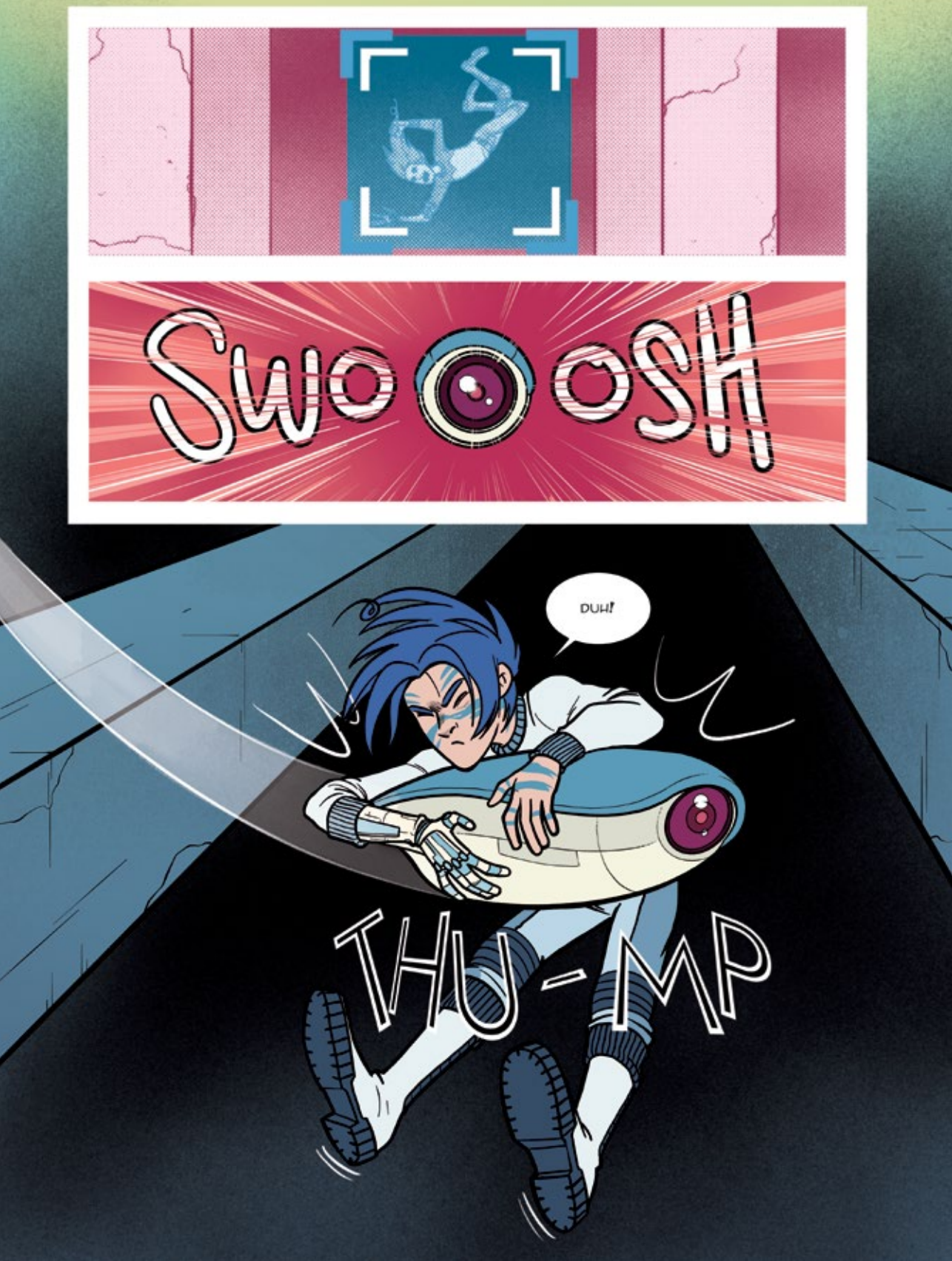

I'VE HAD ENOUGH OF THESE SHENANIGANS.


YOU'LL BE JOINING YOUR FRIENDS SOON ENOUGH.


CRASH


FSSHHHHHH
WHAT A WASTE ...
HUH?
65%


AAH!
NO!

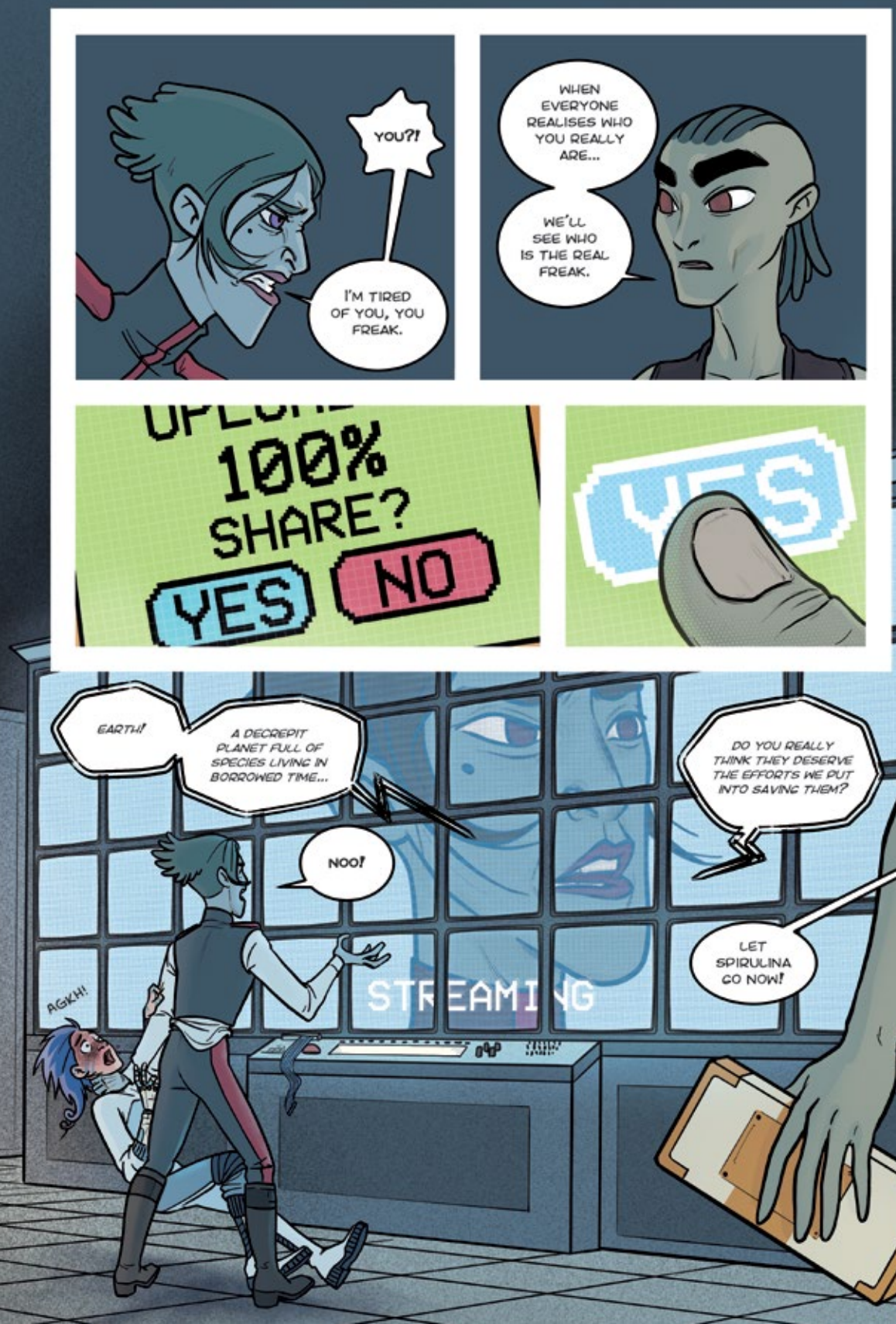

SWOOSH
DUH!
THU-MP

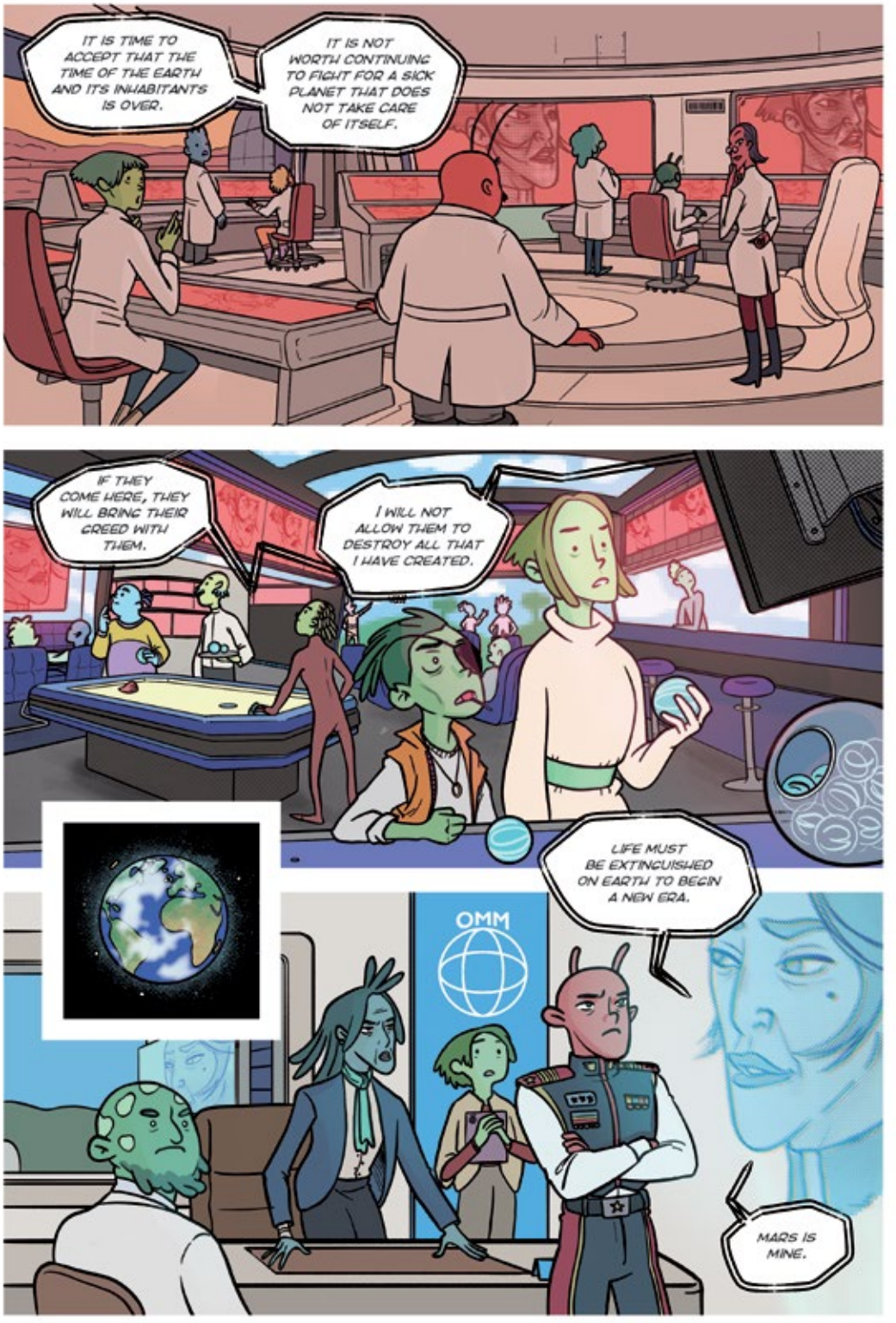

I GOT HER!
GO ON, LUCA!
WASTO?
THAT WAS CLOSE!
QUICK, TAKE ME UP.
SO, THIS WAS THE PLAN...
LOADING 89%
BUMMER.


THUG
SHE'S ALREADY IN.
TO THE VIDEO-SURVEILLANCE ROOM.


STOP THERE!
WHERE DO YOU THINK YOU ARE GOING?
I'LL TAKE CARE OF THIS.
GO ON WITHOUT ME.
SNAP


TAC
TAC
AHEM...
TAC!
WHAT!?
I THINK YOU HAVE DROPPED SOMETHING...
LET HER GO!


YOU?!
I'M TIRED OF YOU, YOU FREAK.
WHEN EVERYONE REALISES WHO YOU REALLY ARE...
WE'LL SEE WHO IS THE REAL FREAK.
100%
SHARE?
YES
NO
YES
EARTH!
A DECREPIT PLANET FULL OF SPECIES LIVING IN BORROWED TIME...
NOO!
DO YOU REALLY THINK THEY DESERVE THE EFFORTS WE PUT INTO SAVING THEM?
LET SPIRULINA GO NOW!
AGKH!
STREAMING


IT IS TIME TO ACCEPT THAT THE TIME OF THE EARTH AND ITS INHABITANTS IS OVER.
IT IS NOT WORTH CONTINUING TO FIGHT FOR A SICK PLANET THAT DOES NOT TAKE CARE OF ITSELF.
IF THEY COME HERE, THEY WILL BRING THEIR GREED WITH THEM.
I WILL NOT ALLOW THEM TO DESTROY ALL THAT I HAVE CREATED.
LIFE MUST BE EXTINGUISHED ON EARTH TO BEGIN A NEW ERA.
OMM
MARS IS MINE.


BAH!
DO YOU THINK THIS MATTERS AT ALL?
I'M NOT GOING ANYWHERE.


THIS PLACE BELONGS TO ME!
AND I WILL PREVAIL OVER EVERYONE! I AM MARS!
I AM-


POW


I TOLD YOU, LET SPIRULINA GO!


IT WORKED!
THEY ARE ON THEIR WAY!


ARE YOU OKAY?
NOW I AM.


THE MERIT HAS BEEN ALL OURS, TRUTH TO BE TOLD...
WE ALL HAVE FAMILY ON EARTH, YOU KNOW?
COME ON MOVE!
YOU WILL HAVE TO GIVE MANY EXPLANATIONS.

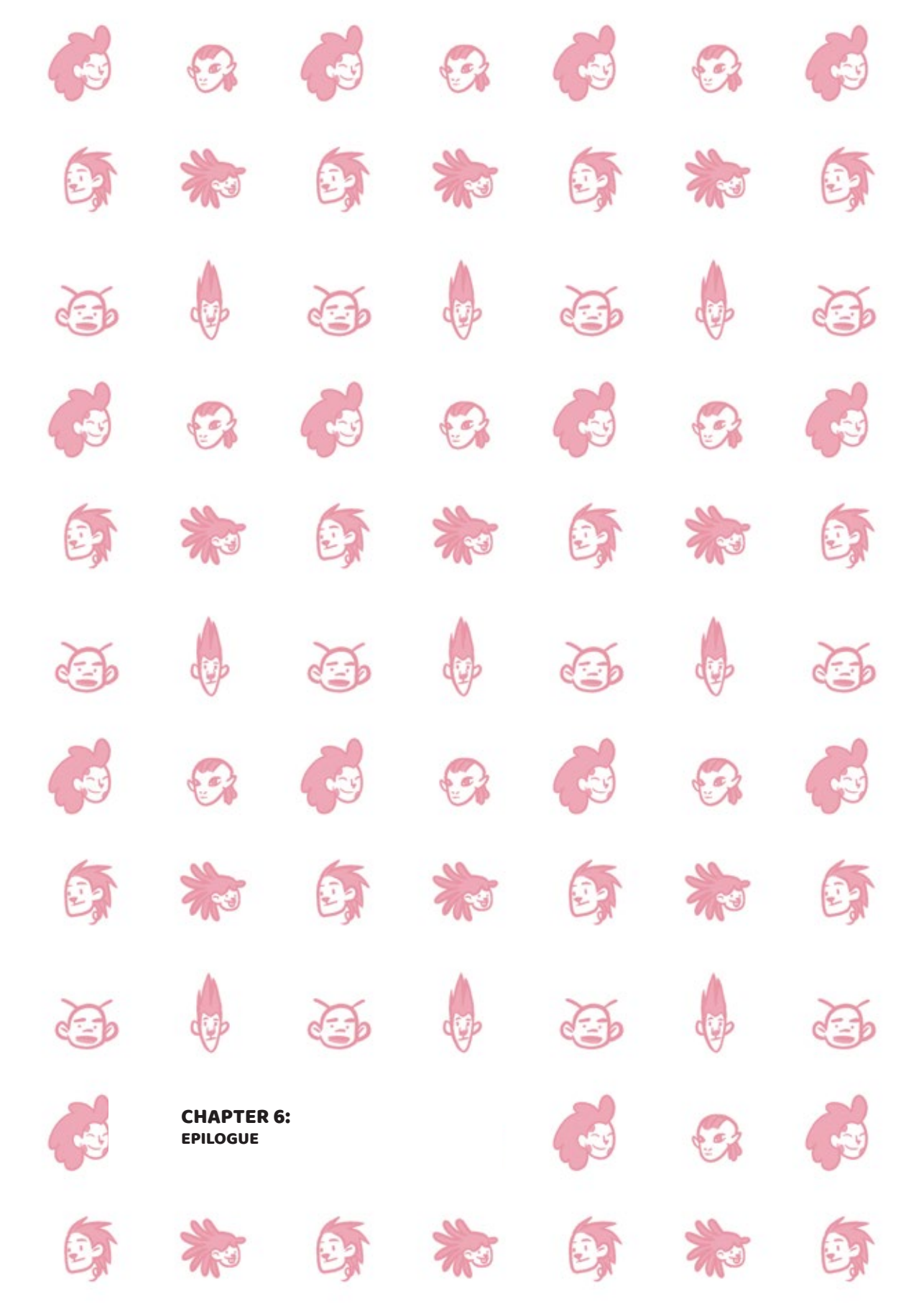
TERRAFORMING

Terraforming is the application of scientific and technological processes that will transform an uninhabitable planet into a world very similar to Earth, where humans can live without special spacesuits and where it can generate an ecosystem like Earth.

It is not easy, as any planetary process requires enormous amounts of energy and time. A possible starting point would be to begin by terraforming small parts, such as the underground volcanic caves and the great Marineris Valley Depression on Mars. Another option is to establish floating cities in the clouds of Venus, and then move on to the entire planet.

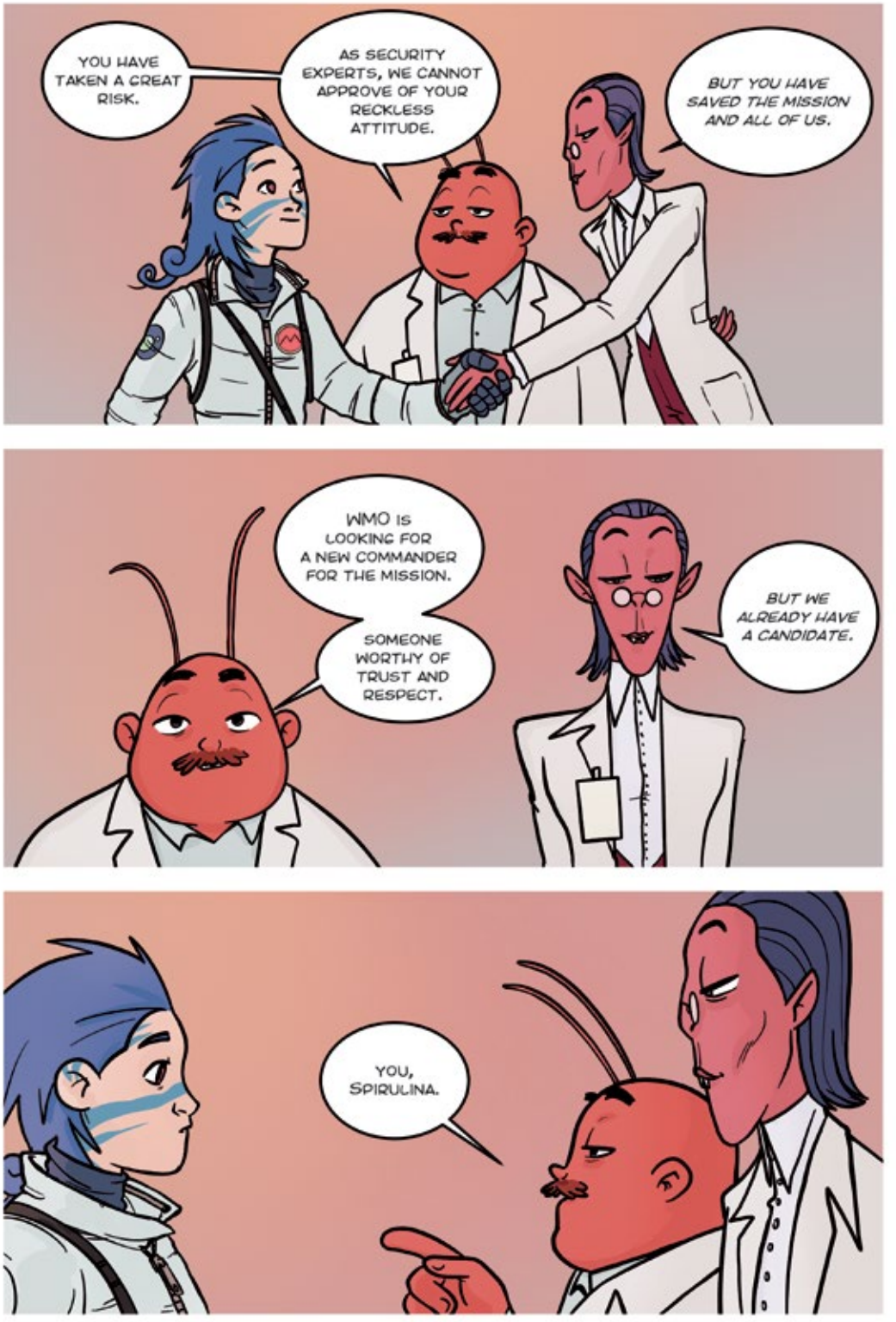
It is paramount to generate an atmosphere that allows the presence of water in liquid form. Subsequently, introduce live species capable of generating an atmospheric composition that allows breathing , and finally, the organism such as lichens necessary to generate soil and the rest of the ecosystem.

It may seem like science fiction, but the human species can already generate these changes, not on other planets yet, but on Earth. As an example, global warming due to human activities is already changing the soil-atmosphere system, increasing temperature, raising sea level, or acidifying the oceans... If we are already doing this on our planet, even by mistake, nothing prevents to doing so on other planets.

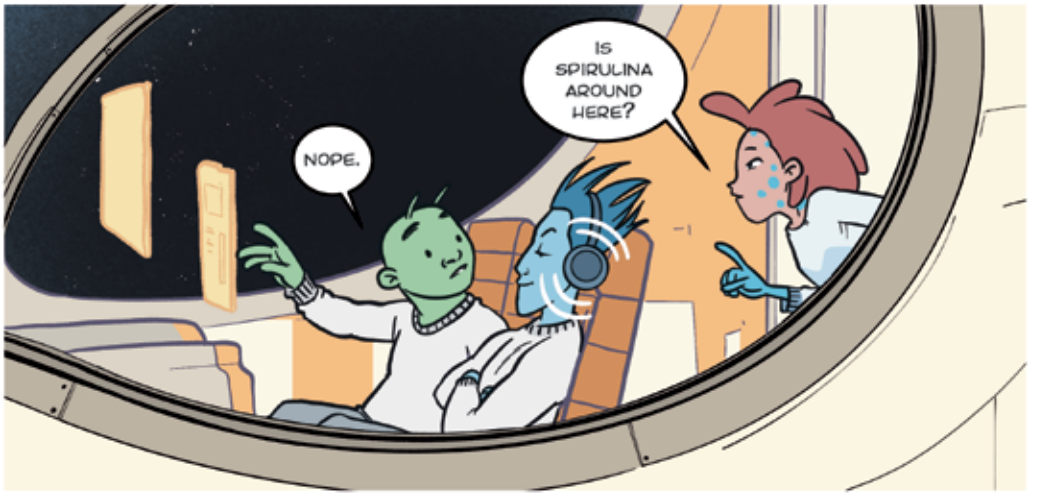


CHAPTER 6:
EPILOGUE


NOW, MY PEOPLE WILL BE ABLE TO RETURN HOME.
AND MARS IS AGAIN A FREE PLANET.
I DON'T KNOW HOW TO THANK YOU...
EXIT
AND YOU WILL ALWAYS HAVE A PLACE AMONG US.
WE COULD USE AN ESCAPE ARTIST EXPERT IN RESCUE MISSIONS.
MAYBE SOMEDAY ...
I KNOW WE HAD A BAD START, BUT...
COME HERE!
PLAS PLAS

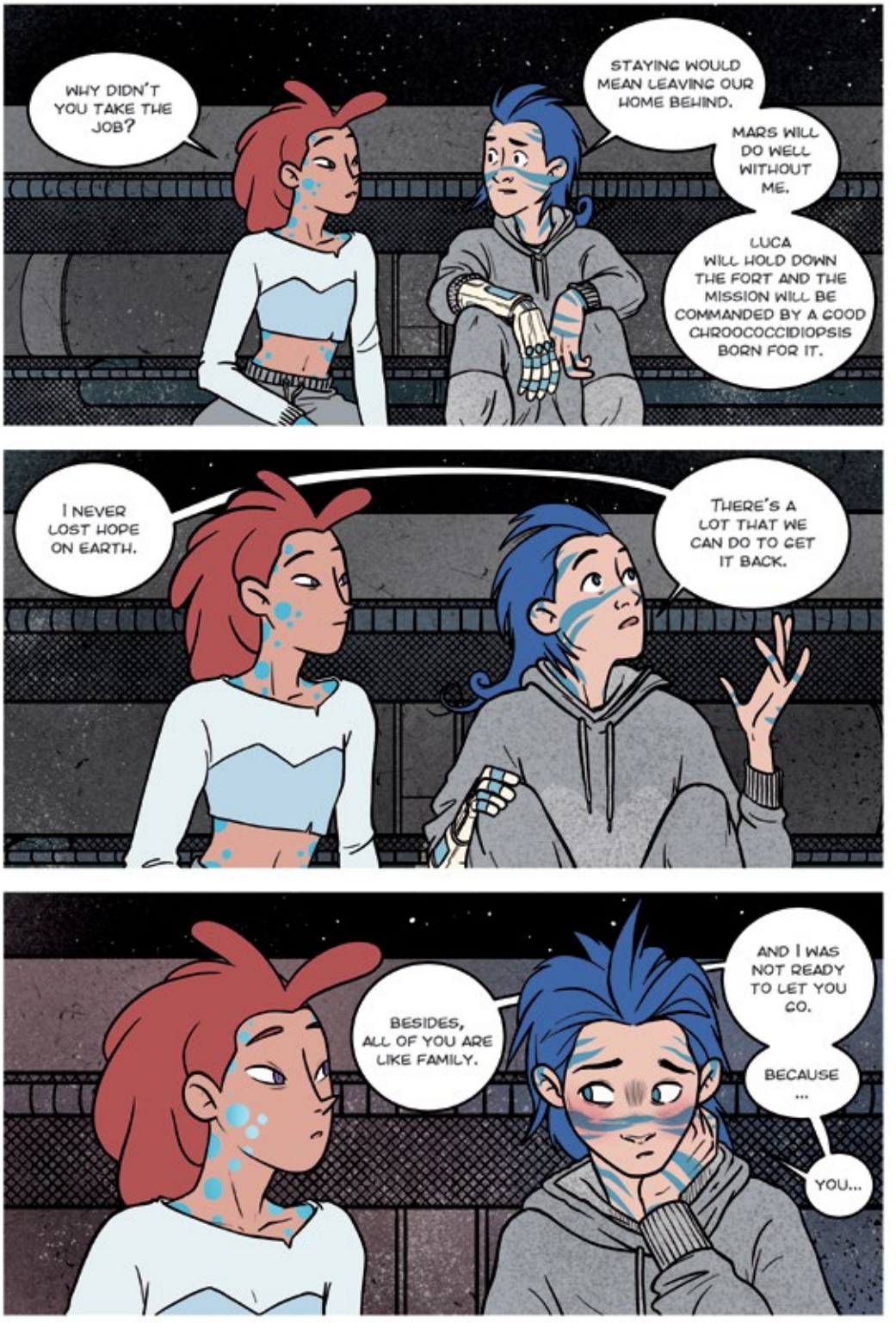

YOU HAVE TAKEN A GREAT RISK.
AS SECURITY EXPERTS, WE CANNOT APPROVE OF YOUR RECKLESS ATTITUDE.
BUT YOU HAVE SAVED THE MISSION AND ALL OF US.
WMO IS LOOKING FOR A NEW COMMANDER FOR THE MISSION.
SOMEONE WORTHY OF TRUST AND RESPECT.
BUT WE ALREADY HAVE A CANDIDATE.
YOU, SPIRULINA.

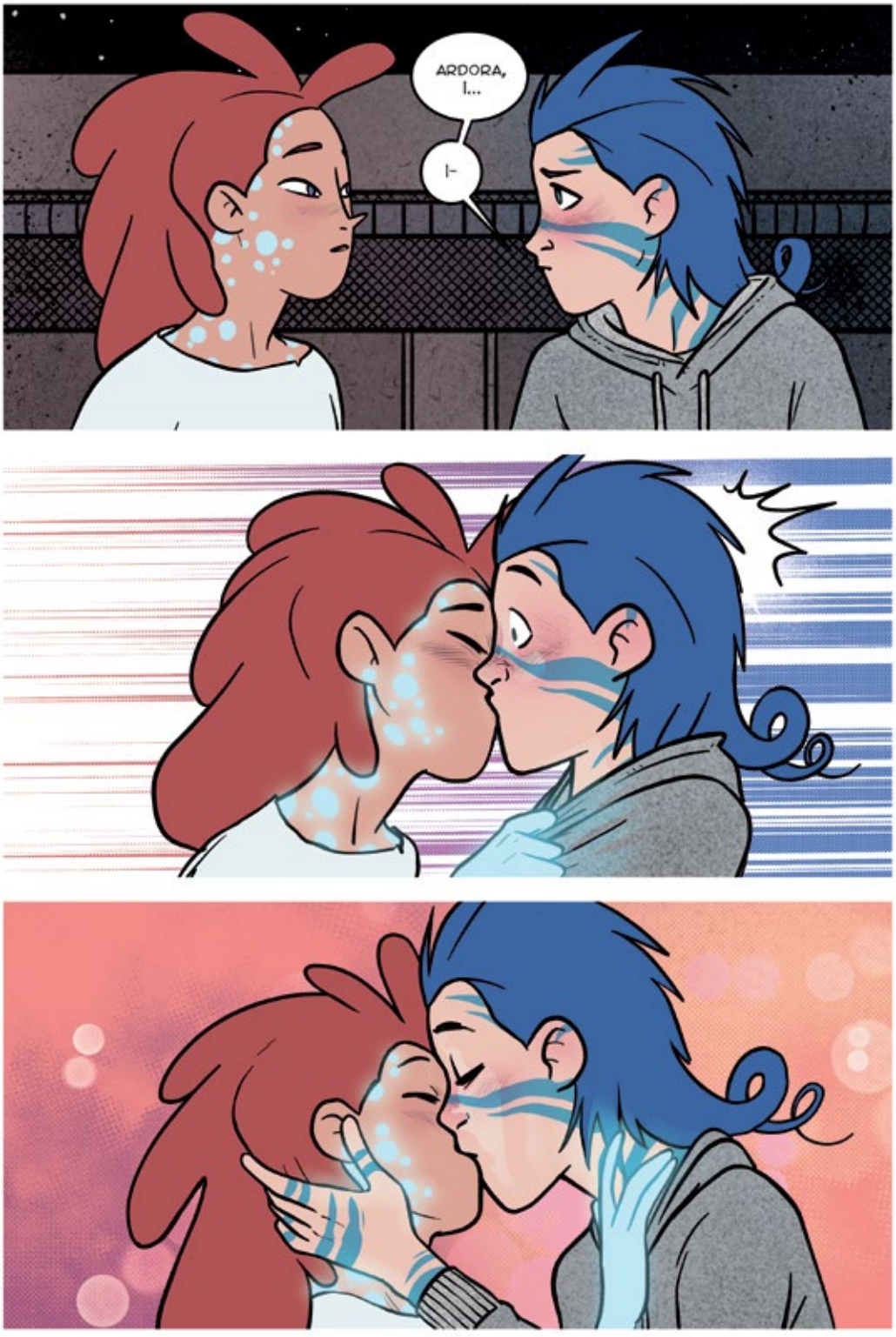

ME?
WE BELIEVE YOU ARE THE RIGHT ONE TO LEAD THIS MISSION AND FACE THE CHALLENGE OF ESTABLISHING A NEW RELATIONSHIP OF MUTUAL RESPECT WITH LUCA AND HIS PEOPLE.
THE ONLY TRUTH SAID BY COMMANDER WAS THAT THIS MISSION NEEDS YOU.
I DON'T KNOW WHAT TO SAY.
I...

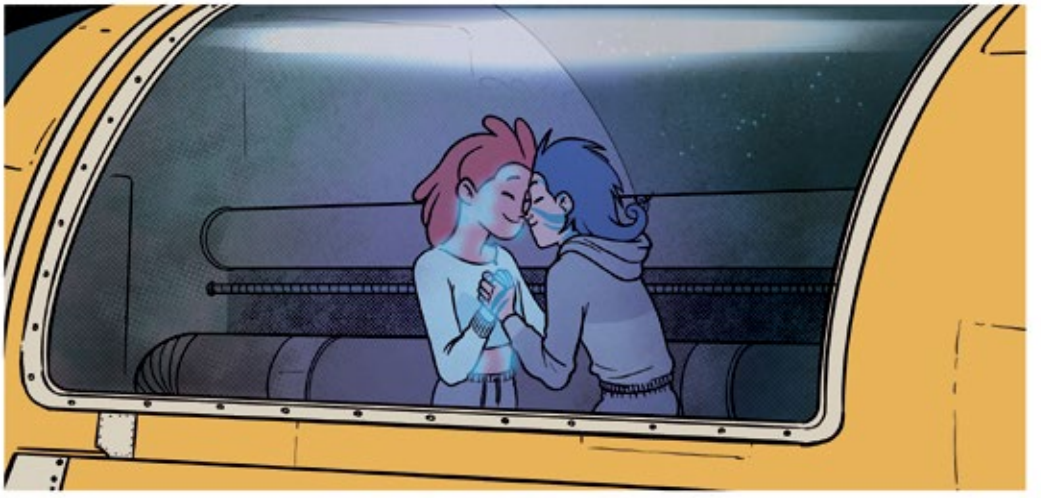


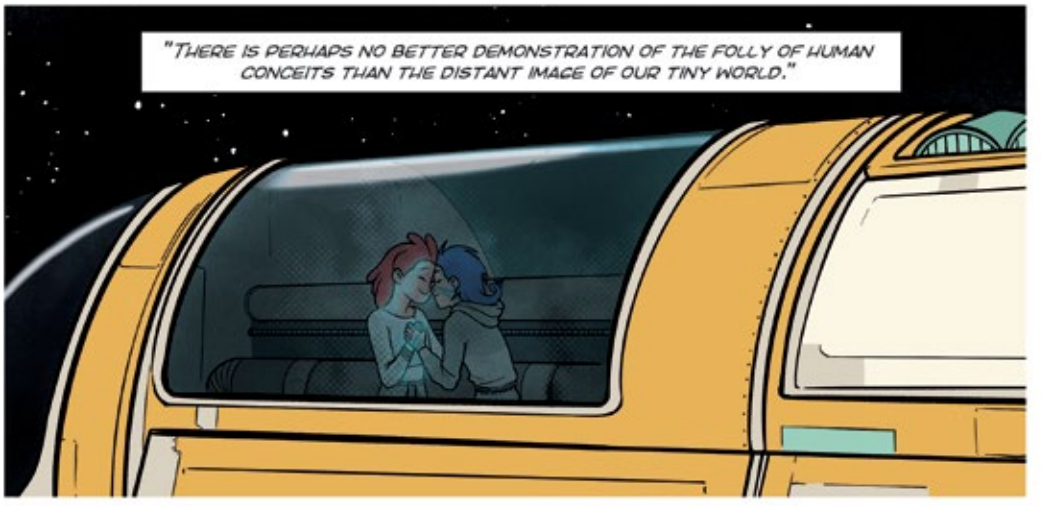
* EXTRACT FROM THE BOOK "*A PALE BLUE DOT: A VISION OF THE HUMAN FUTURE IN SPACE*" BY CARL SAGAN.

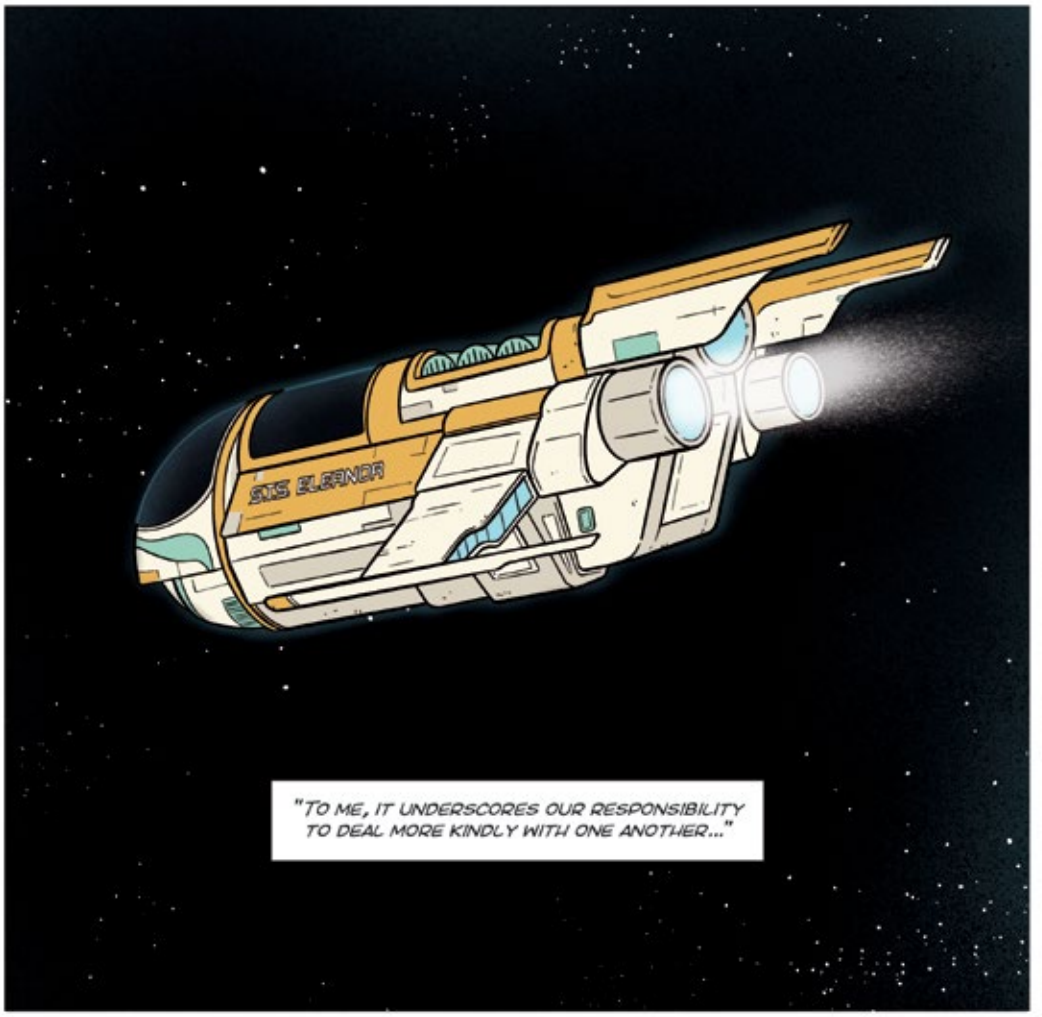

HERE YOU ARE.
IS EVERYTHING OK?
YES, I WAS TAKING ONE LAST LOOK.
I WILL MISS IT.


WHY DIDN'T YOU TAKE THE JOB?
STAYING WOULD MEAN LEAVING OUR HOME BEHIND.
MARS WILL DO WELL WITHOUT ME.
LUCA WILL HOLD DOWN THE FORT AND THE MISSION WILL BE COMMANDED BY A GOOD CHROOCOCCIDIOPSIS BORN FOR IT.
I NEVER LOST HOPE ON EARTH.
THERE'S A LOT THAT WE CAN DO TO GET IT BACK.
BESIDES, ALL OF YOU ARE LIKE FAMILY.
AND I WAS NOT READY TO LET YOU GO.
BECAUSE ...
YOU...

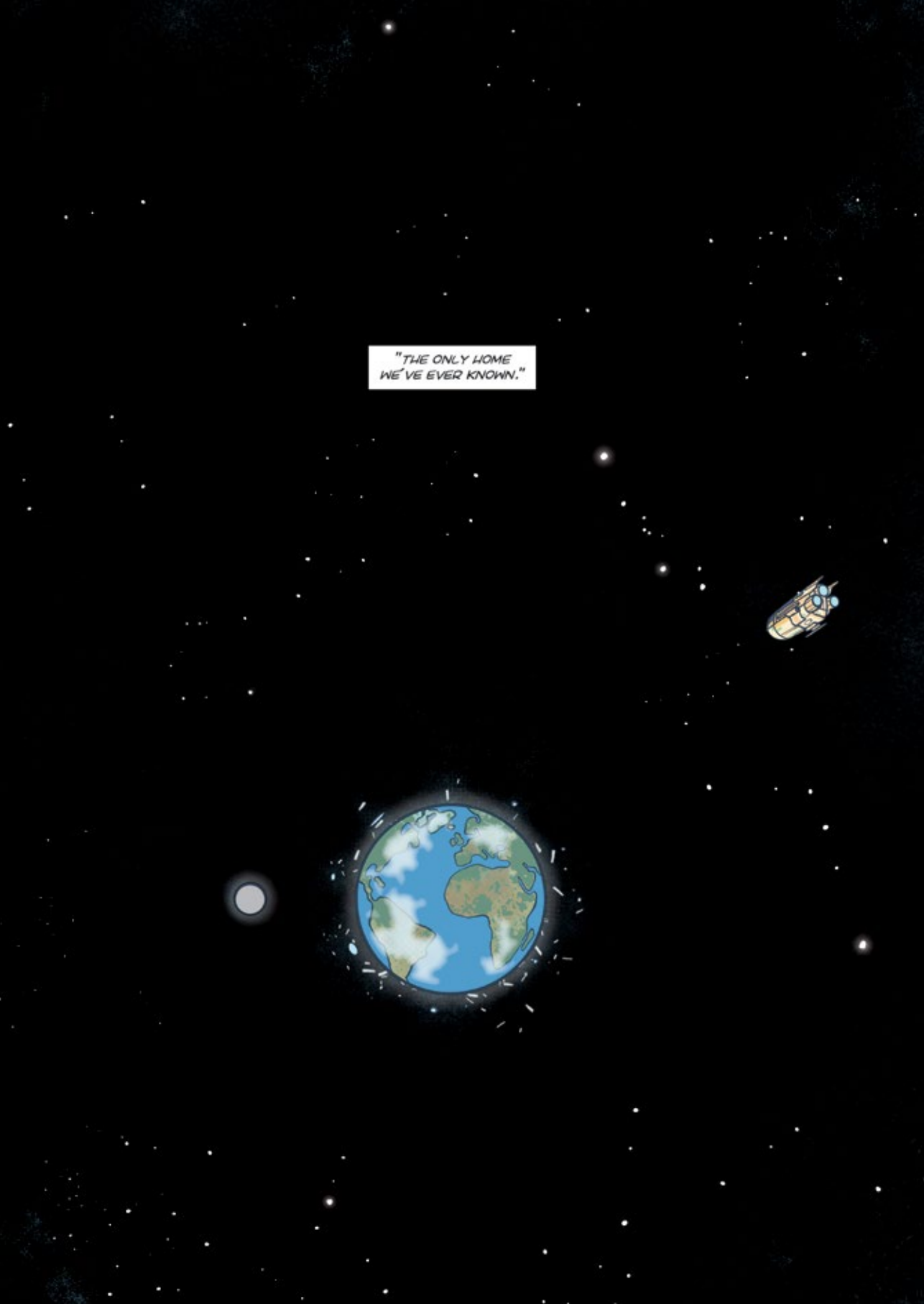

ARDORA, I...
I-




"There is perhaps no better demonstration of the folly of human conceits than the distant image of our tiny world."


SNS ELEANOR
"TO ME, IT UNDERSCORES OUR RESPONSIBILITY TO DEAL MORE KINDLY WITH ONE ANOTHER..."


"AND TO PRESERVE AND CHERISH THE PALE BLUE DOT,"


"THE ONLY HOME
WE'VE EVER KNOWN."


THE
END

THE FUTURE OF THE EARTH

Our planet as we know it and the future that we dream of are in danger.

The UN 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, aims a shared blueprint for peace and prosperity for people and the planet, The 17 Sustainable Development Goals (SDGs) are an urgent call for actions by all countries in a global partnership. They recognize that ending poverty and other deprivations must go together with strategies that improve health and education, reduce inequality, and enhance economic growth – all while tackling climate change and working to preserve our oceans and forests.

Progress has being made in many places, but overall, actions to achieve the SDGs is not yet progressing at the speed and scale needed.

The increasing global population parallels increasing global food demands, a current food security issue. Achieve the protein requirements of humans by 2050 will be a major challenge soon. Moreover, food waste and food-processing effluents pose a huge environmental threat due to their large volume generated annually.

Microalgae have an increasing interest and play an important role in various sectors because of their potential to contribute to the circular economy. Simultaneously food-processing wastewater treatment and its use to grow microalgae biomass to produce proteins, pigments, carotenoids, omega-3 fatty acids, and as a source of clean energy: biodiesel, biogas, and bioethanol is already happen. The significance of microalgae also arises from their abilityto consume CO_2, which is the main greenhouse gas and the major contributor to climate change.

Science has an indispensable role to play in accelerating progress towards all the Sustainable Development Goals. In this regard, progress is being made on more sustainable aquaculture and agriculture and on waste valorisation. New alternative sources of protein, such as micro and macroalgae, insects, microbial protein, or cultured meat, are being proposed as a result of an advances in biotechnology in the last decade.

So, the future will be determined by the way we act. Choose Your Issue. Make An Impact. Act Now!

https://www.un.org/es/actnow

SUSTAINABLE DEVELOPMENT GOALS

MICRO ALGAE
BEYOND EARTH