STEAM Tales

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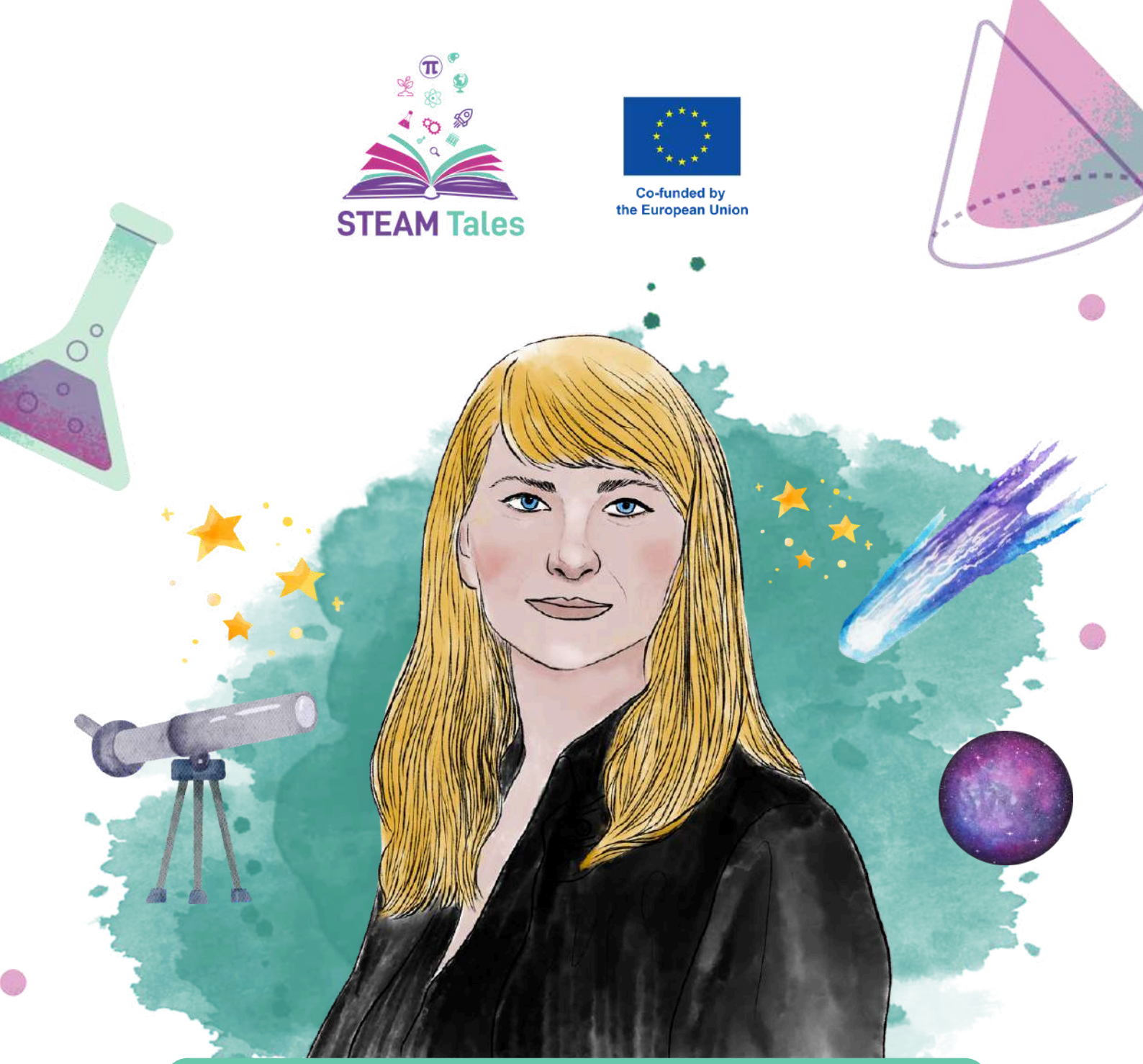

Stories of inspiring women in STEAM:

Andreja Gomboc

Prepared by GoINNO

GoINNO

Project Title

STEAM Tales – Enhancing STEAM education through storytelling and hands-on learning (KA220-HE-23 -24-161399)

Work Package

WP3 - STEAM Tales resources and stories of women in STEAM
A1: Women in STEAM role models and stories development

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Partners

MIND (Germany)

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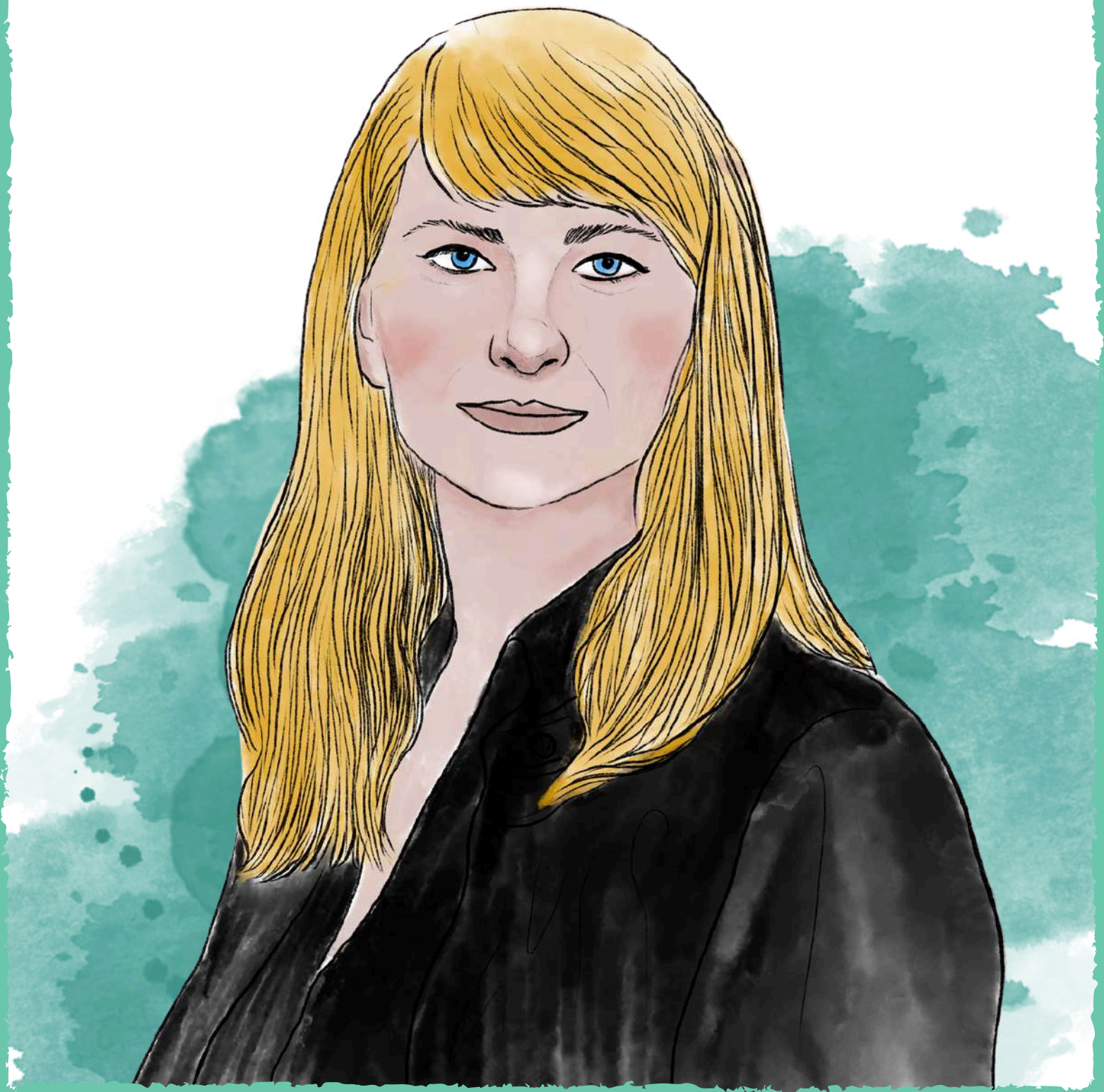
Universidade do Porto (Portugal)

LogoPsyCom (Belgium)

Andreja Gomboc: A professional stargazer



Endless plains and infinitive Universe

Andreja was born and raised in Prekmurje, a special part of Slovenia known for its endless plains. Away from the pollution of city lights, with the cleanest air, the crystal-clear night sky was right within Andreja's reach ever since she was a little girl.

The ever-changing moon, bright stars, and our Milky Way were always there to accompany her in the long winter evenings and sleepless nights.

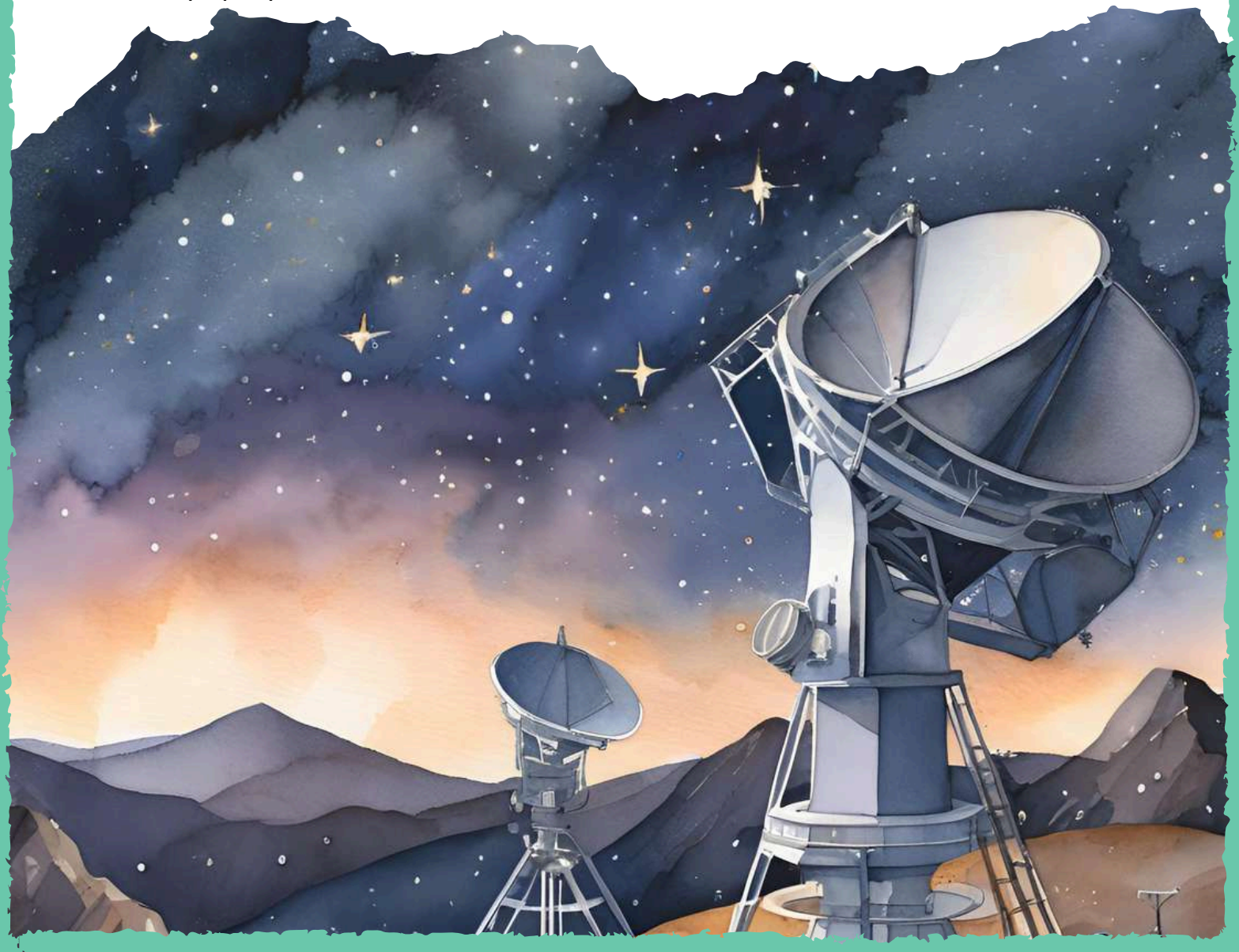
The sky, full of stars, made Andreja curious. She started asking herself exciting questions: Where do we come from? What more can we discover? Her passion for astronomy was probably born right then and there – on her quest to find answers to all of those big questions, she turned to her fellow companion, the night sky. She became more and more interested in the infinitive dimensions of the Universe.

Question for children:

Do you like stargazing? What do you feel and wonder when you look into a sky full of stars?

From physics to astrophysics, from Earth to Space

Andreja's mother and father were very supportive parents who did not restrict Andreja when it came to her interests. Despite the supportive environment and the fact that her fascination with everything connected to space grew, she just could not find, at least not just yet, the courage to study astrophysics (the study of stars, moon, planets and other things we can find in the Universe by applying the laws of physics). Her hesitation was also due to a lack of role models; she did not know of any astrophysicists, and this whole field of study was just starting to develop in Slovenia. All this led to her decision to study a more familiar and known territory, physics.



She was very much fascinated with the fact that although they are far, and I mean really far away from us, we can still find a way to get to know so much about those little bright dots in the sky that we call stars. She was studying hard and was just about to end her studying period with her final work, when her professor, who knew about her fascination with everything connected to space, suggested a theme for her final work about stars and black holes. She enthusiastically accepted his proposition and thus, in her mid-twenties, her journey into space began – not literally with a rocket, but through books, theory, and research.

Explanation for children:
Did you know that we can learn a lot about space without ever going on a rocket mission? We can study our Universe from Earth and people have been doing this since the beginning of civilisations.

The secret of black holes

Only now was she able to gather the courage to fully immerse herself into something she was truly passionate about and she could not stop studying – there was just so much more to discover, to learn, to research; the possibilities were as endless as the Universe itself.

The topic that especially caught Andreja's attention was the question of what happens with stars that fall into a black hole.

Explanation for children:
Black holes are these special places in the Universe that we cannot see with our eyes because even light cannot get out of them. And stars that are near these places act differently; black holes can even tear them apart, and that is precisely what Andreja is researching. Much like a detective, she is always on the lookout for other clues (like light) that can tell us that a particular star is near the black hole.

To find out more about stars and black holes, you need very special equipment. All these things are so far away that you can't see them with your eyes or even with a telescope.

That is why Andreja decided to leave her home country, Slovenia and continue to study in England, a place where astrophysics is a well-developed field and offers far better equipment to observe black holes and stars (and other events that Andreja finds particularly interesting). But access to equipment was not the only thing she gained from studying abroad. She had a chance to work with many other experts from all over the world who shared their knowledge with her and others. That's when Andreja realised that being a scientist means working as a team. The best ideas often come when people work together, not alone.

Question for children:

If a teacher gives you a task, do you like to do it in a group with your schoolmates or do you prefer doing it by yourself? What do you think the benefits of working in a group are?

The dilemma

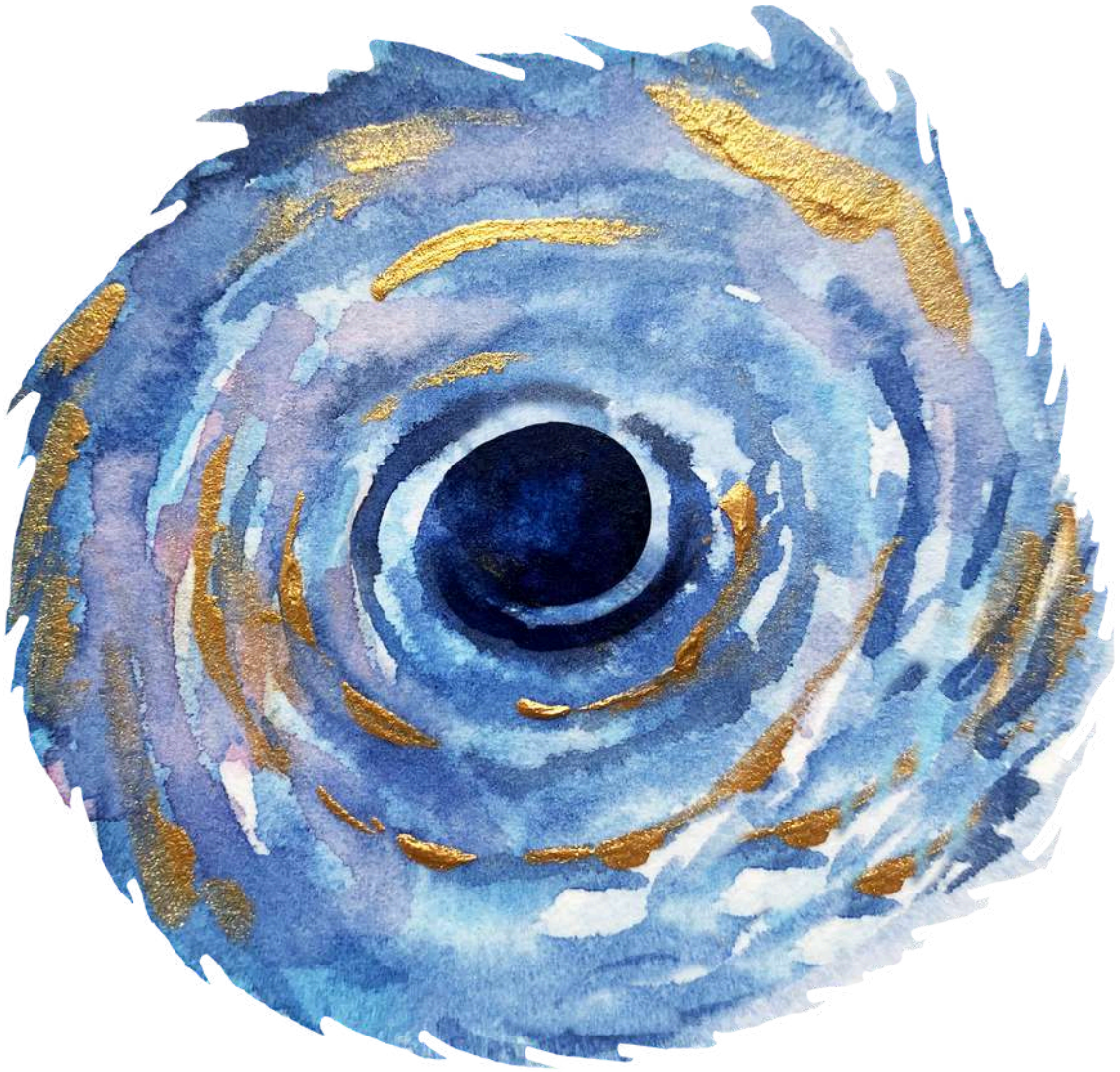
After spending some time abroad, discovering new things, and forming important connections with her colleagues, she wanted to move to her homeland. Together with her family, she returned to Slovenia. But then some challenges occurred…

She wanted to continue exploring black holes and stars, but for Andreja to do this, she would need to have access to some really big and really expensive telescopes. This kind of equipment is so expensive that only a few countries in the world can afford it, and little Slovenia is unfortunately not one of them. So, what is Andreja to do? She has a family in Slovenia, she enjoys living there and being surrounded by beautiful nature.

But on the other hand, she enjoys discovering all that is still to be discovered about black holes, stars, and this mysterious place that we call the Universe just as passionately as ever. She does not want to give up her work and career but she also does not want to leave Slovenia.

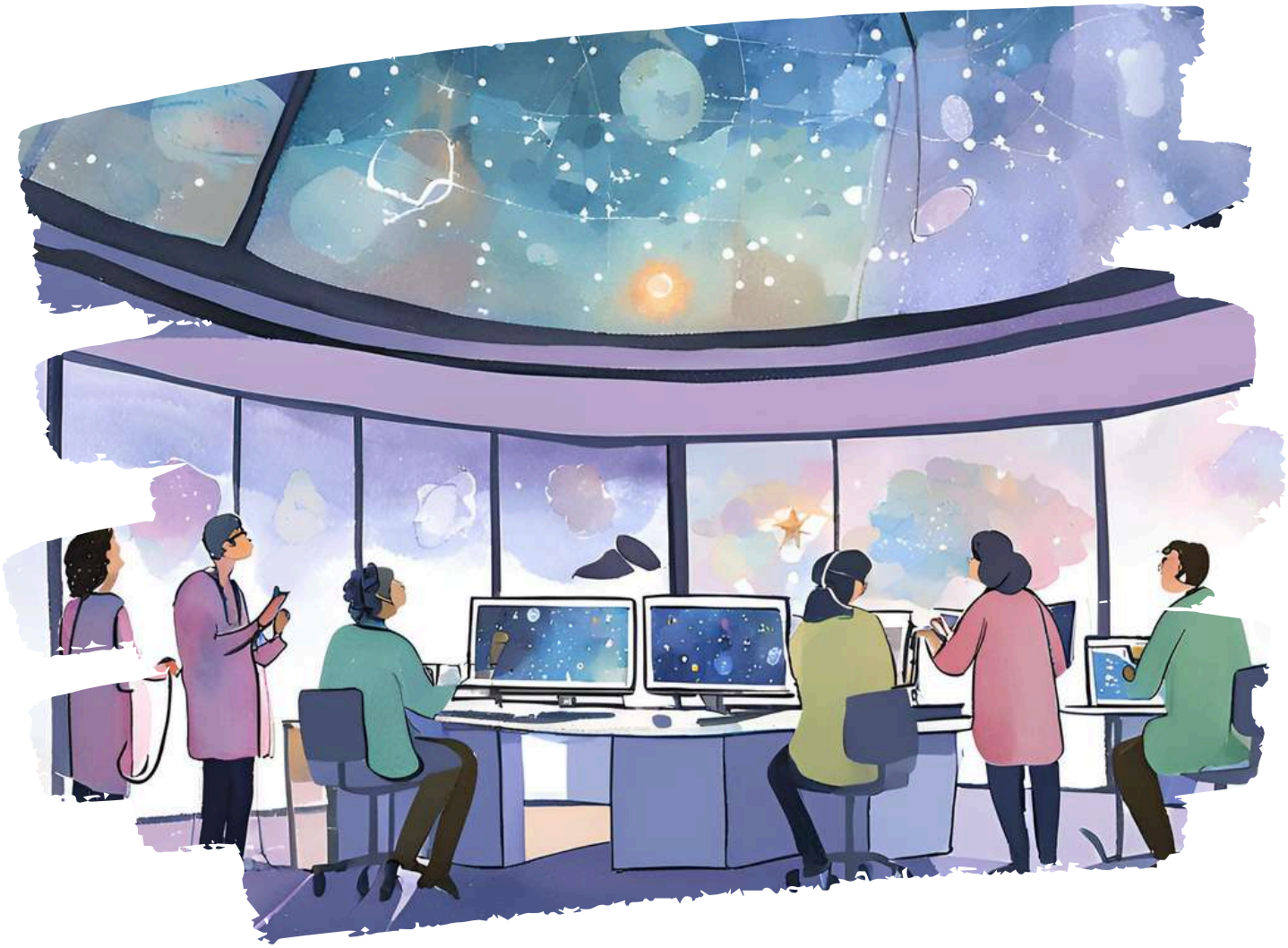
Question for children:

What would you have done if faced with a similar decision? Would you choose one and leave the other or would you try to find a solution?



The solution!

Besides many other things, there is also one thing every good scientist must have and that is resourcefulness. And that is exactly the skill Andreja pulled out of her sleeve to resolve this dilemma. She found a way to bring the expensive observatory equipment to Slovenia without actually physically bringing it to this small country. She turned to her colleagues, whom she had already collaborated with in the past, and that way, she could use the biggest robotic telescope in the world!



The result of another one of her collaborations is the Slovenian telescope, which is located on the other side of the world in the desert in Chile, a place that offers the best conditions for observing the night sky. The Chile desert is the homeplace of another very important project Andreja is part of. Scientists from all over the world are teaming up to build a new observatory for the most precise observation of the Universe to date.
All of these activities allow Slovenian students and researchers access to important information; they can look through this telescope from Slovenia, and all they need is access to a computer! The result of Andreja's active approach opened a whole new world of opportunities for other Slovenians, not just astrophysicists but also other students and researchers.

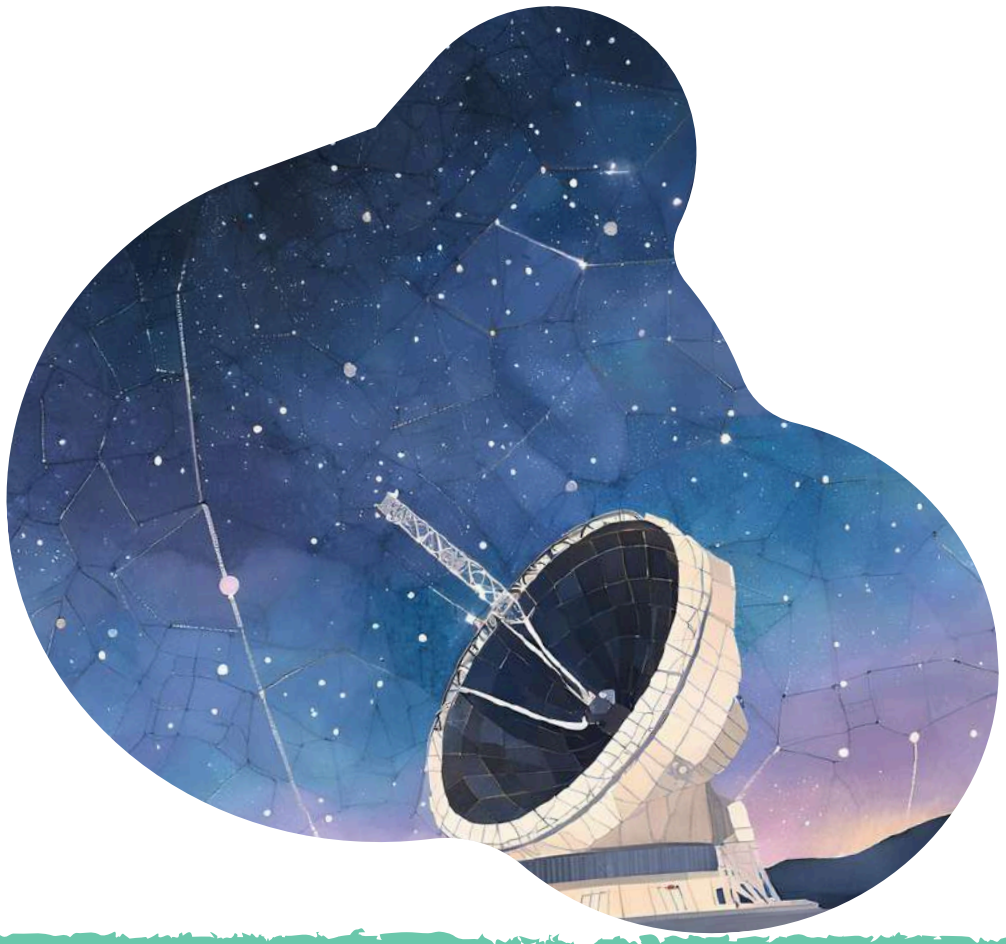
Explanation for children:
Isn't that nice? Sometimes when you are searching for solutions to your challenges you also help others along the way.

Amazing discoveries

Andreja is now living in Slovenia with her lovely family and at the same time working within her beloved field of astrophysics. To this day Andreja continues working with experts from all over the world in the fruitful exchange of knowledge. Andreja is doing what she loves and she does this very well.

In 2017, when she was 48 years old, an extremely important event took place in the sky. An event that Andreja and her colleagues were waiting for for a very long time.

Telescopes and computers were able for the first time in history detect a collision of two dense stars, and during this occurrence, a very special kind of light, a light that a human eye cannot see (like infrared or ultraviolet light, which we know exists but we cannot see it) was detected, called gamma light. It was a big moment for Andreja and all the other scientists because something they had only imagined for a long time could finally be seen.



How cool is this – to witness something for the first time! All of those long working hours and data gathering that Andreja and other researchers had been working on for so long finally paid off.

She and her colleagues, who are all part of different scientific teams continue to discover new amazing things. In 2025, the observatory that Andreja is part of will start to operate and take pictures of the Universe with the biggest camera in the world. We can only wait and see what new discoveries await Andreja and other scientists.

Question for children:

Do you ever wonder what else scientist will discover in the future? Maybe one day you will be part of one of the groundbreaking discoveries!

Andreja has a successful and fulfilling career and she did not have to sacrifice her private life to achieve all that, she is walking proof that one can have it all – sometimes it just takes a little bit of inventiveness, adaptability, and creativity to achieve it all.

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