Guidepost through the planetary path

1. Introduction

The Planetary Trail is designed as an educational journey through the solar system by means of a hike. However, the solar system is scaled down to 1:1 billion so that you can also explore it on foot or by bike. The reduction in scale seems huge, but as you walk through it, you will realise that the distances involved can be calculated in hours. At the chosen scale and a normal pedestrian speed, you appear to be travelling through the solar system at around three to four times the speed of light. This corresponds approximately to warp 2 in the nomenclature of the spaceship 'Enterprise'. You are guided by an orange travelling sign:

Figure: Travelling sign

All objects (in addition to the sun, the planets, the dwarf planets and the moons) that have a diameter of 900 km upwards are integrated into the model of the solar system. Each object is labelled by a plate attached to two square tubes. The plate and the square tubes are made of stainless steel. However, the distances between some moons are so small that in two cases two objects and in one case four objects have to share one plate. The name of the object and some additional information are written on the plate. This data may have changed on a smaller scale as a result of more recent research. However, you will find the most up-to-date information on the website.

The distance always refers to the major semi-axis of the ellipse of the orbit of the respective object. For planets, the distance is the distance between the sun and the planet, and the same applies to dwarf planets. For moons, the distance is the distance between the planet and the moon. However, the distance always refers to the distance as the crow flies between the two objects, so that the travelling distance can be longer, similar to the trajectory of satellites.

However, all size representations and distances have the same scale in our model of the solar system. For the smaller celestial bodies, an arrow on the plate points to the respective object, which is shown in the form of a hemisphere (diameter between 1 mm and 13 mm). The hemisphere is located right next to the tip of the arrow. If you do not immediately recognise the tiny hemispheres, use your finger and run it over the flap next to the arrowhead. You will then feel a small bump. The large planets Jupiter, Saturn, Uranus and Neptune do not have an arrow. Their hemispheres have a diameter of between 50 and 140 mm and are clearly visible.

The panels of the moons are only half as wide due to their close proximity. You will also find a QR code on each panel, which you can use to go to the website of our association associated with the object. On the website, you will find further information about the object. There is also the option to request information in Polish and English.

Figure: Board with Saturn without arrow

Figure: Board with Earth with arrow

Figure: Board Neptune with moon Triton

The sun, the largest object, is a hollow sphere made of stainless steel with a diameter of approx. 1.40 m and is located in the courtyard of the town hall of Muellrose. There are two panels at its side. One gives you some physical and astronomical information about the sun. You can use the QR code to obtain further information, also in Polish and English, via the sun's

website. The other panel shows the list of sponsors. The sun's mirror-like surface is ideal for selfies and other special photo settings. Try it out and be creative!

Figure: Sun with their boards

Below the boards, you will find a smaller board with information about the Planet Trail. Using the QR code on these narrow panels, you will find general information about the Planet Trail, which will help you to find your way through the planet path.
By trying to get very close to the scale of the solar system, we want to give you an idea of the cosmic distances compared to the size of the individual objects. Travelling through 'infinite expanses' is a special adventure.
To bridge the sometimes-long distances in the vastness of the solar system, you can find additional boards with information about the sun system. There are four different meanings for these panels:

- Two information boards document boundary lines of the solar system. They have a fixed distance to the sun, which corresponds to their distance to scale in reality. These are the Termination Shock and the Heliopause.
- Several other panels provide information about objects that cannot be visualised in our model due to their small size. Their huge number (up to several million) also prohibits separate object tables. Examples are comets, meteoroids, (small) moons and Trojans. As the objects in these groups are distributed across the entire solar system, there are no distances given here. The arrangement was made according to aspects of an interesting walking.
- The third group of these boards are copies of original panels. The objects shown are so far away from the sun that they cannot be walked on. The originals are located in the building of the Berlin Planetarium (Prenzlauer Straße), in Słońsk/Poland and in the German School Medellin in Itagüi/Colombia. You can also use the copies to find out more about these buildings.
- The fourth group contains information on the position of the sun in the Milky Way and a comparison of its size with other stars.

You can use the integrated QR code to return to our website and obtain more information in Polish and English.

Figure: Board for the Trans-Neptunian objects

In addition, nature with its flora and fauna offers you plenty of variety. The path through the town of Müllrose and along the many former water mills on the Schlaube with their history is particularly interesting.
If you miss a board or parts of the board on your hike, it has not yet been erected or completed. However, you are welcome to come back, as our model of the solar system is gradually being erected (subject to availability of time and money).

2. Suggested hiking routes

The Planet Trail goes through six towns and villages: Müllrose, Mixdorf, Siehdichum, Grunow-Dammendorf, Schlaubetal and Neuzelle. There are also position in Berlin, Słońsk/Poland and Itagüi-Medellin/Colombia. There are many ways to organise your exploration. However, none of the suggested routes is circular. Therefore, remember that you need a way back (pick-up or walk back the same way). So consider the way back into your account when planning your route! Round trips would distort the true situation in the solar system. There are no round trips in space either.
We would like to give you some suggestions. However, you can also develop your own hiking routes using the map material. You will be guided along all routes by the orange signposts. You will also find maps at regular intervals to help you find your way.

Route 1: Investigation of the planets (about 9 km) Müllrose – Ragower Mühle (map 1)
The starting point for the route is the Müllrose town hall courtyard, where the central star of the solar system, the sun, is anchored. You can find the sun with the help of a sign at Müllrose town hall:

Figure: Townhall with sign of the planet path

After you have collected information about the sun, leave the townhall courtyard through the rear fence gate and turn left onto the educational and hiking trail. Follow this until you reach the street “Biegenbrücker Straße”, which you then turn left onto. In between, you can explore the small rocky planets Mercury, Venus, Earth with its moon and Mars. Do not be surprised, the Earth is only a tiny sphere and yet it is our home planet.

From Mars, you follow the street “Biegenbrücker Straße”. You can make a quick detour to the Edeka supermarket to order provisions for the rest of the route. You now cross the street “Beeskower Straße” before entering the city park. At the beginning of the city park you will find the dwarf planet Ceres and a board about the asteroids, the number of which exceeds one million. You cross the city park by keeping to the right, so that you end up in the street “Jahnstraße” between the school and the kindergarten. There, Jupiter, our largest planet, with four of its largest moons (Io, Europa, Ganymede and Callisto) is ready for you to explore. You are now also on the educational campus of Müllrose, which consists of a primary and secondary school, music school, practical learning centre and municipal nursery.

Now follow the street “Jahnstraße”, keeping straight ahead and then left, until you reach the lake “Großer Müllroser See”, where you turn into the circular hiking trail around the lake and follow it out of town (on the right). The “Großer Müllroser See” is the largest lake in the nature park “Schlaubetal” and a popular sailing and bathing area. You will then pass the ringed planet Saturn with five of its moons, Thetys, Dione, Rhea, Titan and Iapetus, and Uranus with its four moons, Ariel, Umbriel, Titania and Oberon. You should also take the time to familiarise yourself with these planets. After you have left the Trojan board behind you and crossed our little river, the Schlaube, you cross the next railway tracks.

Shortly after the railway crossing you will find a board about moons and so-called quasi-satellites. You now use the Schlaubewanderweg trail to continue exploring the solar system. You will pass the lake “Belenzsee”. Near the Ragower Mühle culture barn, you will find our outermost planet, Neptune with its moon Triton. It is located directly at the junction to the Christopherusheim of the Protestant parish in the Schlaubetal. Because of the great distance, Neptune is already in the municipality of Siehdichum. Just a few more steps and you can recover from the rigours of research work in the Ragower Mühle.

Route 2: Investigation of the dwarf planets (about 12 km) Ragower Mühle - Bremsdorfer Mühle (map 2)

You start your second tour at the hamlet Ragower Mühle and take the Schlaubewanderweg trail in a southerly direction. Before you set off, you can stop for refreshments at the restaurant Ragower Mühle or pay a quick visit to the small mill museum. Along the river Schlaube, you first come to the dwarf planet candidate Orcus and the dwarf planet Pluto with its large moon Charon. After another short stretch, you will pass the dwarf planet Haumea and the dwarf planet candidate Quaoar. Shortly before you reach the Kupferhammer restaurant, you have to explore the dwarf planet Makemake before you can stop for a short break in the restaurant.

The planet trail continues on the other side of the river Schlaube. After crossing the Schlaube and following it upstream, you will come to the copy of the board for the dwarf planet candidate Sedna. The original is on display in the Great Zeiss Planetarium in Berlin (distance approx. 76 km). You follow the Schlaube and its lakes and now reach the hamlet of Siehdichum, where you will find the information board for the trans-Neptunian objects, which are mainly located in the Kuiper Belt. If you want to take a break, you can stop for refreshments at the restaurant at the top of the hill.

Below the hill, you cross the Schlaube and now take the mill-hiking-trail. You walk along the lake “Hammersee” and continue your hike on the trail “Mühlenwanderweg”. You will now reach the dwarf planet candidate Gonggong and shortly afterwards the dwarf planet Eris. Immediately afterwards, you cross the river Schlaube via the wooden bridge and continue along the trail Schlaubewanderweg. Shortly before the point where the lake “Kleine Scherlauchsee” and the lake “Großer Treppelsee” meet, you will see a copy of the Oort Cloud. The original is about 10,000 kilometres away in Colombia. A second copy is located in the secondary school “Albert-Schweitzer-Gymnasium” in Eisenhüttenstadt.

Once you have crossed the small river “Planfließ”, you will find the information board on the interplanetary medium, the ‘filler’ of the solar system, right next to the beautiful barbecue hut. With a final effort over the last kilometre, you will reach the hamlet Bremsdorfer Mühle, where you can fortify yourself for the return journey in the restaurant.

Route 3: To the edge of the sun system (about 10 km) Bremsdorfer Mühle – Wirchensee (map 3)

Starting at the hamlet Bremsdorfer Mühle, you will be travelling to the outlying areas of the solar system. You can stop for a snack at the mill and then start your hike with renewed vigour. You walk upstream along the river Schlaube on the trail Schlaubewanderweg. After a short stretch of way, you will reach the meteorite board. The next destination on your hike is the interstellar objects (galactic visitors) that roam the solar system and then disappear again into the vastness of the galaxy. After another part of the journey, you will reach the so-called Termination Shock. The solar particles are strongly decelerated and thus heat up in this very narrow region. Shortly before you change sides at the hamlet Kieselwitzer Mühle, you will pass a board dedicated to comets.

Take a left turn to cross the Schlaube and reach the eastern side of the Schlaube. On the eastern side of the Schlaube, you cross small rivulets that feed the Schlaube as tributaries. There are some very pretty little water mills along these small streams. Well worth a look!

Your journey through the solar system now takes you past a copy of the Sednoid objects. The Sednoids are a group of objects that are very far away from the sun. That is why the original board is located in Słońsk/Poland about 50 kilometres from your current location. Słońsk is the Polish partner municipality of the Schlaubetal district.
Now you leave the area of the Schlaubetal district and reach a second boundary line of the solar system, the heliopause. From this point onwards, cosmic radiation predominates and increasingly displaces the solar wind. If you then walk past the mill Schlaubemühle, you will come to a road that you have to cross. On the other side of the road, you will find a board that gives you an insight into the infinite expanse of the cosmos with some information. After the hike so far, you can rest and recharge your batteries at the restaurant Waldhotel Wirchensee. There is an interesting path around the lake Wirchensee, which also takes you to the sources of the Schlaube. On this path, you will find two boards informing you about the star Rigel B and the proportions of the stars. The natural monument 'Kobbelner Stein', one of the largest erratic blocks from the Ice Age in Germany, serves as a comparison. As the name suggests, it is located in the village Kobbeln of the municipality of Neuzelle. A visit to the stone is well worthwhile. At the southern end of the lake Wirchensee, which is also the end of the Planet Trail, you will find a board that provides information about gravity as a universal force.

Route 4: Trips to the big wide world (map 4 and map 5)

As already briefly explained, some of the boards in the original are placed in far-off locations. The reason for this is the huge size of the solar system, which is ultimately just a speck of dust in space. We have three 'outposts'.

- The dwarf planet candidate Sedna is located in Berlin, very close to the S-Bahn station 'Prenzlauer Allee' as a screen presentation in the building of the planetarium there. In addition to visiting the presentation there, you can also attend a lecture in the planetarium. Combine both during your visit!
- We were able to place the sednoids in Słońsk/Poland next to the memorial to the victims of the German occupation. You can reach Słońsk by car via the Frankfurt (Oder) border crossing. There you can explore the municipality with its Johanniter Church and the Lower Warta Valley Nature Park. A visit to the memorial is definitely worthwhile.
- The third outpost is located outside Europe in South America. The Oort Cloud is located on the grounds of the German school in Itagüi/Medellin in Colombia. If you are on holiday in Colombia, do not miss a visit to this place.

3. Short Routes

If the suggested routes are too long for you, you can also divide the Planet Trail into smaller sections. Here is a suggestion for dividing the trail into five stages:

- Route 1: Sun to Saturn (approx. 2 km), starting point: townhall courtyard of Müllrose, end point: circular trail around the lake Großer Müllrose See (also suitable for wheelchair users)
- Route 2: Uranus to Neptune (approx. 4.5 km), starting point: car park for hikers near the Müllrose-Mixdorf road, end point: Ragower Mühle

- Route 3: Pluto - Transneptunian Objects (approx. 8 km), start: Ragower Mühle, end: hamlet Siehdichum
- Route 4: Transneptunian Objects - Comets (approx. 8 km), start: hamlet Siehdichum, end: Kieselwitzer Mühle
- Route 5: Comets - Rigel B (approx. 7 km), start: Kieselwitzer Mühle, end: Wirchensee

However, you can also organise your own tours. It is always helpful to use the mills as starting and finishing points. A connection with the A400 bus excursion line and its stops is also an option.

4. Bicyling and Geochaing

The solar system can also be explored by bike. You can easily complete all three pedestrian routes in one day. However, you can also divide the route into stages. Two days tours are favourable. This gives you enough time to admire nature and complete the geocaching tasks. When cycling, you should always bear in mind that the hiking trails are not designed for cyclists. It is therefore advisable to use the cycle paths outside the Schlaubetal. An all-terrain bike is helpful. You should not mind pushing your bike up a hill for a short time. We would also like to ask you as a cyclist to show consideration for hikers and especially for nature.
Geocaching is a special highlight, not just for cyclists. A special challenge awaits you at every board. You can find more information and the geocaching tasks on the Planet Trail website.

5. Information for Wheelchair Users

Unfortunately, wheelchair users cannot reach all destinations due to the given hiking trails. Some of the paths are too narrow or too uneven to be travelled on with a wheelchair or similar vehicle. The planets from Mercury to Saturn are particularly easy to reach. The paths starting from the sun are developed accordingly. You can reach Neptune from the Ragower Mühle on a tarmac path. It is also worth stopping in Kupferhammer to visit the dwarf planet Makemake. In the Siehdichum hamlet area, you can explore the trans-Neptunian objects as well as Gonggong and Eris. The comets at the Kieselwitzer Mühle and the boards at the Wirchensee car park and around the Wirchensee can also be reached. The two outposts in Berlin and in Słońsk/Poland do not pose any difficulties for wheelchair users.

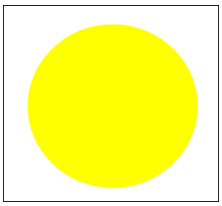
6. Sponsoring, Member of the Association, Protection of the Nature

We would like to thank the many sponsors whose donations have made it possible to finance this unique planetary trail. More than 95% of the money came from private individuals or companies. You will find the sponsors who have taken on a direct sponsorship via a board noted directly on the board. There were a large number of sponsors for the sun, the most important of which you can find on the sponsorship board next to the sun. However, there were also a considerable number of small donations that were collected during guided tours

and other events or were transferred directly to our account as donations. Some sponsors supported us with material resources or labour. All sponsors can be found summarised on a website, which you can access via the QR code on the sponsor plate on the sun.
We would also like to thank the representatives of the communities of Grunow-Dammendorf, Mixdorf, Neuzelle, Schlaubetal, Siehdichum, Słońsk/Poland, the town of Müllrose, the Protestant parish in Schlaubetal, the Brandenburg Forestry Commission, the families Pöthke and Griebel and Mr. Budach from Mixdorf for allowing us to erect our boards on their land.
The many donations and donors, an overview of which you can find on our website, show the great interest and commitment of the population to the planetary path. The members of the association have invested more than 1000 hours in the construction of the solar system model and the associated internet. They continue to sacrifice many hours of their free time for maintenance and upkeep. Therefore, please treat the facilities with care, the next visitors will also want to enjoy the Planet Trail. We also ask you to protect our beautiful Schlaubetal valley. Stay on the hiking trails and dispose of your rubbish in the rubbish bins provided or, even better, take it home with you. The next visitors will enjoy a clean environment. We have tried to minimise the impact on nature with our boards and signs.

We look forward to your visit!

7. Signs for used Hiking Trails


Circular hiking trail Großer Müllroser See


Schlaube hiking trail


Mill hiking trail


Planet hiking trail

8. Overview about the places of the Boards

Pitch 1: Sun with information board and sponsor board
Pitch 2: Planet Mercure
Pitch 3: Planet Venus
Pitch 4: Planet Earth with its moon
Pitch 5: Planet Mars
Pitch 6: Dwarf planet Ceres

Pitch 7: Asteroids
Pitch 8: Planet Jupiter with the moons Io, Europa, Ganymede and Callisto
Pitch 9: Planet Saturn with the moons Thetys, Dione, Rhea, Titan and Iapetus
Pitch 10: Planet Uranus with the moons Ariel, Umbriel, Titania and Oberon
Pitch 11: Trojans
Pitch 12: Moons/Quasisatellites
Pitch 13: Planet Neptune with the moon Triton
Pitch 14: Dwarf planet candidate Orcus
Pitch 15: Dwarf planet Pluto and moon Charon
Pitch 16: Dwarf planet Haumea:
Pitch 17: Dwarf planet candidate Quaoar
Pitch 18: Dwarf planet Makemake
Pitch 19: Dwarf planet candidate Sedna (copy)
Pitch 20: Transneptunians objects
Pitch 21: Dwarf planet candidate Gonggong
Pitch 22: Dwarf planet Eris
Pitch 23: Oort Cloud (copy, other copy in the school Albert-Schweitzer-Gymnasium in Eisenhüttenstadt)
Pitch 24: Interplanetary Medium
Pitch 25: Meteoroids/Meteorits
Pitch 26: Termination Shock
Pitch 27: Galactic Visitors
Pitch 28: Comets
Pitch 29: Sednoids (copy)
Pitch 30: Heliopause
Pitch 31: Beyond the solar system
Pitch 32: Rigel B
Pitch 33: Gravity

Pitch Eisenhüttenstadt: copy Oort Cloud in the school Albert-Schweitzer-Gymnasium
Pitch Berlin: Sedna as display presentation in the Carl-Zeiss-Großplanetarium
Pitch Słońsk/Polen: Sednoids
Pitch Itagüi/Columbia: Oort Cloud in the school Deutschen Schule Medellin

9. Important Links

https://www.astrowis.de/ https://www.astrowis.de/planetenweg/

https://www.astrowis.de/befreundete-partner/

Contact: info@astrowis.de