

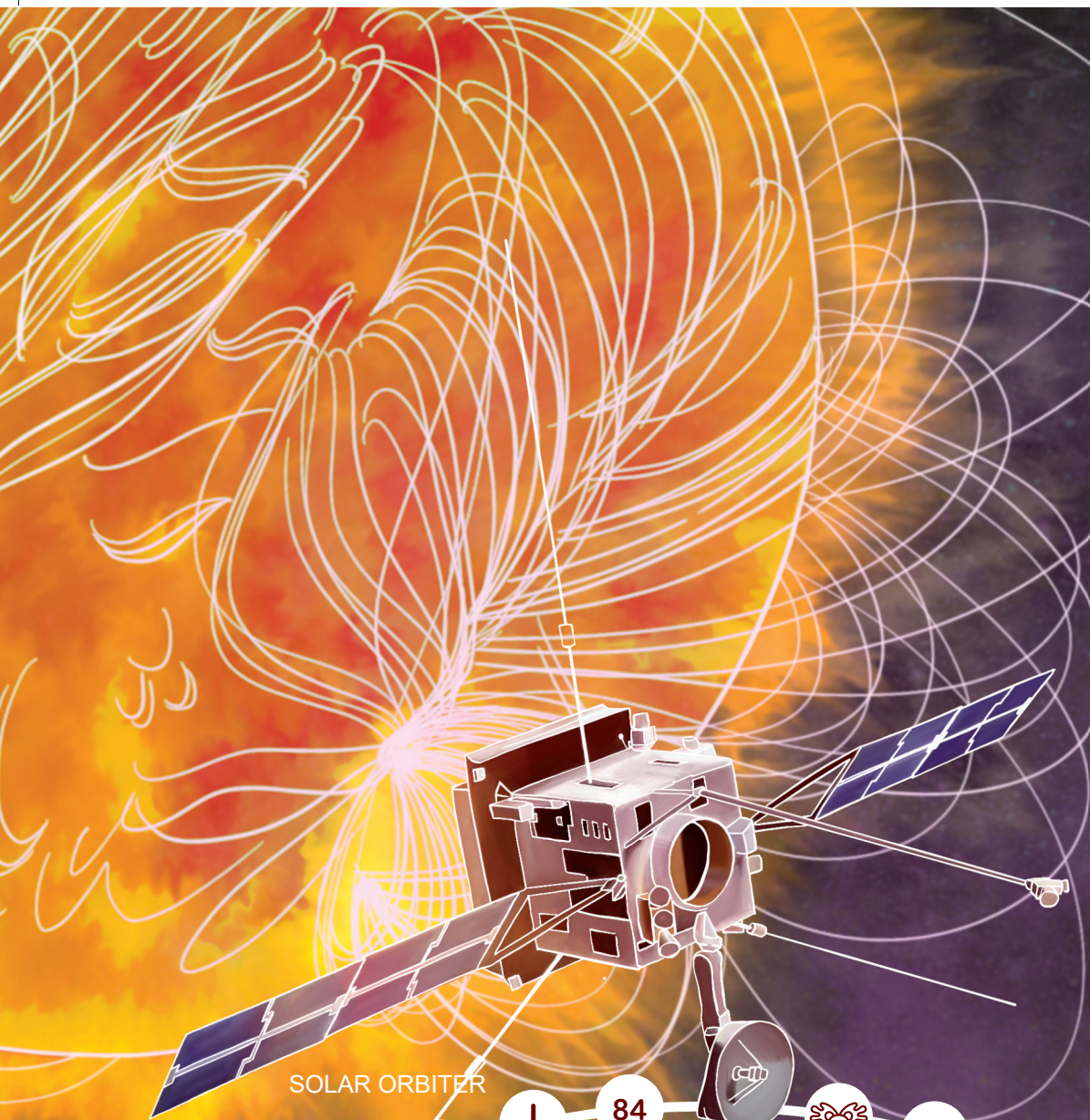
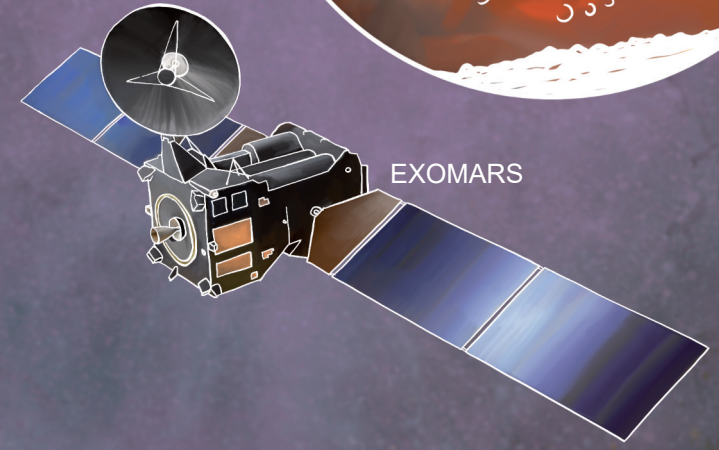
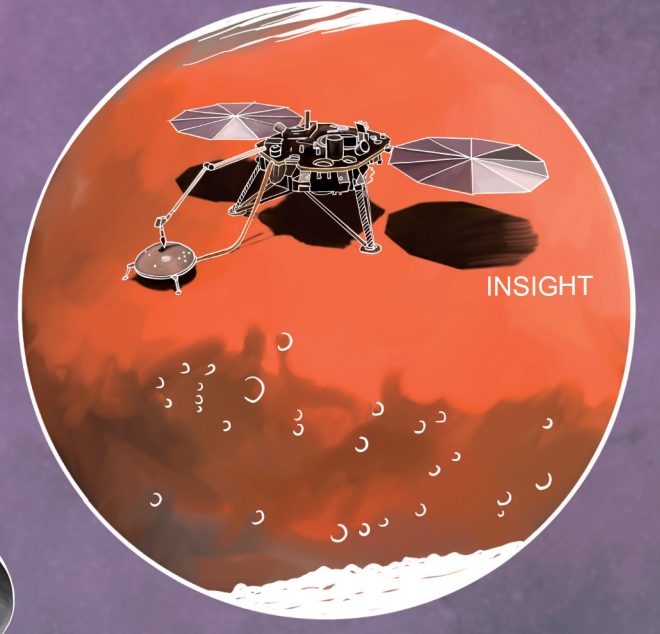
Illustration: Karolína Kučerová / concept: Petr Brož, Matěk Machek and David Píša / gamedesign and text: Julie Nekola Nováková
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MAGNETOSPHERE CHASERS

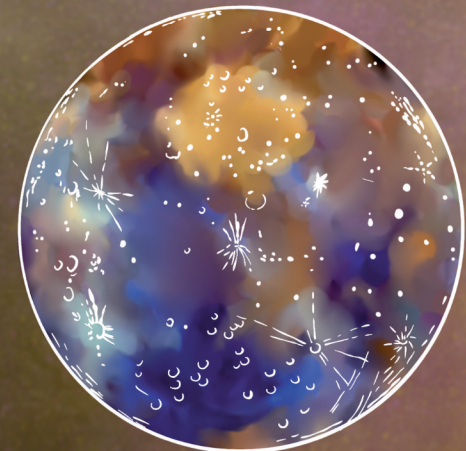
Catch the animals that our siblings encountered in the magnetic field in the story! Start on Earth at Grandad Magnet's, throw the die and move forward along the magnetic lines of force by the number on the die.

Along the way, you can gain points for storms, animals, and for visiting various cosmic phenomena, bodies, and probes, from where you will always return to your former spot on the playing field without missing a turn.

You finish back on Earth. The first player to reach the finish receives five points, and the game ends at this point. The player who gains the most points is the winner.



- STORM (1 point)
- ANIMAL (2 points)
- THROW AGAIN
- MISS ONE TURN



MERCURY (2 points)
 You will be transported to Mercury, the innermost planet of our solar system. Like Earth, Mercury has a dipolar magnetic field, which means its huge metal core is probably partially liquid. This field is about one hundred times weaker than Earth's, which may be a result of the smaller size of the planet. As the core cools down more rapidly, and because Mercury turns around its axis very slowly - only once every 60 Earth days or so - the currents in outer core are weaker, making a weaker magnetic field.

TASK (2 points): Can you name all eight planets in our solar system in order, beginning with the Sun?

AB AURORA BOREALIS (1 point)
 You find yourself in the middle of the northern lights in the northern hemisphere! Charged particles at high southern latitudes are accelerated along the magnetic field lines toward the Earth, where they collide with the Earth's atmosphere, creating this breath-taking visual phenomenon.

MARS (2 points)
 The Red Planet welcomes you! Present-day Mars lacks a magnetic field, but the remnants of magnetic rock found in its southern hemisphere suggest that the planet used to have one. Today, its outer liquid core is too thin, or perhaps cooled down too slowly, to have currents originate in it.

TASK (2 points): Do you know the names of Mars' two small moons?

B-C BEPI - COLOMBO (1 point)
 The European-japanese probe launched in 2018 will explore the magnetic field and other characteristics of Mercury. Why is it that Mercury has its own magnetic field even though it has such slow rotation? Does it have sufficiently strong currents in its outer core in spite of this?

SUN (2 points)
 Even stars have magnetic fields, including the Sun! It is formed by the flow of conductive plasma in the convective layer found on the surface, and since various parts of the Sun rotate at different speeds, its magnetic field is more complicated than Earth's. The amount of radiation emitted by various parts of the Sun's surface can differ by several orders of magnitude. Did you know that sunspots have the strongest magnetic fields in our solar system?

TASK (2 points): Do you know which star is located nearest to the Sun?

Gan GANYMED (2 points)
 The largest moon of Jupiter, as well as in our solar system, is the only moon known to have its own magnetic field, similarly strong to that of the slightly smaller planet of Mercury. It is probably due to its size that its core has yet to completely cool down and solidify. It may be also heated by the gravity forces of the other moons and of Jupiter itself, which "kneads" this moon using tidal forces (an effect like the heating of the ball in a game of squash).

TASK (3 points): Do you know who discovered Jupiter's moons of Io, Europa, Ganymede and Callisto?

S SWARM (1 point)
 How does the Earth's magnetic field change over time, and how will it affect our satellites? What magnetic track do ocean currents have? These are the objectives of the European mission known as SWARM, but also of the satellites Cluster II, MMS, and Arase.

TASK (2 points): Do you know the name of the warm ocean current found in the Atlantic that heats up Western Europe? It, too, has its own magnetic track!

AA AURORA AUSTRALIS (1 point)
 You find yourself in the midst of an aurora in the southern hemisphere! Charged particles at high southern latitudes are accelerated along the magnetic field lines toward the Earth, where they collide with the Earth's atmosphere, creating this breath-taking visual phenomenon.

SO SOLAR ORBITER (1 point)
 You find yourself on board the European probe exploring the Sun, which even Czech scientists had a hand in creating. There is much about the Sun that we have yet to discover! Why does it have an eleven-year cycle, after which the amount of sunspots changes, not to mention the overall activity and other characteristics? How does solar wind accelerate, which then creates auroras, for example, on Earth? Why does the solar corona - the "halo" just above its surface - have a temperature of over one million degrees Celsius in contrast to the "mere" 5,500 °C of the Sun's surface? This is probably caused by the solar magnetic field, and the probe's task is to try and find out how.



J JUICE (Jupiter Icy Moons Explorer) (1 point)
 A European probe also contributed to by scientists from the Czech Academy of Sciences that is to explore the icy moons of Jupiter, including Ganymede and its magnetic field. It is to be launched in 2022. How thick are the icy crusts of Europa, Callisto, and Ganymede, and how active are these moons? JUICE will help us discover these answers!

EM EXOMARS (1 point)
 The European-Russian ExoMars mission also includes the Kazachok lander, which will examine the magnetism of Mars. Scientists from the Czech Academy of Sciences built an audio receiver with a deployable antenna. It will for the first time measure radio waves at audible frequencies on the surface of Mars. It is planned to launch in autumn 2022.

I INSIGHT (1 point)
 This probe landed on Mars in November 2018 and explores Marsquakes and the rate at which heat escapes the planet's interior. Perhaps it will help explain when and how Mars lost its magnetic field.

Correct answers to tasks: MERCURY: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune; MARS: Phobos and Deimos; THE SUN: Proxima Centauri, ca. 4.2 light years away; It is a rather active red dwarf, and it surely has a remarkably interesting magnetic field; GANYMED: Galileo, Galileo, Galileo; If you also mentioned Simon Marius, you have three more points; SWARM: The Gulf Stream