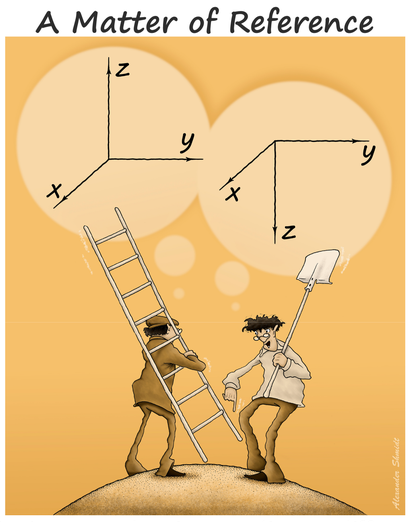
Geodesy Cartoons

Visualizing Geodesy for Everyone

A Matter of Reference

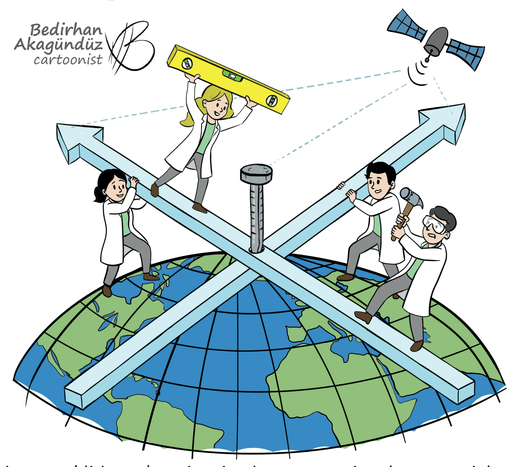


The point is the same, but its coordinates differ. In geodesy, positions are defined within reference frames. Only by choosing and consistently applying the right system can measurements be correctly interpreted and compared.

geodesy .science /cartoon

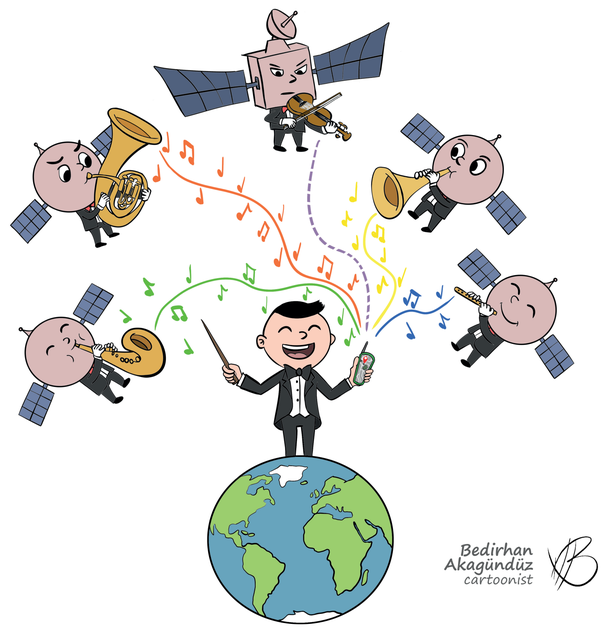
Alexander Schmidt cartoonist

Perfecting the Global Reference Frame



Geodesists establish and maintain the International Terrestrial Reference Frame (ITRF), defining Earth's three-dimensional most accurate coordinate system. By combining satellite observations and ground measurements, they determine stable X, Y, and Z axes, the planet's center of mass, and its orientation in space — ensuring that every position on Earth is globally consistent and precisely defined.

The Orbital Symphony of Positioning



Bedirhan Akagündüz cartoonist

GNSS satellites transmit precisely timed signals from orbit. By combining signals from multiple satellites, geodesy determines exact positions on Earth. Like instruments in an orchestra, the satellites work together — and geodetic processing turns their signals into globally consistent coordinates.

Idea

Communicating complex geodetic concepts such as reference systems and GNSS to non-expert audiences remains a key challenge. The Geodesy Cartoon initiative, launched **in 2024** by the **GGOS Coordinating Office** at BEV (Federal Office of Metrology and Surveying, Austria), addresses this challenge by translating scientific content into **clear**, **engaging**, and **humorous** visual narratives. The big goal is to **mak geodesy more visible** through humour and visual storytelling. All **cartoons can be used for free** (CC-BY licence) by everyone and are available at: https://**geodesy.science/cartoon**

The Reference Frame Crisis



You can't level a picture if the floor is moving. Geodesy provides stable reference frames that allow us to track our changing planet and make measurements we can trust.

Competition

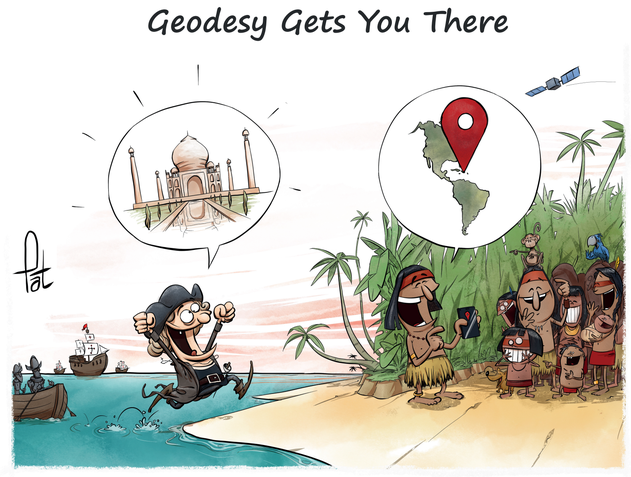
The **Geodesy Cartoon Competition** was initiated and organised within the GGOS Coordinating Office to get more cartoons help promoting geodesy. It **encouraged creative minds** in the geodesy community (and beyond) to draw cartoons in one of the **three categories**. Submissions were possible from **September 2025 to March 2026**. The competition was supported by the International Association of Geodesy (IAG), funding **prizes** of 300 € GOLD and 150 € SILVER in each category. The **international jury** consisted of 59 voting members from the IAG Executive Committee (EC) and the GGOS Governing Board (GB). The response clearly exceeded expectations: **274 cartoons** were submitted by **119 cartoonists** from **46 countries**, highlighting both the global reach of the initiative and the creativity within the geodetic community.

Geodesy and the Global Vertical



The direction of "up" is defined by gravity, not by perception. Through precise gravity field modeling and unified height reference systems, geodesy provides a consistent global vertical. Without this common standard, alignment, construction, and engineering would differ from place to place.

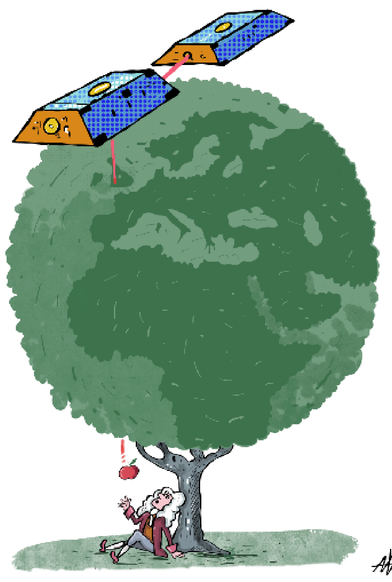
Geodesy Gets You There



Geodesy determines the exact position of GNSS receivers on Earth, keeping navigation precise and reliable. Without it, even the greatest explorers might have missed their destination.

From Newton's Apple to Satellite Gravity

Category 2 GOLD 1st place



Doru Axinte cartoonist

Gravity once revealed itself with a falling apple. Today, geodetic satellites measure tiny changes in Earth's gravity field from space, allowing scientists to track mass changes such as melting ice, shifting water, and ocean circulation.

The Geodetic Tailor

Category 1 GOLD 1st place



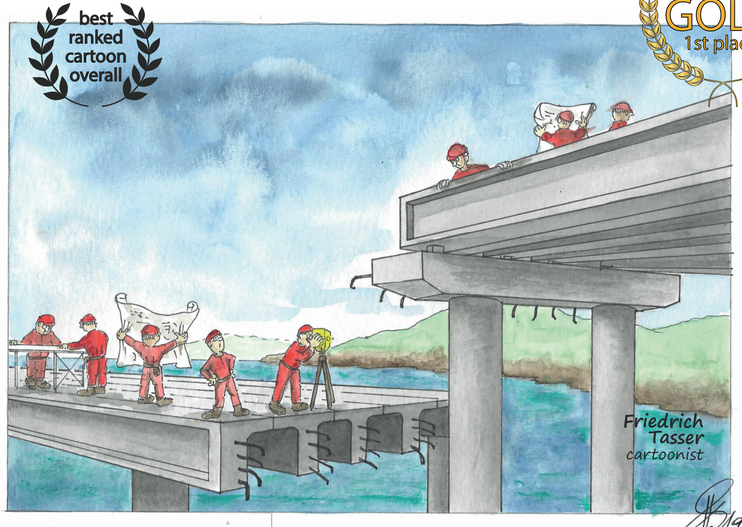
Eda Uzunoglu cartoonist

Geodesists stitch together observations of Earth's surface, gravity, rotation, and their changes to tailor the most precise model of our dynamic planet.

Precision in Connection

Category 3 GOLD 1st place

best ranked cartoon overall



Friedrich Tasser cartoonist

Before structures connect, geodesy ensures they align. It is providing the precise measurements that make bridges meet perfectly. Just make sure both sides use the same reference frame.

scan me

view all cartoons

geodesy .science /cartoon

Author Contact:
Martin Sehnal (BEV - Federal Office of Metrology and Surveying)
Email: martin.sehnal@geodesy.science
Vienna, Austria

Federal Office of Metrology and Surveying