



# The future at your fingertips

Discover the world of tomorrow, today at Deutsches Museum Nürnberg



Image: Ludwig Olah/Deutsches

**How will we live in 10, 20 or 50 years? How will technology continue to develop – and what challenges will arise from this for us as a society? What are our wishes? What fears do we have? The branch of Deutsches Museum in the heart of Nuremberg's old town invites you to an exciting and insightful look into the future. The basic concept is the comparison of "science" and "fiction" which runs as a common approach through all areas of the exhibition. Here projects from current research are presented that may already influence our lives very soon. Subsequently, the opportunities of various technologies as well as their possible risks and consequences for our very personal everyday lives and society will be discussed. What ethical questions will technology pose for us?**

The exhibition extends over 2.900 square metres across five thematic fields. These begin in the very personal living space of the individual with "Work and Daily Life" and "Body and Mind", and then broaden the perspective to include "City System" and the „Earth System", and finally end with mankind's everlasting dream of travelling through "Space and Time".

**Work and Daily Life** deals with the developments that affect our familiar way of life. The world is going digital: robots, artificial intelligence (AI), big data, social media and the internet of things are making our lives easier and more comfortable. On the other hand, they may also take away our jobs, collect our data and monitor us wherever we go. Will we end up in a world dominated by machines like in dystopian Hollywood movies? The variety of robots at Deutsches Museum Nürnberg raises the question in which field of life we desire machine support: From industrial robots to therapy robots like "Paro", which can be used in nursing, to sex robots with surprisingly real "skin". The "Telex plus", lets visitors try their capabilities at remotely defusing a bomb using its robot arm. Elsewhere, the extensive topic of neural networks is addressed and made tangible. What abilities does AI have and how does it learn? Will it one day even be possible to extract and store our memories as a set of data? And if so, what will that do to us as individuals?

**Body and Mind** is the topic of the second exhibition area. It is all about the visitors' personal environment. The exhibition is focused around technologies that fulfil mankind's dreams: no more diseases, no more ageing, perhaps eternal life. At the same time, many concrete research approaches also cause fear of optimised humans, genetically modified babies and cyborgs. Whereas medicine has so far been about curing ailments, in the future it could be a matter of creating a "superhuman". The exhibition shows numerous developments that could already become reality in no time: neuronally controlled prostheses or sensors that can determine body data and send it directly to the doctor. Thanks to the latest processing techniques visitors are able to encounter and examine a digital "data clone" of a human being at a hands-on station. This way the public can find out for themselves how far we really are from the "medical tricorder" from the sci-fi series "Star Trek", which is also on display. The possibilities of genetic engineering and the technology of growing viable organs in the future will also be highlighted. A bio-printer can produce body parts from hydro-gel during guided tours. It is not only here that the question arises: What makes us humans special? What kind of life do we want to tolerate in the future? Are we allowed to interfere with the human genome in order to eradicate diseases such as trisomy 21 before birth?

**City System** is the area that outlines the future infrastructure of megacities: On the second floor, the Zukunftsmuseum turns to developments in society as a whole. By 2050, around 80 percent of the world's population might live in cities with each more than ten million inhabitants. So what will a city worth living look like in the future? It can become intelligent: flying cars, smart homes, architectural wonders in the clouds and under water. Yet the



solutions to our traffic and environmental problems remain complex. Can shifting traffic underground or into the air provide a long-term relief? Prototypes like "Hyperloop" or "pop.up Next" (image) outline current developments of what mobility could look like in the future. Will there still be individual transport in a few years at all? Architecture also has to adapt to newly emerging conditions. Various research projects are looking for new ways to build sustainably and conserve resources. Nature for example is a source of ideas: the "Elytra Pavilion" took the wing structure of the Colorado potato beetle as inspiration. An interactive station shows scenarios of our society after a period of 1.000 days of power failure. This clearly shows our dependence on resources.

**Earth System** contrasts the areas considered so far with the future macrocosm of our entire planet.

Food for everyone, unlimited energy, control over the climate - technology is to make it possible. But every development needs resources. What can and what has to be done to keep the earth habitable?

To illustrate how fragile the blue planet continues to be in the future, just take a look at the gigantic globe (image): set in scene by a total of eight high-performance beamers, global interrelationships become visible. The effects of climate change for example can be illustrated vividly in this way. The

mountain of rubbish, also brought to life by projections, confronts visitors with uncomfortable truths.

The energy consumption of data streaming is made tangible by having the audience generate the electricity needed for this themselves at an interactive station. Furthermore our possible diet of the future is made visible by a dining table with futuristic dishes from science fiction and science.



Eventually, on the third floor, **Space and Time** looks farthest into a universe full of promise: Humans use asteroids as a source of natural resources, colonise moon and mars and discover distant galaxies. But the human body is not built for life in space - and not all technical questions have been answered yet. Of course an exhibit that has already left this earth once is compulsory here. The soviet "Foton 1" space capsule completed an unmanned, twelve-day mission through space back in 1985. The knowledge gained at that time still inspires the imagination today. Ring-shaped space stations appeared early in science fiction movies. Today, NASA is actively researching their feasibility, as a model of the "Nautilus-X" space station shows. How will the colonisation of moon and mars take place? First impressions are given of which materials could be used for construction. How does it feel to steer a mars rover on an exploration trip? The hands-on station reveals it. That all our ambitions in space are not without consequences for the earth is shown by the staging of space debris around the globe. This gets visible by looking down on the earth from the third floor.

The „drop tube“ is a unique installation which connects all three floors. It enables experiments in free fall, which can be recorded by a high-speed camera. The contents of the five thematic areas are also brought together in the open forum. Here, in the heart of Deutsches Museum Nürnberg with its auditorium and large information cube with moving display panels, the journey begins and ends. This is where experiences and ideas, impressions and visions can be exchanged. Our team of "future communicators" will actively shape the dialogue between visitors and discuss ethically difficult questions and dilemmas - hopefully controversially. The forum makes Deutsches Museum Nürnberg a place unique in the world by taking up the feedback from visitors and reflecting it back into the research projects. This is where a long-term exchange and genuine dialogue between science and society begins!

A library, the "Zukunftswerkstatt" (future workshop) and the two visitors' labs "Voyager" and "Discovery" complete the facilities of the museum. There is also the opportunity to take a very personal VR journey into the city of Nuremberg in the year 2050. The building accommodating Deutsches Museum Nürnberg is located in the Augustinerhof directly at the Pegnitz River and in proximity to Nuremberg's "Hauptmarkt". It is star architect Volker Staab's latest creation in Nuremberg, where already designed the Neues Museum and the Sebalder Höfe. Together with the premises of the nearby open innovation laboratory "JOSEPHS", a branch of Fraunhofer ISS, the opening of the Deutsches Museum Nürnberg will create a futuristic quarter and another attraction in the heart of the old town.

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