SCIENCE
TECHNOLOGY
MEDICINE

DOCUMENTARY
30 MIN.

VERSIONS
Arabic, English, Spanish
French: 39 x 30 min.

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Science Workshop

The series is designed to show viewers how scientific research can affect our everyday lives. The emphasis is not on dogmatic certainties but on the struggle to extend the frontiers of knowledge. This "workshop atmosphere" is intended to give the viewer a better understanding of scientific research and make it clear that even the most complex subjects can be broken down into a logical sequence of small, individual steps.

61 Rice from the Drawing Board
62 Quantum Foam and Artificial Intelligence
63 Ozone
67 Alone in the Universe
68 After Us the Robots?
69 Mankind the Creator
70 The Blue Revolution
71 Power from the Sun I
72 Zero Waste
73 The End of the Coral Reefs
75 The Chip for Eternal Life?
88 Killers from Space – How Dangerous are Comets and Asteroids?
89 As If They Came from Another World – Slime Fungi
91 The Big Bang – The Hunt for God's Plan

98 Liquid Gold
With fresh water in ever shorter supply on our planet, the search is on for ways of tapping sources in the oceans. Isolating fresh water in the sea is a costly undertaking. And even locating such sources in the first place is a difficult task. The search for submarine liquid gold is an expensive adventure involving the use of state-of-the-art technology.

102 The Future of the Past
This film focuses on how new technologies are helping restorers and conservationists save cultural treasures. Bacteria, lasers, and micro-low-pressure cleaning are used in the restoration of murals, statues, and busts.

103 Expedition into Nanoland
Nanotechnology – science on the border of the perceptible. Tiny particles and molecules are giving growth in research and industry an undreamt-of boost. This film presents some of the most interesting projects; for example, how nanoparticles hunt viruses, how nanominerals dispel toothache and how nanoglass makes the sun shine more brightly.

104 Healing with Molecules
Medicinal drugs cure disease and save lives. But a new drug usually takes twelve years to develop, often at a cost of more than 500 million euros. Co-operation between university hospitals, biotechnology firms and the research departments of pharmaceutical companies is of vital importance. This film traces the development of a medicinal drug and explains what Germany-and Europe as a whole-has to do to regain its place among the world's elite.

105 Intelligent Plastics
Polymers, plastics obtained from petroleum, are more versatile than virtually any other type of material. They are replacing conventional materials in more and more areas of application. The advantage of polymers is that they are light, have a long service life and can be recycled. These are outstanding prerequisites for becoming the leading materials of the future. And now plastics are revealing an entirely new capability: they are starting to organize themselves...

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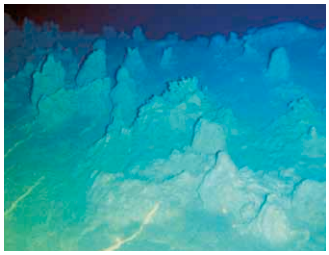

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106 Concerns, Inventors, and Innovations
This film takes an exciting journey through the research laboratories of major concerns and organizations. Optical data networks, the world's starchiest potato, the fastest rail vehicles, outer space in the classroom, the digital motor car, air traffic logistics of the future – and time and again the question of whether firms in Germany, and Europe as a whole, are equipped for global competition.

107 The Life and Death of Stars
A journey into our solar system with Hubble, the space telescope. We present the various planets and explain how they were formed. The film provides a thrilling insight into the life and death of stars and also focuses on the turbulent future of the Milky Way, the galaxy which is our home in the infinite vastness of the universe.

109 The Mysteries of the Universe
Hubble, the space telescope, takes us to the mysterious black holes which, through their enormous gravity, can bend space. We report on distorted optical images which act like giant cosmic magnifying glasses. And we highlight the approach cosmologists are taking in order to determine how the universe was formed.

111 Tsunamis in the Mediterranean
Just how likely is a tidal wave in the Mediterranean? What might cause one: an earthquake, a volcanic eruption, a landslide? And how could people protect themselves if a giant wave struck the coast within minutes? Scientists are trying to find answers to these questions.

112 The Seat of Evil
Does crime arise in the brain? With the help of modern imaging techniques such as nuclear magnetic resonance, scientists are trying to track down the origins of violence in the brain. But if acts of violence can be attributed to cerebral anomalies, are the perpetrators of such acts at all capable of behaving any differently? Modern brain research indicates that we are controlled far more by our brains than we would like to believe.

On a Research Trip in the Pacific
Off the coast of Central America scientists on board the German research vessel "Meteor" are studying oceanic regions where tectonic plates are pushing against one another. They want to find out more about processes which influence the genesis of earthquakes, volcanic eruptions, and tsunamis. The following three parts of this mini-series not only take the viewer down to unknown depths, they also provide a look behind the scenes of a modern research ship.

113 A Look into the Depths
In this film an ROV submersible descends to a depth of up to two thousand metres in search of gas vents, bacteria mats, and samples of sediment.

114 Change of Staff
We experience a final dive on board the ROV submersible before heading for the port of Caldera. The exhausted scientists leave the ship with their "booty" to be replaced by a new team equipped with a deep-sea drill.

115 Messages from the Mud
In this film, as the Scottish team go into action with the deep-sea drill, geologists on board tensely await the first samples. But then the computer crashes...

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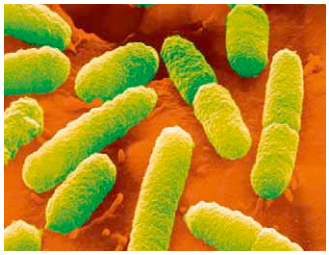
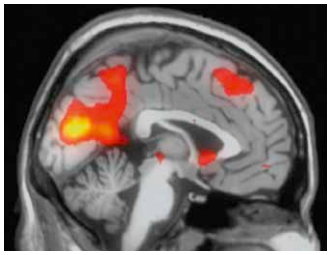


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116 Tectonic Motion – Earthquake Research
Mountains form where tectonic plates meet. It is the same mechanism that causes earthquakes. Geophysicists can learn a lot about the forces at work underneath the earth's surface by looking at mountain formations. Professor Heiner Igel, a seismologist at the Geophysics Department of Munich's Ludwig Maximilians University, is researching this force. The basis for his work are the recorded 20,000 earthquakes every year – data accessible via internet.

117 Ionization – Producing High Performance Plastics
High performance plastics are in strong demand for applications in the aerospace industry, in medical and engineering technology and for car manufacturing. Standard plastics often do not have the chemical, mechanical and thermal properties needed. These can only be achieved through the material's exposure to a highly energetic field of electrons and gamma rays. Through ionization mass produced plastics can thus be transformed into high performance materials.

118 Nerve Cells on a Silicone Chip
How does the brain actually work? Are we able to observe or even measure the process of thinking? Professor Peter Fromherz at the Max Planck Institute for Biochemistry in Martinsried is researching this process and wants to watch the brain at work. The basic concept of his approach is to connect nerve cells with a computer chip. After years of basic research he has managed to combine the watery world of the brain with the solid world of a silicon chip.

119 Energy Research – Fuel Cells and Superconductors
Energy supply is becoming ever more important for industrialized societies. The development of hydrogen driven fuel cells seems to be a very promising method of power generation. It's efficient and environmentally friendly with clean water being the only residue. The transmission loss in electrical devices can be as high as 30 percent. Superconductors would allow for a power supply without loss of energy. Researchers at Braunschweig University are working on ways to affordably produce resistance free electrical wires for large scale manufacture.

120 The Mighty Oceans – Research in the Depths
The mighty seas hold secrets of their own. They cover 70 percent of the earth's surface and are often thousands of meters deep. For ages mankind hasn't been interested in knowing more about the deep sea world and its diversity. Not only do deep sea creatures exhibit very unusual features but there also chemical processes in great depth, which may be crucial for the future development of the earth's climate and living conditions on land. In an attempt to assess the risk of possible consequences of these hidden processes to the climate for example researchers look deep down into the seas.

121 Ambassadors of Culture – Paper, Parchment, e-paper
At the beginning of the so-called digital age visionaries dreamed of paperless offices. But their dreams didn't come true. Rather the opposite was the case. The internet and networked printers flooded offices and households alike with paper. Scientists from the Fraunhofer Research Society want to hold on to the vision of a "nearly" paperless office. Their concept is based on electronic or e-paper.

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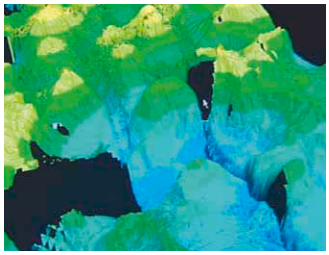

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122 How the Brain Learns
The human body is controlled by twenty billion nerve cells. Each nerve cell is linked to thousands of others, transmitting and receiving impulses via contact points called synapses. When we learn, scientists believe, the number and strength of the synapses change.

123 Perceiving Space – The 3-D-Puzzle of the Neurons
How does the brain perceive the spatial world? And what questions arise when this phenomenon is researched? In their efforts to learn more, neuro-scientists are making only slow progress. It is an issue that also interests biologists, engineers, and philosophers.

124 Marine Research – Searching for Clues in the Deep
Studying the oceans, which cover 70 percent of the earth's surface, is no easy task. For thousands of years mankind was blind to life in the depths. Yet processes take place there that have a decisive influence on life and death on land. Researchers are trying to assess the dangers arising from these processes and to find solutions in the deep to the major problems facing mankind – like climate change.

125 Cool Beauties – Focus on Cold-Water Corals
The sea off the coast of Europe, especially the continental shelf, is a paradise for coral. It is a world ruled by cold water corals, which feed on small crustaceans. Unlike their tropical relatives, these corals need neither sunlight nor algae. Only one location seemed too adverse for cold-water corals: the Mediterranean. So an expedition was mounted to find out why. The surprising result of this research is that the corals also inhabit the Mediterranean. It is just that their presence is cleverly concealed.

126 Synthetic Aperture Radar Reconnaissance
The synthetic aperture radar reconnaissance system (SAR) does not operate with normal photographic methods. Instead it utilizes radar technology which enables it to see through cloud cover and take pictures even in the dark. Developed in Germany, the SAR process yields high-resolution images from a height of approximately 500 kilometres. The system can monitor the entire globe.

127 Quantum Computers
Quantum computers are microscopically small and need comparatively little energy, but in terms of computing power they are to present-day computers as a rocket is to an ox-cart. Quantum computers still belong to the realm of science fiction. But researchers are already working on the fundamentals of these computers of tomorrow.

128 Exploring Endurance Running
For decades, scientists have asked what gives runners their "high"? Is it really explained by endorphines, transmitters that function like feel-good drugs in the body? Researchers have found a new method of showing what happens in the brain.

129 RFID Chips for Bees and Humans
This show looks into the fascinating world of bees. We explore efforts to find out about the mysterious illness afflicting hives across North America, look at ways of fighting the fearsome varroa mite, and document groundbreaking advances in decoding the language of bees. The report also shows how innovative technologies such as the RFID chip can enhance bee research and human medical research as well.

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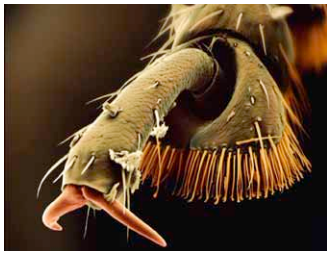


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130 Improving Life with a Disability

Paraplegics, stroke patients and multiple sclerosis sufferers are united in the hope that one day a treatment may be found to help them regain their mobility and ability to walk. In this programme, we look at the intensive research underway and show how crucial the active participation of patients is in developing new treatments.

131 Slow Food – A Journey of Discovery Back to Pleasure

"Slow food" is emerging as the countermovement to fast food – the unhurried and pleasurable way to enjoy a meal. The world's first University of Gastronomic Sciences was founded in Italy in 2004. Its two campuses have a total of 400 students from 22 countries, rediscovering the joy of good, slow food.

132 The Big Bang – The Quest for our Beginnings

The European Organization for Nuclear Research (CERN) near Geneva houses the world's largest and highest-energy particle accelerator, the Large Hadron Collider. It's here that astrophysicists hope soon to simulate the Big Bang and the conditions that followed it, in order to answer at last some of the most fundamental questions about the beginnings of the world and the universe.

133 The World's New Eyes

New advances in perception have been made thanks to the advent of raster electron microscopes, extreme high speed cameras and neutron tomography. These devices enable us to see things in the world that would otherwise remain invisible.