SCIENCE

EUROPEAN SCIENTIFIC HERITAGE
ESA’s Science Programme has achieved some remarkable firsts, allowing Europe to lead in many domains of space science. Giotto’s encounter with comet 1P/Halley inspired Rosetta’s mission to Comet 67P/Churyumov-Gerasimenko, Hipparcos’ star map paved the way to Gaia’s multi-dimensional map of our home galaxy, while LISA Pathfinder has provided us with the technology needed for LISA to detect gravitational waves from space. ESA’s trio of upcoming exoplanet missions, Cheops, Plato and Ariel, each with their own unique goals to understand worlds beyond our own, is based on European scientific and technological heritage at the forefront of this rapidly evolving field.

WORLD-CLASS TOOLS
ESA’s Science Programme allows scientists to study the Sun, planets and small bodies in our Solar System, and to observe the wider Universe, from stars and their planets in our Milky Way, to distant galaxies beyond, investigating cosmic mysteries such as star formation, black holes, dark matter and dark energy. It provides the European scientific community with the tools needed to maintain and extend its world-class space research.

INNOVATION TO IMPROVE LIVING STANDARDS
Science is the motor of innovation and prosperity in Europe – and the world – and society is based on technology and knowledge. Investing in space science to attract the best talents, especially from younger generations, will help all of us to improve education and inform evidence-based policy, to maintain and raise our standard of living. The now ubiquitous satellite-based navigation devices are one example as they would not have been possible without understanding and using Einstein’s general theory of relativity.

PLAN NOW FOR FUTURE SUCCESS
The preparations for previous European world-class successes in space science started more than two decades ago. The funding was substantially higher at that time. In order to maintain Europe’s global leadership in this field now and in the future, we need to start by increasing funding by 20% at Space19+.

#Space19plus
AIMING HIGH

Securing funding will push ‘multi-messenger’ astronomy research to new heights, allowing Athena and LISA to operate together and perform a unique and unprecedented experiment: observing the merger of supermassive black holes throughout the Universe in both X-rays and gravitational waves. The 20% increase will also allow us to send a mission to the ice giants Uranus and Neptune, taking advantage of a favourable alignment of Jupiter to provide gravity assists from the late 2020s to the early 2030s. Analysing these worlds will help scientists better understand the diversity and similarities of the planets in our own Solar System as well as the thousands of exoplanets discovered in other solar systems – the vast majority of which fall into the size range between Earth and Neptune. More funding will enable additional support to Member States for developing new technologies to meet the challenging demands of scientific exploration in space. In addition, ESA will be able to pursue more F-class (fast) missions, taking advantage of existing M-class (medium) mission launch opportunities to maximise the science return for European scientists.

SPACEFARING NATIONS UNITE FOR SCIENTIFIC PROGRAMME

Competition as driver and cooperation as enabler have shaped ESA’s scientific programme since its inception. ESA’s Science Programme is a sought-after partner for international cooperation. ESA has flown missions together with all main spacefaring nations, including Canada, China, India, Japan, Russia and the US. It has also united ESA’s Member States to build cutting-edge space missions they could not have implemented on their own.

→ FUNDING ESA’S SCIENTIFIC PROGRAMME

For every €1 spent in ESA’s Science Programme, €1.6 is returned to the economy

An employment multiplier of 2.1 is generated by economic activity of ESA’s Science Programme

FUNDING SPACE SCIENCE

This graphic shows the long-term development of the funding for ESA’s mandatory scientific programme (red line) over a period of more than three decades, with L-class (large missions) depicted as red launchers and M-class (medium) in blue. The loss of buying power in recent decades has led to a noticeable reduction in mission opportunities. In parallel, there is an increased ambition, reflected in the substantial growth of the number of ESA member states and the Gross Domestic Product (grey line) over the same period. With a 20% increase in funding to ESA’s scientific programme from the current situation, projected as the dotted red line beyond 2019, more mission opportunities can be foreseen. ESA’s scientific programme would be able to consolidate global leadership in a number of key areas, enabling scientists to continue tackling fundamental questions concerning the Solar System, exoplanets, black holes, dark matter and dark energy, for example.

More information at www.esa.int/space19plus