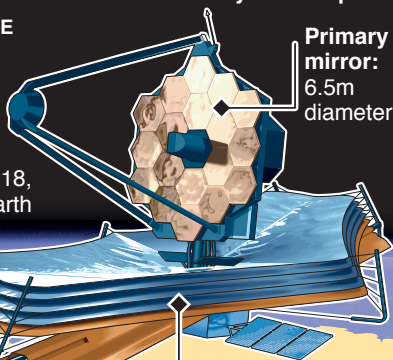


New generation of super-telescopes

Three new telescopes, each hugely more powerful than any before them, may soon be able to answer vital questions about the origin and evolution of the universe and whether there is life beyond our planet

■ JAMES WEBB SPACE TELESCOPE

Successor to Hubble telescope, but mirror almost three times bigger will enable much greater light-gathering capability to penetrate farthest reaches of universe. Due to enter service in 2018, in orbit about 1.5 million km from Earth



Primary mirror:
6.5m diameter

Sunshield:
Tennis court-sized shield blocks sunlight

■ EUROPEAN EXTREMELY LARGE TELESCOPE

Largest optical telescope ever built. Sited on mountain top in Chile's Atacama desert, 40-metre diameter mirror will produce images 16 times sharper than Hubble

■ SQUARE KILOMETRE ARRAY

\$2.5bn radio telescope sited in Australia and South Africa, due to be fully operational by 2024. Combined collecting area totalling one square kilometre, made up of 3,000 dishes



In use by 2022, E-ELT's resolution will allow direct imaging of rocky planets beyond our solar system

SKA will be 50 times more sensitive and 10,000 times faster than any other telescope on Earth