When the going gets tough, copper gets going

Testing of the MIRI thermal shield for the James Webb Space Telescope – NASA's Goddard Space Flight Center, Greenbelt, MD, USA

copper gets going to observe distant galaxies

copper wire in thermal shield for Webb Telescope

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European Copper Institute
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Going on a magnified space mission

Due to be launched in October 2018, the James Webb Space Telescope will follow up NASA's Hubble Space Telescope and the Spitzer Space Telescope. This new observatory will feature a larger 6.5-metre diameter mirror – compared to Hubble's 2.4-metre mirror – making it the most powerful telescope ever built. The expectations for the Webb are also larger: to shed light on the formation of our own solar system, and even the origins of the universe.

Going to use pioneering technologies

A collaboration between NASA, the European Space Agency and the Canadian Space Agency, this large infrared telescope features some groundbreaking technologies, including 18-segment, ultra-light beryllium mirrors that unfold after takeoff; hypersensitive cameras and spectrometers that record images undetectable to the human eye; and a tennis court sized 5-layer sunshield in order to protect the extremely delicate equipment from intense heat and light.

Going to keep it cool

Copper wires are very important to help control the temperature of the Mid-Infrared Instrument under the shield. The equipment has to perform in the extreme cold of outer space, and must be kept at temperatures under –250 °C to avoid being overwhelmed by its own infrared radiation. And it's the telescope's infrared capabilities that can potentially observe the dim glow of the very first galaxies.

Going back to the Big Bang

For the next decade, astronomers all over the world will get a glimpse of never-before seen images of far-away planets, stars and solar systems – a window all the way back to the Big Bang. And copper will have played its part in understanding our cosmic history!