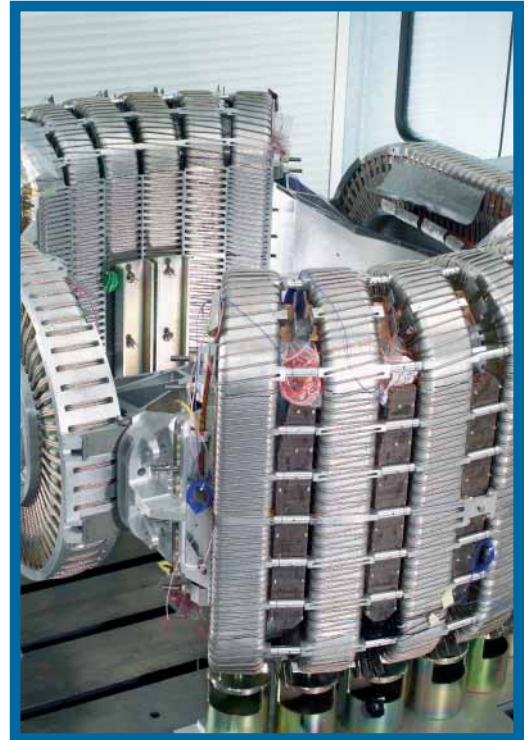


AMS-02 Superconducting Magnet

AMS-02 is the Alpha Magnetic Spectrometer, a superconducting particle physics experiment which will be launched on the Space Shuttle and installed on the International Space Station. The project is an international collaboration of 56 research institutes from 16 countries.

Specification

Central Magnetic Field $B_x(0,0)$	0.86 T
Dipole Bending Power	0.78 Tm ²
Room Temperature Bore Diameter	1100 mm
Cryostat Outside Diameter	2800 mm
Overall Cryostat Height	1500 mm
Cold Mass	2200 kg
Operating Temperature	1.8 K
Superfluid Helium Capacity	2500 litre
Maximum Stray Field at R=2.3m	15.2 mT
Maximum Stray Field at Y=2.3m	7.6 mT
Maximum Stray Field at R=3.0m	3.9 mT
Peak Field on the Dipole Coils	6.59 T
Peak Field on the Racetrack Coils	5.91 T
Magnetic Torque (in Earths Field)	0.27 Nm
Nominal Operating Magnet Current	459 A
Stored Energy	5.15 MJ
Nominal Magnet Inductance	48.9 H



Scientific Magnetics is responsible for the design, manufacture and test of the superconducting magnet for the experiment. With a diameter of nearly 3 m and a cold mass approaching 2 tonnes, AMS-02 will be the first large superconducting magnet to be launched into space. The 14 coils generate fields up to 7 T, and are cooled to 1.8 K by 2500 litres of superfluid helium stored in an ultra-lightweight aluminium vessel.

The rigours of space qualification, launch, and extended zero-gravity operation make AMS-02 one of the most challenging superconducting magnet projects ever undertaken.