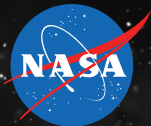


ASTROLYMPICS

ACCELERATION



www.nasa.gov

Definition: the change of velocity of an object over time

Units: meters/seconds² (m/s²), miles/hour/second (mi/hr/s), kilometers/hour/second (km/hr/s)

COSMIC EXAMPLE

B1509: The gravitational acceleration on the surface of a neutron star is about a trillion times that on Earth. About three trillion m/s²



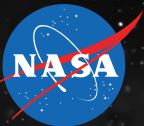
PARALYMPIC EXAMPLE

Elite wheelchair tennis players can accelerate very quickly during sprints. 17 m/s²

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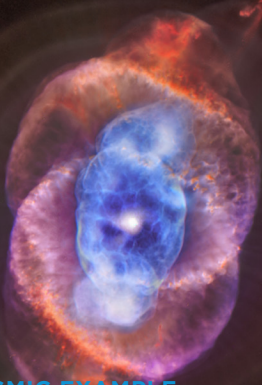
ASTROLYMPICS

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Definition: how much mass is in a certain volume

Units: kilograms per cubic meter (kg/m^3); grams per cubic centimeter (g/cm^3)



COSMIC EXAMPLE

Neutron star: These stellar cores, which often emit X-rays that Chandra can detect, are some of the densest objects in the Universe. $1 \times 10^{18} \text{ kg/m}^3$ (1,000,000,000,000,000,000 kg/m^3)



PARALYMPIC EXAMPLE

Sailing: Boats are largely hollow and float because their total volume has a much lower density than water. Air: 1.2 kg/m^3 ; Water: $1,000 \text{ kg/m}^3$