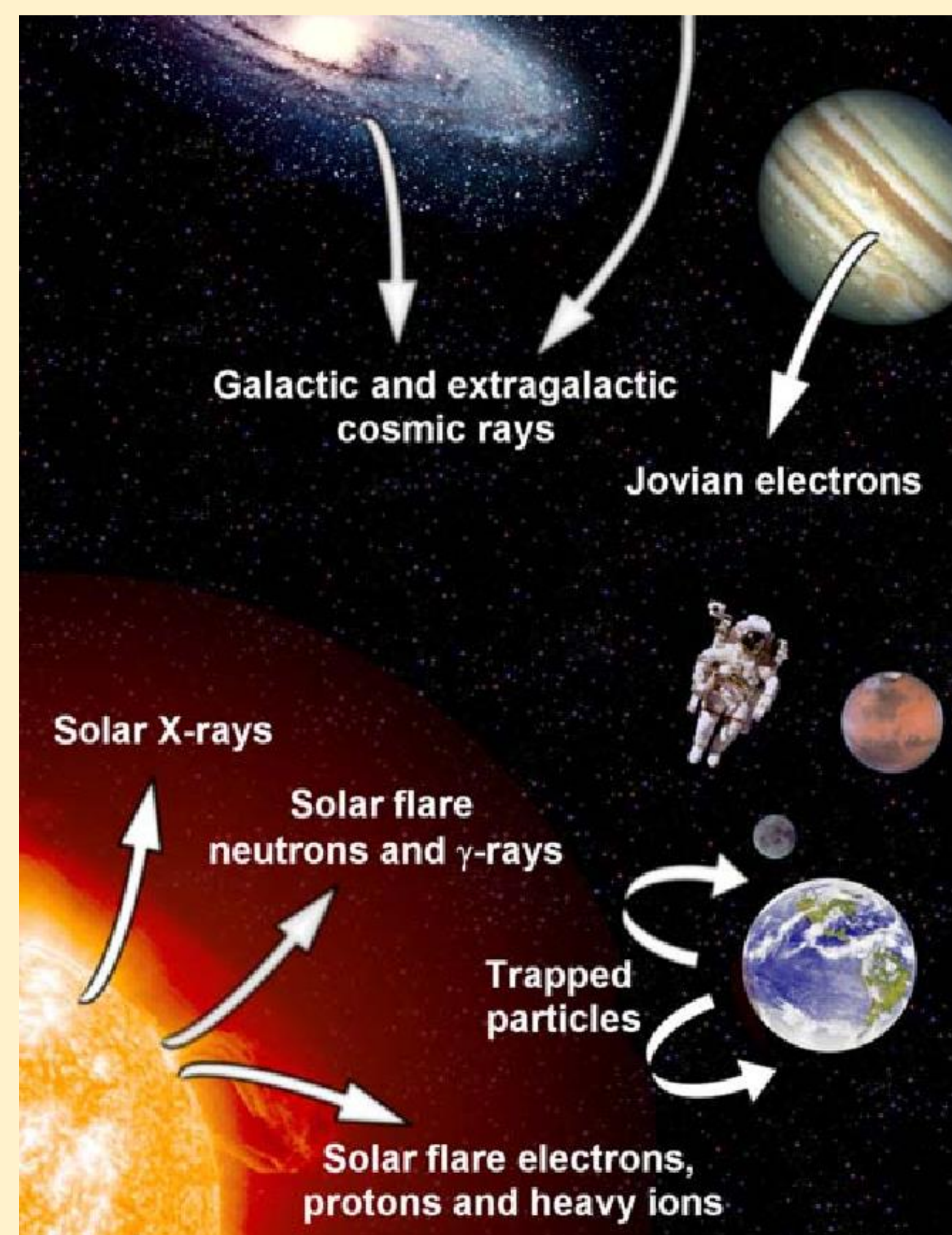
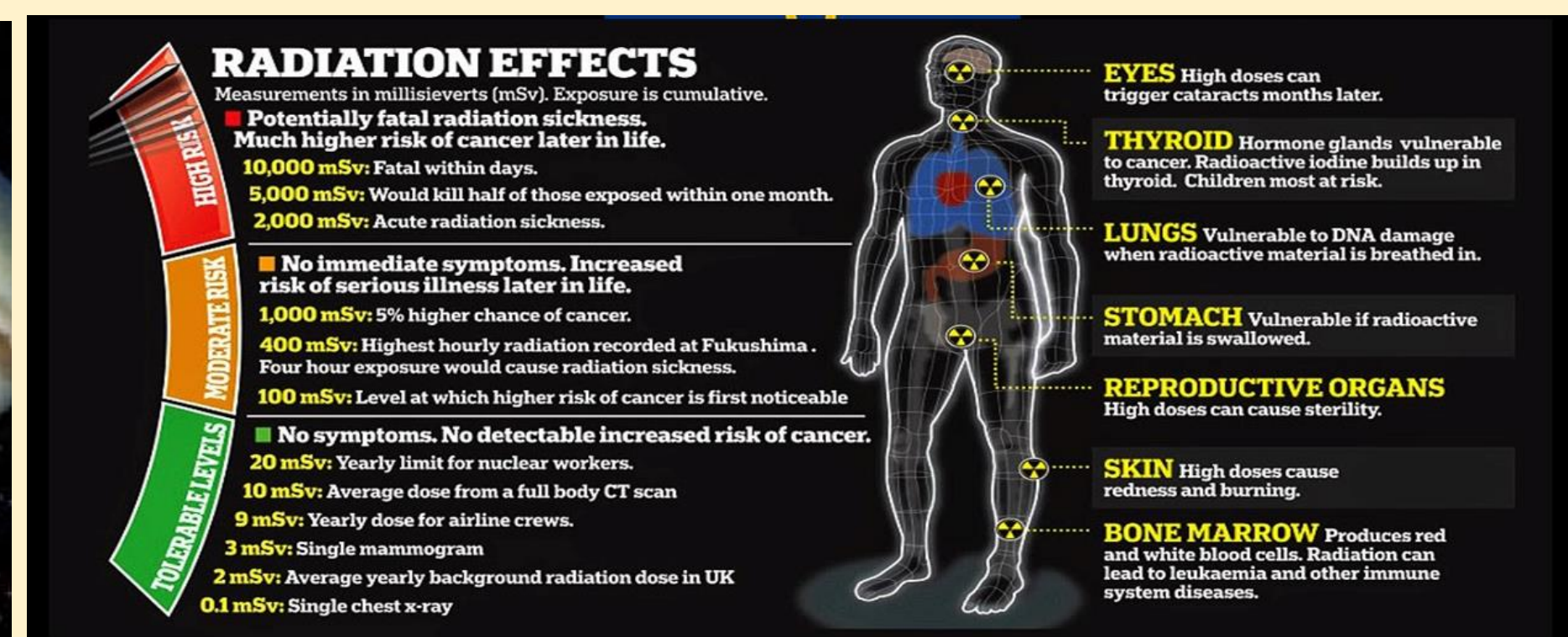


Impacts of cosmic radiation

Radiation shielding and detection



Space radiation sources of our solar system

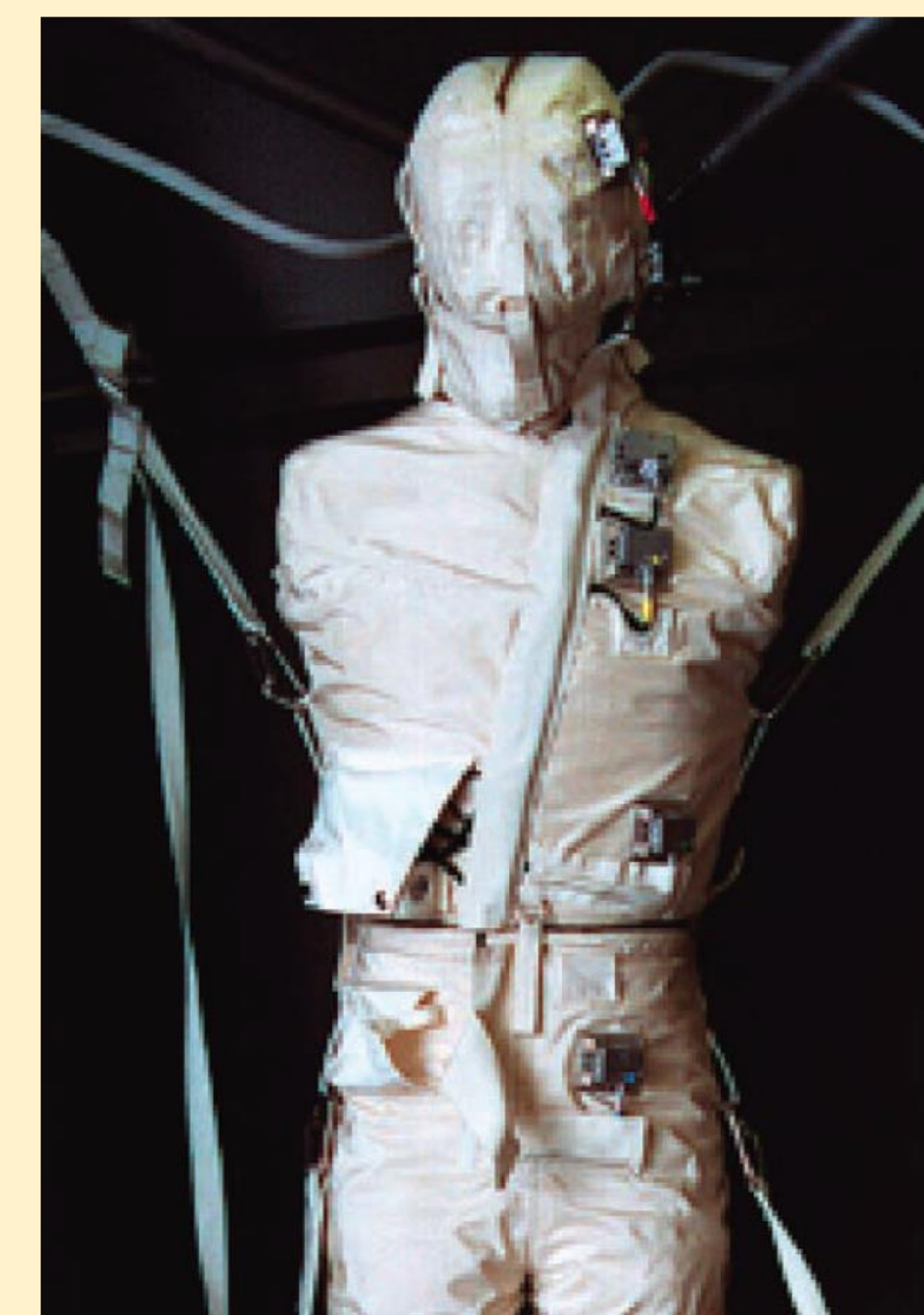


Potential radiation damages to astronauts (In a solar particle event, astronauts may receive fatal dose of radiation exposure in a short time)

Material	Damage Threshold (Rad)
Biological matter	$10^1 - 10^2$
Electronics	$10^2 - 10^6$
Lubricants, hydraulic fluid	$10^5 - 10^7$
Ceramics, glasses	$10^6 - 10^8$
Polymeric material	$10^7 - 10^9$
Structural metals	$10^9 - 10^{11}$

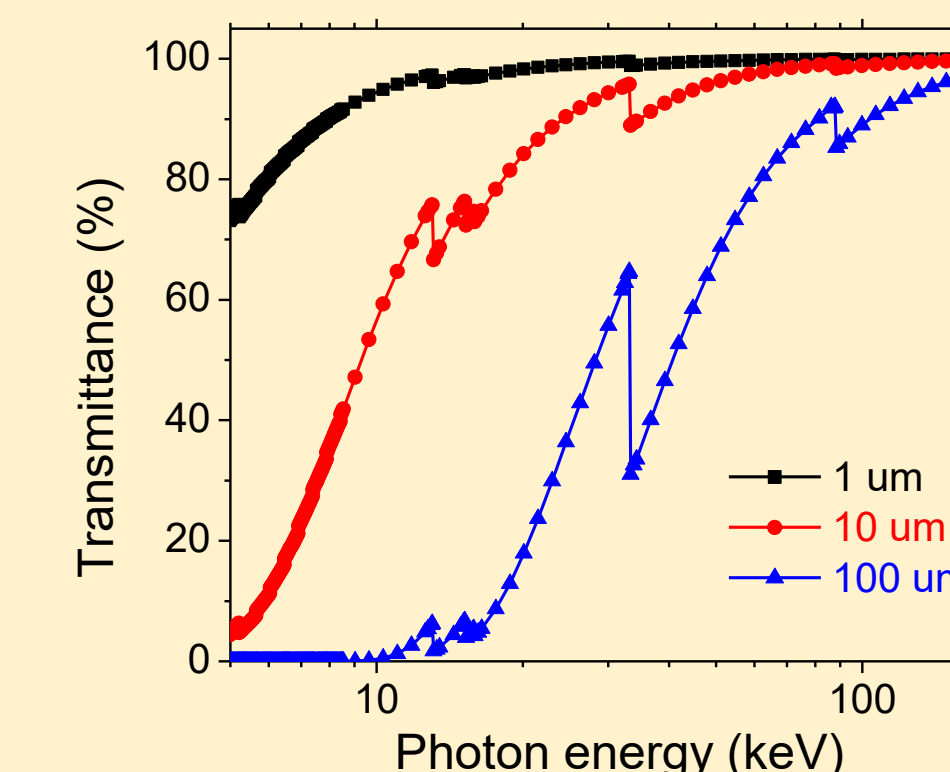
Accumulative radiation damages to space shuttle components

- It is critical to effectively shield and continuously monitor radiation in space to ensure the safety of astronauts and the quality of launched shuttles.



- Existing technologies deal with radiation shielding and detection separately.
- NASA uses a radiation monitoring system that contains more than 300 radiation sensors mounted on human torso and head.
- We have developed a new composite that can be potentially coated inside space shuttles to shield radiation and quantitatively measure the doses.

A new composite approach



- Light weight, any desired shapes, very-large-scale manufacturing
- Highly absorbing to high energy space radiation
- Quantitatively measure both radiation sources and doses

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