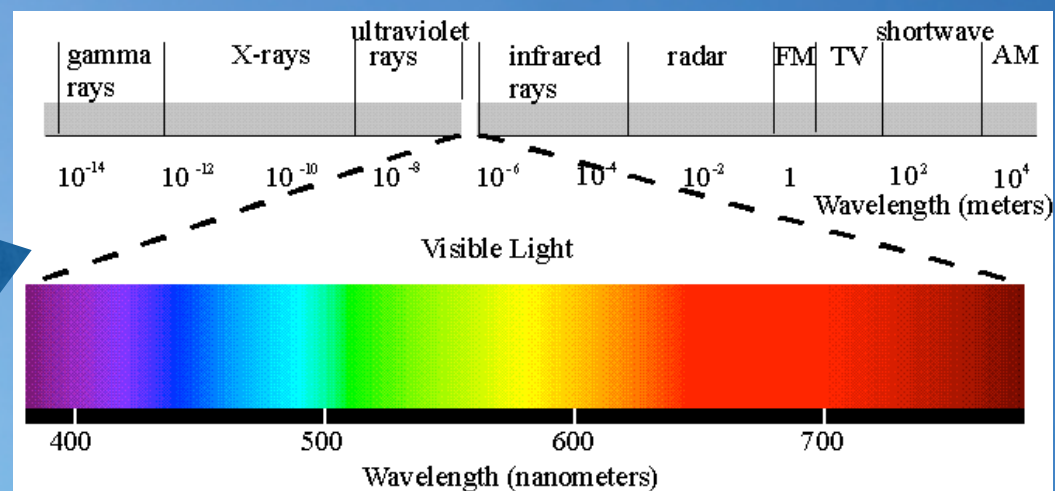
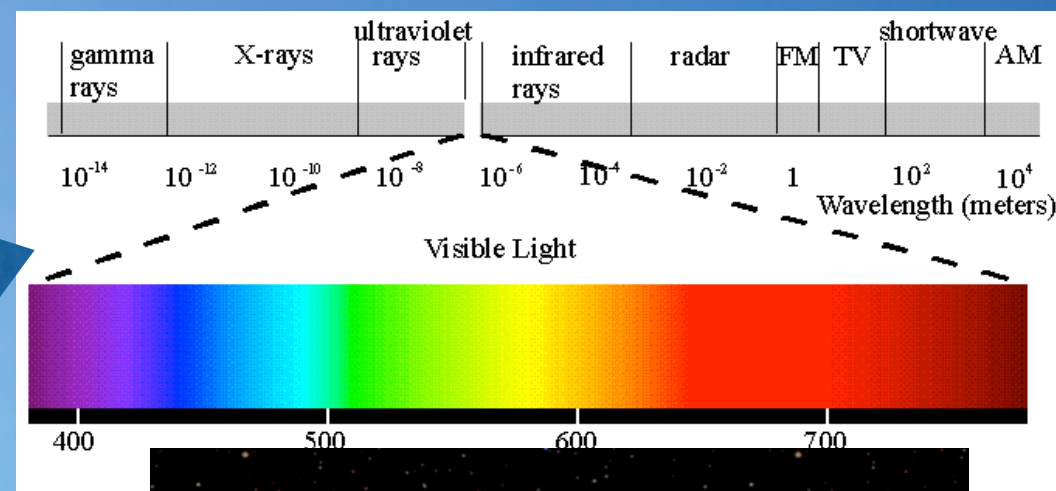




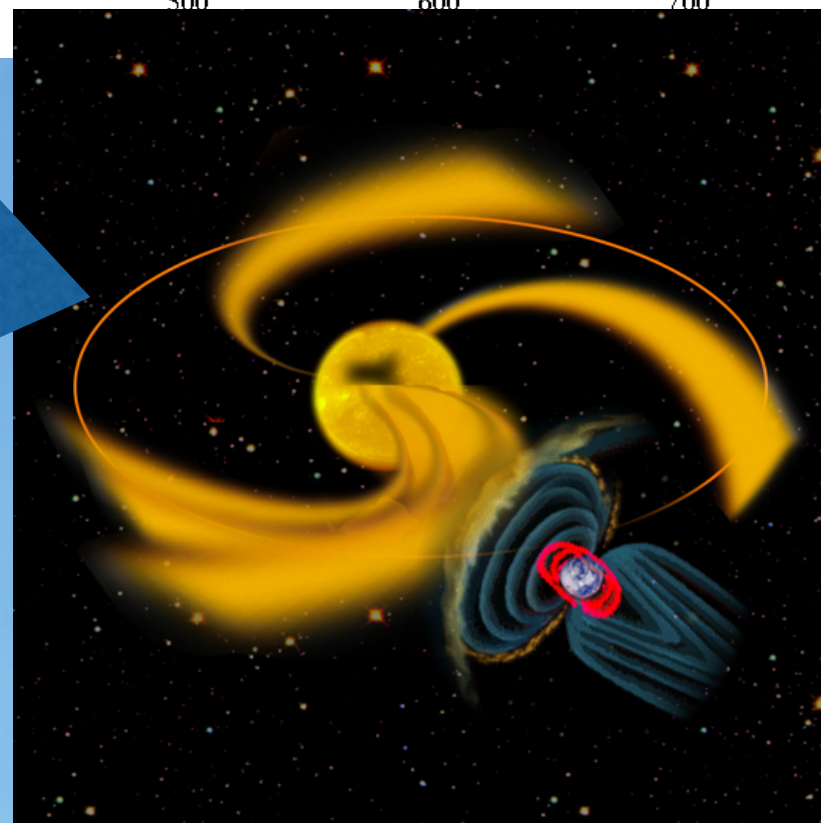
Light
(X-ray to radio)



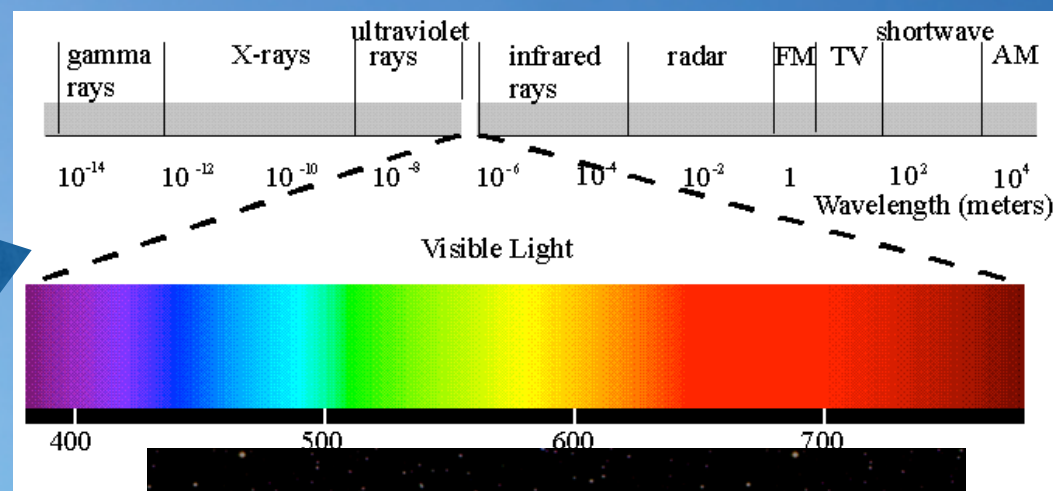
Light
(X-ray to radio)



Magnetized wind

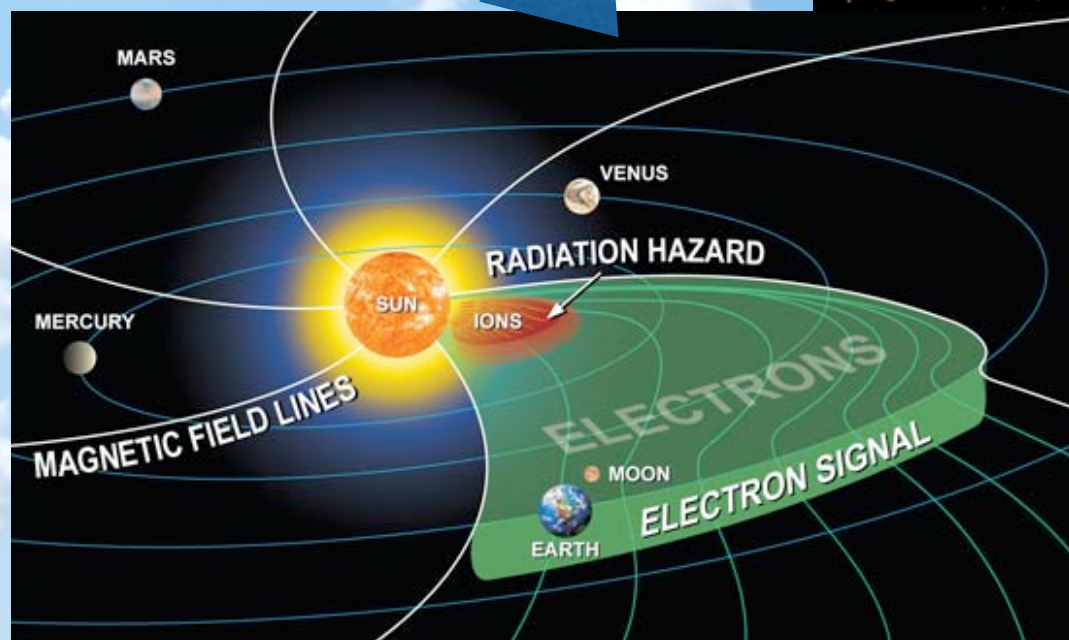
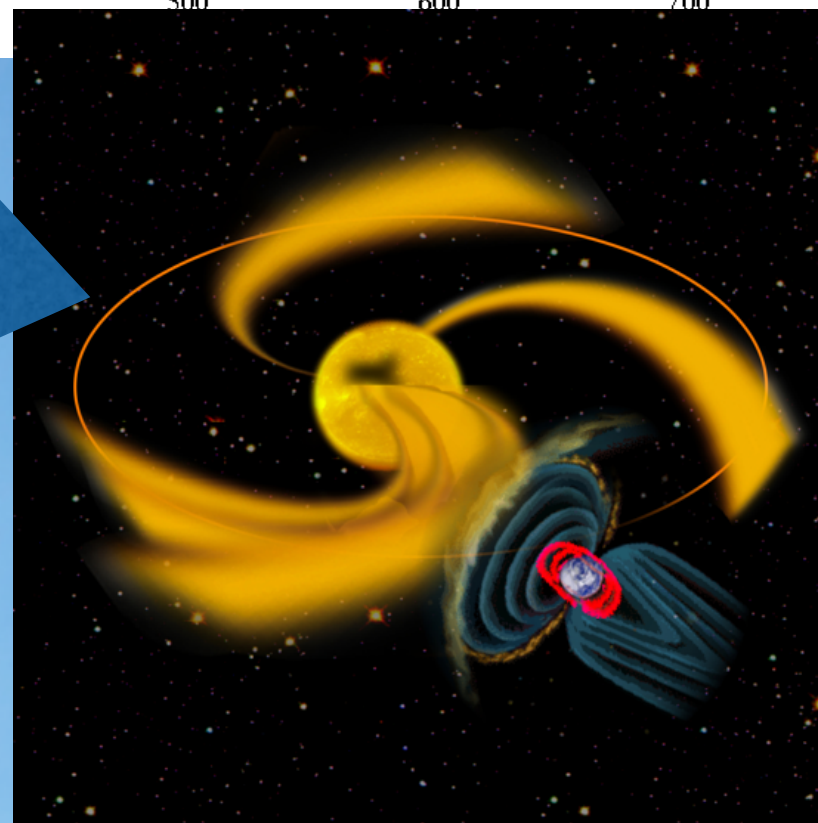


Light
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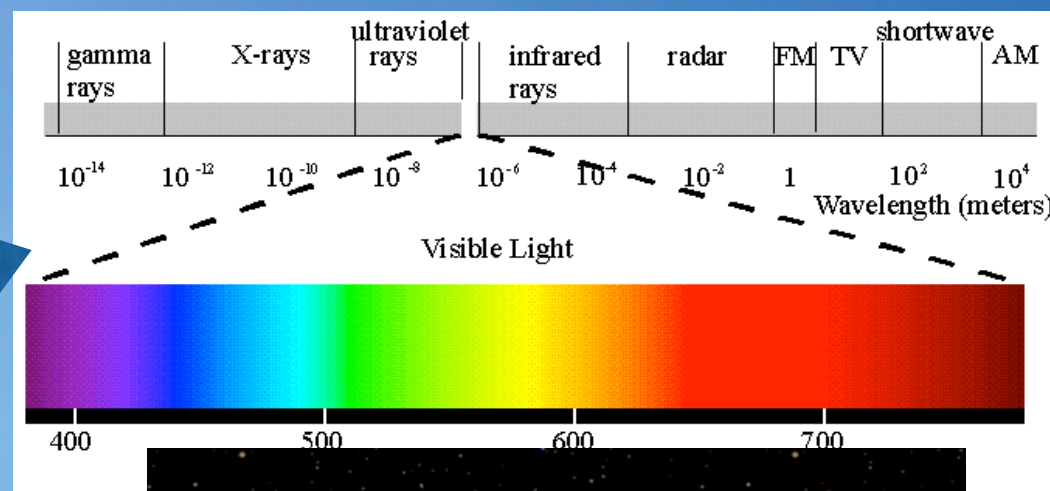


Magnetized wind

Particle radiation

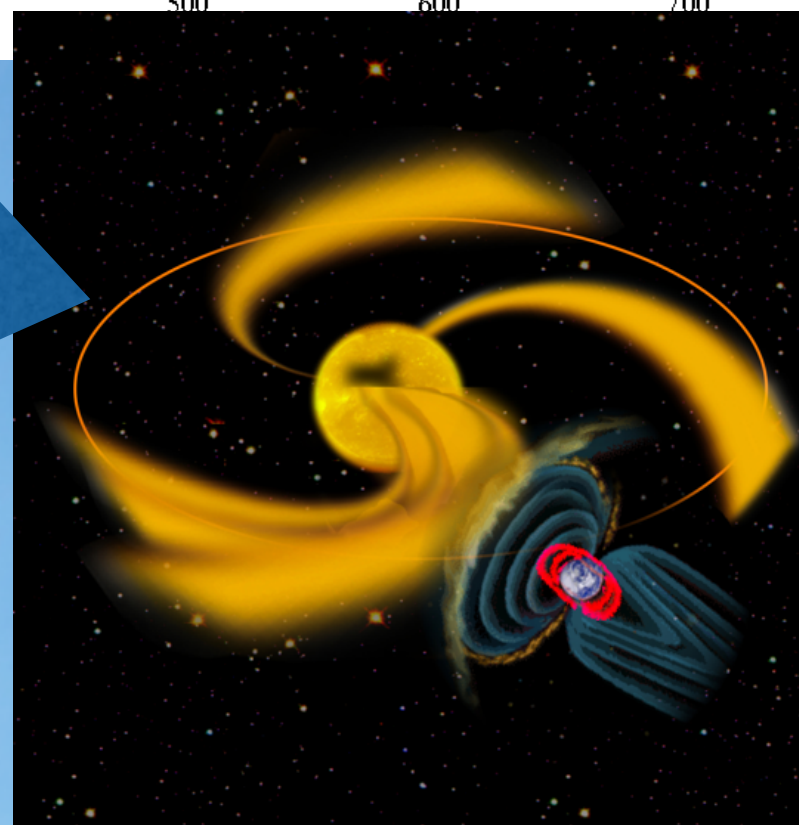


Light
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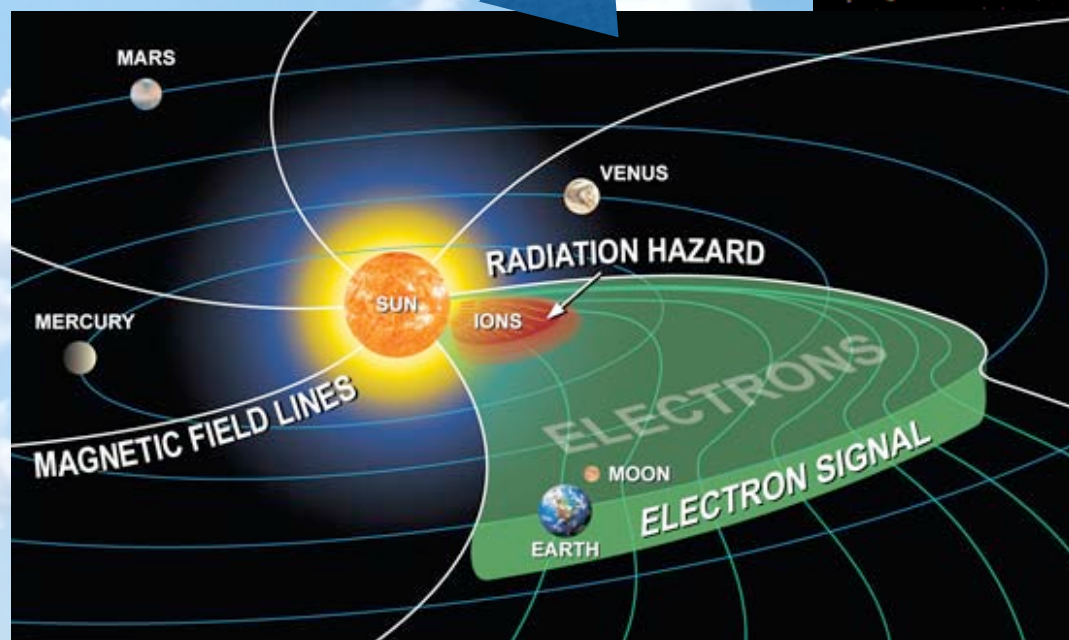


Radio blackouts;
satellite drag; problems for
dayside satellite navigation
[R scale]

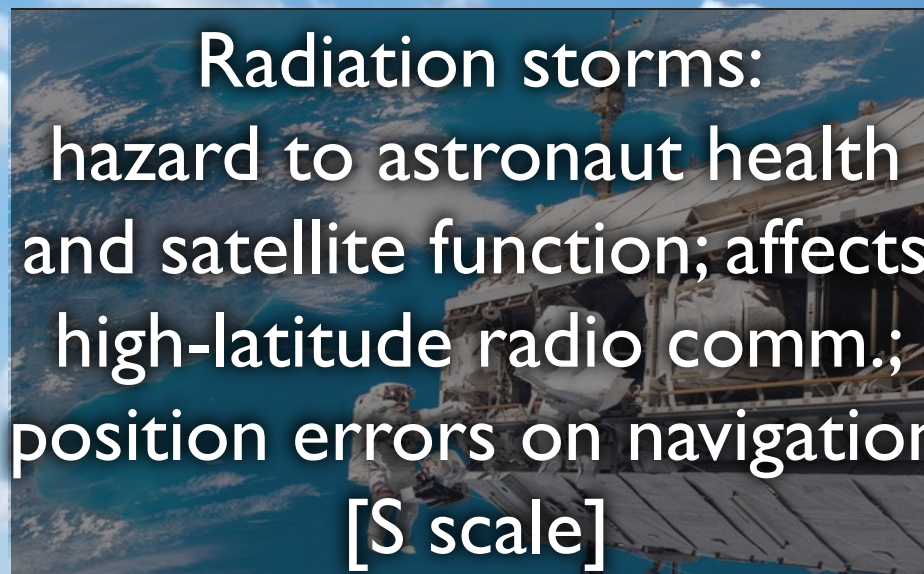
Magnetized wind
Particle radiation



Geomagnetic storms:
couple into power grids,
cause ionospheric
disturbances affecting
satellite navigation; aurorae
[G scale]



Radiation storms:
hazard to astronaut health
and satellite function; affects
high-latitude radio comm.;
position errors on navigation
[S scale]



Executive Order -- Coordinating Efforts to Prepare the Nation for Space Weather Events

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Understanding space weather to shield society: A global road map for 2015–2025 commissioned by COSPAR and ILWS

Carolus J. Schrijver^{a,*}, Kirsti Kauristie^{b,*}, Alan D. Aylward^c, Clezio M. Denardini^d, Sarah E. Gibson^e, Alexi Glover^f, Nat Gopalswamy^g, Manuel Grande^h, Mike Hapgoodⁱ, Daniel Heynderickx^j, Norbert Jakowski^k, Vladimir V. Kalegaev^l, Giovanni Lapenta^m, Jon A. Linkerⁿ, Siqing Liu^o, Cristina H. Mandrini^p, Ian R. Mann^q, Tsutomu Nagatsuma^r, Dibyendu Nandy^s, Takahiro Obara^t, T. Paul O'Brien^u, Terrance Onsager^v, Hermann J. Opengoorth^w, Michael Terkildsen^x, Cesar E. Valladares^y, Nicole Vilmer^z

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^f RHEA System and ESA SSA Programme Office, 64293 Darmstadt, Germany

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Abstract

There is a growing appreciation that the environmental conditions that we call space weather impact the technological infrastructure that powers the coupled economies around the world. With that comes the need to better shield society against space weather by

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Understanding space weather to shield society: A global road map for 2015–2025 commissioned by COSPAR and ILWS

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“Review current space weather capabilities and identify research and development priorities in the near, mid and long term which will provide demonstrable improvements to current information provision to space weather service users”