



SPACE::LAB

Why to apply ML on SPACE DATA?

by Simon Mackovjak

Credit: <https://ourpint.com>

Why to apply ML on SPACE DATA?

Because we have no other option.

Why ML can be so effective?

- **Big data** are available (for free)
- Great **computation power** is accessible
- Top **IT tools** can be used (open-source)

Discover the origin, structure, evolution, and destiny
of the universe, and search for Earth-like planets

Astrophysics

Study Earth from space to advance scientific
understanding and meet societal needs

Earth Science

The Science Mission Directorate

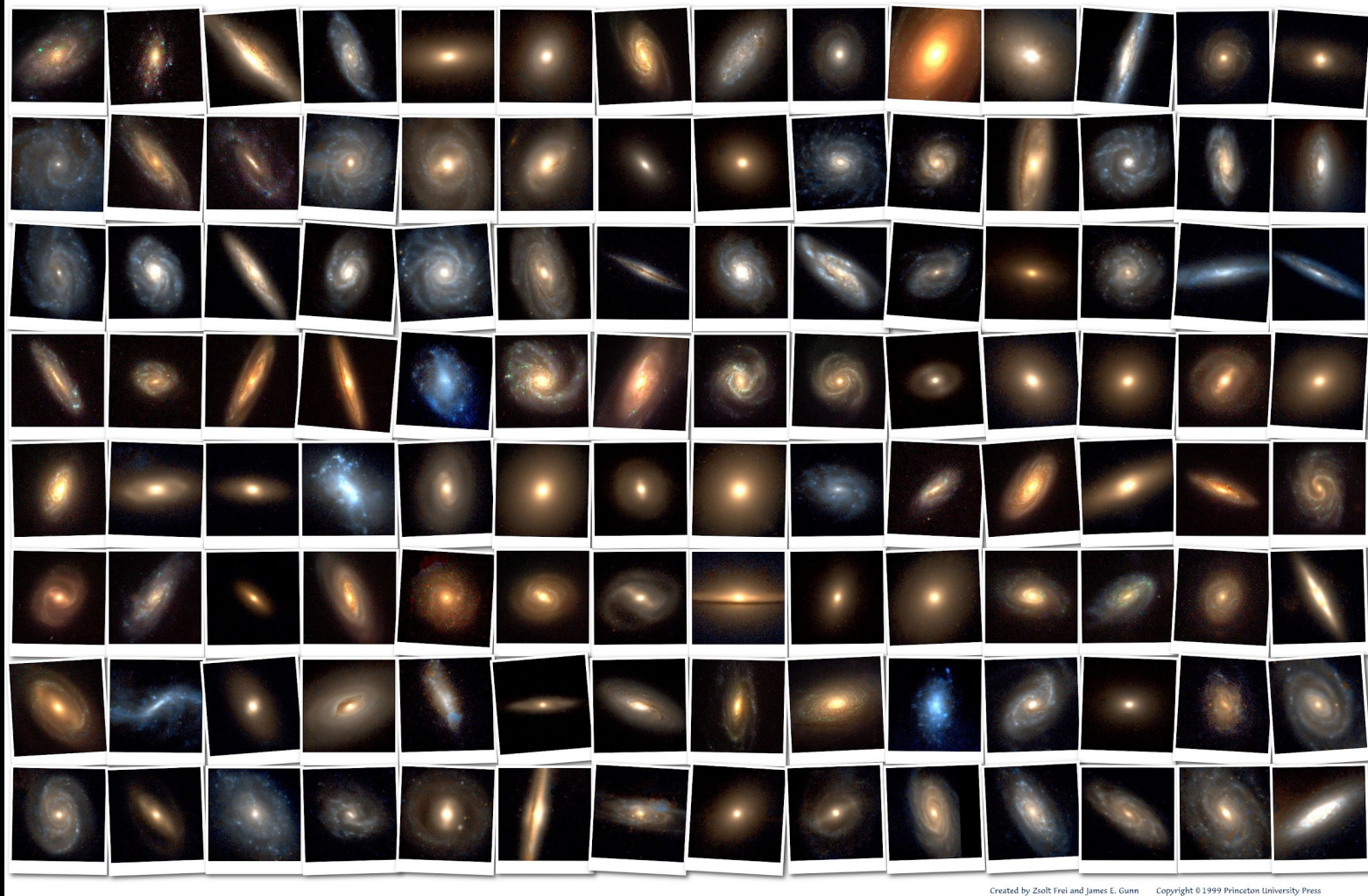
Heliophysics

Understand the Sun and its effects on
Earth and the solar system

Planetary Science

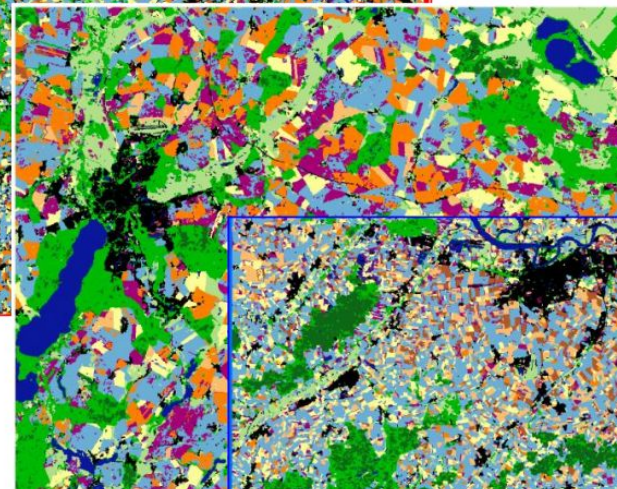
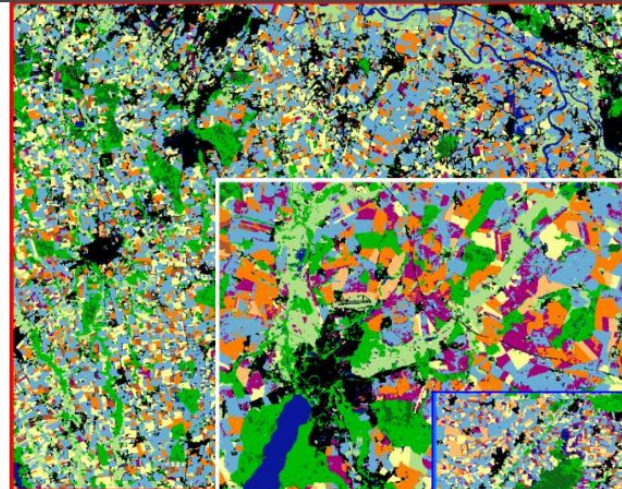
Advance scientific knowledge of the origin and
history of the solar system, the potential for life
elsewhere, and the hazards and resources
present as humans explore space

Credit: NASA's Vision and Fundamental Physics in Space



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German Crop landscape



Grassland	Potato
Winter Cereals	Grapevine
Maize	Deciduous&Mixed Forest
Winter Rapeseed	Coniferous Forest
Spring Cereals	Built-up
Sugar Beet	Water

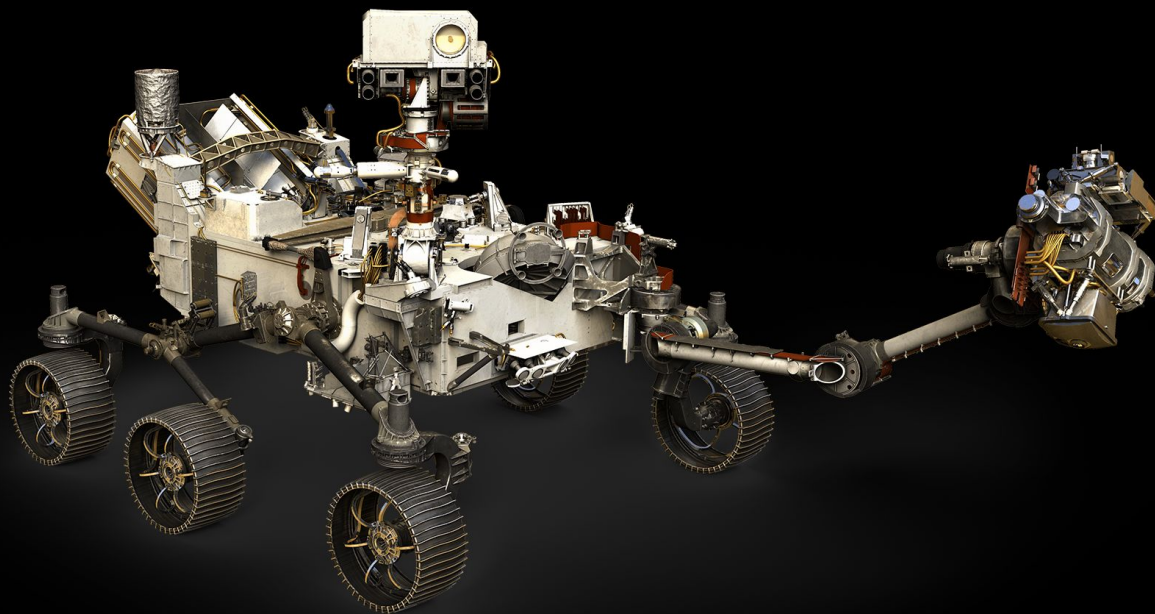
Full Resolution Visualization Online:

http://www.esa.int/spaceinimages/Images/2017/08/Mapping_Germany_s_agricultural_landscape

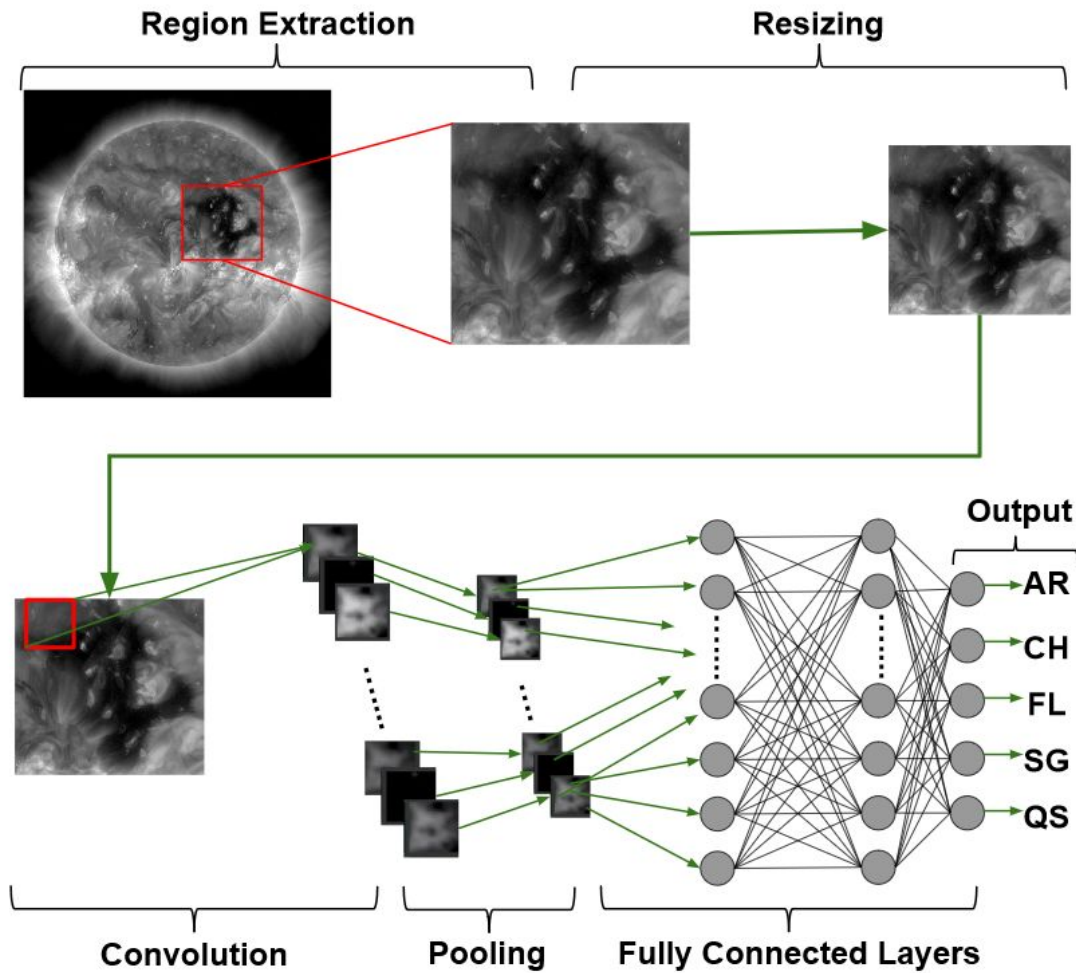
ESA UNCLASSIFIED - For Official Use



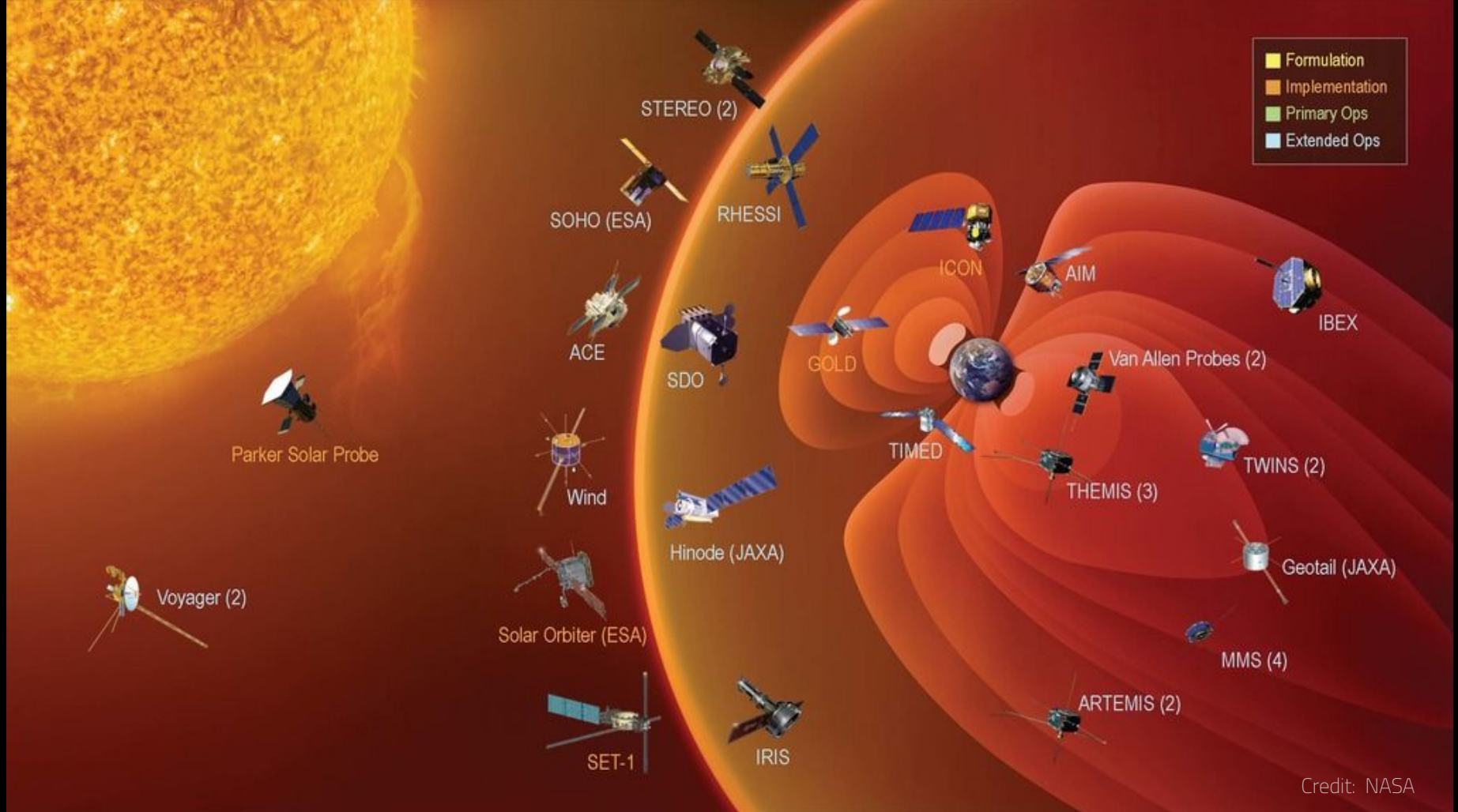
European Space Agency



Credit: Mars 2020 rover - NASA/JPL

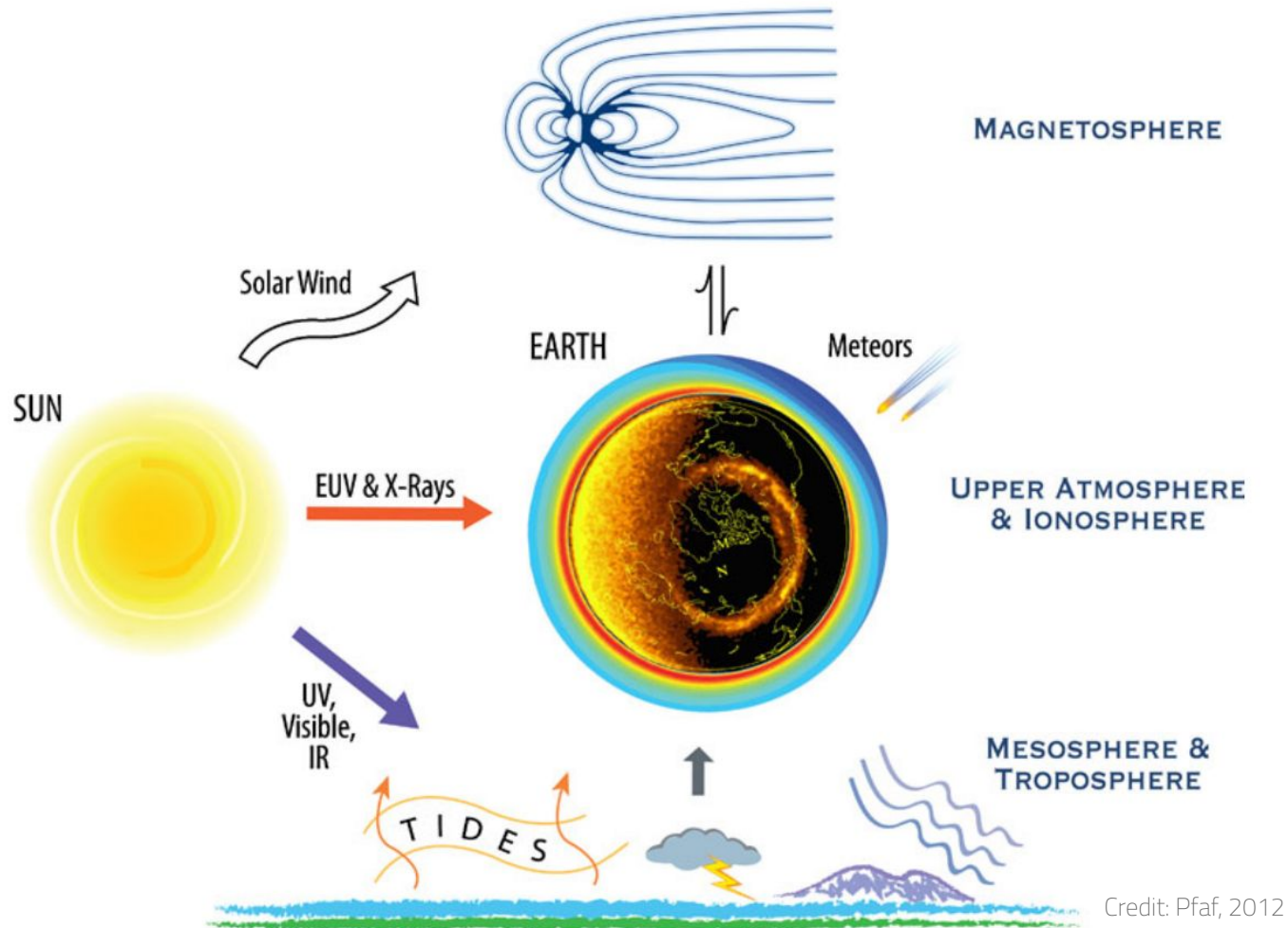


Credit: Kucuk et al., 2017



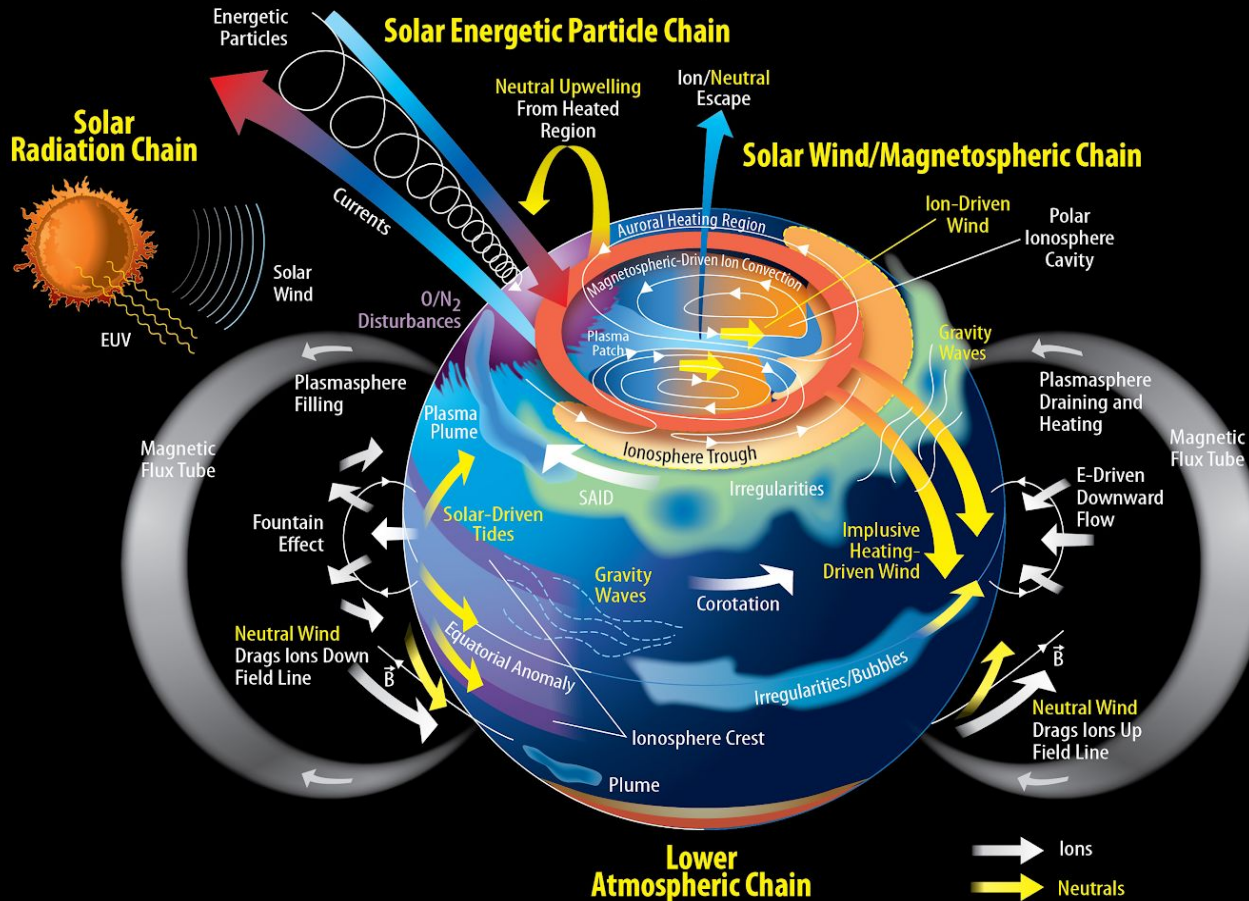
Credit: NASA





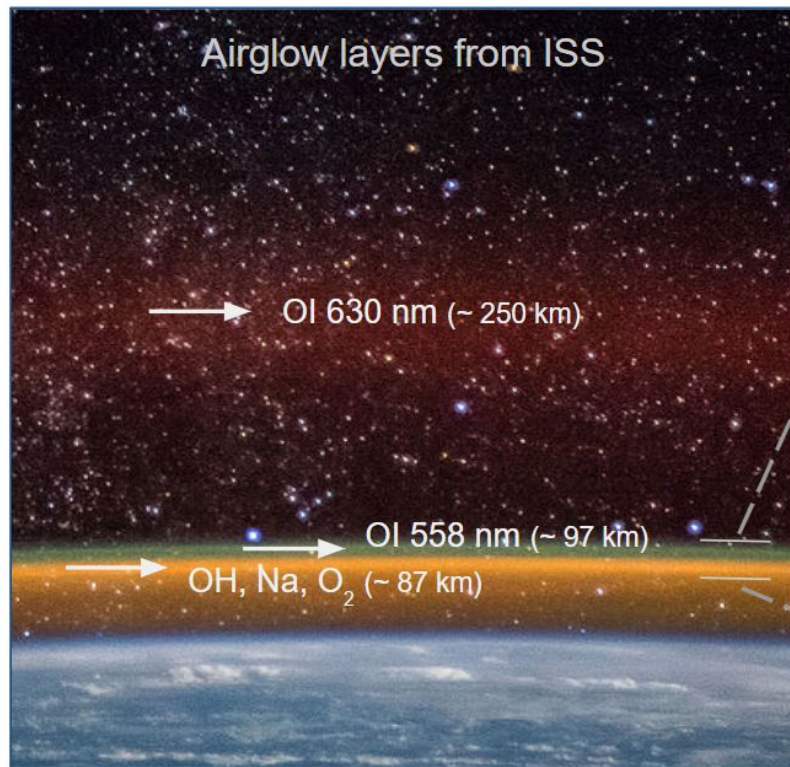
Credit: Pfaf, 2012

Terrestrial Atmospheric ITM Processes

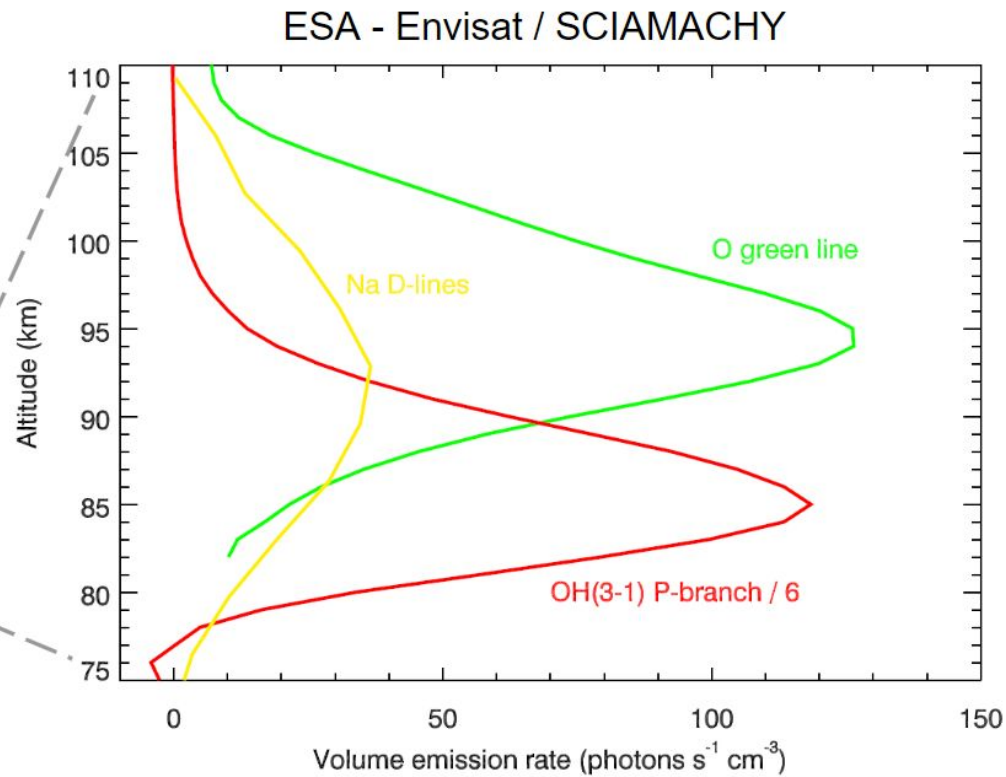


Credit: NASA / J. Grobowsky

The airglow can be used as indicator of upper atmospheric dynamics



(S. Cristoforetti from ISS, ESA)

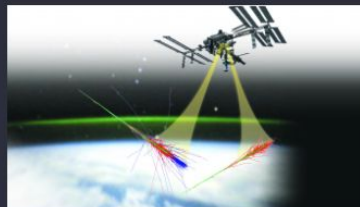


(Envisat / SCIAMACHY, ESA)



SPACE::LAB program

Aktuálne témy, ktorým sa venujeme na
Oddelení kozmickej fyziky



JEM-EUSO

JEM-EUSO (Joint Experiment Missions for
Extreme Universe Space Observatory) Participácia
na medzináro...

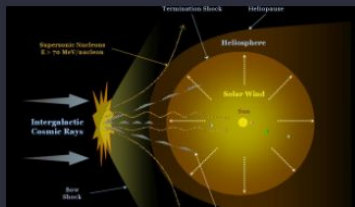
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Misie ESA

Priamy inžiniersky príspevok na konštrukcii
vedeckých aparátúr pre vesmírne misie Európskej
vesmírnej agentúry (Rosetta, Double Star,
BepiColombo, JU...

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Kozmické žiarenie

Teoretické modely šírenia častíc kozmického
žiarenia v heliosfére a magnetosfére. Kozmické
žiarenie tvorí prúd častíc prichádzajúcich na
povrch atmosf...

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Observatórium na Lomnickom štíte

Lomnický štít je vďaka svojej nadmorskej výške a
infraštruktúre najvhodnejším miestom na
Slovensku na detekciu sekundárnych častíc
kozmickeho žiarenia...

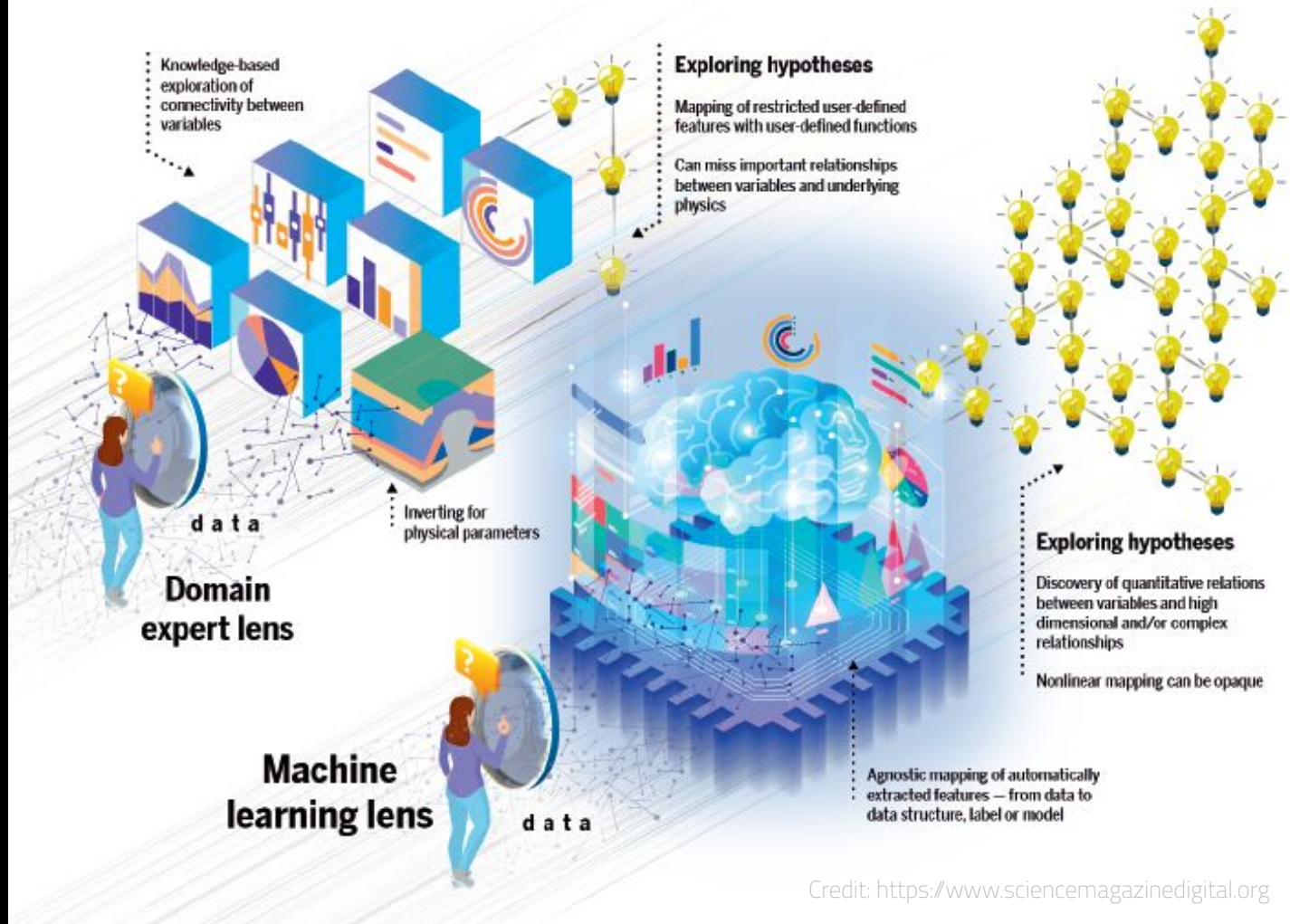
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AMON-net

AMON-net (Airglow Monitoring Network) Sieť
detektorov AMON-net monitoruje žiarenie hornej
atmosféry Zeme a má ambíciu prispieť k
pochopeniu ionosféry...

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Credit: <https://www.sciencemaginedigital.org>