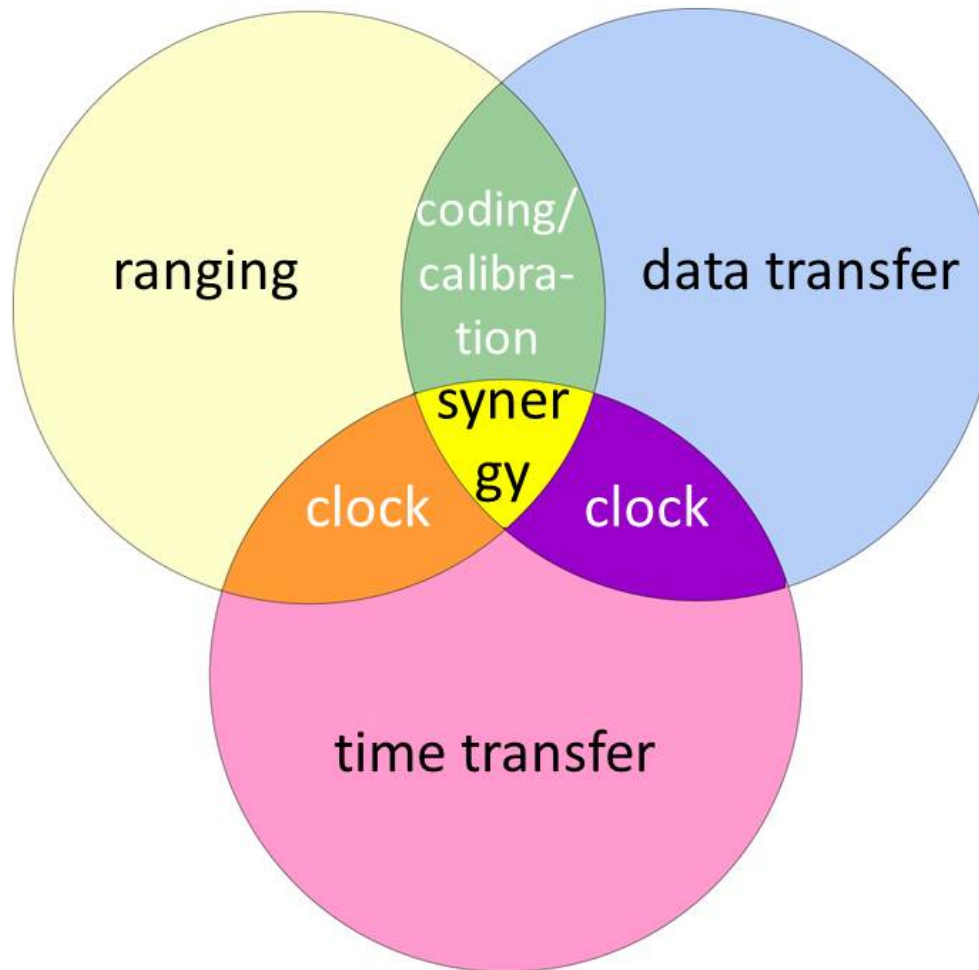


# Concept for a Geodetic and Time Reference in Space (GETRIS)

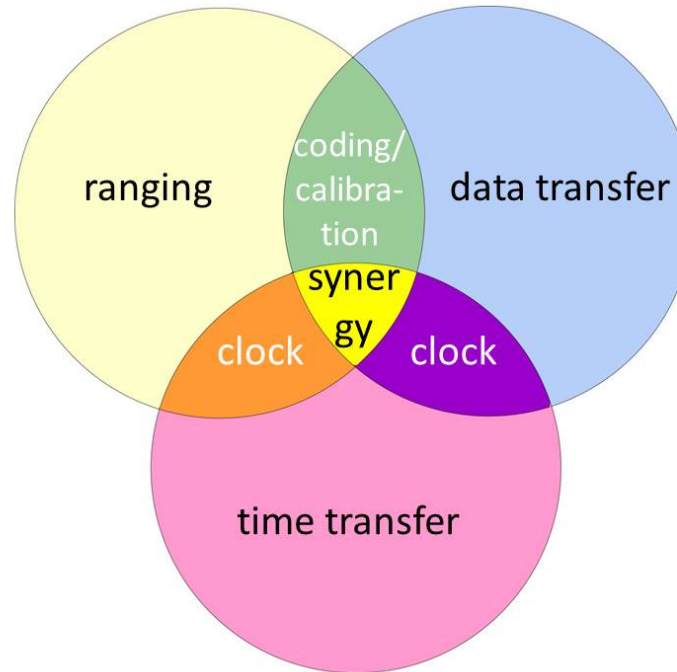
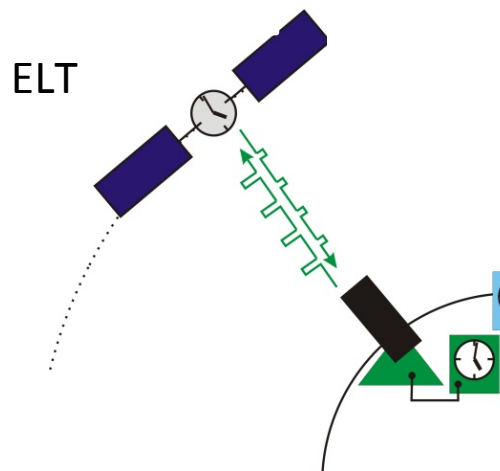
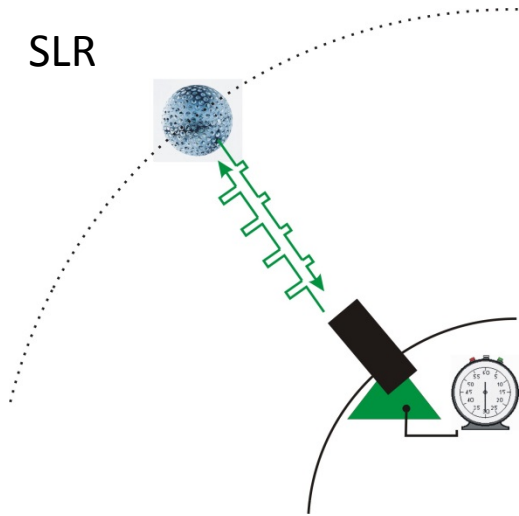
Anja Schlicht, Urs Hugentobler,  
Monika Stetter, Wolfgang Schäfer



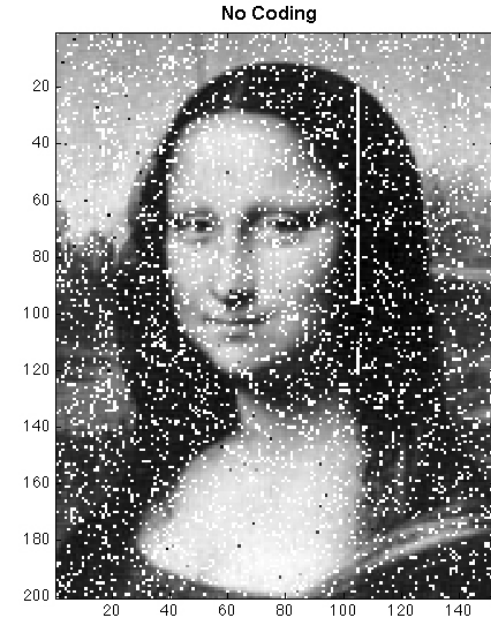
# Synergy



# Synergy



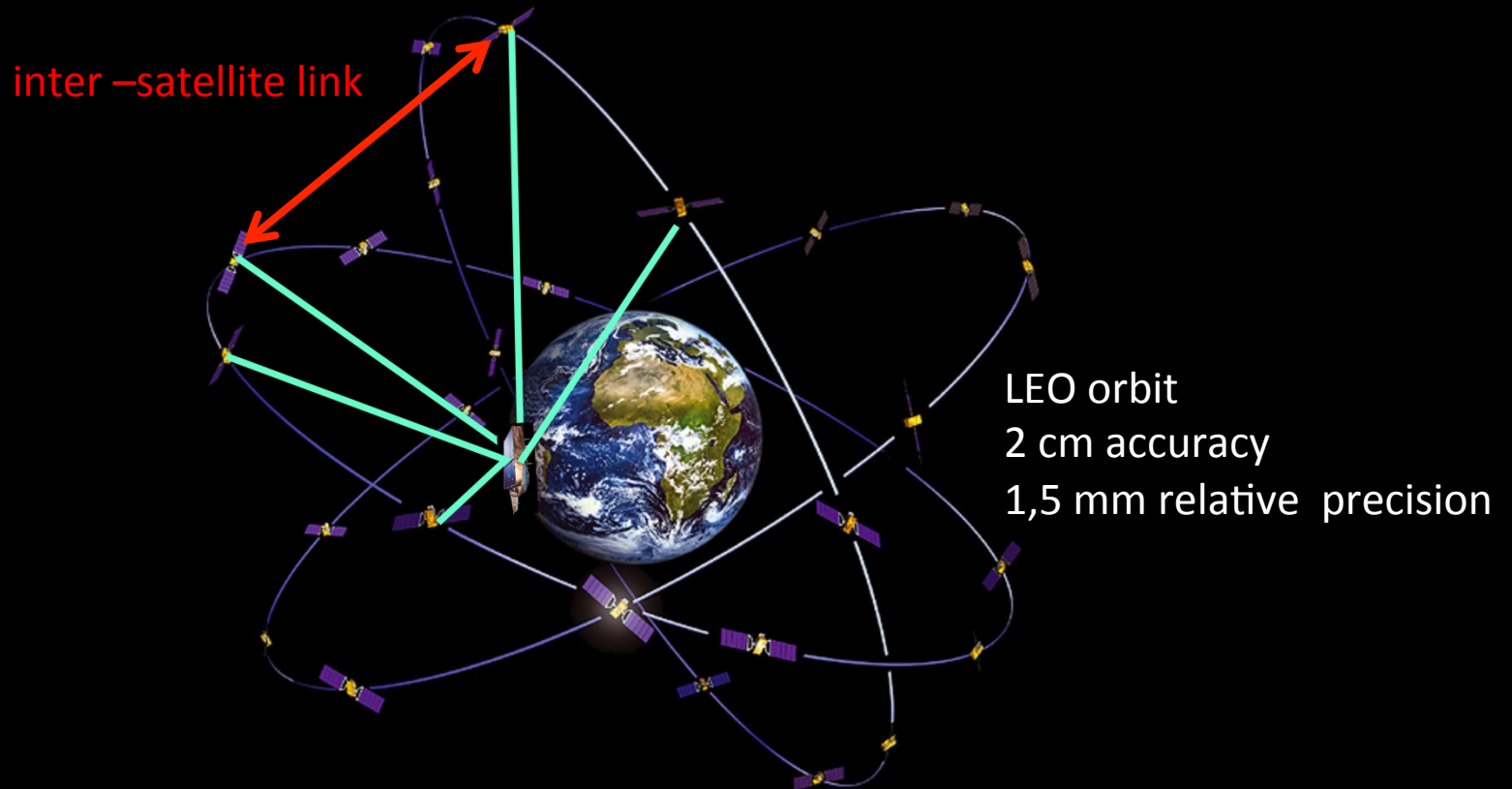
Puls Position Modulation  
Kirchner et al. ConTEL 2011



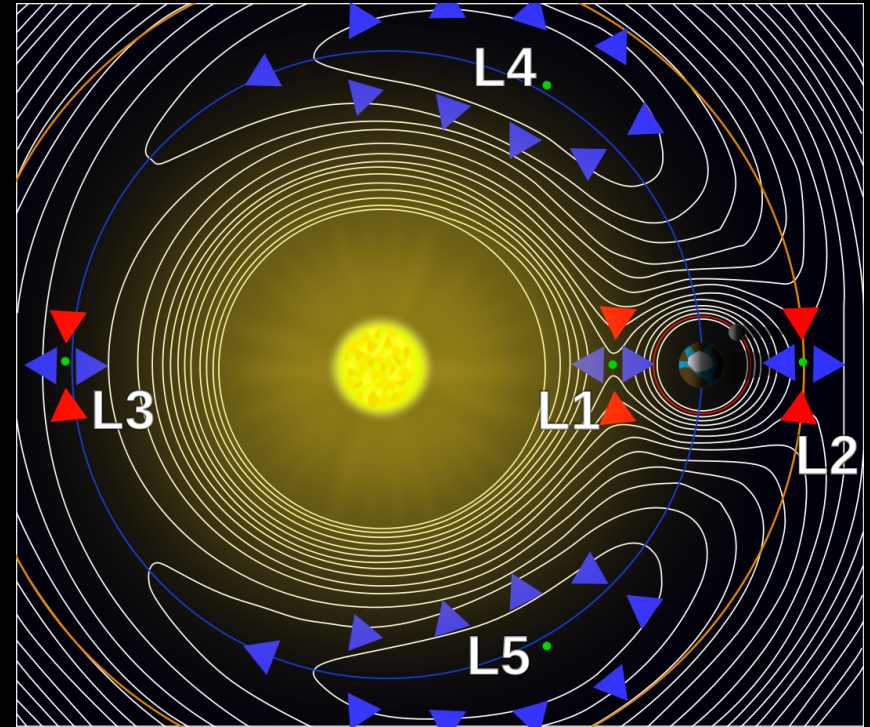
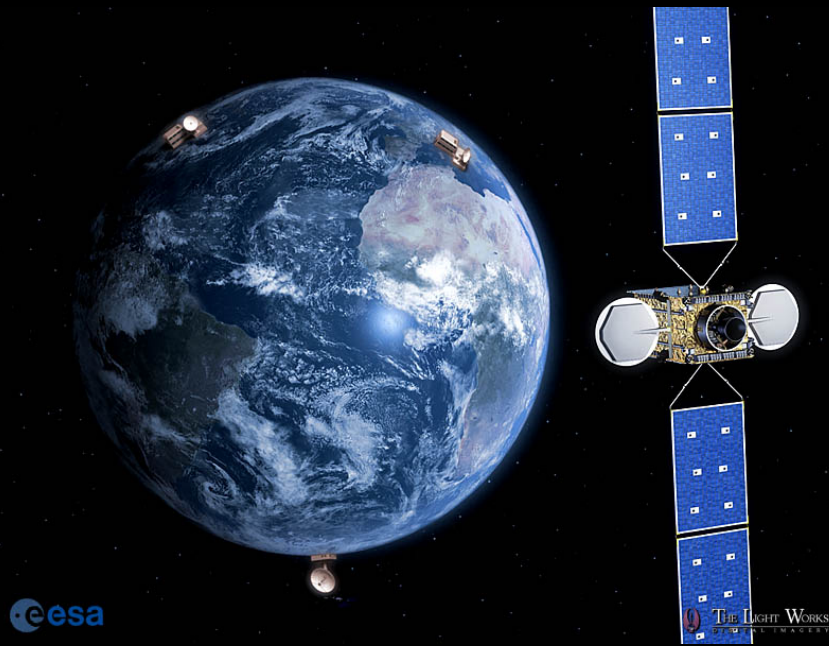
Sun et al. Optics Express  
21 (2013) 1865

# Ranging: GNSS

ESA / J. Huart

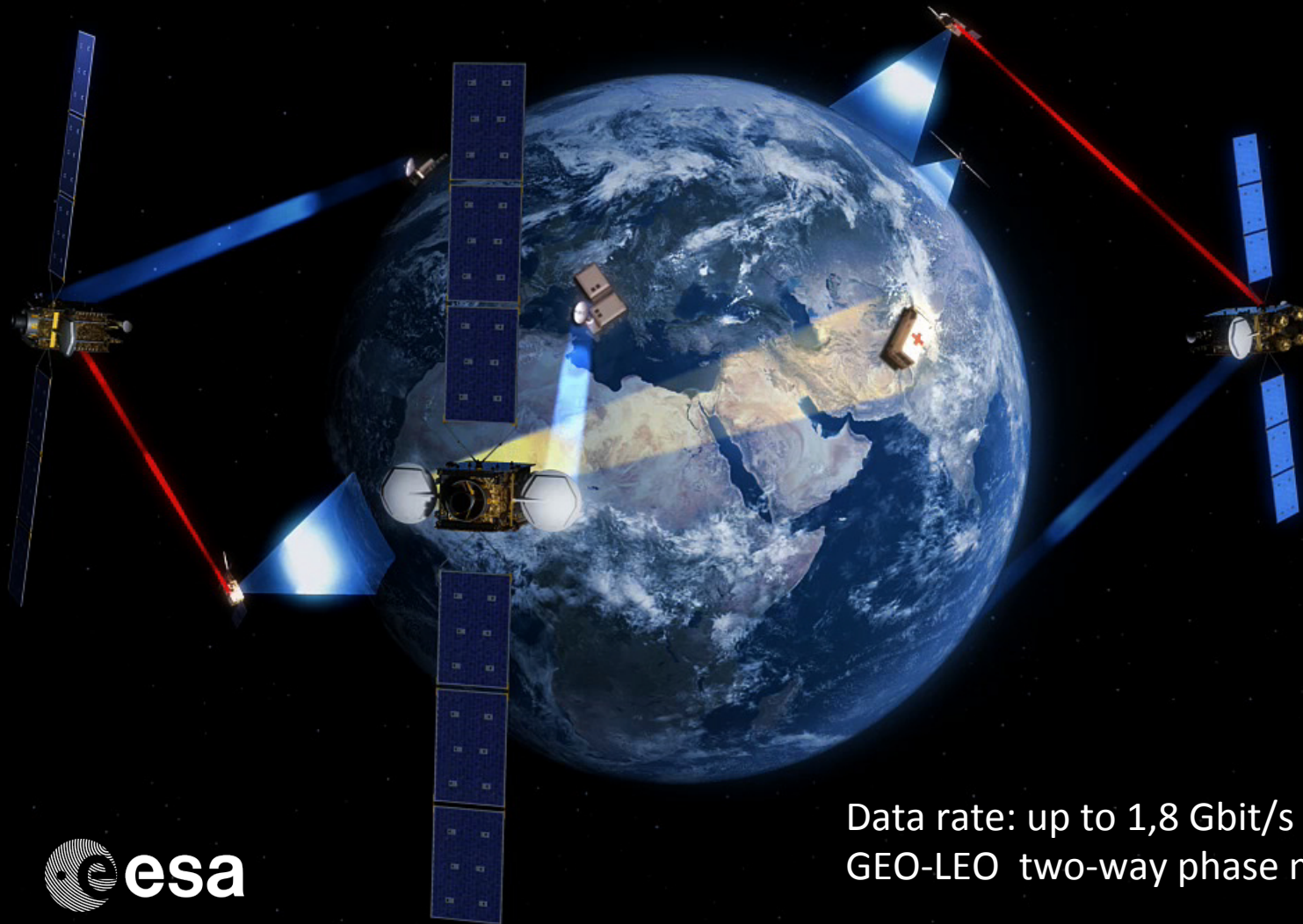


# Time reference



wikipedia

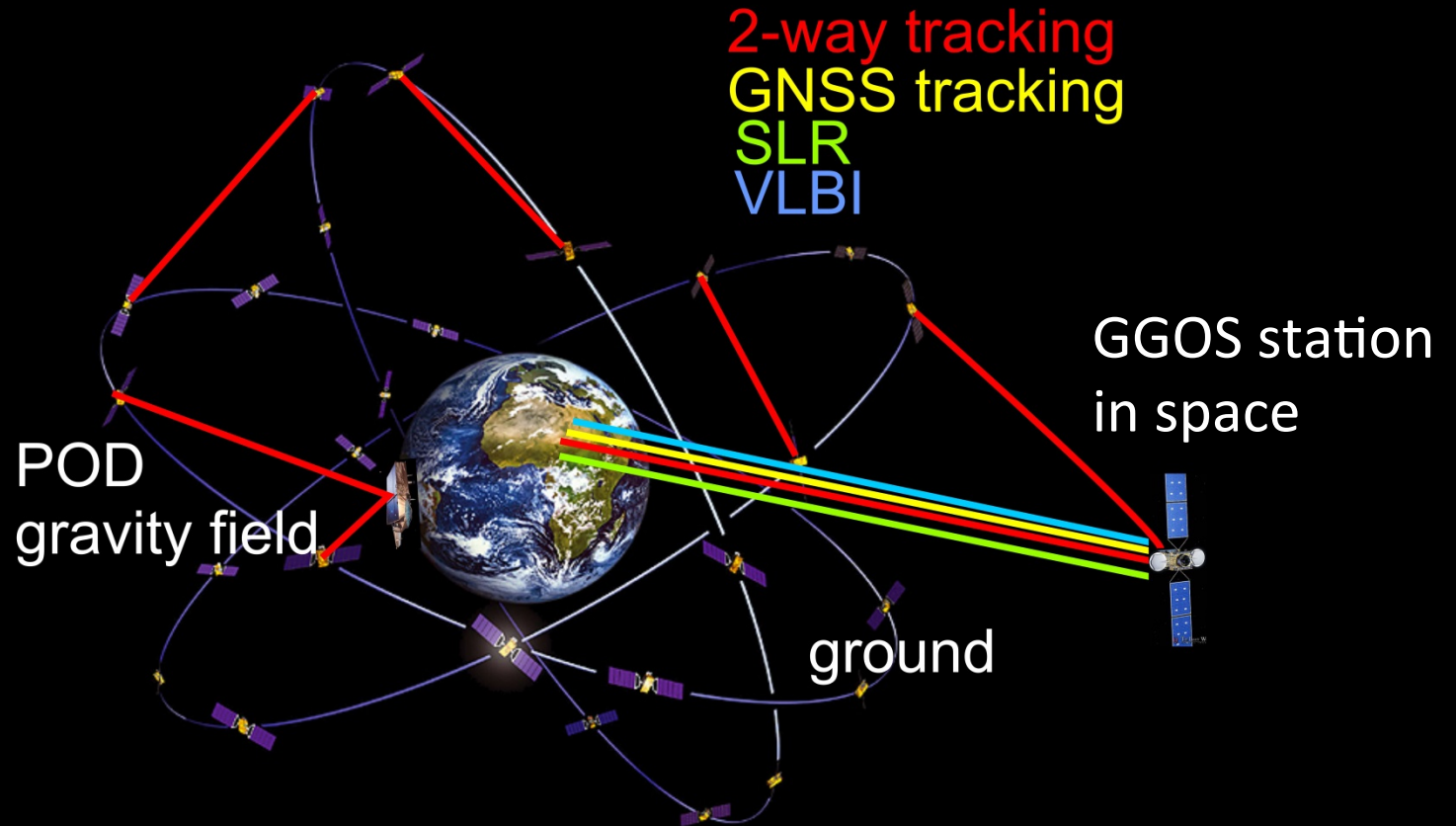
# European Data Relay System (EDRS)



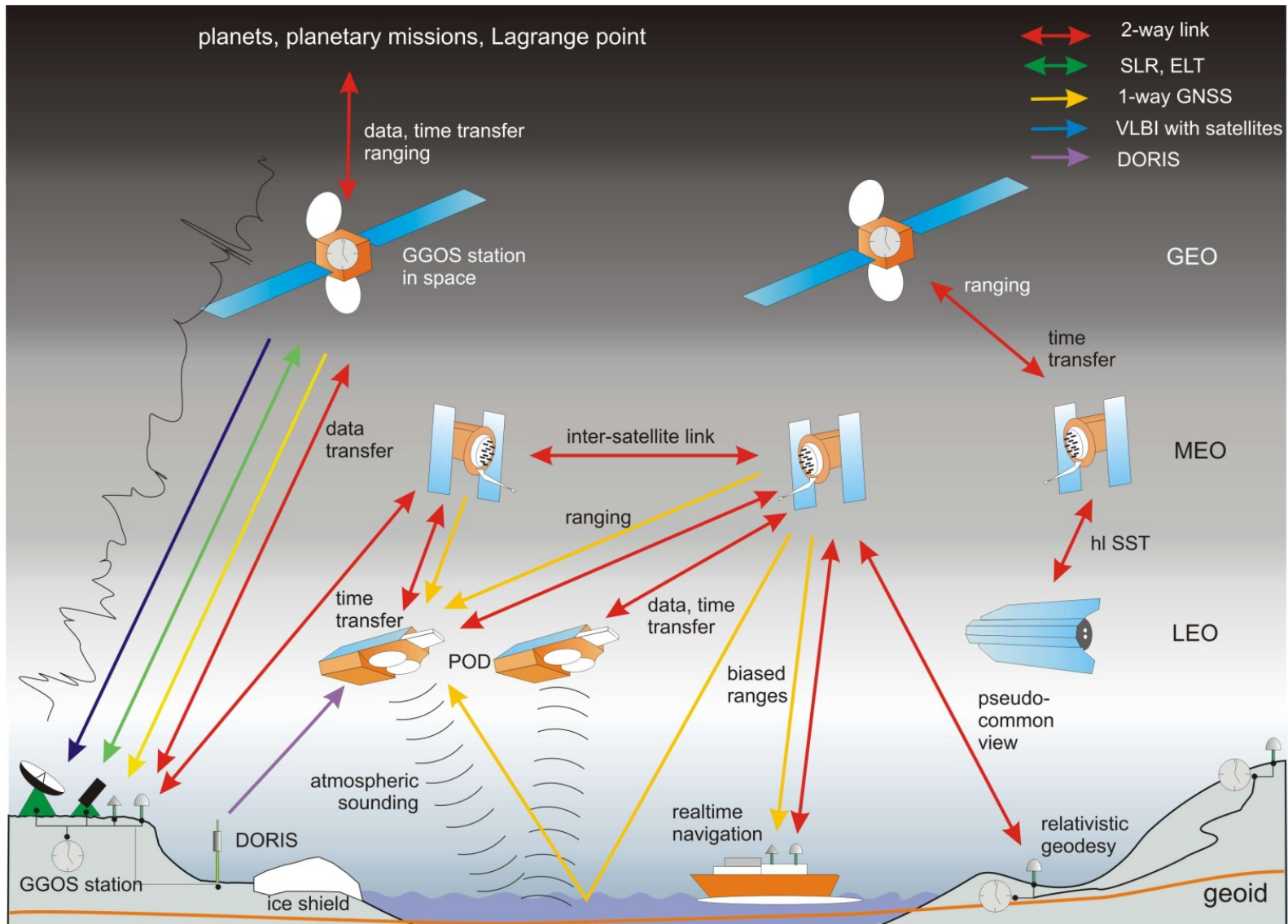
Data rate: up to 1,8 Gbit/s  
GEO-LEO two-way phase modulated

# GETRIS concept

ESA / J. Huart

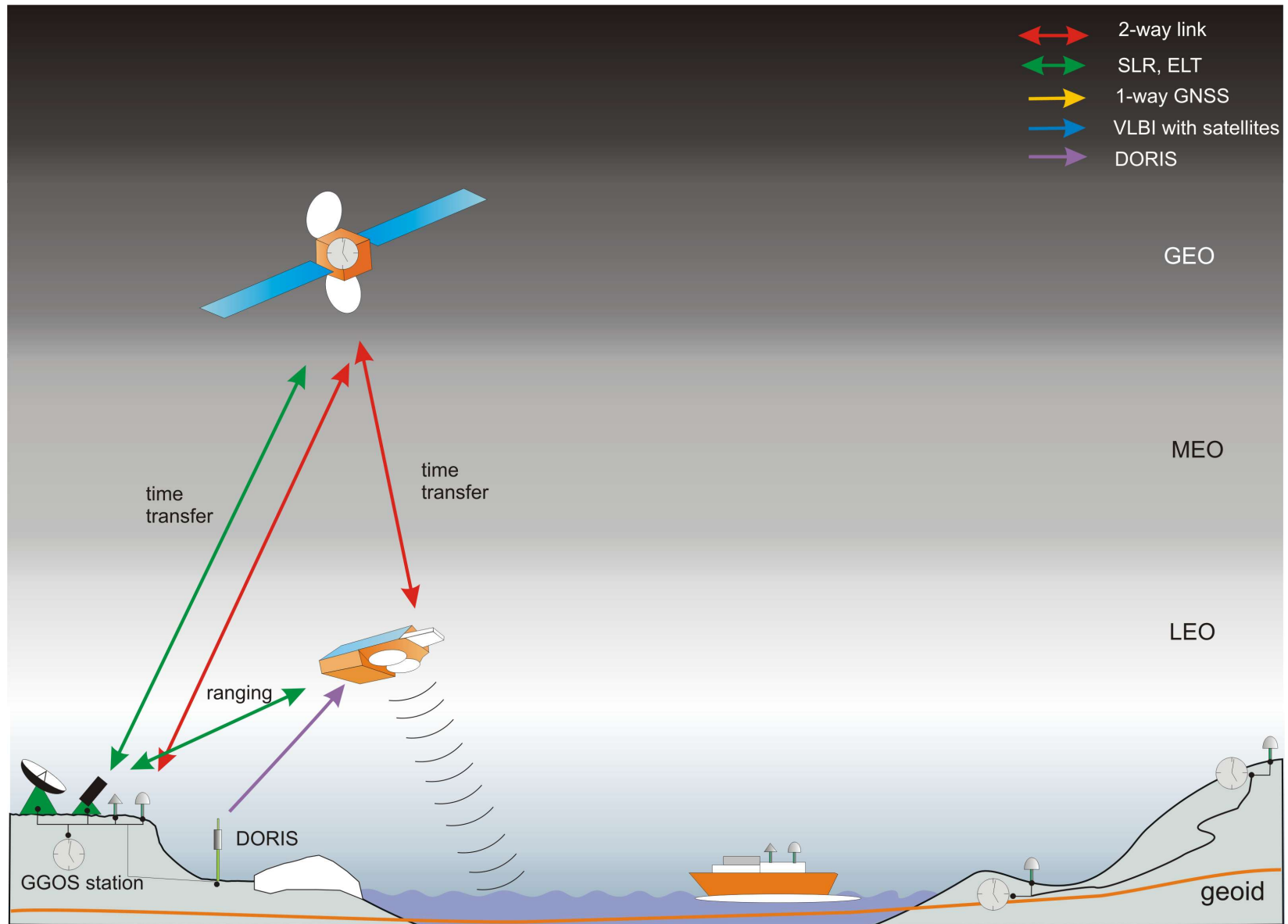


# Field of applications

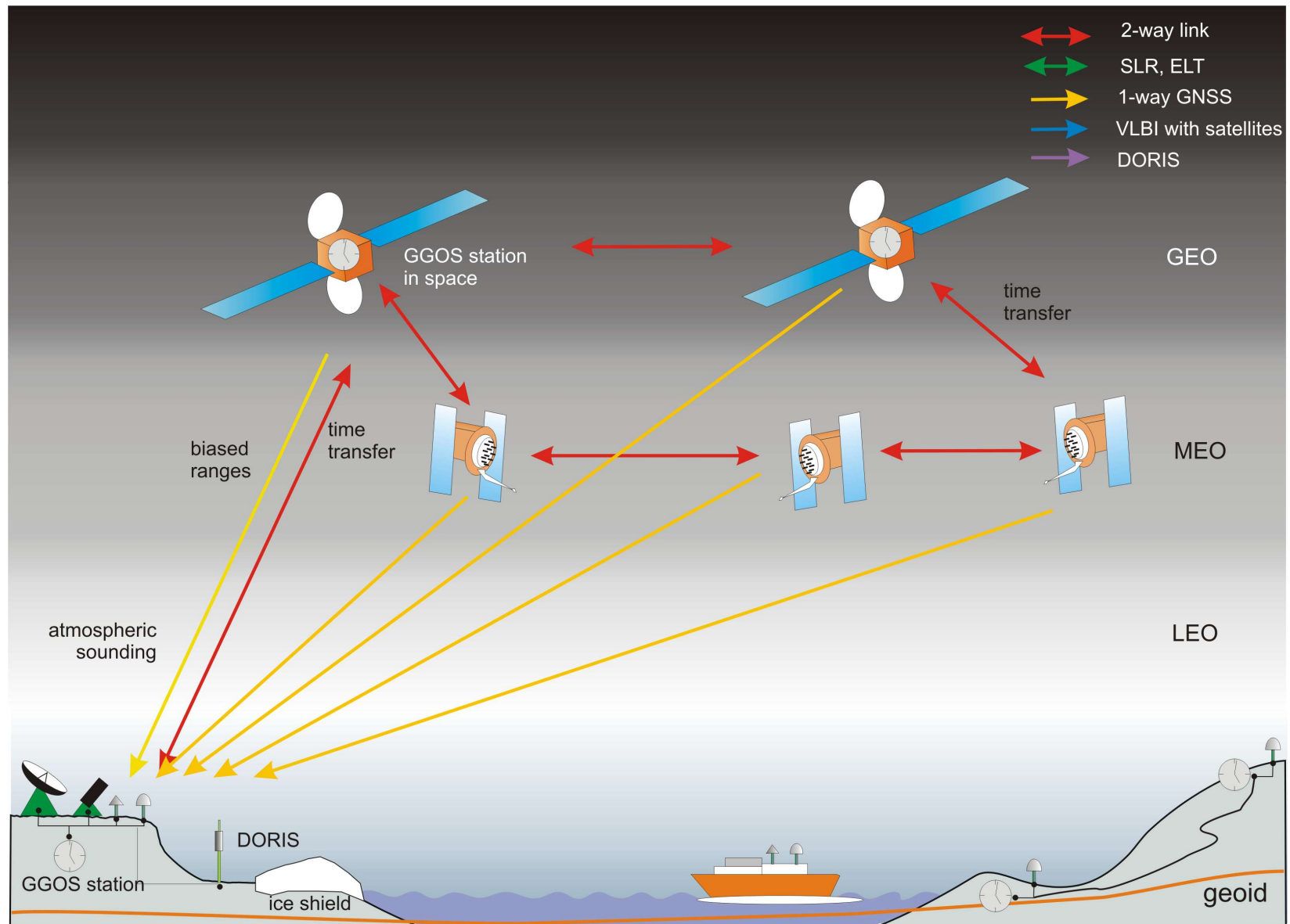




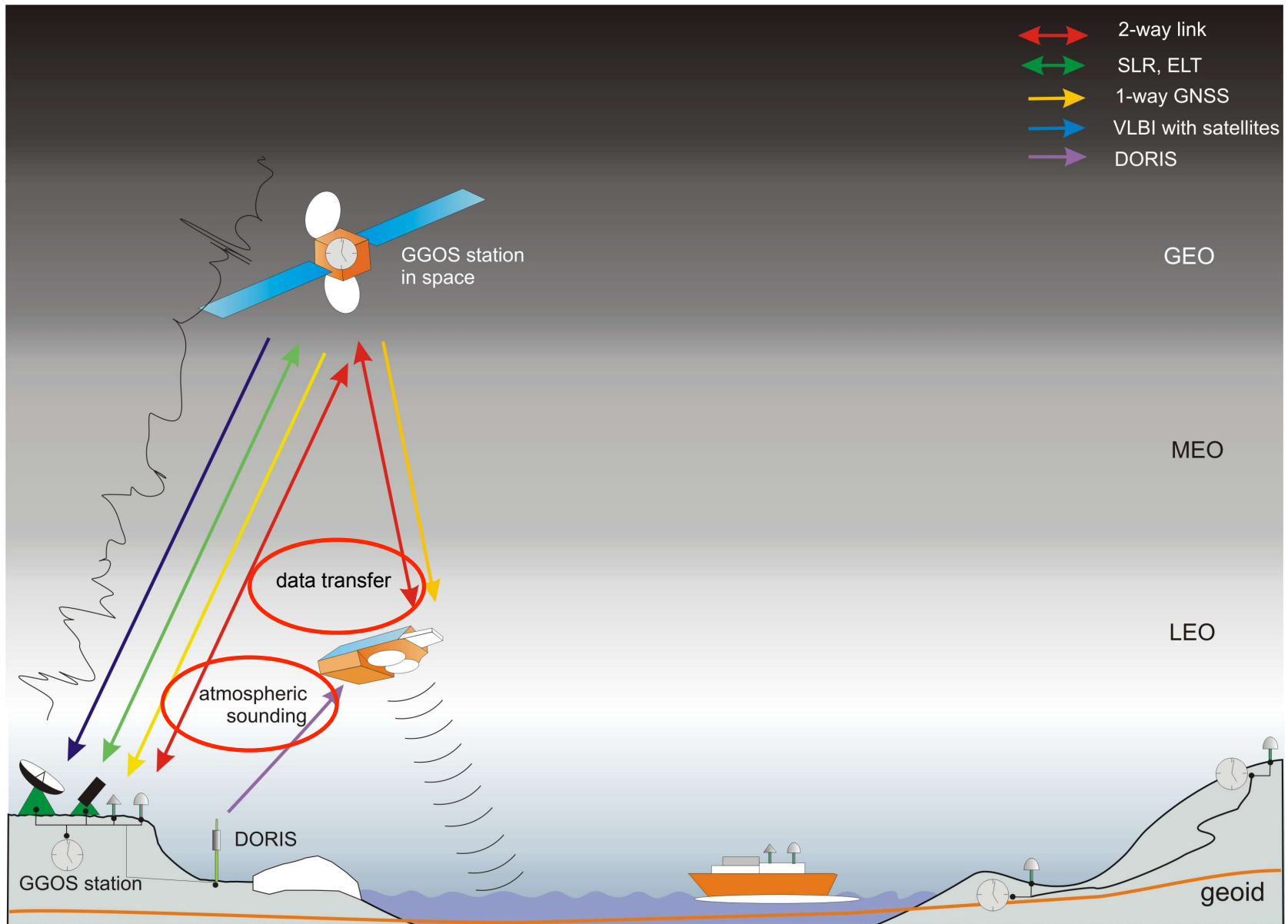
# DORIS and distribution of time



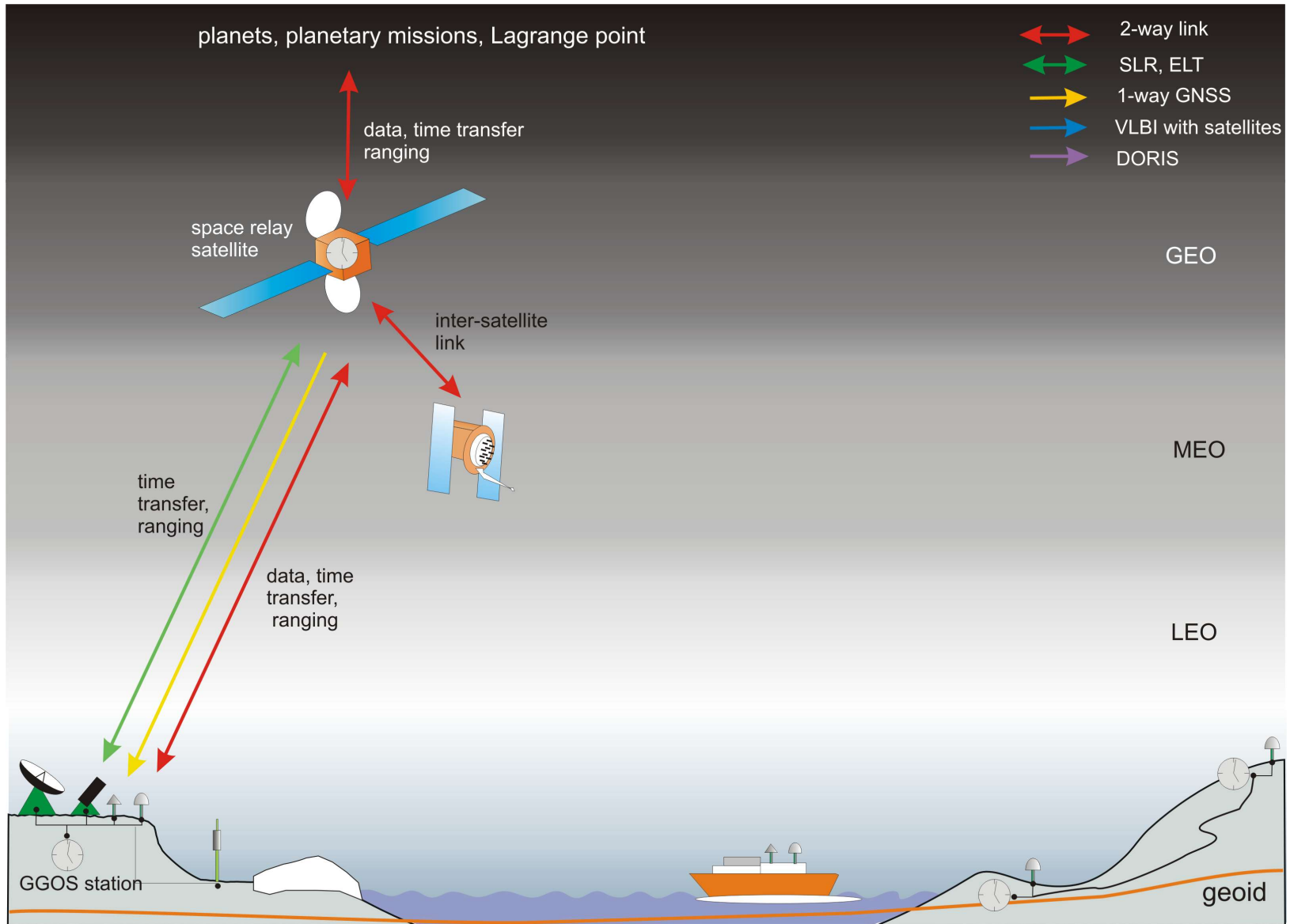
# Atmospheric sounding



# GGOS station in space and on ground



# Going into space



# Win-Win-Situation

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ILRS, GGOS offer to ESA can be:

- a **validated survey of Galileo clocks in precision and accuracy** and **precise orbits** of Galileo satellites from stations with a **well observed troposphere**
- **Data up/down link for early warning messages** or even **scientific data**

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# **Thank you very much!**

The view in this talk can in no way be taken to reflect the official opinion of the European Space Agency.