

NAVISP Industry Days

Preparation of Navigation Programmes for CM 22

16/06/2022

An important event for Space in Europe:

- 3 years cycle
- Review and decision by Member States of:
 - ESA long term strategic orientations
 - Proposals for all Programmes of the Agency
 - Budget approvals
- Involves all public and Industrial stakeholders in Space



GNSS: A success story calling for more...

GNSS is a huge success:

- Galileo and EGNOS provide top class services
- Billions of receivers
- The largest Space Application domain
- Has penetrated most domains of Economy and Society with large public and private investments worldwide



Europe must continue to invest:

- To continue develop and operate top class GNSS systems
- To create opportunities for European Industrial sector
- To anticipate and prepare future trends
- To take benefit of GNSS technologies to create synergies with other sectors of Space activities

**GALILEO &
EGNOS
Infrastructures &
Upstream R&D
(EU funded)**

**Fostering
PNT Innovation
&
Competitiveness
(NAVISP)**

**NEW NAV
Programme(s) /
Activities
funded by ESA
MS**

ESA NAV proposals for CM22 aim:

- To create opportunities for European Industrial sector
- To anticipate and prepare future trends
- To take benefit of GNSS technologies to create synergies with other sectors of Space activities

NAV proposals for CM22



**NAVISP
Continuation
(Phase 3)**

Proposals for New Activities

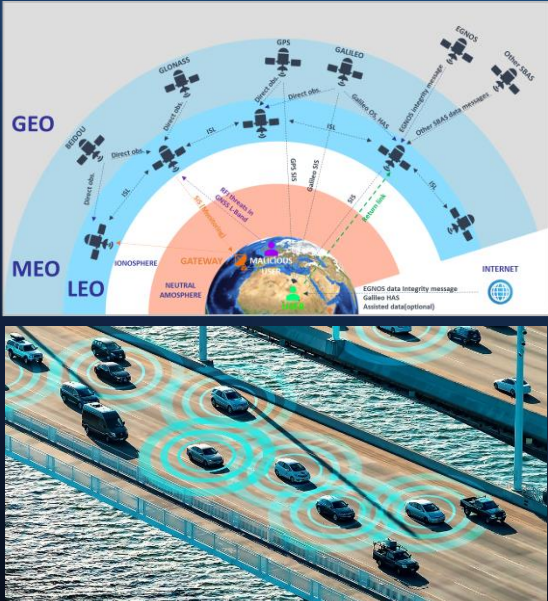
FutureNAV Programme

**Contribution to
Moonlight Programme**

Innovation and European
Competitiveness on the
worldwide PNT market

Component 1:
LEO PNT

Component 2: GENESIS
*Colocation of Geodetic
techniques in Space*



Navigation related
infrastructure



NAVISP Phase 3: the right tool to support expanding European PNT capabilities

Element 1

Analyse and develop new PNT systems technologies



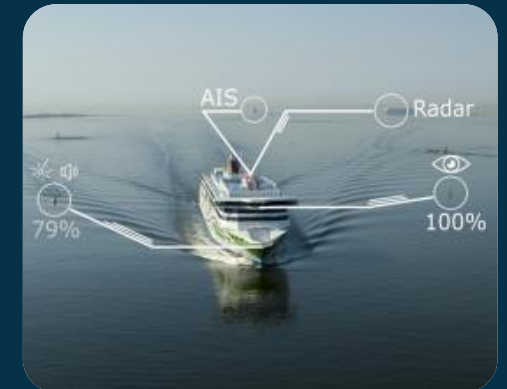
Element 2

Ad hoc technological developments and pre-operational activities
Support the emergence of innovative PNT services



Element 3

Support to MS National Programmes along the whole value chain

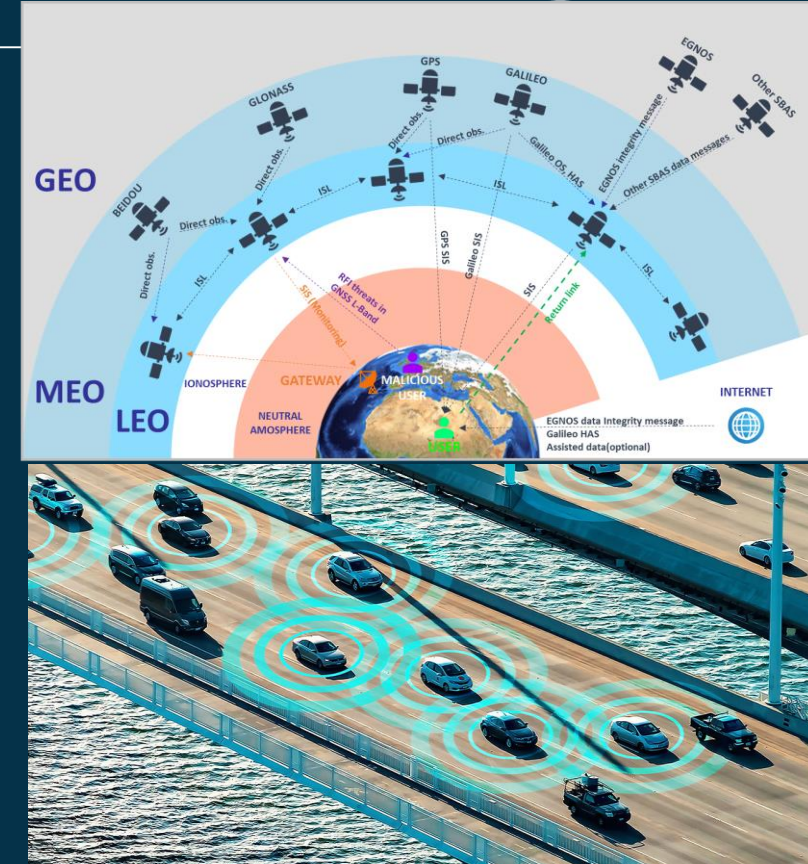


Low Earth Orbit Positioning, Navigation & Timing

1. Program Objectives: Prepare the future of GNSS by anticipating PNT market trends and more demanding needs i.e.:

- Fast convergence, high accuracy, secure, resilient PNT
- Outdoor, autonomous vehicles, UAVs
- Indoor, Personal LBS and Industrial IOT (logistics, machine control)
- Low-energy IOT asset tracking
- Integration with Terrestrial 5G/6G for ubiquitous PNT
- Connected PNT (2-way data channels)

2. Demonstration of LEO PNT: Fast convergence PPP, additional data channel, two way communication for IOT, in-door positioning, robustness increase, frequency diversity (UHF, L, S, Ku, Ka band), optical ISL connectivity on-board autonomy



Fast Track !

Genesis: Colocation of Geodetic Techniques in Space

1. Program Objectives:

Development of highly innovative GNSS Mission, on-board collocation of four space GNSS/Geodetic techniques (GNSS Rx, VLBI, DORIS, SLR) to contribute to improve GNSS, Geodetic and Earth Science techniques, and supporting the “Space for a Green Future” Accelerator

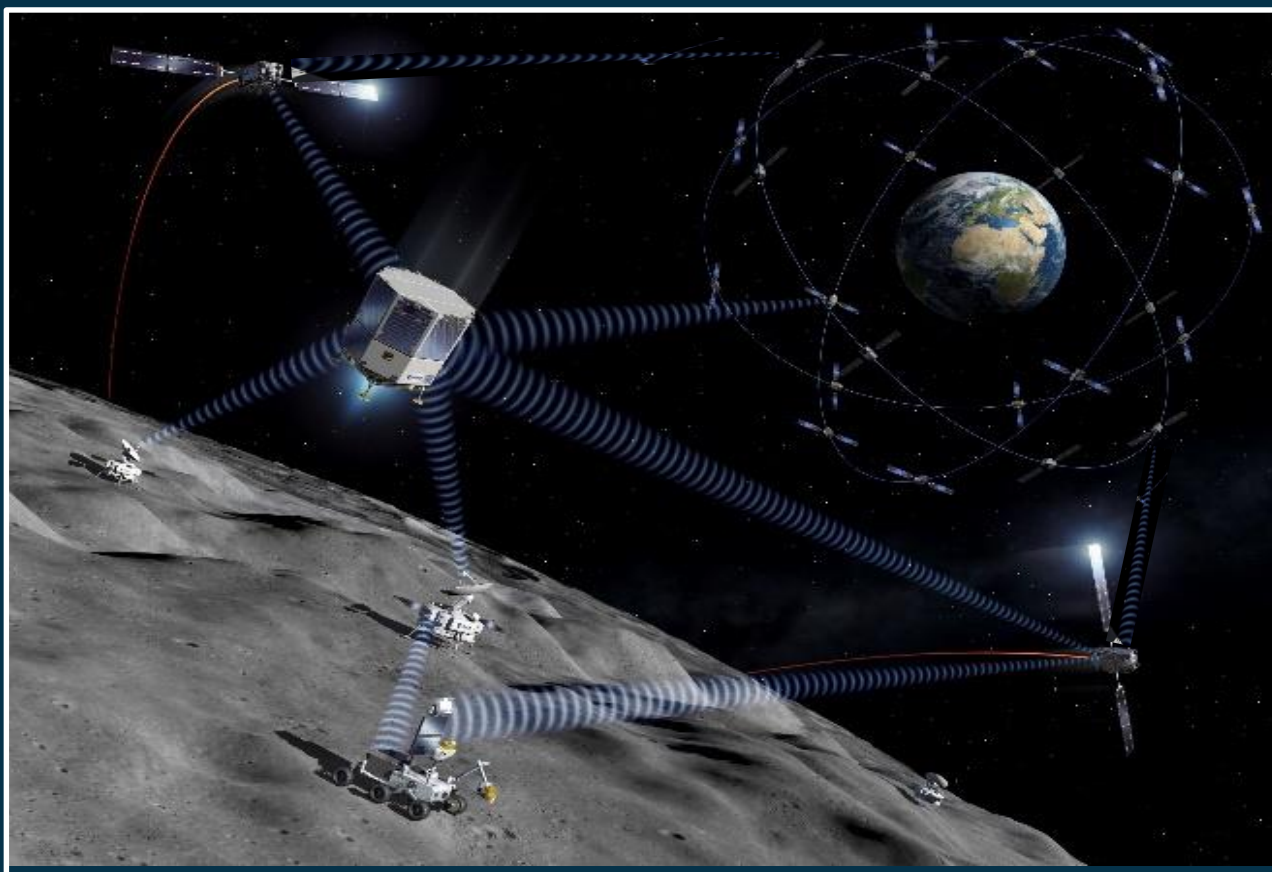
1. Benefits:

1. **Navigation** - Improvement on GNSS orbits and GNSS positioning
2. **Geodesy** - Improvement of the International Terrestrial Reference Frame (ITRF)
3. **Earth Sciences** - Improvements in sea level change measurements, ice mass losses, gravity field improvement,



Contribution to Moonlight

ESA's Lunar Communication and Navigation System



- Based on the use of GNSS technologies this system will provide real-time position, velocity and time to lunar surface and Cislunar users from 2027
- Moonlight will create a new paradigm on lunar exploration and a major boost to future lunar economy: **A great opportunity for Europe !**

 Flexible landing site	 Higher Service Availability	 Higher Autonomy of Operations	 Faster Orbit Determination (75%)
 Longer Surface Operations	 Operational Cost Savings	 Higher Science Return (more payload/data)	 New mission concepts



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#SpaceAmbition

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