ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

SATCOM RESEARCH CHALLENGES FOR THE NEXT DECADE (2020-2030)

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The content of these slides is partially based on the
Networld2020 Satcom WG white paper
''**SatCom Resources For Smart & Sustainable Networks And Services**''
November 25, 2019 - bit.ly/SatComWG

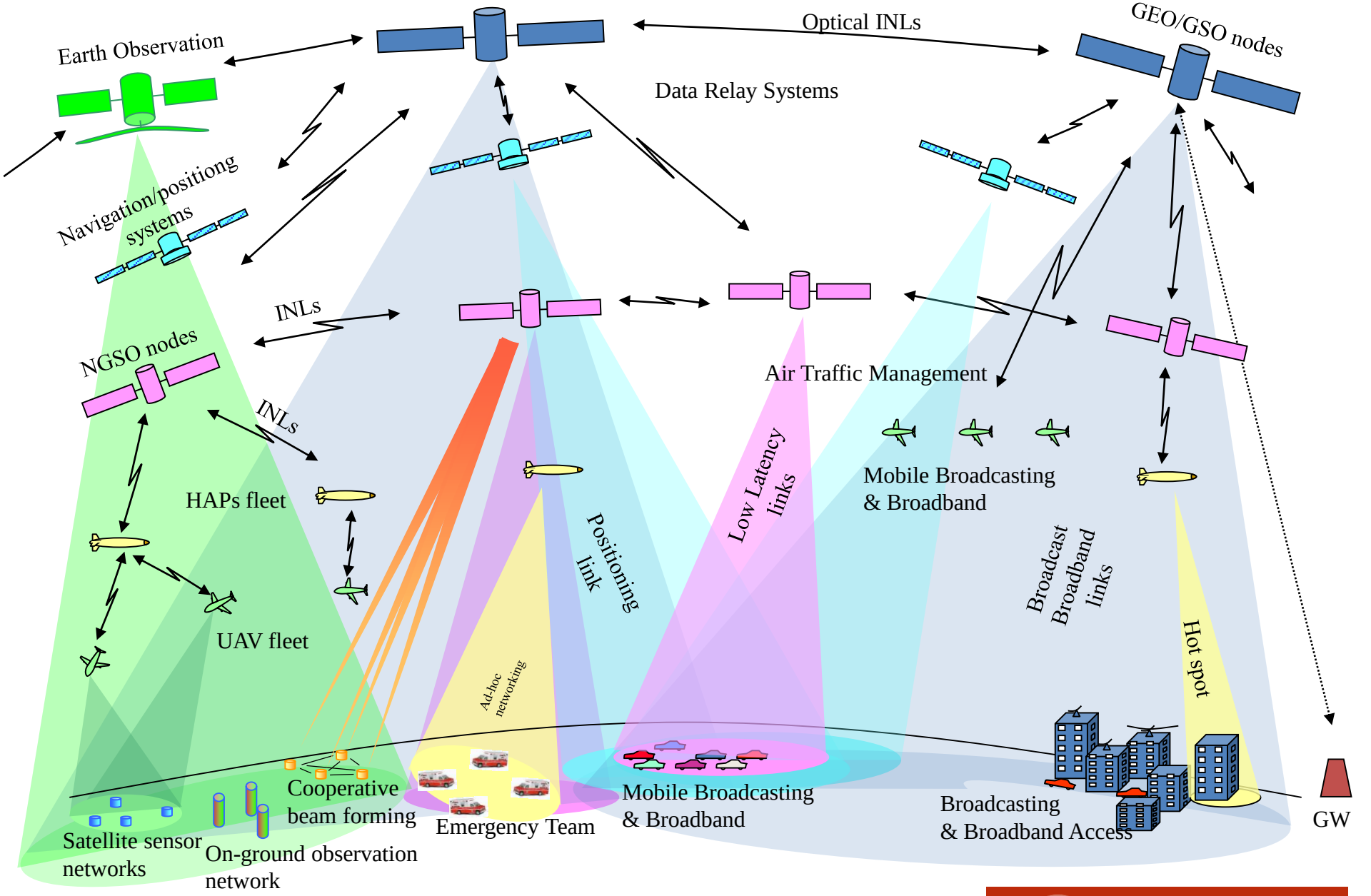
The vision reported in these slides is my own

SatCom
from separate networks to an integrate component

- **Satellite broadband, broadcast, and IoT usually developed as ''standalone'' networks**

- **From 3GPP release 17 SatCom (aka Non-Terrestrial Networks) are also an integrated component of the overall 5G Architecture**
  - **NR-NTN (eMBB) Rel. 17 Normative phase**
    - LEO and GEO constellations
  - **IoT-NTN Rel. 17 Study (and normative) phase**

- **The architecture now consists of**
  - **a terrestrial dimension**
  - **a NTN multi-layered dimension**



Future Satellite-Terrestrial integrated Architecture

- **A global and flexible architecture for sustainable, resilient, and inclusive networks and services (Anywhere, Anytime, to Any Device)**

- **Multi-layered and multi-dimensional**
  - **Terrestrial + Satellite Components**
  - **GSO, NGSO, HAPs, UAV constellations**
  - **Inter-node vertical and horizontal links**
    - Vertical: terrestrial/NTN, GSO/NGSO, NGSO/HAPs…
    - Horizontal: same constellation nodes

Research needed at different levels of the architecture to manage complexity, flexibility, and integration

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AI & ML	• System Complexity management • Network predictive configuration

Further reading:

- ’’**SatCom Resources For Smart & Sustainable Networks And Services**’’, Networld2020 Satcom WG white paper, version 1.0, November 25, 2019, bit.ly/SatComWG

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