Space for Twin Cities: *Cultural Heritage*

Piera Di Vito

Business Applications and Space Solutions
European Space Agency

European Space Agency

→ Space Applications

Space technologies

Space Weather

Earth Observation

Satellite Navigation

Satellite Communication

Human Spaceflight Technologies

Users and Markets

- Big Data analytics
- VR/AR
- Artificial Intelligence
- Megaconstellations
- 5G
- Crowdsourcing
- IoT
- Cybersecurity
- Blockchain
- ....

Maritime

Healthcare

Transport

Environment

Agriculture

Media

Energy

Education

Aviation

Financial

esa
space solutions

BIG DATA

Partners

eesa
space solutions

European Institutional Actors

**Frontex
EMSA
EU SatCen
EDA
EASA**

**National Governments&
Regulators**

**DCMS (UK)
MID (IT)
MISE (IT)
IT Ministry of Education
OPRED (UK)
Traficom (FI)**

Vertical Industry and associations

**ENTSO   ENEL
Friends of the Supergrid
CarbonTrust
Indian Energy Storage Alliance
OneSea Alliance
DMEC
Global Sustainable Energy Alliance**

**UNICRI
IOM
Eurocontrol
WWF**

Platforms/Foundations

**Toilet Board Coalition
The Plastic Bank
Mirpuri Foundation
Genius100 Foundation**

Smart Cities/Regions

Technology toppers

**Vodafone
AWS**

**Roma
Torino
L'Aquila
Abruzzo
Groningen**
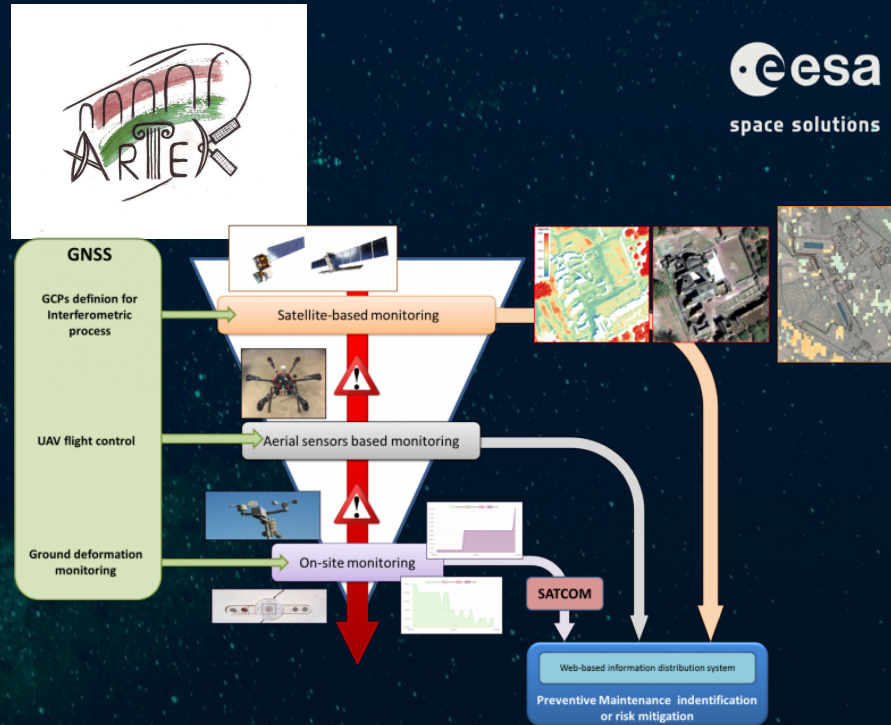
Space Agencies

**JAXA
AMS
SANSA**

European Space Agency

Space in support of Cultural Heritage preservation and fruition

ARTEK project

ArTeK provides systematic high frequency monitoring of cultural heritage sites supporting the preventive maintenance of Cultural Property (CP)
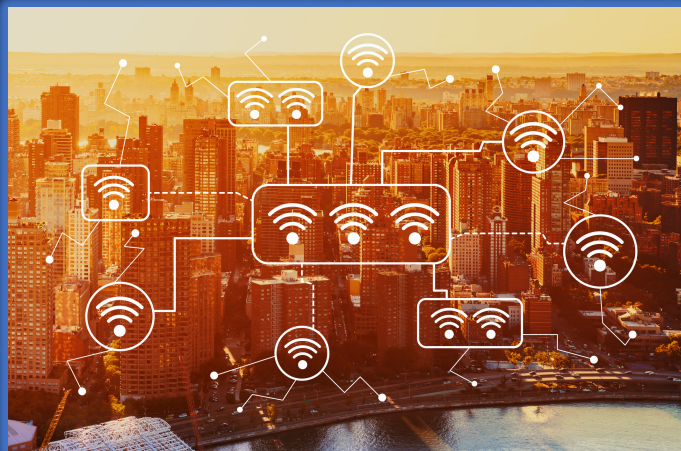
5G for L'ART: L'Aquila and Abruzzo Region, Roma, Torino

➢ In 2019 ESA has signed three Memorandum of Intent with Roma, Torino, L'Aquila and the Abruzzo Region.

➢ Scope of the MoIs is on <u>pursuing space based activities making use of the 5th Generation of communication networks.</u>

➢ ESA Business Applications and the involved municipalities have identified the following thematic:

- **Law enforcement and emergency response**
- **Cultural heritage fruition and preservation**
- Structural monitoring
- Intelligent transport

5G for L'ART: Cultural Heritage projects (1/2)

Six activities have been kicked-off with the support of the involved municipalities, the IT Ministry of Cultural Heritage and Tourism and of the Italian Space Agency:

- **SpacetoTree Demo Project** (Prime Digimat): to design, implement, test and validate a dedicated Alert System (AS) for the **monitoring of the public green**, in particular those located inside areas of relevant historical and cultural sites.
- **VADUS Demo Project** (Prime: Next): to develop and demonstrate a new set of applications for **the enrichment of the tourists ' visit experience** based on the convergence of Augmented Reality (AR)/Virtual Reality (VR) technologies, the 5G networks and satellite services.
- **POMERIUM Demo Project** (Prime: e-Geos) to implement a **cultural heritage monitoring and management system** in support of ordinary and extraordinary management activities.

5G for L'ART: Cultural Heritage projects (2/2)

- **AMOR Demo Project (Prime: NAIS):** to develop sustainable services for the safeguard and fruition of Cultural Heritage in rich and dense historical city centers affected by a significant anthropic pressure, especially represented by huge visitors' flows.
- INVENTA Feasibility Study: to investigate the technical and commercial feasibility of cultural heritage fruition services such as: SUSTAINABLE TOURISM where EO data and 5G and GNSS are integrated to made available Virtual Guides in Augmented Reality (AR) through the INVENTA APP, giving real-time information on tourist flows.
- EXTENSION Demo Project: to develop and to demonstrate an end-to-end cultural heritage fruition service where the users may acquire detailed information on surrounding places, monuments, churches, artworks thanks to AR and through the accurate localization .

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