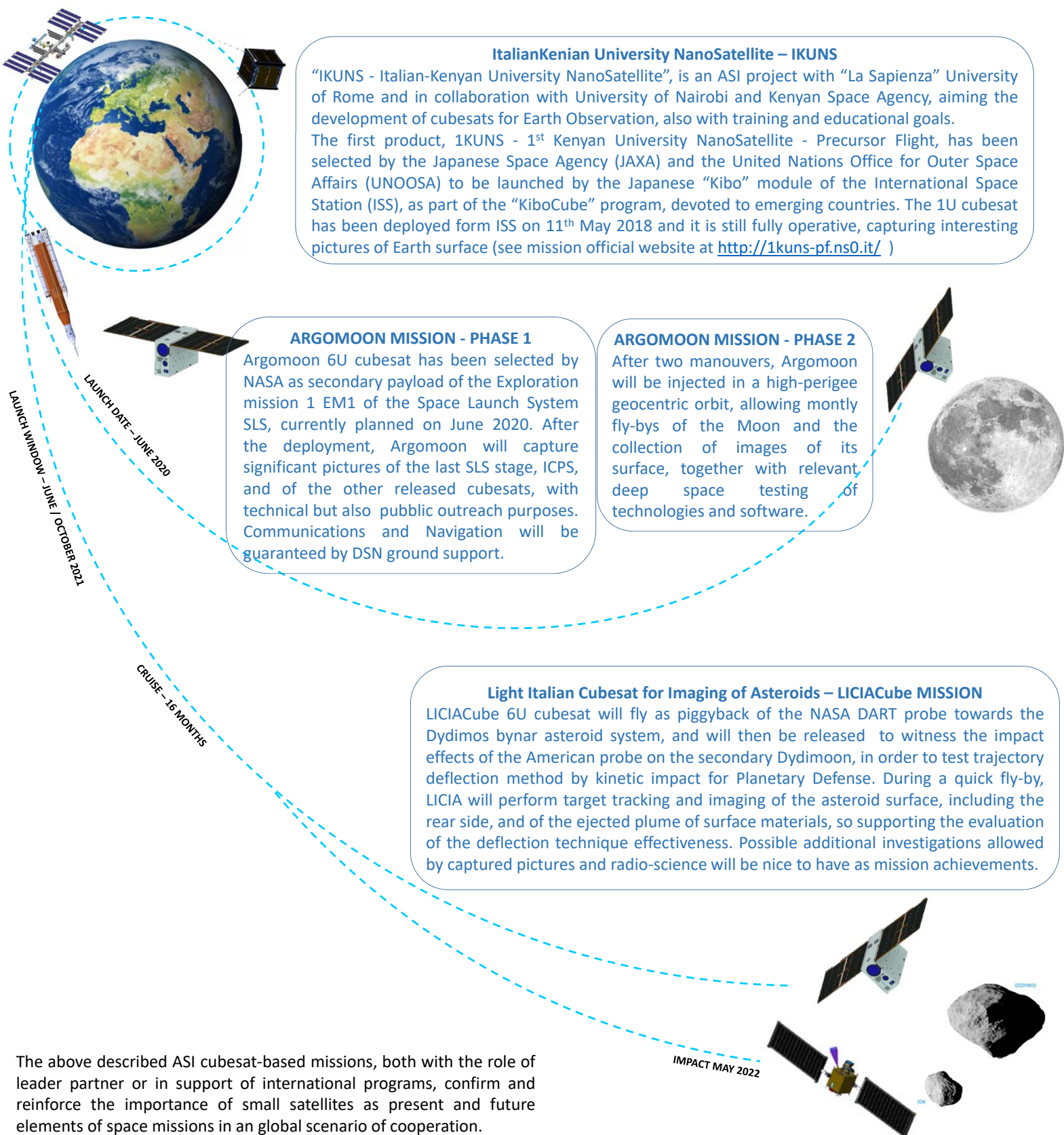


Italian Nanosatellites for exploration in International Cooperation

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Space science is one of the areas where cubesats can be used to complement the investigations performed by the traditional probes. The nanosats can be devoted to specific tasks, sometimes for a limited part of the entire mission. Moreover, the limited financial required effort makes missions affordable for a wider group of potential space actors, so allowing the participation of small or emerging countries in big challenges and fostering the international cooperation at different levels.

The Italian Space Agency - ASI is currently implementing several programs for cubesats development in international environment.



ItalianKenian University NanoSatellite – IKUNS

“IKUNS - Italian-Kenyan University NanoSatellite”, is an ASI project with “La Sapienza” University of Rome and in collaboration with University of Nairobi and Kenyan Space Agency, aiming the development of cubesats for Earth Observation, also with training and educational goals. The first product, 1KUNS - 1st Kenyan University NanoSatellite - Precursor Flight, has been selected by the Japanese Space Agency (JAXA) and the United Nations Office for Outer Space Affairs (UNOOSA) to be launched by the Japanese “Kibo” module of the International Space Station (ISS), as part of the “KiboCube” program, devoted to emerging countries. The 1U cubesat has been deployed from ISS on 11th May 2018 and it is still fully operative, capturing interesting pictures of Earth surface (see mission official website at <http://1kuns-pf.ns0.it/>)

ARGOMOON MISSION - PHASE 1

Argomoon 6U cubesat has been selected by NASA as secondary payload of the Exploration mission 1 EM1 of the Space Launch System SLS, currently planned on June 2020. After the deployment, Argomoon will capture significant pictures of the last SLS stage, ICPS, and of the other released cubesats, with technical but also public outreach purposes. Communications and Navigation will be guaranteed by DSN ground support.

ARGOMOON MISSION - PHASE 2

After two manouvers, Argomoon will be injected in a high-perigee geocentric orbit, allowing montly fly-bys of the Moon and the collection of images of its surface, together with relevant deep space testing of technologies and software.

Light Italian Cubesat for Imaging of Asteroids – LICIAcube MISSION

LICIAcube 6U cubesat will fly as piggyback of the NASA DART probe towards the Dydimos bynar asteroid system, and will then be released to witness the impact effects of the American probe on the secondary Dydimoon, in order to test trajectory deflection method by kinetic impact for Planetary Defense. During a quick fly-by, LICIA will perform target tracking and imaging of the asteroid surface, including the rear side, and of the ejected plume of surface materials, so supporting the evaluation of the deflection technique effectiveness. Possible additional investigations allowed by captured pictures and radio-science will be nice to have as mission achievements.

The above described ASI cubesat-based missions, both with the role of leader partner or in support of international programs, confirm and reinforce the importance of small satellites as present and future elements of space missions in an global scenario of cooperation.