

MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)
Microgravity Sciences Onboard the International Space Station and Beyond (6)

Author: Mr. Tom Hoppenbrouwers

Space Applications Services N.V./S.A., Belgium, tom.hoppenbrouwers@spaceapplications.com

Mr. Richard Aked

Space Applications Services N.V./S.A, Belgium, richard.aked@spaceapplications.com

Mr. Luigi Castiglione

Space Applications Services N.V./S.A, The Netherlands, luigi.castiglione@spaceapplications.com

Mr. Leonardo Surdo

Space Applications Services N.V./S.A, The Netherlands, leonardo.surdo@spaceapplications.com

Mr. Karsten Kullack

Space Applications Services N.V./S.A, The Netherlands, karsten.kullack@spaceapplications.com

ICE CUBES – INTERNATIONAL COMMERCIAL EXPERIMENT CUBES
ESTABLISHING A FAST-TRACK, LOW-COST SERVICE FOR SMALL EXPERIMENTS TO THE ISS

Abstract

The International Commercial Experiment Cubes service (ICE Cubes) will provide rapid, simplified, low cost access to the International Space Station, creating the opportunity to maximise the use of the remaining lifetime of the ISS. The initial service –currently under development- will enable any organisation, public or private entity or individual, such as universities, academic programmes and pharmaceutical companies/research centres or private persons to perform experiments on and from the ISS. Furthermore the ICE Cubes service will develop special miniaturised capabilities for use in space that do not exist today, in response to market needs. ICE Cubes fully supports the process of experiment development and takes care of the flight acceptance, launch manifest and operation of the customers' experiments. The ICE Cubes service includes:

- As much or as little customer support as needed, throughout the process of experiment development ('coaching' of the experiment developer), flight acceptance, launch and operation of the customer's experiment.
- The ICE Cubes on-orbit facility consisting of (1) a Framework facility for 'plug-and-play' modular Experiment Cubes and (2) the PharmaLab, a novel multi-cube facility for pharmaceutical research and development.
- An out-of-the-box installable ground monitoring and control software to allow the customers access to their experiments.
- Market-driven development of additional added value miniaturised equipment and facilities.

Space Applications Services NV/SA is currently developing the ICE Cubes on-orbit facility, aiming at a launch to and installation in the International Space Station (ISS) mid-2017. Furthermore it is setting up the ICE Cubes services towards the customers and is initiating an entrepreneurial ecosystem of supporting technology development companies. In order to test and validate the ICE Cubes service, the International Space University (ISU) has been selected as the pilot user and they will be developing an Experiment Cube to be launched together with the ICE Cubes Framework facility.

This paper describes the concept of the ICE Cubes service, the operational and organisational aspects behind it and provides an overview of the ICE Cubes Framework and PharmaLab facility design.