



## Space Applications Services supports the European Columbus module on the ISS

On 7 February 2008 at 20:45 CET the Space Shuttle Atlantis lifted off from the Kennedy Space Centre in Florida, bringing the European Columbus module to the International Space Station (ISS). Columbus is the major European contribution to the ISS. The Columbus laboratory accommodates numerous scientific experiments, or payloads, both inside the pressurised environment as well as outside exposed to space.

### Ground Segment Definition and Implementation

Space Applications Services, located in Zaventem, has participated in the definition and implementation of two USOCs (User Support and Operations Centres), the Belgian USOC (B.USOC) located in Brussels and the Erasmus USOC located in Noordwijk, The Netherlands. The USOCs are control centres responsible for controlling the Columbus payloads including the European Drawer Rack (EDR), the Protein Crystallization and Diagnostics Facility (PCDF), as well as the European Technology Exposure Facility (EuTEF) and the SOLAR external payloads. EuTEF includes 9 technology-oriented instruments, while SOLAR includes 3 instruments dedicated to the measurement of solar radiation.

### Operations

Space Applications Services has prepared the science operations of EDR and EuTEF from Erasmus USOC, and of PCDF and SOLAR from B.USOC. This entails the definition, preparation and validation of all operations concepts and products such as flight procedures, as well as the training and certification of payload operators and ground controllers. Space Applications Services also supports scientists in preparing in-orbit experiments.

Space Applications Services will be on-console at the two USOCs 24 hours a day, 7 days a week controlling the on-board experiments from the ground. At the B.USOC this is done jointly with the Belgian Institute for Space Aeronomy in Uccle, Brussels.

### Operations Software

Space Applications Services has developed several software products supporting Columbus operations. In particular:

- PCDF and SOLAR Software Simulators, for validating operations procedures and displays and training ground operators and scientists in executing experiment procedures.
- PCDF Script Authoring Tool, supporting scientist in writing PCDF experiment procedures.
- Authoring Tools for the SOLAR and EuTEF payloads, supporting scientists and ground operators in writing experiment procedures.
- Tracking Tools for the SOLAR and EuTEF Payloads, supporting scientists and ground operators in monitoring the state of the experiments during actual operations.

### Astronaut Training for Columbus and Automated Transfer Vehicle

Space Applications Services has for many years been actively involved in the design and development of training material for ISS astronauts in areas such as Columbus payloads or Rendezvous and Docking procedures of the Automated Transfer Vehicle (ATV). Space Applications Services is also providing astronaut trainers to the European Astronaut Centre in Cologne, Germany.

### About Space Applications Services

**Space Applications Services** is an independent Belgian space technology company, founded in 1987, whose aim is to develop innovative systems, solutions and products for the aerospace markets as well as related industries. The company's main business lines are:

- novel space system concept development;
- complete ground segments, control centres and control systems for spacecraft and robots;
- human-machine and human-robot interaction systems and products, including visualization systems;
- space system operation services: ground facility set up, operations preparation, planning, training and execution;
- knowledge management products.