



SpaceDys is a spin-off of the Celestial Mechanics Group of the University of Pisa, which develops software for the orbital determination of natural and artificial objects orbiting near the Earth and provides also services in the field of Flight Dynamics. SpaceDys is a worldwide leader in the activities of Impact Monitoring, thanks to the NEODyS (Near Earth Objects Dynamics Site), which provides daily data on the probability of impact monitoring in the next century. According to the SSA Program, this activity is now in a migration step at Agenzia Spaziale Europea – ESA – ESRIN.



Company name: SPACE DYNAMICS SERVICES S.R.L.

Location: NAVACCHIO (PI), Via Mario Giuntini 63, 56021

Fiscal and VAT code: 02009070505

Established: May 2011

Legal form: LIMITED LIABILITY COMPANY (LLC, SRL)

Internet site: <http://www.spacedys.com/it/>

NACE Code: 72.19

Sector: Aerospace Engineering

Spinoff: Università di Pisa

Turnover  
Value  
**25 – 100 K**

Subscribe  
Capital  
**16,5 K**

**NO**  
Female,  
Foreign or  
Young  
Predominance

# Board of Directors



**Fabrizio Bernardi** is Chairman and Chief Executive Officer of SpaceDyS.

Expert in identification and physical characterization of asteroid families, orbit determination of Near-Earth Asteroids at small solar elongation and impact risk, observation strategies and correlation algorithms of space debris objects. He gave his valid contribution in the discovery of Apophis.



**Linda Dimare** is mainly involved in the orbit determination of space debris. She coordinates the software development of the radio science experiment of the NASA-JUNO mission to Jupiter. She is also involved in the development process of a new orbit propagator tool.



**Stefano Cicalò** is the SpaceDys expert in space mission radio science experiments. His research interests are related to Celestial Mechanics, especially to rotation of asteroids and terrestrial planets, and orbit determination for radio science experiments.



N 12  
Employees



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# SPACE SITUATIONAL AWARENESS (SSA)

Since its constitution SpaceDyS has been actively involved in different project and studies of the Space Situational Awareness (SSA) program of the European Space Agency (ESA). The SSA program deals with the hazards coming from space, both from natural and artificial events. Among these events there are the threats caused from asteroids impacting the Earth and the threats of space debris to human critical infrastructures.

Thanks to the strong experience of SpaceDyS's team in the field of orbit determination and impact monitoring of asteroids, the company participates to the precursor service activities of the SSA program.

Since September 2011 SpaceDyS has signed a Service level Agreement (SLA) directly with ESA for the provision of data and services from NEODyS and AstDyS to the new ESA's NEO (Near Earth Object) Coordination Centre (NEOCC). The NEOCC is a data centre that provides information and coordinates activities related to the impact hazard coming from asteroids.

Since July 2012 the ESA's NEOCC activities are maintained also by SpaceDyS's employees.

SpaceDyS is also involved in the development of advanced orbit determination algorithms for space debris in LEO, MEO, HEO and GEO orbits. Therefore, the company is also interested in the SSA activities of the Space Surveillance and Tracking (SST) segment.

Another important field of research and study for SpaceDyS in the SSA program is the new concept Fly-Eye telescope, made in collaboration Compagnia Generale per lo Spazio (CGS-OHB), which is in the development phase and that will be an important asset for the SSA SST and NEO segments. SpaceDyS role concerns the support activities for validating the Fly-Eye concept, and new advanced software tools for tracklet detection and image processing.

# SPACE MISSIONS

## JUNO

JUNO is a NASA mission launched on 5 August 2011, which will reach the orbit around the planet Jupiter in 2016. JUNO's goal is to understand the origin and evolution of Jupiter. By using spinning, solar powered spacecraft, JUNO will produce global maps of the gravity, magnetic fields, and atmospheric composition from a unique polar orbit with a close perijove.

**SpaceDyS role in JUNO mission is to develop an orbit determination code for the radio science experiment and the Superior Conjunction experiment performed by the JUNO mission.** Such a code has been commissioned to the University of Pisa by the Italian Space Agency (ASI), which signed an agreement with NASA.

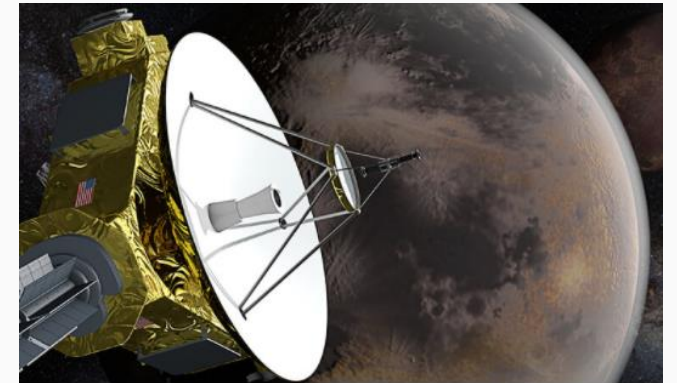
## BEPICOLOMBO

BepiColombo is an European Space Agency mission launched in 2016. Its purpose is the in-depth exploration of the planet Mercury. It has been identified as one of the most challenging long-term planetary projects. The radio science experiment is one of the on board experiments, which would coordinate a gravimetry, a rotation and a relativity experiment, using a very accurate range and range rate tracking. With our data processing algorithms most of the measurements errors introduced can be removed, improving of about two orders of magnitude with respect to the past technologies.

**The team of SpaceDyS advises and cooperates with the Celestial Mechanics Group (CMG) of the University of Pisa on the realization of the orbit determination code that will be used for MORE (Mercury Orbiter Radio science Experiment), the radio science experiment of the BepiColombo mission.**

## END-OF-LIFE DISPOSAL CONCEPTS

The aim of the study is to provide strategies of disposal for spacecrafts operating on either Libration Point Orbits (LPOs) or Highly Elliptical Orbits (HEOs) at the end of their life.



# MARKET AREA OF INTEREST

SpaceDyS has consolidated its position in the market areas concerning the NEO and SST segments of ESA's SSA program, studies in the same sector of the European Union, and the radioscience experiments of interplanetary missions. In this market, the main customers are space agencies, any industrial partners in the aerospace sector and research organizations participating in these studies. Although during these first three years the reference market of SpaceDyS has been the European one, the goal is to expand interest in extra-European markets.

*The market areas that affect SpaceDyS can be divided into four groups, corresponding to different scientific sectors and / or different types of customers:*

**SSA:** this area includes all contracts relating to the European SSA program, both for the NEO segment and for the SST segment. This area corresponds as main customer, ESA, and, through participation in consortia, many European aerospace industries of which SpaceDyS can be a sub-contractor. Other possible clients are the national space agencies, EDA and the Italian Ministry of Defense.

**Space Agencies:** this area includes contracts for ESA projects or projects of national space agencies or other research bodies, which are not part of the SSA program.

**EU:** this area includes studies financed through EU programs (FP7, CIPS, H2020, ...) The main client for this area is the EU and, through the formation of consortia, the European aerospace industries.

**Space Missions:** this area includes the studies and development of software for radio-science experiments on interplanetary missions (JUNO, BepiColombo, JUICE, ...). Clients can be space agencies or research organizations.