



# CONNECT

ESA Telecommunications Newsletter

Dear Readers,

The ESA Telecommunications Team would like to wish you all a Happy 2006!

The European Space Agency (ESA) will continue to stimulate industry in order to create leading-edge technology and maintain and defend the competitiveness of the European Industry.

The activities supported by ESA address both the need for continuous innovation in satellite telecommunications technology and the need to match the demands of Satellite Operators, Service Providers and users in a very complex and competitive marketplace.

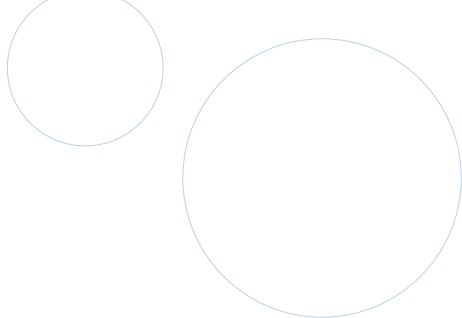
We look forward to working with you in 2006.

*Your ESA Telecom Team*

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# **Interview with Magali Vaissiere**

– New Head of ESA’s Telecommunications Department

Magali Vaissiere, 48, has taken over from Pietro Io Galbo in September 2005 as the new Head of the Telecommunications Department within the Directorate for EU and Industrial Programmes. Before joining ESA, Mrs Vaissiere was responsible for the global management of Astrium’s civil institutional accounts in France in liaison with EADS Space. She successfully managed various ARTES projects. Magali Vaissiere has an Executive MBA, a Master of Sciences in Electrical Engineering from the University of Stanford and studied at the Ecole Nationale Supérieure des Télécommunications de Paris. She is a French national and has two daughters.

As the new Head of the ESA Telecommunications Department, what do you see as your biggest challenge in the coming years?

*Quite clearly the end objectives of ESA activities lie in the satellite telecom sector. The objective of ESA, together with its Member States, is to build and run the most efficient Telecom Programme, and by that I mean the ARTES programme and all of its accompanying elements, to best support the competitiveness of the whole of European industry on the World market. This is indeed a big challenge, since we have to succeed with an ESA ARTES budget which is modest when compared with the institutional budgets made available to the competitors of European industry. This is going to require the ESA Telecom Programme to adapt even more to the market environment and makes it particularly important that ESA succeeds in continuing to build partnerships with private partners and other institutions.*



Are you satisfied with the outcome of the recent ESA Ministerial Council in Berlin?

*Most certainly, the outcome of the Berlin meeting allows ESA to proceed with the construction of new programmes such as AlphaSat and the Small Satellite while also pursuing the necessary technology developments and focused competitiveness enhancements.*

*However, coming back to the new programmes, I am very much aware that we need to keep on working this year to freeze the detailed mission requirements and define the most appropriate financing and operational scheme with the selected partners.*

Before joining ESA you occupied several positions with EADS-Astrium and focused on the telecom business. How is your industry and marketing experience influencing your work at ESA?

*My experience comes from 24 years in the industry, dealing firstly with ground-based radars and then with satellites. The major lesson that I learnt is that the market is always moving and its global nature means that changes are coming faster and faster. Competitiveness is an everyday challenge. The telecom satellite market is at the crossroads of two different worlds: the space business world is very much driven by Institutional policies, while*

*the telecom world is global and a place of continuous innovation. Intervention in the satcom market requires a deep understanding of these two worlds, which makes it possible to work in both according to their specific rules.*

**For further information about ESA Telecommunications visit our website at:**

**<http://telecom.esa.int>**

The satcom market, having undergone a major crisis, is expected to recover in the medium term. How is ESA reacting to this change in the market?

*The currently proposed structure and content of the ARTES programme remains ESA's instrument for reacting to the market.*

*The ARTES Programme plan was first created as a continuation of past efforts, which defined a set of Elements (Elements 1, 3, 4, and 5) to enhance the capability and competitiveness of industry in terms of systems, subsystems and equipment through a variety of focused actions. The programme plan also promotes satellite-based solutions related to the needs of commercial or institutional user groups through the setting-up of several demonstrations of applications.*

*In addition, ARTES includes the implementation of two new programmes based on two new ARTES elements that I have already mentioned; namely the AlphaSat mission programme and the small GEO satellite programme. These two mission programmes will enable the development of new space products like new GEO platforms to expand the current European offerings, with new payload equipment and architectures, as well as the emergence of new satellite services and applications for European citizens. These two programmes require relatively larger budgets federating, based on common objectives, several ESA Member States and their industries.*

Several European States have deployed or are considering deploying operational defence communications systems. The military market is limited and represents less than one satellite per year, but the capability to deploy and operate satcom systems is an asset of considerable strategic importance. What role will ESA play in this market in the future?

*We must recognise that the massive support provided by the US Government to its industry in the development of advanced technologies under the Department of Defense programmes will enlarge the gap in capabilities that already exists between the American and European industries.*

*Therefore ESA, within its Telecommunications Programme, must keep on improving the provision of services to European institutions in response to specific needs, such as Data Relay services, and must also anticipate the provision of new systems and services, making the most of the development of dual-use 'satcom' technologies.*

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*New missions, namely ELINT and SIGINT, have been identified at a European level as priorities for the European Defence sector, and this reinforces the importance of satcom competences in Europe. The challenge for ESA and its Member States is to determine the best response to these new needs within the European framework of political, operational and financial constraints that prevail in this strategic field.*

What role will applications play in the future?

*Of course, since they address the needs of the citizens and create demand for capacity and services, applications must receive significant and dedicated support. However, in this field I believe that a key success factor for ESA is to support the emergence of new applications with relevant partners on a case-by-case basis.*

*Obviously, active cooperation with the European Commission in this field will be crucial.*

What importance do satellite telecommunications missions have in the ARTES programme plan?

*ESA certainly intends to support satellite telecommunications missions: these missions allow the demonstration and qualification of new technology, the introduction and promotion of new services and also address the needs of institutions and citizens that are not covered by commercial service provision. Through the support of such missions, ESA can provide a more substantial effort to industry.*

Specifically, what kind of scenarios does ESA have in mind for the implementation of missions?

*ESA is neither a telecom satellite operator nor a satellite service provider. Therefore the support by ESA for telecom missions either onboard new dedicated satellites such as AlphaSat, the small GEO satellite, or piggy-backed on private satellites requires partnership with Industry, Operators and/or Institutions.*



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**"The European Space Agency (ESA) inspires the vision for Europe's future in space and, through a diverse range of projects, develops the strategies needed to see it realised"**

What will the AlphaSat mission consist of and why is it such a unique opportunity?

*AlphaSat is an ambitious mission that aims to demonstrate new services in the areas of broadband multimedia to fixed terminals and broadcasting and interactive communications to mobile terminals. AlphaSat will also enable the full qualification of the AlphaBus platform in orbit along with the relevant payload and system technologies and equipment.*

*Realising a first mission using the new platform is essential for increasing customer confidence in the AlphaBus product, and presents a unique opportunity for demonstrating new technologies, systems and services in orbit.*

*The AlphaSat mission comprises a core pre-operational mission/ payload, which constitutes the main justification for launching such a satellite. The technology package benefits from the in-flight opportunity offered by the maiden flight of AlphaBus.*

*At the end of 2005, ESA chose three Potential Partners through an open selection contest. Based on a Memorandum of Understanding (MoU) between ESA and each Potential Partner (PP), the Agency is currently launching three Phase-A studies, each dedicated to the mission scenario of each PP. The selection of the final Partner will be made at the end of the Phase-B study by the end of 2006. This will allow time to ensure compatibility for the launch of the AlphaSat satellite in 2010.*

Besides Alphasat, ESA is also pursuing the small GEO satellite initiative. Why, and how will this be structured?

*In the context of probing the market with a new service or an existing service under new conditions such as in a new geographical area, operators are searching for a satellite with a limited capacity and low cost.*

*To answer this need, the ARTES programme plan now encompasses a small GEO satellite initiative, which will be implemented through a new dedicated ARTES-11 Element. This new programme will have a similar structure as ARTES-8 and will allow the development of a small European*

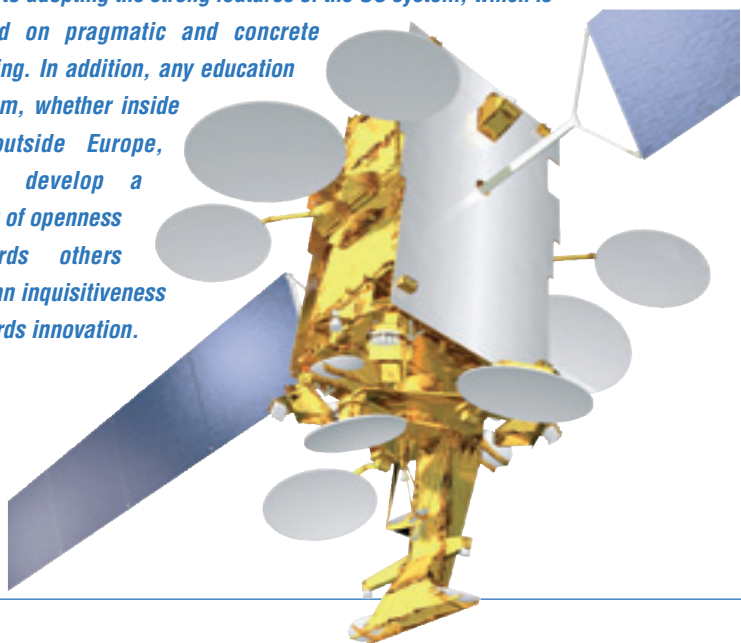
*GEO platform in the low-end range of platform products (< 3kW payload power). Ultimately, the first protoflight model developed by ESA will provide further opportunities to fly innovative technologies, products and/or services, complementing the AlphaSat mission.*

With all of the recent developments, interest in space is growing. Based on your long experience, what would be your advice to anyone seeking a career in the space sector?

*Not to have a pre-conceived view of his or her complete career. Rather, undertake a professional career with the ability to adapt to the fast-changing world of technology. Hard work is important, but so too is not taking anything for granted and a willingness to remain open and flexible. There is no one way. A student interested in the space sector could either start in the institutional space programmes such as the ESA Science Programme, or start working for a few years with a telecom operator or equipment manufacturer, and later on bring his or her experience into the satcom sector...*

You went to the Ecole Nationale Supérieure des Télécommunications de Paris, have a Master of Science in Electrical Engineering from Stanford University in the United States and an Executive MBA from the Centre de Perfectionnement aux affaires. What is your experience with the different education systems in the USA and Europe?

*At the time I studied, the two education systems were different and yet complementary. I believe that, since then, the European education system has evolved somewhat towards the US one. In the future, I hope that we will keep in our European system what has always been good. By that I mean a wide 'general' culture and solid theoretical knowledge, but still being open to adopting the strong features of the US system, which is based on pragmatic and concrete training. In addition, any education system, whether inside or outside Europe, must develop a spirit of openness towards others and an inquisitiveness towards innovation.*





## **Successful Optical Data-Relay Link between OICETS and Artemis**

The first optical link between Kirari, the Japanese satellite known officially as OICETS (Optical Intersatellite Communications Engineering Test Satellite), and ESA's Artemis was made on Friday 9 December 2005 at 02:05 UTC.

Kirari (meaning 'glitter' or 'twinkle' in Japanese) is the second optical data-relay satellite to use Artemis, following the world premiere laser link with SPOT-4 in November 2001 in the framework of the SILEX development, an innovative payload which provides a laser beam as a data signal carrier. This optical service has operated regularly since then, accumulating more than 1100 links totalling 230 hours to date.

The Kirari experiment is the result of a long-standing agreement between JAXA, the Japanese Aerospace Exploration Agency, and ESA for cooperation on data-relay services, and builds upon the SILEX development. Kirari has, for the first time, used an optical link for both data and command transmission. The quality of the link was excellent. The experiment between Kirari and Artemis will continue through 2006, making several optical links under different environmental conditions to completely qualify and characterise the Kirari technology.

Optical technology has several advantages for data-relay applications, including the ability to provide high data rates with low-mass, low-power terminals, combined with secure, interference-free communications. Earth observation, telecommunications services, science applications and space operations can truly benefit from this new way of transmitting data around our planet.

ESA has continued to develop optical technology in Europe under its ARTES technology programme, and JAXA also intends to pursue this technology.

The successful completion of the Kirari experiment is a further demonstration of the value of international cooperation and the excellent relationship between ESA and JAXA. It is the first demonstration of interoperability between agencies using an optical link and augers well for continued cooperation in the fields of data relay and technology.

### **Background note:**

ESA's Advanced Relay and Technology Mission (Artemis) carries payloads for the demonstration and promotion of advanced technologies and services, in particular data relay, land-mobile communications and navigation. Artemis was launched by an Ariane-5 vehicle on 12 July 2001, but failed to reach geostationary orbit due to a launcher malfunction. After 300 days of operation using its onboard electric-propulsion system for orbit control, Artemis was successfully placed into geostationary orbit on 31 January 2003.

Since the start of operations in April 2003, Artemis has provided an operational data-relay service to Envisat (ESA's large Earth-observation platform) using a microwave link. Envisat now uses Artemis for more than two-thirds of its science data acquisition.

SILEX, which was developed by EADS-Astrium (Toulouse), as prime contractor, and funded under the Artemis programme, operates at a wavelength of 800 nanometres using direct-detection principles. Kirari operates in low Earth orbit at an altitude of about 600 km. As with the SILEX development, the Kirari link carries data at 50 Mbps in the return direction between the satellite and the ground, and 2 Mbps in the forward direction between ground and satellite. The transmissions through Artemis are downlinked to the ESA ground station at Redu in Belgium, which is connected via data lines to the Kirari Control Centre at Tsukuba in Japan.



## EADS Astrium Develops Affordable Transportable Satellite Tranceiving Station

Disaster Relief Agencies can now use a new vehicle to support their efforts, thanks to EADS Astrium which has recently completed an ESA-sponsored project for the development of TRACKS: Transportable Station for Communication Network Extension by Satellite.

TRACKS can provide a rapidly deployable platform that can extend the coverage of an existing telecommunication infrastructure or replace it in times of calamity. Wherever it is deployed, TRACKS can quickly enlarge the telephony and Internet services in a given area, including the rural areas of developing countries.

Mr Hilarion Raobadia from EADS Astrium and Project Manager for TRACKS was very pleased with the support that EADS Astrium received from ESA, commenting that: *"EADS Astrium plans to target telecom operators in Africa, the Middle East and Russia, where TRACKS would be a highly suitable solution. It can provide telecom coverage and services in remote rural areas with a low initial investment and it can do this quickly."*

Mr Stefano Badessi of ESA Telcom pointed out that: *"TRACKS is a demonstration of ESA's commitment not only to industry but also to users. As a product, TRACKS is oriented not just towards Telecom Operators, but also to Civil Protection agencies and police forces, which can potentially employ TRACKS for security applications, especially in situations requiring crisis management in areas where terrestrial infrastructures are either lacking or temporarily damaged by a disaster. Use of GSM makes TRACKS interoperable with other systems and is in line with our philosophy that such projects must be user-driven."*

For more information visit:  
<http://telecom.esa.int/tracks>



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