The space needed...
to get business ideas off the ground
Jargon buster

entrepreneur: Someone who assumes the financial risk of the initiation, operation and management of a business.

incubator: From Latin incubare: to lie upon. A business incubator helps to nurture new companies as they strive to develop new products or open new markets.

innovation: The process of making improvements by introducing something new. Innovate: comes from innovatus, past participle of innovare “to renew or change”, from in- “into” + novus “new”.

investment: Literally means: “The action of putting something in to somewhere else”

investment fund: An investment fund is the legal vehicle that invests the pooled funds of retail investors for a fee. By aggregating the funds of a large number of small investors into specific investments, the investment company gives individual investors access to a wider range of securities than the investors themselves would have been able to access.

Also, individual investors are not hampered by high trading costs since the investment company is able to gain economies of scale in operations.

seed capital: Is the money used for the initial investment in a project or start-up company. For proof-of-concept, market research, or initial product development.

It is also referred to as “spark funding” or “love money” since it is often provided by people such as friends and family who have a special interest in the project.

start-up & early-stage company: Refers to companies that have not yet fully established commercial operations and may also involve continued research and product development.

In other words, they are new business ventures in their earliest stage of development.

in this issue...

ESA’s Technology Transfer Programme

The essentials of technology transfer |
National initiatives: |
Belgium, Finland, The Netherlands |
Measuring success |
Success stories: |
Safety and Security, Environment and Health |

Incubation activities

ESA’s incubators |

at ESTEC, ESOC and ESRIN |

Events |

Mobilising the investment community

Bridging the equity gap

Our special thanks for their contributions to this issue to:
Luz Becker (LEX/HQ), Gabriele Boretti (TEC/ESTEC), Simonaeta Cheli (EOS/ESRIN), Alexander Civitello (OPS/ESOC), Bruno Noauda (TEC/ESTEC), David Raitt (TEC/ESTEC), Alberto Tobias, Head of the System, Software and Synthesis Department (TEC/ESTEC).

ESA Internal Communication

ESA Today special issue on the Technology Transfer Programme

Director of the Publication: Jean-Jacques Dordain, Director General. Michel Courtois, Director of Technical and Quality Management (D/TEC). Fernando Doblas, Head of the Communication Department.

Editorial team: Anne du Fretay (Editor), Nicola Firth, Stuart Clark (freelance journalist).

Authors: Frank Salzgeber, Acting Head of the Technology Transfer Programme Office (TEC/ESTEC), Aude de Clercq (TEC/ESTEC), Niels Eldering (TEC/ESTEC), Laura Holt (TEC/ESTEC), Katrine Vetlesen (TEC/ESTEC), Fernanda Valsesio (TEC/ESTEC).

Tel: +33 (0)1 53 69 72 45 / 80 12 Fax: +33 (0)1 53 69 76 90 E-mail: Anne.du.Fretay@esa.int


Photo credits: © ESA, ESA – Stephane Corvaja, ESA – Anneke Le Floc'h, D.R.
Space systems are increasingly part of our daily lives. Today, there are more than 200 telecommunication satellites in geostationary orbit. Over the last three decades they have revolutionised society, changed the way our economies work and introduced new dimensions to television and entertainment. Satellite observations have provided us with effective methods to monitor climate change and the impact of land use. Space has pioneered methods for generating and exploiting electrical power more efficiently. Scientists using bio-imaging for diagnosing disease have benefited greatly from sharing imaging technology with space researches and the demands of space travel have thrown up the need for strong lightweight materials which have quickly found research centres on developing all kinds of technologies. If these are not commercialised, they will never reach their full potential and society could well miss out on the possible benefits.

As a result, the ESA Technology Transfer Programme Office (TTPO) was set up in 1990 and is now part of the Directorate of Technical and Quality Management (D/TEC). It aims to adapt space technologies for commercial application on Earth and by so doing it strengthens European industry and competitiveness. By finding applications for space-based technologies in non-space sectors, the TTP acts as a bridge supporting suitable transfer projects by providing funding, in partnership with others, for feasibility studies, pre-marketing studies and creation of prototypes. It also provides seed funding and support for start-up companies through three facilities known as business incubators.

Our aim is to adapt space technology for commercial applications on Earth.

Since its creation, the range of activities of TTPO has considerably developed and exciting initiatives have been recently launched including the establishment of two new incubators, at ESOC and ESRIN, and an investment fund.

This special issue of ESA Today aims to give you an update and explain how you can be part of this highly innovative venture.
Technology transfer is the process of using technology, expertise, know-how or facilities for a purpose not originally intended. It implies that a technology developed for one sector can be used in a totally different area.

At ESA, we focus on the adaptation of technologies developed as a result of space programmes for non-space applications. This includes the transfer of software, hardware, know-how and also covers the commercial application of satellite systems.

What is Technology Transfer?

Technology transfer is the process of using technology, expertise, know-how or facilities for a purpose not originally intended. It implies that a technology developed for one sector can be used in a totally different area.

What advantage does technology transfer from space bring?

Space research focuses on developing and perfecting technologies and processes so that they can withstand the harsh nature of space. For example space systems are characterised by low weight, efficiency, reliability, radiation and temperature resistance. These characteristics may present significant benefits in our daily life and help us to develop new solutions.

Why do we need technology transfer programmes?

To be at the forefront of space research and technology, it is vital that European industry maintains a high level of innovation. Spinning off technologies allows for further development, which may not be possible as part of a budget-constrained space programme.

The level of innovation in European industry, especially in Small and Medium-sized Enterprises (SMEs), can be dramatically boosted if supported and promoted by large international centres of excellence.

At ESA, the Technology Transfer Programme actively promotes the transfer of knowledge between Member States and the development of a supportive infrastructure throughout these States.

This will contribute to a European environment that is more open to new opportunities and, in this way, it will stimulate the search for new uses of the technology created.
A network of technology brokers, operating throughout ESA Member States and Canada, conducts most of the actual technology transfers. This Technology Transfer Network (TTN) is managed by MST Aerospace GmbH Cologne, Germany, and matches technology requests from the non-space industry to technologies developed within European space programmes.

Certain Member States have reinforced this central action by putting into place their own additional brokerage activities tailored to their own national needs. (see National initiatives, page 6)

How is technology transfer performed at ESA?

The main role of TTN, consists of extracting and marketing suitable space technologies, services and applications. In other words, they analyse the technology needs of non-space companies and identify suitable space technologies to meet these needs.

On behalf of ESA, MST Aerospace operates a virtual market place to offer organisations the ability to search for technologies and to submit their market demands.

At present more than 300 technologies available for transfer and licensing are stored in a space technology database; while more than 450 requests from European non-space companies are included.

What is the role of TTN?

The brokerage is performed by using the complementary approaches of 'technology push' and 'market pull'. Technology push activities include the identification of transferable space technologies and their subsequent marketing in the non-space domain, whereas the market pull activities start with a request for technology from the non-space sector, which triggers a search for appropriate solutions from the space sector.

For speed-skiing, skier designer used stabilising mechanisms originally used on board Rosetta.
In 2001, the DTTP was established to extend the basic service provided by the TTN. The DTTP has been highly successful thanks to the extensive network created through local clustering. The initiating partners were ESA, the Dutch Ministry of Economic Affairs (MEZ) and The Netherlands Organisation for Applied Scientific Research (TNO).

They have now been joined by The Netherlands Institute for Space Research (SRON), the Ministry of Education Culture and Science (OCW), The Netherlands Foundation for Research in Astronomy (ASTRON) and The Netherlands Agency for Aerospace Programmes (NIVR). The nationally orientated scheme allows these partners to use their knowledge of the local demands and competencies when taking an active role in steering technology transfer activities to obtain the maximum benefit.

"By ensuring that investments in space programmes find their way into innovative products and services in other sectors, the programme fits in very well with the Dutch Government’s policy of promoting innovation," explains Friso van Oranje, Director of TNO Space.

More information: www.tno.nl

Clean fuel for motor sports: the H2 Cartridge

Transportation without negative effects on the environment is something we all want. Fuel cells and the hydrogen economy bring us the promise of a clean energy future. Interestingly, the technology is already available today; the next step is to gain mass support by capturing the interest of the general public. Formula Zero is a new generation of car racing that exploits motor sport’s popularity to champion clean fuel by using fuel cell-powered go-karts.

In setting up Formula Zero, however, the problem of how to store hydrogen safely was raised. The answer came from a collaboration between Formula Zero, TNO Space and Bradford Instruments, a spin-out company from the Dutch firm Bradford Engineering BV. The result: the H2 Cartridge co-developed by Formula Zero and Bradford Instruments and designed to make a safe “click and go” cylinder exchange possible for small to medium fuel cells. In developing the H2 Cartridge, Bradford Instruments used Bradford Engineering’s knowledge of gas handling systems, developed for space applications. In return there are opportunities to spin hydrogen handling systems back into the space industry, based on the experiences with the high-pressure hydrogen storage cartridge for Formula Zero’s fuel cell race kart.

Finland

The Space Technology Transfer Finland (STTF) Project

In Finland, the STTF Project is the operational link between ESA’s TTP and the Innovation Relay Centre (IRC) network of the European Union (EU).

The STTF Project helps companies and research organisations with the creation of technology offers and requests all the way to the signing of a technology transfer agreement. Its core task is to follow up all technology offers and requests coming from the Finnish IRC network.

The STTF Project has updated two catalogues: ‘Space Directory of Finland’ and ‘Mobile Location Directory Finland’.

Technology to help fight breast cancer

Recently, the STTF project brought together two Finnish companies: Oxford Instruments Analytical Oy in Espoo, near Helsinki, and Planmed Oy in Helsinki. Oxford Instruments Analytical Oy had developed a GaAs – Gallium Arsenide detector for possible use on the BepiColombo mission to Mercury. Planmed Oy, which specialises in medical technology, found the detector could be used in its future mammography equipment. The two Finnish companies now have an ongoing R&D project to help Planmed Oy manufacture improved digital mammography equipment to be deployed in the fight against breast cancer.

Belgium

The Belgian Space Technology Transfer Platform

For a small country of 10 million inhabitants, Belgium makes a substantial financial investment in space. To encourage payback from this investment, a strong technology transfer effort has been established by the Belgian Science Policy. Since 1997, this additional brokerage has been performed by the Belgian Space Technology Transfer Platform, a consortium of several companies with complementary expertise including two technical Research Centres (CRIF and CSL/Liége), a legal office (Hans Braquené, in Leuven) and an innovation consultancy company (Créaction International Belgium SPRL, in Redu).

In 2006 three technology transfers were accepted. Eight further transfers are currently in preparation and 51 technology needs have been identified.

New tracking system for buses

Satelbus is a Belgian-Canadian technology transfer managed by Créaction International Belgium SPRL, in Redu. It aims to manage the demand for public transportation in rural areas using ESA’s Artemis satellite. In these areas, a bus service only operates on demand. At present passengers are obliged to reserve the bus a day in advance so that the driver can map out the optimal route. This new satellite tracking system will provide vehicles with a mapping function and a two-way messaging system between the bus and a call centre. Passengers can call the bus from any location at any time. A call centre receives these requests and software computes a new course including all new requests, every five minutes. The updated route is subsequently sent to the driver of the bus for re-routing. Pilot projects are currently under way in Belgium and France.

Satelbus who is in charge?

The satellite space segment is operated by Vitrociset EPB, the Belgian subsidiary of the Italian Vitrociset Group, which is also responsible for the ground segment at Kourou (Rendez-Vous). To get the Satelbus project off the ground, the company had to apply to ESA for a sufficient bandwidth (at least 30 KHz) on Artemis. EMS Satcom Inc. provides the satellite communication terminals and the necessary hub equipment installed at the local Earth Station (LES) in Redu. This includes providing a dedicated clear channel data connection to the data hub of Mobile Satellite Ventures, operating the message-processing center in Ottawa, Canada. The Satelbus project has already grown in magnitude. Now called Messaging And Tracking Infrastructure Satellite Services (MATISS), it aims to provide similar services elsewhere in Europe, the Middle East and North Africa.
Measuring success

Key ingredients for a successful technology transfer

There are four basic pillars upon which a successful transfer rests:

◗ The technology must have strong economic potential – especially
   in those industries that are expected to result in high turnover
   and job creation.
◗ It must have a social impact by addressing for instance environmental
   issues, aiding public relations, benefiting society or improving daily life
   in a tangible way.
◗ There must be a large scope for non-space utilisation.
◗ The owner of the rights of the technology is motivated and willing to
   commercialise the technology and market it accordingly.

How should success be measured?

Keeping track of technology transfers and spin-offs necessitates the
development of performance measures capable of evaluating their
short and long-term impacts. Short term measures of success include the
number of leads, the number of partnerships, the amount of venture
capital raised, the number of start-ups created, the transfer processing
time, and the number of actual success stories. Long-term measures of
success include the economic impact, the income generated, the number
of jobs created, and the perceived and actual benefits to society.

What has been achieved so far?

◗ Some 200 successful transfers to date, with half of the transfers being
   transnational.
◗ The creation of 30 spin-off/start-up companies.
◗ The creation of a portfolio of some 300 space technologies that are
   available for transfer, licence and application.

What can we expect in the near future?

The cumulative turnover received by technology providers is expected
to exceed €80 million by end 2007, which represents 15 to 20 times
ESA’s investment in the Technology Transfer Programme
or the creation of 1500 jobs.
In order to increase the frequency and depth of its interactions with European universities, research institutes and industry, the Agency has launched in 2006 the ESA Networking/Partnering Initiative (NPI).

The goals of this initiative are to enhance research for space applications in general and to identify potential spin-in technologies. This particularly applies to new developments in the nano and micro-technology domains.

ESA-NPI can offer the following support:

- co-funding: the NPI can co-fund research for doctoral or post-doctoral investigations (up to 50% or €30 thousand/year).
- access to ESTEC’s laboratories: NPI participants are required to conduct from six to twelve months of their research at ESTEC.
- technical support: NPI participants can contact experts at ESA to discuss proposal concepts and verify their relevance to space applications.
- networking (building ‘innovation networks’): through the links ESA provides, NPI participants have the opportunity of finding potential partners for further cooperation.

Potential spin-in technologies

Technology spin-in is the opposite of a technology spin-off. It means that instead of the space industry spinning out a technology, it acquires and applies a technology originally developed for another application – for example in the field of consumer electronics and material sciences.

If you are in contact with researchers from European universities and research organisations belonging to ESA Member States, who could submit innovative doctoral or post doctoral proposals for activities involving any technical domain relevant to space applications, let them know that they can contact the NPI Programme Manager, Jörg Wehner via email at: Joerg.Wehner@esa.int
Through the Safe&Cool Project, the technology used in space suits to protect astronauts in direct sunlight is now being used to develop protective clothing with a built-in cooling system. Liquid is circulated through tubing inserted into cavities in a special 3D-textile structure, creating artificial ‘blood vessels’ that remove excess heat.

Conceived within ESA’s TTP, the Safe&Cool system is being developed by a consortium of six SMEs from Italy, Belgium and Poland. Besides the immediate application for the Safe&Cool innovative thermal management system, which consists of creating clothing to protect professionals working in harsh environments, such as fire fighters and steel workers, several other promising applications have been identified. For instance, the cooling apparatus used in the project has already been successfully applied to clothing for McLaren’s Formula-One mechanics and for Sete Gibernau, the Spanish Moto-GP driver.

Roboclimber, a machine designed to prevent landslides without endangering human life has been developed thanks to technology derived from ESAs space missions. Expertise from manoeuvring satellites into the correct orbit has been used to develop the Roboclimber, which is remotely controlled by a system originally built for the Agency to control space robots and a robotic satellite arm.

Landslides can be a big problem. In Italy, alone, more than 400 take place each year causing death and an estimated €1200 million of damage.

The conventional procedure for preventing landslides involves drilling rods into a rock slope. In order to do this, large scaffolds (4-5 metres wide) are fixed to the rock face. However, this solution is not cost-effective due to the time consuming operations, the costs for the scaffolding and for the personnel involved in their construction. It is also dangerous. According to ISPESL, the Italian Authority on Work Safety, scaffolding is responsible every year for about 8000 accidents, 30 percent of which result in permanent injury to workers.

Roboclimber is equipped with a special Comacchio 28kW drilling machine that is about 80 times stronger than a typical hand-held electric drill used around the home. Roboclimber can drill a 10-metre deep hole into solid rock. The drilling is controlled remotely from a safe distance using a computer, supplied by the Belgium company SAS, and a wireless link. Once approximately in place, an onboard web-camera enables the operator to manoeuvre the robot into the correct position without difficulty, execute the drilling and insert the rods.
Safety and security: Passive imaging technology improves airport security

Startiger is a new approach to conceiving important space technology in a short time period by bringing together a small team of highly motivated young researchers. In a pioneer project, Startiger I, eleven young researchers developed a new passive terahertz camera system prototype in only four months. ESA subsequently filed two International Patent Applications for the camera system and a phase shifter in order to protect the intellectual property generated by the Startiger I team.

ThruVision Ltd, a spin-out company of the CCLRC Rutherford Appleton Laboratory, is currently developing a commercial passive terahertz imaging system under an ESA licence for the above patent applications. This system can screen personnel for concealed objects in airports or other sensitive areas. In 2004, ThruVision won the UK Research Councils’ business plan competition and was presented with a £25 000 prize by UK Science and Technology Minister, Lord Sainsbury. A prototype of the company’s terahertz system is currently being deployed at the Canary Wharf business complex in London.

Health: Unit to protect immune-deficient patients

In response to concerns from hospitals about how to prepare for an eventual flu pandemic, the French company AirInSpace has successfully adapted a high-tech air-conditioning unit, developed to protect astronauts, so that it can be used in critical care centres to protect immune-deficient patients against airborne pathogens.

European space industry has long been developing systems to clean the air on-board spacecraft, and has achieved excellent results in air monitoring and purification for human spaceflight missions.

The AirInSpace’s Plasmer™ bioprotection system is a multistage system that uses strong electric fields and cold-plasma chambers to eliminate micro-organisms in the air. It completely removes the airborne avian flu virus from highly concentrated aerosols. With support from ESA’s TTP, AirInSpace used this space technology in 2001 to develop a transportable and easily deployable ‘clean room’ for hospitals to use in emergency scenarios. It has now been used in more than 70 medical centres in France.

AirInSpace is now actively working to expand the use of the Plasmer technology in other air treatment systems, such as commercial airliners, private jets, industrial environments and residential usage.
While working on a space project in the field of microgravity, Tony Anson, a Shape Memory Alloys (SMA) expert, realised that shape memory nickel-titanium alloys could have interesting applications in the medical sector. SMA are materials that display two unique characteristics: pseudo-elasticity and the shape memory effect. Tony Anson came up with the idea to use this smart material for medical applications. One of his most famous innovations is the endovascular stent. This stent – a small tube made of fabric and metal used to strengthen arteries and veins – is inserted into the heart’s aorta only after being squeezed into a smaller configuration. Once in place it is triggered to return into its original shape by the application of heat.

Tony Anson approached the Technology Transfer Network (TTN) with his idea and obtained a small ESA contract to perform a feasibility study. With this study he won the UK “DTI SMART Award”, a prestigious award granted by the Ministry of Trade and Industry, which gave him the financial means to apply for a patent as well as getting in touch with venture capitalists. One thing led to another and in 2001 he sold his business for more than €26 million to the company Lombard Medical Technologies (LMT), a specialist in cardiovascular device and polymer coatings, based in the UK.

For Tony Anson this was a great business opportunity; for ESA it was a clear case of technology transfer benefiting individuals. This is only one example: more and more start-ups are creating the commercial opportunities offered by the transfer of space technology.

ESA decided to support these entrepreneurs with a process known as incubation and it has now become an important part of TTPO’s strategy for technology transfer. The first incubator facility opened at ESTEC in 2003 and has since supported some 30 start-ups. The Agency set up two more incubators, one at ESRIN in 2005 and the other at ESOC in 2006.
incubation activities

The Technology Transfer Programme Office (TTPO) coordinates ESA’s three incubators at ESTEC, ESOC and ESRIN. These incubators are also linked to ESINET, a European network of 36 business incubators specialising in both space and non-space applications, which is managed by the European Business and Innovation Centre Network (EBN), located in Belgium.

All three incubators offer start-up companies operational services, know-how in a high-tech environment and easy access to ESA’s technical specialists. The service package offered includes:

- Pre-seed funding and access to other sources of finance;
- Access to engineering support from ESA experts;
- Access to ESA resources such as test facilities, laboratories and workshops;
- “Hands-on” assistance;
- Business development support and advice;
- Access to strategic partnership and networking;
- Office space and shared facilities.

More information:
www.ebn.be

Why do we need incubators?

It is not enough to just have a great idea about how to adapt space technology for a product or service. Developing that idea and bringing it to market are big challenges too. Established firms have a lot of business know-how but are not always open to radical ideas. Many of them need to concentrate on their core business and so do not have the necessary time to innovate.

On the other hand, new technology-based firms are open to innovation but often lack business and management capabilities. These are the firms that need the structured support of an incubator. An incubator offers an environment where a start-up company can find just the mix of skills and competences it is lacking to ensure a successful assembly of a sustainable company.

How does it work?

In this sense, we can say that building a company is not so different from building a satellite. It needs several subsystems like a saleable product or service: the instrument, management control systems, the software, cash flow, the energy, strategy, the mission planning and so on.

It also needs a clear mission statement with objectives and a marketing campaign to launch its business. In other words – and to continue with the metaphor – it needs ‘sub-contractors’ who support the integration of these subsystems.

A business incubator offers the services of such ‘sub-contractors’ through a well-established network of technical experts, business experts, accountants, lawyers, venture capitalists as well as a number of researchers and other professionals from universities.

The second benefit of an incubator is cost advantages. Since a business incubator offers its physical premises not just to one start-up, but to several, overhead costs are shared.

Finally, in an incubator start-up companies are clustered together, so that they may benefit from shared experiences: companies can learn from each other, help each other and share their expertise.

This is commonly referred to as cross-fertilisation. After the incubation period, which takes between 6 months and 2 years, all the ‘subsystems’ have to be integrated into the company before it is ready to enter the marketplace. For ESA, this is much more than a confined programme: it is a long term strategy to ensure Europe’s technological advance through innovation on a global scale.

Who are we helping?

- Entrepreneurs
ESA is always looking for entrepreneurs with innovative ideas to use space technologies or systems in a non-space environment. If they are ready for commercial development, they are encouraged to submit their proposal to join the ESA Business Incubation scheme.

- Space Companies
ESA is interested in space companies willing to outsource the spin-off initiatives of their employees in an innovative win-win scheme.

- Research Centres and Universities
ESA asks research centres and universities to encourage staff and young talent to set up their own companies to bring cutting-edge research to the marketplace.
The space needed... to get business ideas off the ground

Incubation works best when it is embedded into a regional network. For example, being close to an ESA establishment allows easy access to the Agency’s expertise and facilities. Likewise, being close to business partners allows faster interaction with them and better access to support. For this reason, ESA has set up its incubators in the vicinity of its existing establishments, allowing start-up companies to benefit from European excellence.

The Incubator at ESTEC in partnership with SenterNovem

The first ESA incubator was launched at ESTEC in collaboration with the Technopartner Programme of SenterNovem, a Dutch governmental agency that supports innovation on behalf of the Dutch Ministry of Economic Affairs. A great deal of resources can be found around ESTEC in the shape of high-profile universities and R&D parks. The construction of a Space Business Park has just started in the vicinity of ESTEC, and due to the very nature of this ESA Establishment, the spin-off activities in the incubator here cover the entire spectrum of ESA’s expertise.

More information:
> www.senternovem.nl

DISAPS Incubation period: May - December 2006

The Dutch company DISAPS offers high-end SatNav solutions for the blind and visually impaired. To test their prototype in a city environment, they set up a network of partners in and around Leiden. Michele Bavaro, one of the entrepreneurs supported at ESTEC explains: “Being incubated at ESTEC helped us solve some technical issues that possibly could have compromised our business. We could concentrate on a market study with help from the Association for the Blind and Visually Impaired in The Netherlands. We used the Region of Leiden to investigate how location based information could be communicated through our guiding system. The methodology of obtaining high-end precision positioning will undoubtedly have an impact on a variety of other applications. “There is no need to stress how important precise positioning is for our users’ navigation, and how nowadays ESA’s EGNOS system provides satellite navigation augmentation even through the Internet”. Currently, DISAPS is running more tests with their working prototype in Italy.

> www.disaps.com
ESA and the regional Government of Hessen have worked together to establish a recently opened Business Incubation Centre, in October 2006 at ESOC. Called the “Centrum für Satellitenavigation Hessen GmbH” (CESAH), it is currently focussing on Galileo related navigations applications.

The Centre has teamed up with renowned universities, research institutions, IT and consultancy firms and future Galileo-user industries, all located in the Rhine-Main metropolitan area.

More information:
> www.cesah.com

The Incubator at ESRIN
In partnership with the Business Innovation Centre in the Lazio Region

At ESRIN, incubation activities began in October 2005 in cooperation with BIC Lazio, the Business Innovation Centre of the Lazio Region. This initiative has already brought together universities, research centres, major firms, the ‘Polo Tecnologico Industriale Romano’ and ESA.

At ESRIN spin-off activities are mostly related to Earth observation data processing, telecommunication services and satellite navigation.

More information:
> www.biclazio.it

The Incubator at ESOC
In partnership with the Regional Government of Hessen

ETA_MAX
Incubation period: since January 2007

The company ETA-MAX Space employs some of the leading experts in Europe in the area of space environment modelling. It provides software engineering services for complex, safety and business-critical systems. Their G-WaLe System, being developed at the CESAH, was the regional winner in Hessen of the Galileo Masters Competition in 2008. Based on data provided by a network of floating Galileo receivers deployed in a river, G-WaLe can generate the water level profile of the river. Holger Sundin, head of ETA-MAX Space, is convinced of the advantage of the system: “Together with our partner, the Danish Hydraulic Institute (DHI), we will be able to offer a solution significantly enhancing the forecasting of river floods and the design of flood protection infrastructure.”

More information:
> www.etamax.de

The Incubator at ESRIN
In partnership with the Business Innovation Centre in the Lazio Region

GEO-K
Incubation period: since April 2008

Created in April 2006, GEO-K is the first spin-off company of the Tor Vergata University, Rome. It conducts R&D activities and provides consulting, services and products in the field of image processing and of microwave, optical and hyperspectral remote sensing. GEO-K is the vehicle that will market the commercial applications developed both by the University Earth Observation Laboratory and the Geoinformation PhD Programme. Partnership with Planetek Italia, one of the main operators in Italy in the field of information sciences applied to land management, is proving fruitful.

More information:
> www.geok.it
>

Satellite view of Rome

Flooding in the Rhine valley, Nijmegen, The Netherlands, February 1995

www.etamax.de
The space needed... to get business ideas off the ground

Events

ESA’s TTPO organises each year a number of events aiming at training entrepreneurs, developing the ESA network of experts, raising the interest of students for technology transfer and start-up companies.

The Community of European Management Schools (CEMS)

The ’Turning Technology into Business’ seminar

Nico van der Meer, student from the University of Rotterdam (RSM), reports on his week-long experience at the “Turning Technology into Business” seminar at ESTEC in 2006.

“As the kick-off to my Master’s degree in International Management, my CEMS time could not have started at a more exciting place. For one week I was a guest at ESTEC, where I took part in the seminar ‘Turning Technology into Business.’ We had one week to transform a space-based patent into a viable non-space business. The technology was supplied by the Netherlands Foundation for Research in Astronomy (ASTRON) and consisted of a very specific milling technique.

In order to become familiar with the literature in the field of entrepreneurship and technology transfer, two classes were scheduled with lecturers from the Erasmus University, Rotterdam and the Bocconi University, Milan. In addition, the engineer who developed the patent informed us about the specifications and the usability of his patent. However, it was the entrepreneurs of the ESTEC start-ups that inspired us with their entrepreneurial spirit to come up with a viable business model for our start-up companies.

As the seminar proceeded, the competition between the groups of international students became fiercer but the team spirit within the teams strengthened. At the end of the week I was surprised by the diversity of applications for the patent. The business models ranged from the new ways of manufacturing golf clubs to the manufacturing of car parts and casings.

Being given the opportunity to gain experience in developing a business model by working on a real life case was highly beneficial. ESA’s hospitality was absolutely great and we got the chance to visit the spectacular test facilities at ESTEC and to attend a 3D virtual tour of the International Space Station. For a brief moment, we felt like astronauts rather then business students!”

Intellectual Property seminar organised with the Dutch Patent Office, ESTEC, February 2007
The Galileo Masters Competition

Galileo Masters, the European Satellite Navigation Competition, is an international event that seeks to help the creation of new applications and services for the Global Navigation Satellite System (GNSS) industry.

The regional winner for The Netherlands in 2006 was Andy Lürling of the Dutch start-up, iOpener. The company won the competition thanks to its ‘real-time racing’ game concept. Its patented technology allows the integration of real moving objects into the virtual world – Internet and games – using the GNSS technology.

According to Andy Lürling, the competition provided iOpener with the opportunity to develop its strategy and formalise ideas. “It was also a unique opportunity to form contacts within the business community,” he says. After winning the competition, iOpener made a successful application to ESA and will be joining the ESTEC Incubator in the next few weeks.

Chicken and egg – which came first?

A typical problem often encountered by start-up companies is the so-called chicken and egg problem – which came first?

To succeed, most start-up companies must accomplish two actions that are mutually dependent on each other. For example, it is difficult to get investment if there is no proof of concept or a working prototype. However, it is also difficult to develop a proof of concept or a working prototype without investment. This is where the incubator comes to the rescue...

The ESTEC Workshop facilities

Andre Zandvliet (left) and Marcel van Slogteren (right), who is in charge of the workshop, have been working at the ESTEC workshop facilities for many years. They have gathered a wealth of experience in the design, manufacture, and development of flight hardware and related space equipment.

Over the last few years they have also supported incubatees and their projects. Thanks to their know-how they are able to help incubatees build their prototypes. They provide advice on how preliminary designs can be improved and implemented.

MiraMap is one of the ESTEC incubatees that Andre Zandvliet and Marcel van Slogteren helped most. The start-up company was developing a passive microwave remote-sensing technology for land and water surface surveys, in order to monitor the strength of dykes. MiraMap was in a complicated situation that required very precise engineering. Whilst the prototype was being built in Russia, the plane it was to be mounted on was still in America.

So, the ESTEC team had to engineer remotely two very important elements of the project: the fuse box of the prototype and the system to fix the 80kg prototype onto the plane. Needless to say that Zandvliet and van Slogteren’s experience was a key element in the success of the project. Both of them explain: “we highly value the opportunity to work with professionals who are so dedicated to projects that seek to improve daily life.”
For any new technological venture, there is a relatively large number of promising start-up and early-stage companies aiming to use space-related technology or satellite applications. However, many of them lack the necessary access to seed- and early-stage equity.

**Bridging the equity gap**

As part of ESA's endeavour to bridge the 'equity-gap' and encourage the transfer and commercialisation of space technology in Europe, the Agency has taken the initiative of establishing a venture capital fund.

The Agency will be the initiator and catalyst of the fund and will also contribute to it. E-Synergy Ltd, an independent fund manager based in London and Geneva, has been selected by ESA to set up the fund, raise the capital and, later on, to manage the fund.

The initial size of the fund is intended to be between €25 million and €40 million. Investors, including ESA, are each expected to commit on average at least €3 million to €5 million. The focus of the fund will be on investing in start-up and early stage companies using space-related technologies or satellite applications in non-space applications. These companies need to be located within ESA's Member States. It is envisaged that investments in start-ups will be made in stages. Up to €0.3 million will be allocated in the initial investment round, with a potential of up to €5 million in total over one to three rounds.

The fund will be the first of its kind in Europe. ESA experts think that it will successfully benefit and promote European companies in this sector. Also, being unique in Europe, it is expected to attract the attention of a large part of all entrepreneurial initiatives using space-related technologies or satellite applications in non-space applications that are in need of funding.

**ESA's Venture Capital Fund Initiative**

The space needed... to get business ideas off the ground

www.e-synergy.com
ESA's Technology Transfer Programme

Lines of business

Transfer of Technology Services and Applications

- ESA Technology Transfer
- National Technology Transfer Initiatives (NTTI)
  - The Netherlands
  - Belgium
  - Finland

Support

- ESA Business Incubation
  - ESTEC
  - ESOC
  - ESRIN

ESA Venture Capital Fund Initiative

- FinanceSpace EC Project
- INVESAT EC Project

ESA Business Incubation

How can you get involved?

The TTPO is always looking for entrepreneurs with good ideas.
If you want to submit a proposal or know someone who is interested,
the ESA Business Incubation application package is available at:
www.esa.int/ttp

ESA’s start-ups are always looking for support.
Can you help us to help them? If you would like to offer the benefit
of your experience and expertise to ESA start-up companies,
please contact the TTPO: ttp@esa.int
The space needed...

to get business ideas off the ground