

# Finding New Opportunities for Region-to-Region Business in the SatCom Field: the *ToscanaSpazio* Association

Keji A. Adunmo, Marco Luise, *Fellow, IEEE*, Sabino Titomanlio, and Giovanni Giambene

**Abstract**—Research and Development in a peculiar field such as Satellite Communications (as well as Space science/technology in general) is known to be the ideal stage *both* for large, transnational companies with the functions of large integrators and system/service providers, *and* for Small-Medium Enterprises (SMEs) specialized in vertical technologies and/or services. Both kinds of actors, and SMEs in particular, may take advantage of different forms of *regional networking* on a smaller-than-national scale to create synergies and exploit complementarities at a local level. This paper reports on a very recent experience of this kind, namely, the newborn no-profit regional association *ToscanaSpazio*, based in Tuscany, Italy. The association, through a number of networking, dissemination, and lobbying actions, helps creating and strengthening competence, and prevents the brain drain and the possible slow decay of the technological, scientific, and entrepreneurship assets of the region. In addition to describing the association, the paper also identifies and informs about the different opportunities of *region-to-region* business for similar regional networks or districts that may arise in Europe with the help of the European Commission, of national and regional Space Agencies, and of international large companies.

**Index Terms**—Satellite Communications, Aerospace, Regional Association, Region-to-region business, SMEs

## I. INTRODUCTION

THE region of Tuscany is well known for its gently sloping hills, its culture, art, Chianti wine, and fashion – all factors leading to a distinctive lifestyle well summarized in the popular movie *Under the Tuscan Sun*. The fact is that under the Tuscan sun the international Space community can also find a whole constellation of companies and research Institutions very active in the field of Aerospace in general and of SatCom in particular.

A recent survey of the field of space and aerospace in the Tuscany area revealed previously unsuspected figures such as

more than 2500 very-highly qualified technical staff, with a gross turnover of around 500 million Euro, and with a large predominance of R&D personnel. The actors of the field are very different in nature and in size: large manufacturing and service companies [Selex Galileo, Ingegneria Dei Sistemi (IDS), INTECS], diverse Laboratories in Academic Departments (University of Firenze, University of Pisa, University of Siena), public research Organizations (Consiglio Nazionale delle Ricerche CNR in its large plants of Pisa and Firenze-Sesto Fiorentino, Consorzio Nazionale Interuniversitario per le Telecomunicazioni CNIT with its laboratories in the three Universities above), medium-size high-tech companies (AvMap, Sitael) and a constellation of very successful small and micro companies, often spun-off from the large companies and research centers above, in the different areas on space science and engineering. All in all, the region boasts state-of-the-art competence in a number of different fields, like: telecommunications, satellite navigation, optoelectronics, conventional and innovative propulsion systems, design and manufacturing of antennas, power and on-board electronics, data handling and earth observation, exobiology and biological experiments at zero gravity, mission planning and control, space debris tracking, just to mention a few.

All of the entities above are already in contact with the main public and private stakeholders in the field like the European Space Agency, the European Commission, the prime space companies in Europe and outside. But, the relevance of the space “district” in Tuscany is failing to find an adequate recognition at the National level. In particular a recent document of the Italian Space Agency ASI [1] did not recognize Tuscany as one of the main areas in Italy for space business (see also Fig. 1).

In this paper, we show on one side that the field of space is well represented in Tuscany, and we outline a number of actions that are need to sustain and enhance the development of activity in this field, starting with a recent networking initiative, namely, the *ToscanaSpazio* association.

## II. THE TOSCANASPAZIO ASSOCIATION

### A. Motivation

The not-for-profit association *ToscanaSpazio* was established in December 2011 with a motivation that directly stems

K. A. Adunmo is with the Agenzia per la Promozione delle Ricerche Europea (APRE) [www.apre.it](http://www.apre.it), Rome, Italy (e-mail: adunmo@apre.it).

M. Luise is with *ToscanaSpazio* [www.toscanaspazio.it](http://www.toscanaspazio.it), Pisa, Italy, and with the University of Pisa, Italy (e-mail: presidente@toscanaspazio.it).

S. Titomanlio is with *ToscanaSpazio* [www.toscanaspazio.it](http://www.toscanaspazio.it), Pisa, Italy, and with M.B.I. Group [www.mbigroup.it](http://www.mbigroup.it), Pisa, Italy (e-mail: [direttore@toscanaspazio.it](mailto:direttore@toscanaspazio.it)).

G. Giambene is with the University of Siena, Italy.

out of the facts stated in the Introduction above: many companies and research Institutions in Tuscany have been active in the field of aerospace technology for years, but their activity is *fragmented* so that they fail being recognized as a key asset and a distinctive feature of the region, as it happens in other regions of Italy like Lazio, Piemonte, Campania, Puglia, Basilicata, Lombardia. This is why a group of scientists, executives, and engineers all involved in the field of aerospace decided to start a *networking initiative* to:

- recognize excellence and disseminate knowledge about competence and results outside the Region;
- accommodate all players, be them large, small, or micro enterprises and/or Research Institutions and Universities across the Region;
- attain a full regional relevance and better compete at the National and European level.

The idea underlying this action was that a pervasive network of companies and research Institutions scattered across the whole region of Tuscany would facilitate the creation and strengthening of competence through the development of technologies and services, and would help preventing the “brain drain” and the possible slow decay of technological, scientific, and entrepreneurship assets.

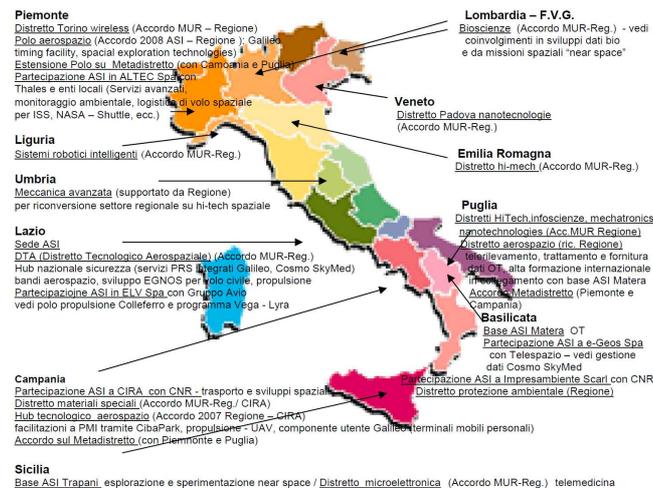


Fig. 1 – The Italian space districts according to [1]

ToscanaSpazio was established to create occasions for Tuscan partners to meet and recognize each other’s competence, to gather groups of excellent partners around specific industrial or research projects financed by national and international companies and Institutions, and to give full (international) visibility to the competences and activities as above through the organization of and participation to meetings, conferences, trade fairs, etc.

### B. Structure and associates

ToscanaSpazio was established in December 2011 by the 14 Founder Associates that we report in Tab. I with their respective competences, and was later on joined by 8 more associates as shown again in the table. The members of the Association

can be both individual people and legal entities, like private companies and public Institutions, with a *peer* level of representation in the General Assembly.

ORGANIZATION	COMPETENCE	TYPE
<b>Founding Members</b>		
Aerospazio Tecnologie	Propulsion & Vacuum	Small Enterprise
Alta	Propulsion & Systems	Small Enterprise
AvMap	PNS & GNSS User Equipment	Medium Enterprise
Consortium UBIQUITOUS Technologies - CUBIT	RF & EMC	Small Enterprise
Consorzio Nazionale Interuniversitario per le Telecomunicazioni - CNIT	Research in Communication Systems and Networks	Research
CNR – ISTI	Research in SatCom	Research
University of Pisa Aerospace Engineering Department	Research in Aerospace Systems	Research
University of Pisa Information Engineering Department	Research in ICT	Research
Flyby	Earth Observation Services	Small Enterprise
Ingegneria dei Sistemi	Electromagnetic design; Aeronavigation	Industry
M.B.I.	Satellite Communications; Ground systems; Hybrid networks	Small Enterprise
Pasquali Microwave Systems	Microwaves and passive components	Small Enterprise
Sitael	On-Board Electronics & Sensors	Medium Enterprise
Wiser	Software-Defined Radio	Small Enterprise
<b>Ordinary Members</b>		
Abstract	Certified Software for space	Small Enterprise
Kayser Italia	Space Life Sciences, Payload technology	Small Enterprise
Intecs	On-board software, Ground systems, Systems for Galileo	Industry
Ride The Wave	EM design, RF testing	Small Enterprise
SkyBox Engineering	Aerodynamics; Structural analysis	Small Enterprise
SpaceDys	Mission analysis, Space Debris Tracking	Small Enterprise
University of Florence	Departments: Electronics and Telecommunication; Evolutionistic Biology; Mechanics and Industrial Technologies; Clinic Physiopathology; Energetics, Physics	Research
University of Siena	Information Engineering Department	Research

Tab. I – The Members of ToscanaSpazio

The Association is represented by its General Assembly (assembly of all associates), and is steered by a Managing Board under the leadership of the President M. Luise and the Executive Director S. Titomanlio. Membership of the association is not restricted to entities based in Tuscany, and in addition to the regular association, a different form of support was also established in the form of *Affiliation* of external partners.

Operation of the Association is well on its way – the interested reader may find more information on its activities at the

website [www.toscana spazio.it](http://www.toscana spazio.it). The logo of ToscanaSpazio can be seen in Fig. 2, and features two main “icons”: the cypresses on a hill that picture at best the *milieu* of Tuscany, and the shining stars – the stars that used to guide the traveler since our ancestors’ times *or* the artificial stars of more modern and technological constellations that guide the contemporary traveler?



Fig. 2 – The *ToscanaSpazio* logo

### C. Perspectives at the National and International level

Italian space industries and research centers are gradually organizing themselves into *districts* or similar entities. The situation in Tuscany is slightly different because the region is characterized by high fragmentation and by the absence of big players, which can act as collectors. In addition, the local Tuscany Government (Regione Toscana, [www.regionetoscana.it](http://www.regionetoscana.it)) has only recently recognized that the Space sector is atomic and horizontal compared to different technological sectors also very well represented in the region, like ICT, Optics, and others.

The activity of ToscanaSpazio is organized in three different actions or levels: Regional, National and International. Its main general objective is to achieve wider recognition of the Space sector as one of the priority R&D areas in the Regional strategic development plan.

ToscanaSpazio is collaborating with the EU branch of Regione Toscana and is making contributions to the *Masterplan for Research* in the area. In the framework of the pre-existing “Poles of innovation” in the region, ToscanaSpazio has initiated a “*space cluster*” that overcomes the division created by such “Poles” where Space is not present as an independent sector.

At the National level, ToscanaSpazio is developing its relationship with the Italian Space Agency i) to promote awareness of the excellence of the different companies/organization in Tuscany, and ii) to scout products and solutions with the aim of complementarity with respect to the other Italian regions. The outcome that is envisaged is increasing opportunities for Tuscany in the competition for resources that are available in Italy.

At the International level, among the most promising prospects, there is the opportunity to establish research, development and/or commercial links with other European regions, which have complementary needs. With this in mind, ToscanaSpazio is pushing for the Tuscany Government to join the NEREUS network (see Sect. IV below), by proposing itself as the natural technical committee. In addition, a number of ToscanaSpazio associates are planning to establish offices and plants outside Europe (Brazil, India, China, USA, UAE) and that ToscanaSpazio is working to ensure these efforts are any-

way beneficial for all of the other Associates interested in developing their markets in those particular areas.

### III. OPPORTUNITIES AND NEW ROLES FOR REGIONS IN EUROPE

The Europe 2020 Strategy [2] launched by the European Commission in 2010, by stimulating the Union to take charge of its future, aims at projecting Europe out of the economic crisis strengthening its assets and *turning it into a smart, sustainable and inclusive economy delivering high levels of employment, productivity and social cohesion*. In order to reach this overarching goal, all European actors and stakeholders at different levels (political, institutional, academic, industrial, societal etc.) are expected to contribute. As underlined by the European Council [3], “*Regional Policy can unlock the growth potential of the EU by promoting innovation in all regions, while ensuring complementarity between EU, national and regional support for innovation, R&D, entrepreneurship and ICT. Indeed, Regional Policy is a key means of turning the priorities of the Innovation Union into practical action on the ground.*”

European Regions and a related adequate policy play an essential role in favouring innovation processes, encouraging research and development, investments and fostering links and exchange with universities and research centres as well as SMEs. These factors make them essential players towards the achievement of the Europe 2020 strategy, especially with reference to the “smart growth” pillar [4]. The focus on Innovation is particularly at the heart of this strategy which made the concept of “smart specialisation” central to the forthcoming European regional policies and innovation strategies. “*Smart specialisation*” requests basically that each region builds on its own strengths, to guide priority-setting in national and regional innovation strategies, as well as **cross-border cooperation** where appropriate [5].

Regional innovation strategies for smart specialisation (RIS3) can be defined as integrated, place-based economic transformation strategies that: 1) concentrate public resources on innovation and knowledge-based development priorities, challenges and needs, 2) outline measures to stimulate private RTD investment 3) build on a region's capabilities, competences, competitive advantages and potential for excellence within European and global value chains, 4) foster comprehensive stakeholder involvement and encourage governance innovation and experimentation, 5) are evidence-based and include sound monitoring and evaluation systems [6]. This new approach will imply mainly the: **selection** of a few **investment priorities** based on a process of entrepreneurial discovery to identify promising areas for specialization; **building on current regional economic specialisation** and **mobilising talent** by matching Research, Technology development & Innovation and business needs and capacities; **developing** world class excellence clusters, cross sectoral links and increased **connectivity between regions**; **collective endeavour** involving not only the academic world, public authorities and the business community, but also innovation users.

This new approach (that also inspired the birth of ToscanaSpazio) implies a change which will bring regions to invest

more in innovation and especially to focus on existing strengths of the regional economy. It will prove to be beneficial not only to advanced regions and technology leaders, but also to less developed ones. This strategy will facilitate the emergence of critical clusters. *Smart specialisation therefore implies rejecting the principle of a sharp division of labour between knowledge producers and knowledge users.*

Designing a Regional Innovation Strategy for smart specialization requires a stepwise approach, which foresees, according to the RIS3 Platform, the following stages:

1. *Proposal for an overall Vision for the future of the region*
2. *RIS3 design and governance– Ensuring participation and ownership*
3. *Analysis of regional potential for innovation-driven differentiation*
4. *Preparation and wide discussion of scenarios*
5. *Selection of priorities for the RIS3*
6. *Definition of coherent policy packages, pilot projects and measurable targets*
7. *Integration of monitoring and evaluation mechanisms into the strategy*
8. *Establishment of strategic policy intelligence resources and capacities*
9. *Communication of the RIS3*
10. *Review and update of the RIS3.*

It is relevant to notice that RIS3 involves a wide range of domains to be targeted, among which most interesting are **clusters** (in the design phase, they can be used to identify the industrial strengths and assets in a region; in the implementation phase, clusters can be used as efficient platforms that can focus on and quickly contribute to smart specialisation's objectives by fostering cross-sectoral cooperation, creating new competitive advantages in a region), **innovation friendly business environments for SMEs, research infrastructures, centers of competence and science parks, universities-enterprise cooperation** [7].

#### IV. REGION-TO-REGION BUSINESS

The acknowledgment of the importance of the role played by European Regions in the Research and Innovation landscape has been re-affirmed through the years at EU level through the creation within the 7<sup>th</sup> Framework Programme of a dedicated programme for them, called *Regions of Knowledge* (RoK) which constitutes an efficient instrument of evolution of regional networking and region-to-region cooperation.

The 'Regions of Knowledge' initiative aims to strengthen the research potential of European regions, in particular by encouraging and supporting the development, **across Europe**, of regional 'research-driven clusters'. These clusters are concentrations of **research entities, business entities, regional/local authorities**, the so-called "Triple Helix" and where appropriate **other local entities such as chambers of commerce, banks, and intermediaries such as technology transfer offices or science parks**, operating in a particular scientific and technological domain or economic sector [8]. ToscanaSpazio

has just the ambition to create, in the long run, one of such clusters in the field of Space.

This programme, created as a follow up of a pilot action initiated in the 6<sup>th</sup> FP, includes as overarching objective the **promotion of European competitiveness and regional development** through **smart specializations** of regions in a globalized world. Through a total budget of €126 million over 7 years, the programme successfully initiated a process of transnational collaboration of clusters and their parent regions in dedicated economic and technological sectors that will harness R&D for regional development in synergy with the EU regional policy and the related structural funds. Most of these activities could not have been achieved by national or other European funding programmes.

The RoK programme focussed its last actions (2012-2013) on the following main initiatives:

- Fostering trans-national, including cross-border, cooperation between high potential research driven clusters in areas or topics of common interest. Projects should respond to challenges from the globalisation of markets, technological change or the evolution of the research framework in the European context and initiate mutual learning between regional actors (legal entities conducting research, business entities, regional/local authorities);
- Improving links between regional authorities, research entities and the local business community for the development of specific regional RTD policies and also partnerships in national or European initiatives;
- Developing Joint Action Plans (JAPs) at the regional and European level to increase regional economic competitiveness through research, technological development activities and innovation in traditional or emerging business sectors. JAPs will also explore opportunities for mobilising financial and other forms of support offered by national/regional authorities, private investments and by EU programmes (Research Framework Programme, CIP and the Structural Funds), in order to exploit the synergies between regional, national and EU programmes for research and economic development.
- Boosting the competitiveness of the regional research-driven clusters via dedicated internationalisation measures;
- Mentoring regions with a less developed research profile to support their capacity in setting up and developing regional research-driven clusters.
- Promoting the visibility of regional research-driven clusters by targeted dissemination actions including regional stakeholders and the wider public.

Despite the efforts made by the RoK programme and other complementary initiatives in EU funding actions, experts assessed lasting weaknesses which should be tackled in the remaining years of the current FP7 and especially towards the new Framework Programme **Horizon 2020** (2013-2020). As a matter of fact the Synergies Expert Group (SEG) stated that still "*Weak complementarities and compatibilities as well as interoperability of policies and programmes, particularly re-*

garding the regional dimension in research and innovation policy and the research and innovation dimension in regional policy” can be detected. In view of Horizon 2020 thus, among the recommendations it can be found that “the SEG sees it of crucial importance that the full integration of the RoK scheme in the Operational Programmes is ensured considering the smart specialisation strategy both in and beyond clusters” [10]. Attention should be paid then, in the Common Strategic Framework for Cohesion Policy (CSFCP) to:

- Capacity building at regional level and structuring the RTDI area by providing ‘staircases to excellence’;
- Close cooperation and interaction between public authorities, higher education and research, and industry (Triple Helix) in the planning and implementation of common RTDI strategies at national and regional level;
- Providing user-friendly innovation eco-systems for SMEs and larger companies, universities, and research organizations and their cooperative structures;
- Supporting the development of European Research Infrastructures and regional Partner Facilities.

A successful example of Regional cooperation in R&I matters and specifically in the SPACE research area is constituted by NEREUS, The Network of European Regions using Space Technologies (<http://nereus-regions.eu/home>). NEREUS is an initiative by regions from all over Europe, which share as Full Members its governance, focussing on the use of space technologies. The network aims to explore the benefits of space technologies for regions and their citizens and to spread their applications. NEREUS works both at political and operational level and among its objectives, as stated in its Political Charter [11], are:

- To introduce the regional level into the elaboration and development of European space programmes and activities linked to infrastructure and applications.
- To promote and implement partnerships, to foster transnational and crossborder cooperative schemes between European regions, in order to develop common or complementary assets and approaches, including preparation of recommendations for common projects and initiatives.
- To fulfil and sustain end-users’ needs from the space services provided by European Union programmes.
- To ensure that space services are used across all European regions so as to ensure a balanced development of the European Union and allow full exploitation of its space technologies potential.
- To support a better promotion of the European space dimension in the globalised economy.
- To increase citizens’ participation in European policy construction and in development of space services markets.

NEREUS, which currently includes over 25 full members and more than 35 associate members, can be considered as a good practice in cross-border and region-to-region collabora-

tion at EU level in the Space sector.

## V. CONCLUSION

Rather than *Conclusion*, the authors would like to re-name this Section as *Next Steps*. The ToscanaSpazio association has started with an ambitious work program. In the ideal world, in 5 years’ time, the output of this activity would be a strengthening of the aerospace field in Tuscany, and an initial solution of the fragmentation issue. We envisage in this respect actions aimed at i) creating structured networks of enterprises; ii) creating stronger links with similar networks at an international level; iii) attract investments from industries outside Tuscany; iv) identify successful products and promote them at a global international level; v) conceive and develop mainstream flagship projects that can act as “federators” and provide long term horizon to the smaller organizations, and finally vi) growing new, larger companies very competitive on the international market out of the network above. One of the main areas of ToscanaSpazio is Satellite Communications, and we do hope that all the regional players in that field, together with all of the other Associates, may reveal as catalyzers to turn the “golden nuggets” that are already planted in the territory into a permanent resource to be mined.

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