

Galileo helps increasing the European Union cooperation with the Grand Caribbean, Central and South Americas

by Marco Lisi

Galileo and Copernicus are not only flagship technology programs of the European Union: they can be the ambassadors of European cooperation in other continents, an effective opportunity for growth and development together. On February 14th and 15th this year, a post-graduate course on satellites technologies and applications was held in Santo Domingo, Dominican Republic, at the Universidad Nacional Pedro Henríquez Ureña (UNPHU).

The activity, supported by the Delegation of the European Union to the Dominican Republic, was organized by Dr. ing. Marco Lisi and by the UNPHU professors Jose Gustavo Rodriguez Mejia, Director of the “Escuela de Ingenieria Geomatica”, and Eugenio Leopoldo Taveras Polanco.

After a general introduction to artificial satellites and their applications (e.g. to telecommunications and Earth remote sensing), the course focussed on global satellite navigation systems (GNSS's) and on Galileo, the European system, in particular.



European Union and Dominican Republic Cooperation

The Dominican Republic is an upper/middle-income country, with the largest economy of Central America and the Caribbean. Since the early nineties, the Dominican Republic experienced sustained economic growth (7.3% GDP in 2014) with relatively low inflation rates. Progress has been made towards Millennium Development Goals and extreme poverty has dropped, however, challenges to inclusive growth persist. The Dominican Republic is member of both the Central American Integration System (SICA) and the Cariforum Group of ACP Countries. The country is also a signatory of the EU-Caribbean Partnership Agreement (EPA), a

comprehensive free trade agreement.

Under the 10th and 11th European Development Funds (EDF), that is in the periods 2007-2013 and 2014-2020, the European Union allocation for the Dominican Republic totalled €79 million and €2 million respectively.

Cooperation focused on poverty reduction, human development and social cohesion (notably education), institution building (mainly modernisation of the public administration), and enhancing competitiveness. EU cooperation was instrumental in introducing strategic planning in key institutions in the country, such as the Ministry of Industry and Trade, Consumers' Commission, National Competitiveness Council, as well as creating

and initiating the operations of the National Quality System (SIDOCAL).

Dominican Republic is signatory of the EU-Central America Association Agreement, a comprehensive free trade agreement with a strong focus on development cooperation. Dominican Republic will benefit during 2014-2020 from the EU sub-regional programme for Central America (€20 million). It must be noted that the focal sectors of cooperation for the sub-regional have evolved for this period. In the past, cooperation was mainly focused on social cohesion and economic growth, while the new programming exercise responds to the emerging needs of the region, namely security and impunity, climate change and private sector development as a vehicle for generating employment opportunities.

La Universidad Nacional Pedro Henríquez Ureña (UNPHU)

UNPHU is the first private non-profit University in the Dominican Republic, founded in 1966. The founders were, and still are, acknowledged representatives of important entrepreneurial organizations in the country, who created the Dominican University Foundation “Fundación Universitaria Dominicana Pedro Henríquez Ureña (FUDPHU)”. “Pedro Henríquez Ureña” was chosen as the name of the university to honor the great Dominican philosopher and humanist known and respected throughout the Americas and worldwide, as a brilliant figure in the humanities.

The UNPHU campus of more than 250,000 square meters is the most privileged campus in the Country (Figures 1 and 2). The university has other faci-



Fig. 1 - UNPHU main building.

lities in the city of La Vega, an Experimental Agricultural Farm with 7,536,000 square meters, and a facility in New York City-USA.

The Department of Higher Education, Science and Technology, the government organ ruling the higher education in Dominican Republic, duly accredit UNPHU as well as all of its schools.

Seven faculties compose UNPHU: Health Sciences; Agriculture Sciences and Natural Resources; Education and Humanities; Legal and Political Sciences; Economics and Social; Architecture and Arts; Science and technology. UNPHU has been acknowl-

ged through its existence for the important contributions to the national development through scientific investigation, in special Agronomy, Medicine and Engineering.

The UNPHU Geomatics Department (“Escuela de Ingeniería Geomática”), managed by prof. Jose Gustavo Rodriguez Mejia, is focussed on the management of geographic information through the use of information and communication technologies. This includes the acquisition, modelling, treatment, storage, recovery, analysis, exploitation, representation and dissemination of geodesy, photogrammetry and remote sensing, Geographic



Fig. 2 - overview of the UNPHU campus.



Fig. 3 - From left to right: prof. Jose Gustavo Rodriguez Mejia, the Author, prof. dr. José Rafael Espailat Muñoz (vice-Rector), Soledad Veronica Perez-Gautier (PRAE), prof. Eugenio Leopoldo Taveras Polanco, Pedro Manuel Cabrera Objio (PRAE)

Information Systems and Spatial Data Infrastructure, and is related to any science that involves processing of geographic information.

The department is a vital reference on geomatics for all the Dominican Republic and has a close relationship with many institutional and private organizations. It is worth noting that UNPHU is the only university in the Country providing an academic curriculum in the Geomatics field.

The UNPHU-IDAC “Air and Space Project Office”

UNPHU and the “Instituto Dominicano de Aviación Civil (IDAC)” have recently created the “Air and Space Project Office” (“Oficina Coordinadora



Fig. 4 - The Author with UNPHU Dean, Prof. Miguel Fiallo Calderón

de Proyectos del Aire y del Espacio, PRAE”), unifying their efforts to work towards the aviation industry in the academic and research fields.

The Dominican Republic Civil Aviation Institute (IDAC) is the civil aviation authority of the Dominican Republic. It was a founding member state of the International Civil Aviation Organization (ICAO). IDAC is an autonomous State agency that regulates and promotes civil aviation in the Dominican Republic; it is the air navigation service provider, contributing to the economic development of the Dominican nation.

The UNPHU Geomatics Department is heavily involved in the PRAE activities because of the growing interest in the applications of aerial drones (UAV’s) to remote sensing. GNSS technologies and in particular the new possibilities offered by Galileo (multi-constellation and dual-frequency receivers) play a fundamental role in the adoption of drones to remote sensing, in a wide range of applications, spanning from agriculture to infrastructures management, natural disasters management and recovery, environmental control, surveillance and borders control. All these applications are considered critical by the Dominican government for the future development of the country.

The Course/Workshop “Las Tecnologías de Satélites y sus Aplicaciones”

The course, the first of this kind at UNPHU and probably one of the first in Dominican Republic, aimed at providing a general overview about artificial satellites and their applications, with a special focus on GNSS. The initiative was organized by

the Department of Geomatics and by PRAE, with the close support by Prof. Dr. José Rafael Espailat Muñoz, Vice-Rector of UNPHU (Figure 3).

The course was also very welcomed by the university dean (Rector), prof. Miguel Fiallo Calderón (Figure 4).

More than fifty university students and professionals, coming from a variety of civilian and military institutions, followed the course:

1. Servicio Geológico Nacional (SGN).
2. Instituto Geográfico Nacional, Hungría Morel (IGN)
3. Unidad de Electrificación Rural y Sub-Urbana (UERS)
4. Instituto Cartográfico Militar (ICM)
5. Instituto Geográfico Universitario (IGU)
6. Dirección Nacional de Mensuras Catastrales (DNMC)
7. Colegio Dominicano de Ingenieros, Arquitectos y Agrimensores (CODIA)
8. Saint Lawrence School
9. Universidad Autónoma de Santo Domingo (UASD) Estudiantes de Geografía y Cartografía
10. Universidad Nacional Pedro Henríquez Ureña (UNPHU)

Estudiantes de Geomática y Topografía

The audience interacted actively with the speakers (Figures 5 and 6) and, during the discussions, it emerged clearly the interest in satellite technologies, mainly for applications in remote sensing and positioning. It was also clear the high potential role these technologies will play in the future development of the Dominican Republic,

which is the largest economy in the Caribbean and Central American region. As a matter of fact, over the last two decades, the Dominican Republic have been standing out as one of the fastest-growing economies in the Americas, with an average real GDP growth rate getting above 7%, the highest in the Western Hemisphere.

It is now the right time to give the Dominican economy a qualitative boost, taking advantage of the information and communications technologies (ICT). The integration and fusion of telecommunications (satellites and 5G), high accuracy positioning (GNSS) and remote sensing (satellites, Internet of Things) will be at the core of this leap forward of the Dominican economy.

Future activities and plans (and one dream)

UNPHU, together with public Dominican institutions and private industries, seems eager to be at the forefront of technology and innovation. Their efforts will leverage on the cooperation programs of the European Union, starting with Horizon 2020 and its follow-



Fig. 5 – Prof. Jose Gustavo Rodriguez Mejia presenting the course to the audience.

on. The Geomatics department and PRAE are part of a team presenting a proposal for the management of infrastructures using aerial surveying in association with high accuracy GNSS positioning.

A technical paper on the effect of antenna phase center errors in high accuracy geodetic measurements will be presented at the 25th Ka and Broadband Communications Conference, to be held at Sorrento (Italy) in October 2019.

New courses on satellites and GNSS are being planned in the near future. One dream, discussed with excitement by students and participants: the development and launch of the first satellite of the Dominican Republic.

KEYWORDS

GNSS; UNPHU; GEOMATICS; ACCURACY POSITIONING; SATELLITES; EDUCATION

ABSTRACT

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Fig. 5 – xxxxx.