REGIONE TOSCANA

Progetti vincenti di Horizon 2020/Spazio e Rete NEREUS: opportunità e prospettive per la ricerca, le aziende e il territorio

Firenze- 2 Febbraio 2016

L'Istituto di Fisica Applicata 'Nello Carrara'

attività in campo Spazio ed Osservazioni della Terra

Roberto Pini *Istituto di Fisica Applicata "Nello Carrara" (IFAC)*
Sesto Fiorentino (FI)

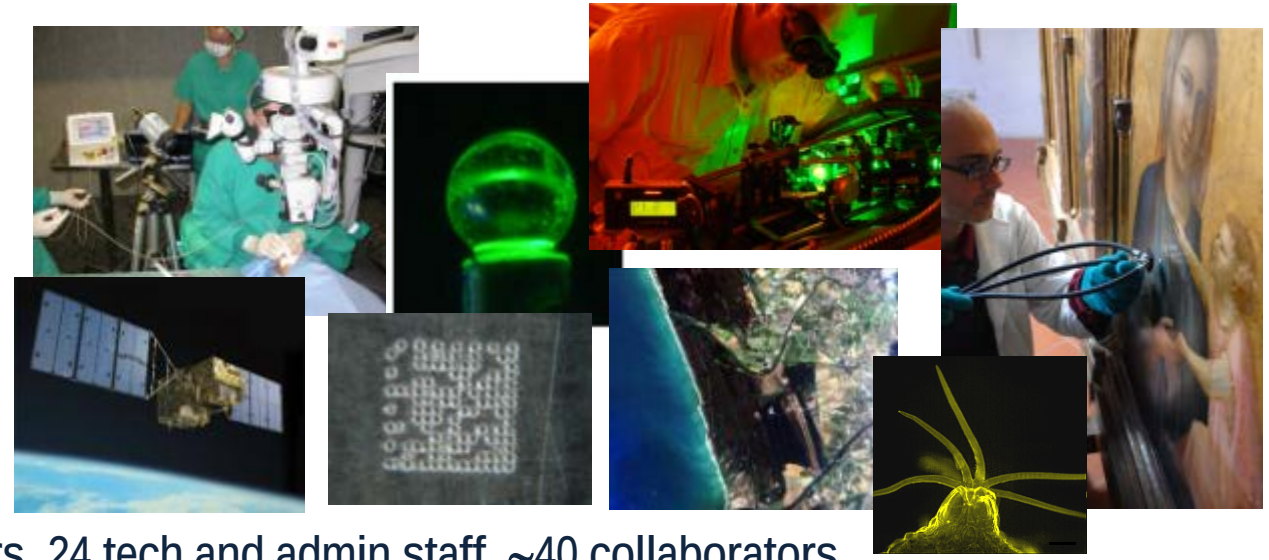
INSTITUTE
OF APPLIED PHYSICS
NELLO CARRARA

http://www.ifac.cnr.it/

The "Nello Carrara" Istitute of Applied Physics (IFAC) of the National Research Council of Italy (CNR) is the largest institute of the CNR Area of Florence.
It enjoys advanced scientific expertise in many areas of Applied Physics related to enabling technologies like ICT, Photonics, Nanotechnologies, Advanced Materials, Biotechnology.

Main research lines:

- Lasers
- Micro-optics
- Biophotonics
- Sensors
- Remote Sensing
- Microwaves
- ICT



PERSONNEL: 81 researchers, 24 tech and admin staff, ~40 collaborators

26 Researchers involved in Space and Earth Observations: B.Aiazzi, F.Barbara, S.Baronti, M.Brogioni, R.Carlà, G.Castellini, S.Ceccherini, U.Cortesi, S.Del Bianco, M.Gai, D.Guzzi, C.Lastri, G.Macelloni, F. Montomoli, V.Nardino, L.Palombi, S.Paloscia, S.Pettinato, V.Raimondi, P. Raspollini, S.B.Ricciarini, E.Santi, L.Santurri, M.Selva, C.Tirelli, N.Zoppetti

REMOTE SENSING: SURFACE

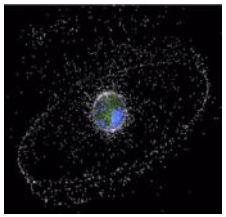
- **Aerospace instruments:** innovative passive and active instrumentation from optical to microwave frequencies: (e.g. **hyper spectral cameras, interferometers, radiometers, LIDAR**)


- **Aerospace data processing:** calibration and validation procedures; data and images analysis; E.M. models; algorithms for geophysical parameters
- **Image processing, fusion and digital filtering:** **speckle noise filtering** in SAR images; **pansharpening** with algorithms developed by IFAC; **noise modeling** of acquisition systems


- **Applications:** evaluation **of Earth surface parameters** at **local** and **global** levels (ground reflectance, emissivity, temperature, humidity); monitoring of **vegetation biomass**, depth/extension of the **cryosphere**, **water cycle**

REMOTE SENSING: ATMOSPHERE AND SPACE

- **Space observation:** Astrodynamics of **asteroids, meteors** and **space debris** (coll. NASA, ESA)

- **Space technology:** processing and control systems for **micro- and nano-satellites** (coll. JAXA)
- **Atmosphere:** radiative transfer models for the simulation of measurements of remote **atmospheric sounding** from VNIR to FIR

- **Atmosphere:** methods and algorithms for **3D-characterization** of **composition** and **temperature**

OPTOSCANA: The Innovation Pole for Optoelectronics and Space

In April 2011 the Government of Tuscany launched a call for **12 Poles of Innovation** as regional organizations aimed at the technological transfer from research centers to SMEs.

In July 2011, the Regione Toscana established <u>as a legal entity</u> the Innovation Pole:

on Optoelectronics and Space Applications

(Coordinated by CNR IFAC and supported with a budget of ~150 kE / year)

<u>110 Partners</u>:
- 90 Enterprises,
- 5 Universities,
- 10 CNR Institutes
- 5 other Research org.

<u>4 Divisions</u>:
- **Opto4Industry**
- **Opto4Life**
- **Opto4Space**
- **Opto4Art**

<u>40 Public and Private Research Labs</u>

NB: the funding from RT is bound to the achievement of specific performances

The Pole OPTOSCANA is part of the network of the EU Photonics Clusters, under the umbrella of the EC Photonics Unit

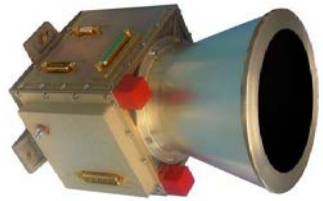
Building a European Photonics community

Photonics innovation ecosystems in Europe

DT- F.O.R.T.I.S

- A New **Technological District** called **F.O.R.T.I.S.** has been issued by **Regione Toscana** in 2014, which includes **OPTOSCANA** as the scientific secretariat**.**
- The acronym **F.O.R.T.I.S.** Indicates technological sectors therein represented, namely: **Photonics, Optoelectronics, Robotics, Telecom, ICT and SPACE.**

The structure of the **Aerospace industrial sector of Tuscany** (1.000 employees, 500 Meuro/year) includes a large enterprise, i.e. Selex-ES (ex-Galileo), Finmeccanica's Group, which plays a strategic role on key technologies (**mainly optoelectronics/photonics**) and a number of SMEs participating to the development of the components.



Main targets:

- Optoelectronic sensors and high resolution hyperspectral cameras
- Optical and electronic components, SW, qualified for space applications
- Systems and services for environmental monitoring, navigation, mobility

Road map 2020:

- 2014-2016: design and construction of production facilities, new equipments, test instruments **for space qualification**
- 2016-2018: prototype development and engineering
- 2018-2020: scaled up production, marketing

Regional Support Policy

- Cooperation with Civil Protection Regional Org. for **environmental monitoring**

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Programma

2 Febbraio 2016

Auditorium di Santa Apollonia, Firenze, Via S. Gallo 25/a

Ora	Intervento	Speaker
09:30	Registrazione dei partecipanti	
10:00	Apertura e benvenuto	Roberto Pini, Direttore Istituto Fisica Applicata, CNR
	Saluti delle Autorità	Stefano Ciuoffo, Assessore Attività Produttive, Regione Toscana
		Sen. Rosa Maria Di Giorgi, 7ª Commissione permanente del Senato della Repubblica
		Cristina Giachi, Vicesindaca, Comune di Firenze
		Marco Conti, Direttore Dip. DIITET (Ingegneria), CNR
11:00	Ricerca, Regioni ed Europa	Augusto Cramarossa, Agenzia Spaziale Italiana
11:20	Il Progetto AURORA di H2020	Ugo Cortesi, coord. scientifico, IFAC-CNR
11:50	Il Progetto ReDSHIFT di H2020	Alessandro Rossi, coord. scientifico, IFAC-CNR
12:20	***Tavola rotonda: il settore aerospazio in Toscana e le opportunità della Rete NEREUS*** Moderatore: Fabio Boscaleri, Ufficio di collegamento con le Istituzioni Comunitarie, Regione Toscana – DG Presidenza	Marco Luise, Università di Pisa, come rappres. Distretto FORTIS Tiziano Mazzoni, Finmeccanica, come rappres. Distretto FORTIS, David Zolesi, Kayser Emilio Simeone, FlyBy Silvia Fabrizi, CGS, delegato Regione Lombardia per NEREUS Vincenzo Naso, Regione Toscana, Direzione Ambiente Maurizio Trevisani, RT, Direzione Urbanistica e Pol. Abitative
13:30	Light lunch	

nereus

HORIZON 2020

IFAC