INOVA-OPTIMA

Optoelectronics in Cultural Heritage

Infrastructure for Research Capacity Increasing and Innovation in Optoelectronics and Analytical Instrumentation

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Sectorial Operational Program "**Increase Economic Competitiveness**" (2007-2013)

- The **Management Authority** is in the **Ministry of European Funds**
- **MA** administrate the Sectorial Operational Program Increase Economic Competitiveness (SOP-IEC)

The SOP-IEC has 4 priority axis:

Priority Axis	EU Investment	National Public Contribution	Total Public Contribution
An innovative and eco-efficient productive system	928 651 290	151 175 785	1 079 827 075
Research, Technological Development and Innovation for competitiveness	536 395 116	109 864 060	646 259 176
ICT for private and public sectors	383 170 104	86 265 570	469 435 674
Increasing energy efficiency and security of supply, in the context of combating climate change	638 475 370	87 064 824	725 540 194
Technical Assistance	67 530 229	22 510 078	90 040 307
Total	2 554 222 109	456 880 317	3 011 102 426

Objectives of the priority Axis 2 of SOP-IEC

The main objective is to increase research and development capacity stimulating the cooperation between institutions and R&D enterprises and increasing the access of the companies at R&I.

The priority axis focuses on the following objectives:

- Increase the research capacity by investing in development of R&D infrastructure and attracting young researchers and high-level experts both in R&D institutions (universities and research institutes) and undertakings with research departments;
- Stimulation of the technology transfer based on the cooperation between institutions of R&D and enterprises;
- Stimulation of innovation demand of enterprises;
- Increase and reinforcement of the number of seed companies with high technology.

Fields of interventions

2.1. Research and Development in partnership between universities/researc institutes, and enterprises for generating results directly applicable in economy

2.2. Investments in R&D infrastructure and related administrative capacity

2.3. R&D&I support for enterprises

Fields of interventions

Operation	Objective of the operation	Eligible activities
2.2.1. Development of the existing R&D infrastructure and creation of new infrastructures	Support the development of the R&D infrastructure of the universities and public institutes (health, agriculture, food safety, energy , environment, innovative products and processes)	Projects for infrastructure, procurement of equipment and modernizing works of the laboratories Projects of constructions / building extensions increasing the research capacity in new research centers, laboratories in public institutions which will extend the capacity area
2.2.3. Development of networks of R&D centers, nationally coordinated and linked with European and international networks (GRID, GEANT)	Increase the involvement of the Romanian researchers in the international networks Increase the networks research and education al capacity of ROEDUNET, to the GEANT standard	To build centers of GRID resources (procurement of equipments for communication, procurement of informatics applications, modernizing buildings, services of technical assistance) Modernizing the RoEduNet network (equipments, informatics applications, building modernizing, information activities, project management)
2.2.4 Strengthening administrative capacity	Improvement of the administrative performance of the management of the universities and public institutes	Consultancy for management, research results, financial instruments, data bases, procurement of tangible and intangible assets

Fields of interventions

INOVA-OPTIMA
INFRASTRUCTURE FOR RESEARCH CAPACITY INCREASING AND INNOVATION IN OPTOELECTRONICS AND ANALYTICAL INSTRUMENTATION

Project's duration: 14 months

Implementing date: 07 October 2015

Management Authority: European Funds Minister

EU contribution: 13.000.000 lei

Romanian's Government contribution: 2.872.617 lei

Project's Budget: 15.872.617 lei

Fields of interventions

The major objective of the project is increasing the competitiveness of the institute through more efficient use of existing expertise using the new infrastructure and strengthening the base research focused on developing innovative processes oriented to technology transfer, with impact on the economic environment.

Innovative directions of the INOVA – OPTIMA correlated by relevant national and European level are:

- **investigation, assessment and conservation of cultural heritage using optoelectronic methods and techniques;**
- development of new multifunctional materials with applications in optoelectronics and related areas using green technologies in plasma processing of surfaces and vacuum;
- food security, with the purpose of obtaining products and services with high added value in terms of quality and competitive, integrated with EU market

Fields of interventions

- ✓ Based on specific research projects results in cultural heritage field and taking into consideration the high potential for know-how transfer and scientific approaches in current practice, the new project is focused on development of an intelligent system of investigation and intervention for education-training-investigation-monitoring for professional intervention.

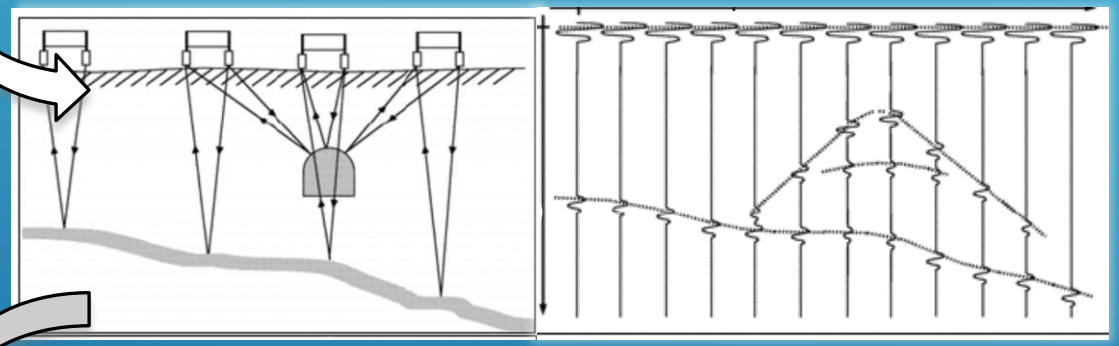
- ✓ As research institution, INOE is designing a complex mobile infrastructure with fast and accurate responses, and urged all potential users to establish and to claim relevant scientific data. The group from INOE is collaborating for all Romanian regions requests, for Balkan partnerships and not only.

- ✓ INOVA-OPTIMA consolidates scientific results and their transformation into best practice.

- ✓ A mobile complex investigation infrastructure for cultural heritage research and protection is a strong and justified demand that has proved economic efficiency .

Large area mapping for archaeological prospections, urbanism, CH protected area study

(Thermovision, LIDAR, multispectral imagistic etc.)



Increased investigation capacity on site

X-Ray Radiology,
XRF Spectroscopy

3D Multilayer Model

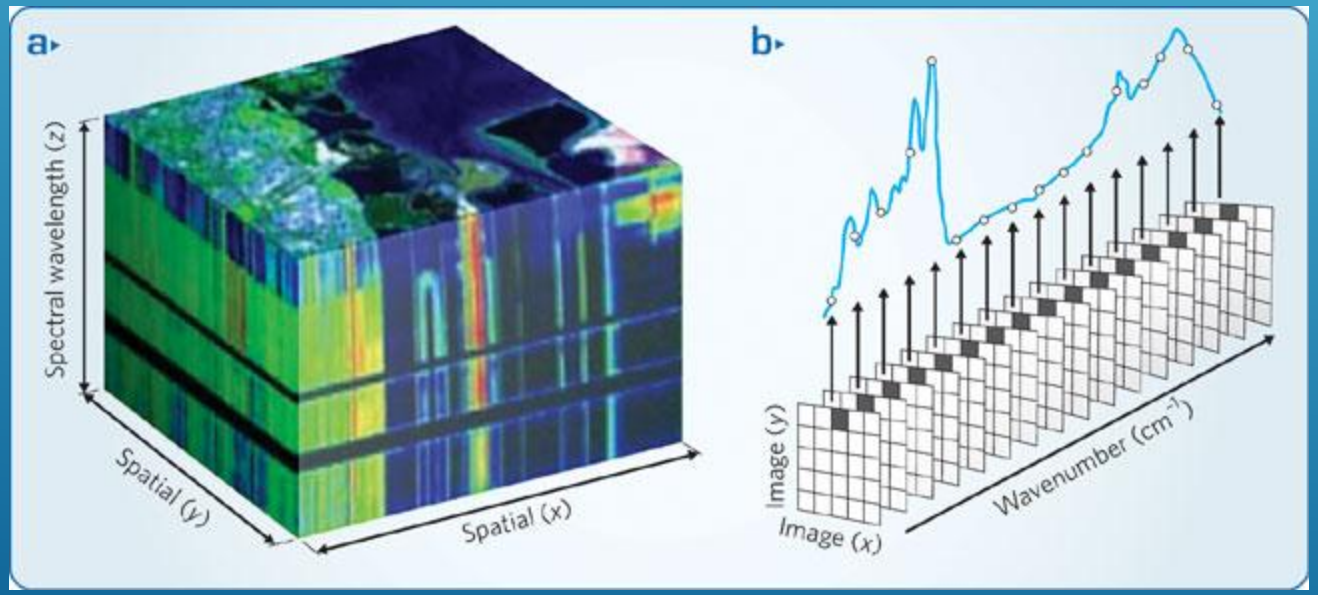
Hyperspectral imaging

Theory

Hyperspectral imaging, or imaging spectroscopy, combines the power of digital imaging and spectroscopy. For each pixel in an image, a hyperspectral camera acquires the light intensity (radiance) for a large number of contiguous spectral bands. Every pixel in the image thus contains a continuous spectrum (in radiance or reflectance) and can be used to characterize the objects in the scene with great precision and detail.

Applications

Hyperspectral remote sensing is used in a wide array of applications. Some of the most important domains are: military surveillance, astronomy, mineralogy, agriculture, food processing and environment.

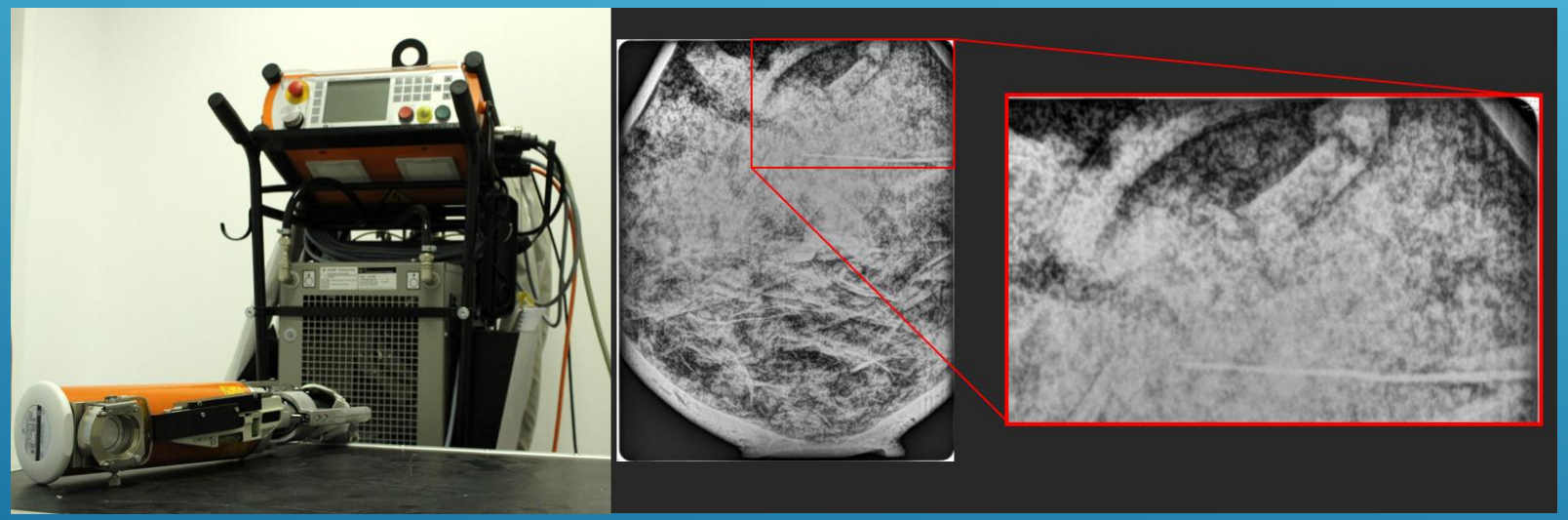


David Bannon - Hyperspectral imaging: Cubes and slices, Nature Photonics,No. 3, pp. 627 – 629, 2009

Computerized radiography station

ISOVOLT Mobile 160 is a complex computerized station for radiography that allows non destructive X-ray investigations in lab and on the field, even in areas that are hard to get to.

The generator and the X-ray tube can operate at 160 kV gaining a maximum power of 1600W and 10 mA.



Emitted energy, power intensity and the irradiation exposure can be modified by the user allowing a wide range of materials and objects to be investigated.
The digital records are scanned in real time to obtain a high resolution image of the radiography. These images can be processed in order to obtain more hidden details.

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