

# CENTRO INTERNACIONAL DE FÍSICA BOGOTA, COLOMBIA



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# COLOMBIA

2<sup>nd</sup> - Number of native tree species

5<sup>th</sup> - Tropical rain forest

3<sup>rd</sup> - Primary forest cover

10<sup>th</sup> - Highest average annual deforestation of primary forests



# CIF

**Mission:** Promote basic and applied research, specially in physics and industrial and technological development in Colombia and the Andean and Caribbean countries.

## Objectives:

- Development of basic and applied research
- Training of scientists
- Industrial technological development and innovation
- Introduction of new technologies in the country
- Creation of knowledge-based industries (spin offs)

# CIF STRENGTHS

- ⦿ High level and qualified basic research
- ⦿ Experience in technological development
- ⦿ Interdisciplinary professional team able to provide integrated solutions
- ⦿ Administrative flexibility

# CIF's GROUPS

## BASIC RESEARCH

- Biophysics and membrane biology
- Optics
- Materials
- Nuclear Physics - U. Nacional



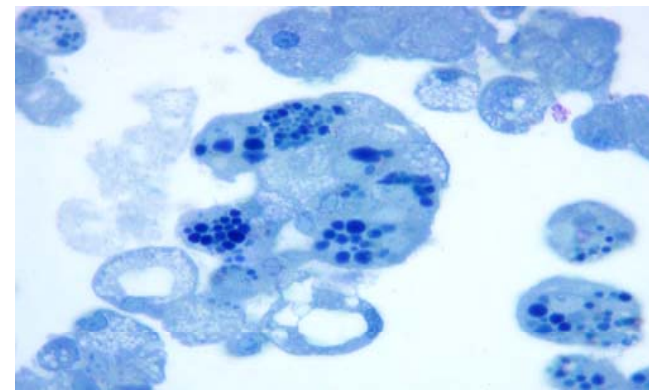
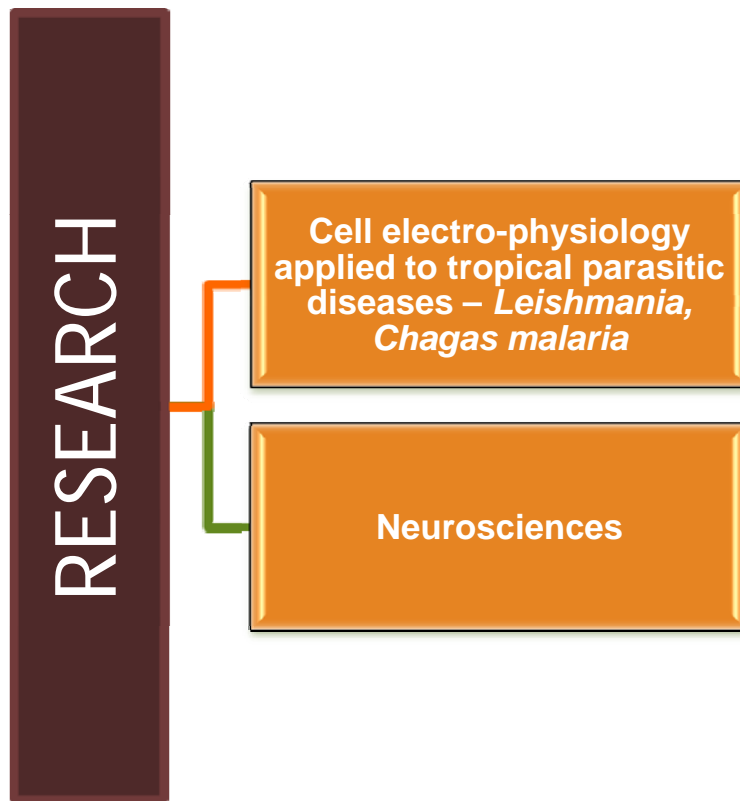
## APPLIED RESEARCH AND TECHNOLOGICAL DEVELOPMENT

- Applied Physics and Tech. Development
- Biotechnology



## PROJECT MANAGEMENT

# BIOPHYSICS AND MEMBRANE BIOLOGY



Director: PhD. Marcela Camacho

Main researchers : PhD.Enrico  
Nassi, PhD.Maria del Pilar  
Gómez

# PROJECTS

- Functional characterization of Leishmania ClC ion channel
- Membrane studies of the *Leishmania* parasitophorus vacuole
- *Leishmania* chloride channels, potencial therapuetic target
- Melanopsin mediated transduction in unconventional photoreceptors

# NUCLEAR PHYSICS\*

Director: PhD. Fernando Cristancho

## RESEARCH

Nuclear structure

Interaction of radiation  
with matter

Applications of nuclear  
techniques to detection  
of "anti-personal mines"



**\*UNIVERSIDAD NACIONAL DE  
COLOMBIA**

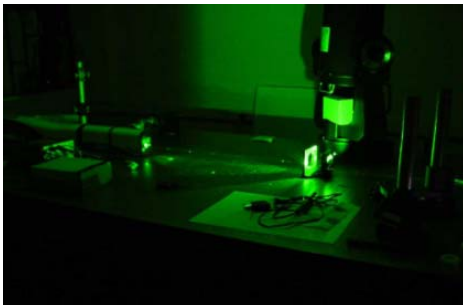


# OPTICS

Topographic LIDAR:  
Laser Imaging  
Detection and  
Ranging

Holography

Laser Thermal  
treatments



# MATERIALS

Production of  
superconducting  
thin films

Nanotechnology

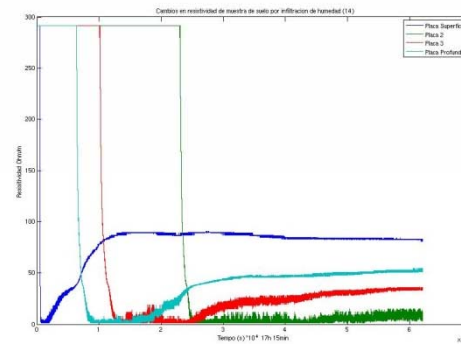
Production of fullerenes  
and nanotubes for  
medical applications



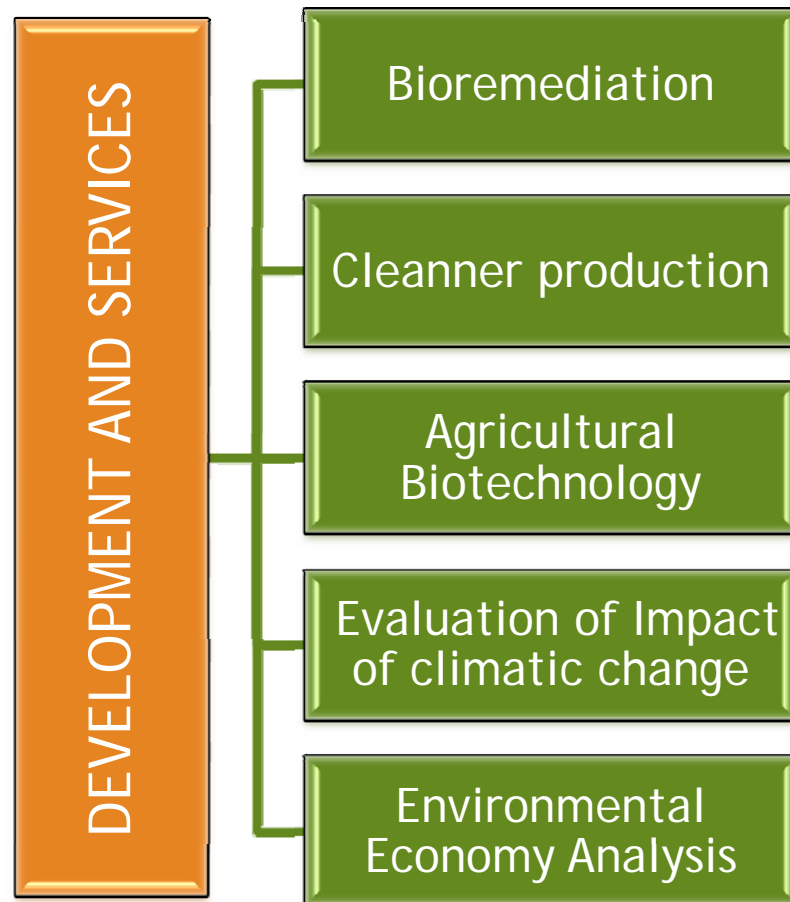
# NEW PROJECTS

## ◉ Light Detection And Ranging Technology

Design and Development of a High Speed Scan Laser integrated to a navigation systems for manufacturing a multifunctional LIDAR.



# ENVIRONMENTAL BIOTECHNOLOGY





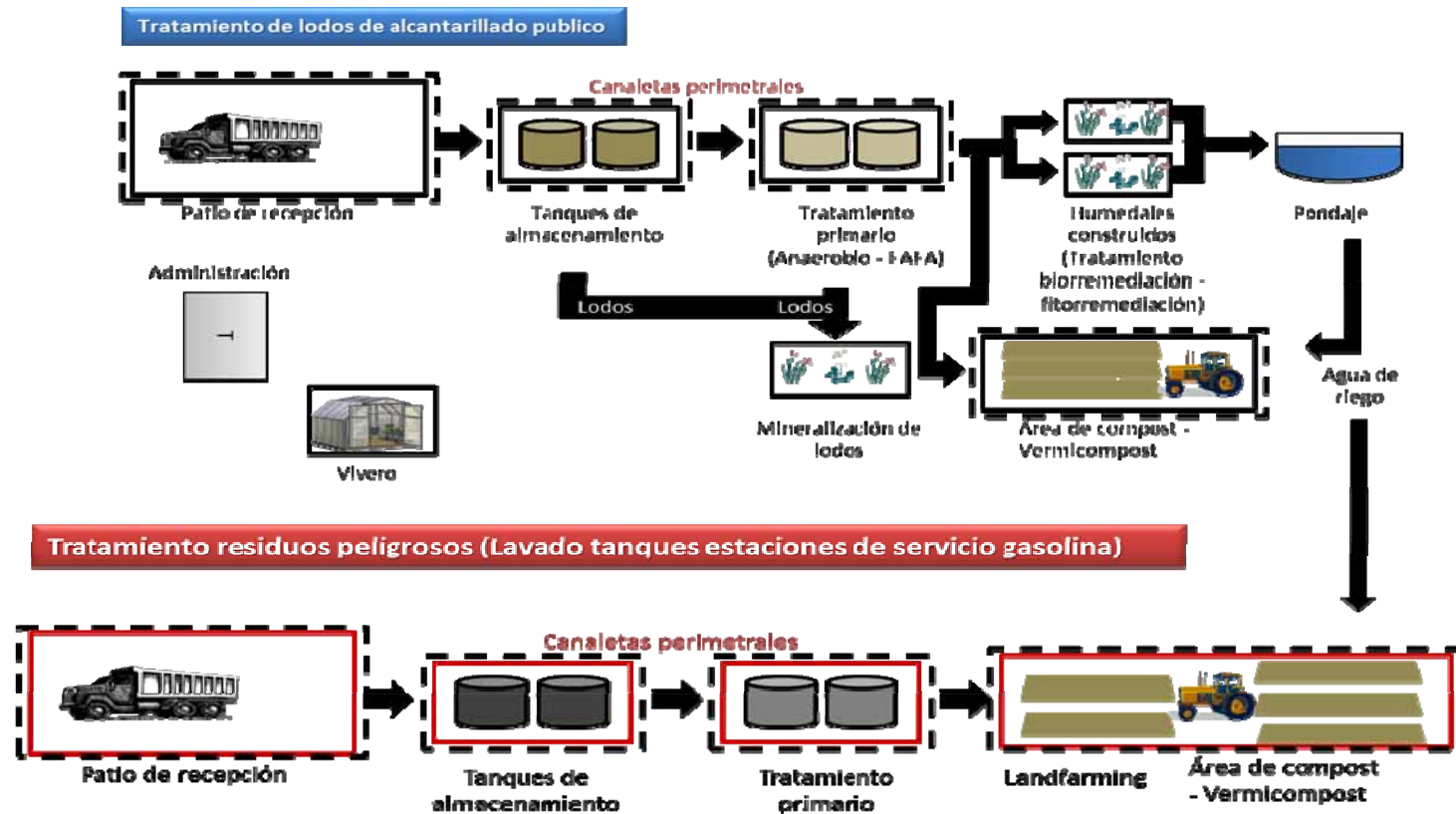


Meetings with panela producers – participative diagnostics

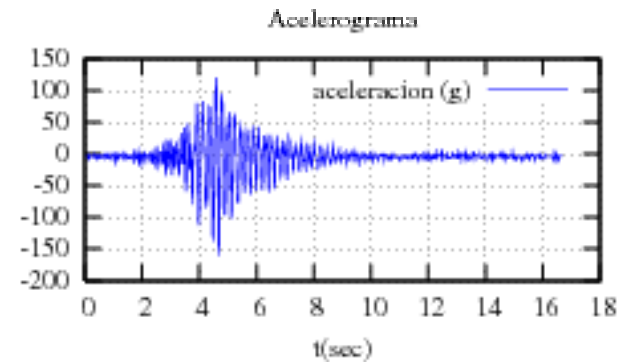
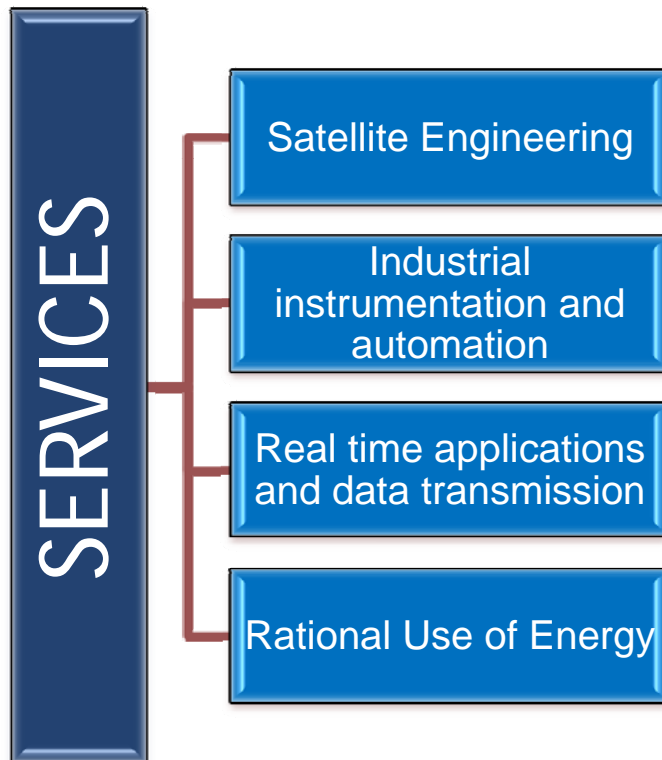


# Industrial sludge management - Spin off

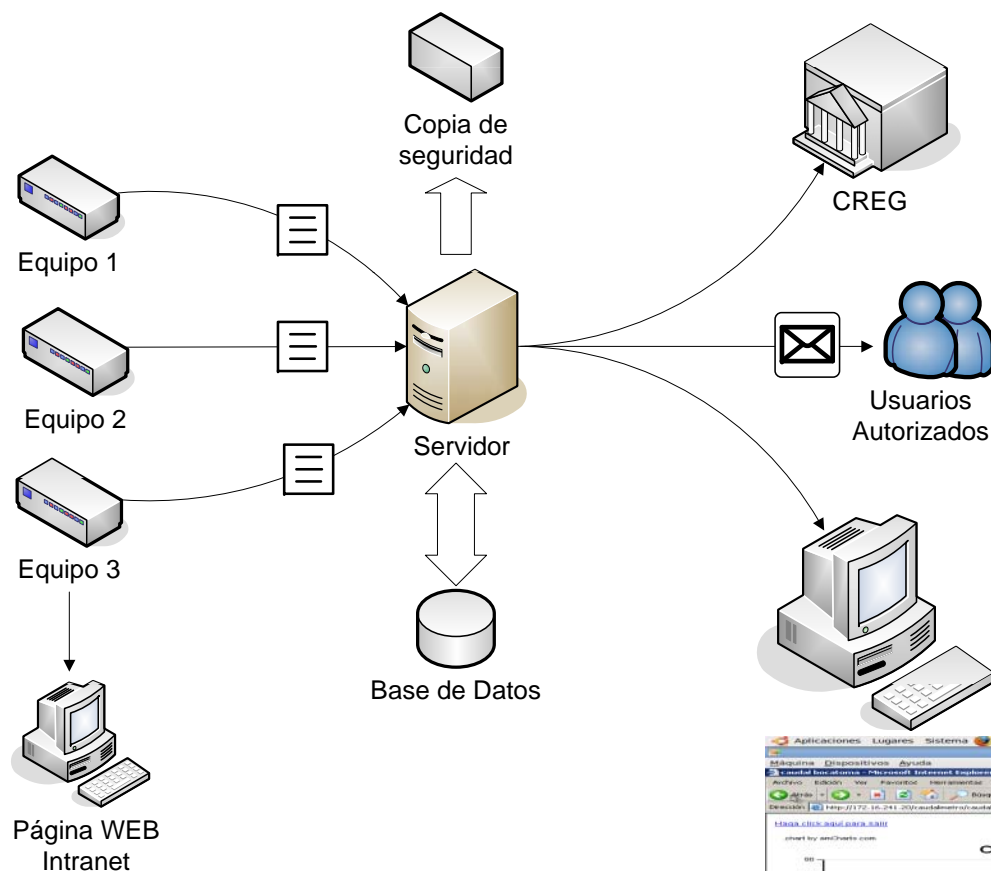
Services of remediation and final disposition of two types of residues contaminated with hydrocarbons.



# APPLIED PHYSICS AND TECHNOLOGICAL DEVELOPMENT



## SMART GRIDS



Monitoring applications to measurement of:

- Energy, gas and water consumption
- River flows
- Oil and gas well production
- Others



# TECHNOLOGICAL-BASED INSTITUTIONS AND SPIN-OFFS

## PROMOTED

- CIC. Corporación para la Investigación de la Corrosión - *Corrosion research corporation* -
- TECLASER. Laser precision cutting
- AIDETEC. Electronic devices production

## NEW PROJECTS

- Sludge management services
- Energy analysis services (consumption and quality)



# INTERNATIONAL COOPERATION

- COMSATS
- ICTP
- TWAS
- Max Planck Institute Goettingen
- Ecole de Physique et Chimie, Paris
- Paris VI
- NWY, Biophysics Institute
- Woodsdhole

# NETWORKING

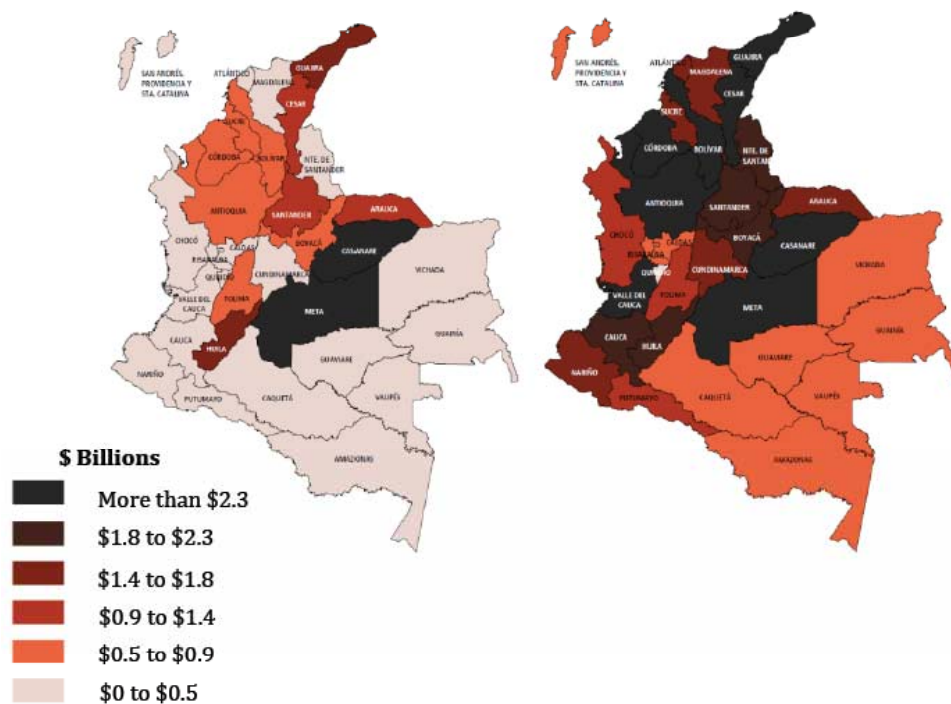
Association of 5 Centres with similar characteristics:

- Complementary research fields
- High scientific and technological level
- Regional and international recognition



# NEW PERSPECTIVES: CONSTITUTIONAL REFORM, ( 10% OF THE ROYALTIES, \$600M PER YEAR, FOR S&T)

**Total Royalties per Department, 2002-2010 vs. 2012-2020**



International prices have led to an expansion of Colombia's Oil and Mining industry. As a result, Royalty revenues From these activities Have increased By nearly 70 percent over the last five years and are expected to double within the next 10 years.

[www.colombiaemb.org](http://www.colombiaemb.org)

[www.cif.org.co](http://www.cif.org.co)

# SCIENCE, TECHNOLOGY AND INNOVATION FUND

Increases by Nearly 40 percent the country's funding in specific areas and is designed to foster regional Economic growth through investments in science, technology Innovation



*CIF Project Approved:  
Identification of alternatives researches to face the  
Climate Change on the basin floor in Rio Negro y  
River Lower Magdalena*



US\$ 2.000.000

Entities:

- 6 Majors
- 2 Universities
- Industries