



Centro Internacional de Física  
Bogotá, Colombia  
COMSATS meeting, Almaty 2018

Eduardo Posada  
Director

Colombia: 50 million people  
1,1 million sq. km

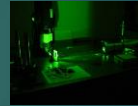


Colombian people know  
Kasajistan:

- Colombian cyclists in Astana pro team
- In Olympic Games, competitors in weightlifting, boxing and wrestling

# CIF's research groups

- Biophysics and tropical diseases
- Biophysics of cellular signaling
- Cellular neurophysiology
- Applied optics
- Materials science
- Environmental biotechnology
- Applied physics and technological development



# Biophysics

Tropical diseases: Leshmaniasis. Patent in process for improved treatment

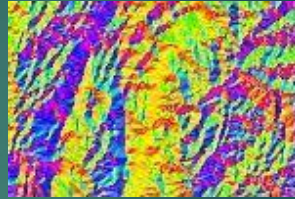
Neurosciences: Mechanisms of vision in insects

Biophysics of cellular signaling

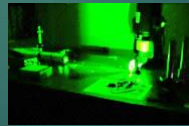


# Optics

Topographic LIDAR

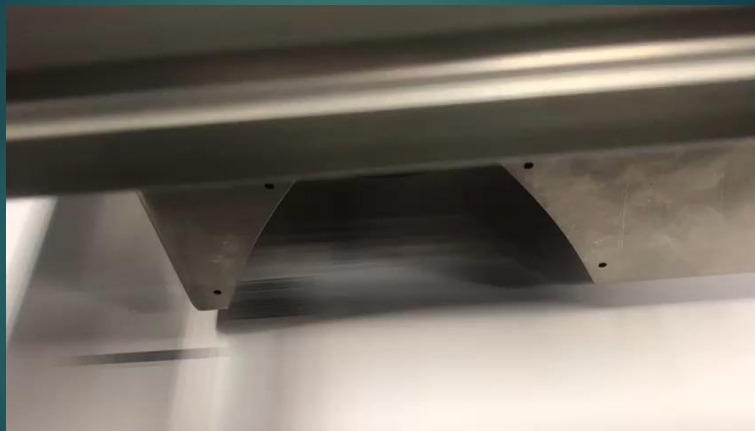


Holography



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High speed laser drilling machine for security paper



# Materials science

Study of the transport  
properties of superconducting  
thin films

Laser annealing of thin films

Nanotechnology for agricultural purposes

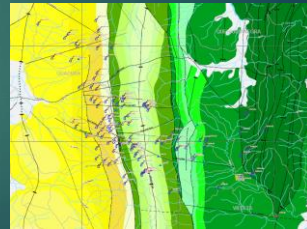
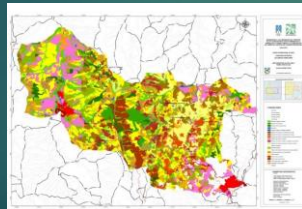


# Environmental Biotechnology

- Strategies for mitigating the impact of climate change in agricultural regions
- Massive propagation of plants
- Use of Arthropods as indicators of ecosystemic health and quality.



## Evaluation of the vulnerability of the region Villeta Guaduas due to road building and climate change



## Bio-filter for H<sub>2</sub>S in a hydraulic power plant



# Applied physics and instrumentation

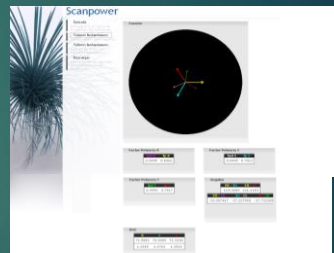
Development of solutions for industrial problems

Great experience in the electrical sector

Reduction of energy consumption in the public sector



# Measurement of the “quality” of energy



Scanpower

## Products already available

On - line monitoring of temperature and current of high voltage transmission lines 220kV, 115kv, 11kV.

Already being used by the largest electricity company.

Patents in process



## Automatic meteorological stations



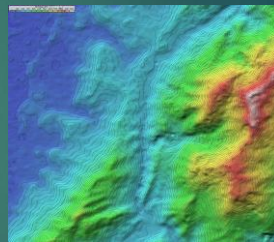


## Measurement of the methane content in coal samples



Canister

## Obtaining and analysis of satellite images



Colombia from space. CIFs earth station



# Centralized monitoring of domestic energy consumption



DISPAC – Quibdo  
EMSA – Villavicencio  
ENAM – Leticia  
CODENSA – Bogotá , Barrios marginales  
ELECTRICARIBE - Barranquilla, Santa Marta,  
Valledupar



Internet connection  
On line connection and disconnection

# Intelligent controllers for street lighting

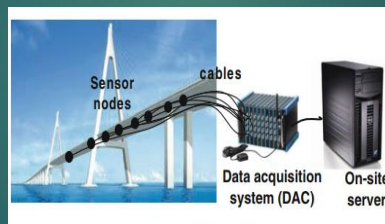


# Structural Health Monitoring

Buildings  
Tunnels  
Bridges

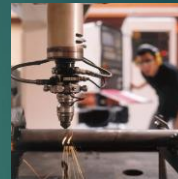
Network of sensors

Monitoring  
Diagnosis  
Alarms



# Creation of high-tech industries

- Precision laser and water cutting services for industry
- Freeze-drying of tropical fruits
- Gamma ray sterilization of fruits and vegetables



# International Networking

COMSATS



ICTP

TWAS



Max Planck Institute, Gottingen



Ecole de Physique et Chimie, Paris



Paris VI

NYW, Biophysics Institute

Woodshole



www.cif.org.co

## What we can offer to COMSATS

- Intensive courses in biophysics and neurosciences in cooperation with the National University of Colombia (in English and Spanish)
- Short courses in specialized topics
- Short stays for scientists in the fields of our activity
- Co-direction of Ms. and PhD thesis in bio-physics with universities to determine
- Training of young entrepreneurs in our industrial experiences
- Sharing our experiences in science policy