



MINISTÉRIO DA CIÊNCIA, TECNOLOGIA, INOVAÇÕES E COMUNICAÇÕES  
**INSTITUTO NACIONAL DE PESQUISAS ESPACIAIS**

# Overview of INPE's Activities

*Visit of Ms Simonetta Di Pippo,  
Director of UNOOSA*

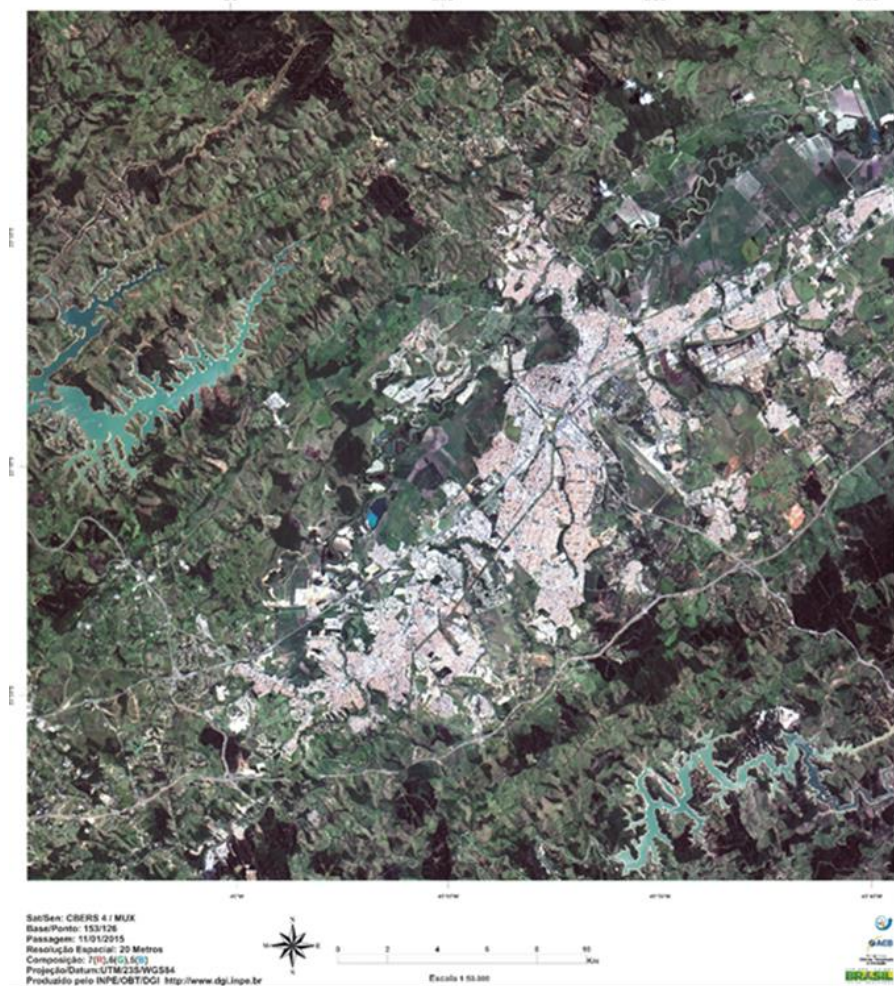
August 02, 2018

*by Maria Virginia Alves and Adriana Cursino Thomé*



# Mission

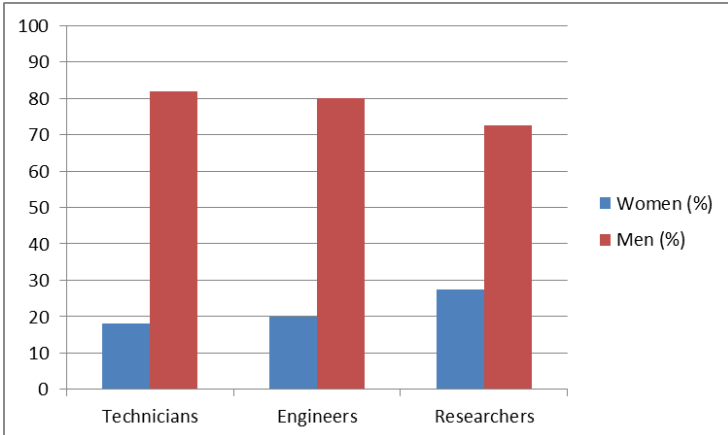
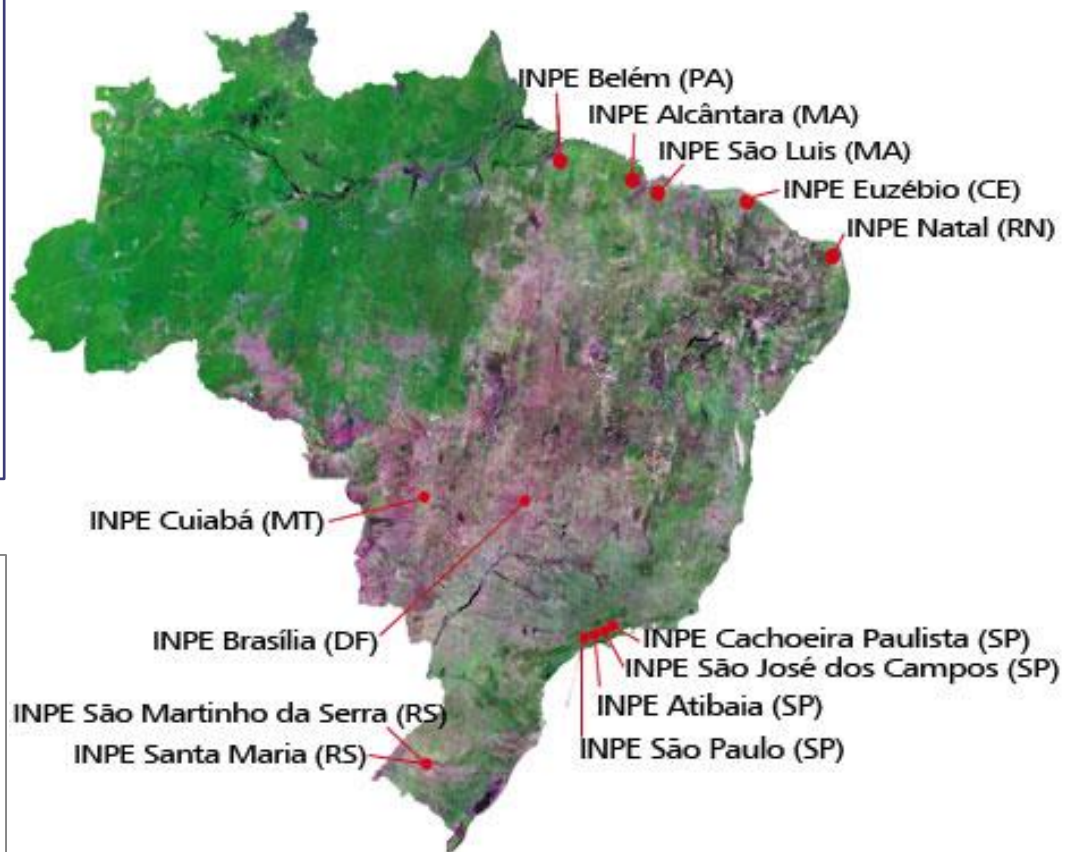
São José dos Campos - SP



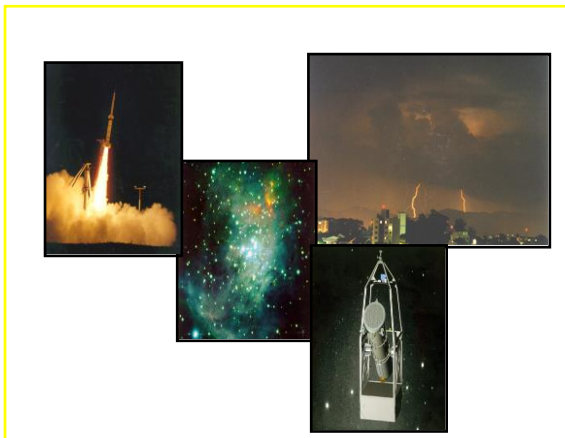
To develop, operate and use space systems for the advancement of science, technology and applications in the areas of outer space and terrestrial environment, and offer innovative products and services for the benefit of Brazil

# Institutional Profile: Facilities - Personnel

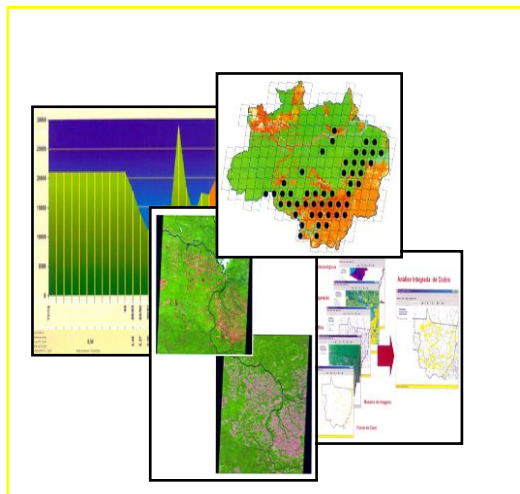
- Staff: ~ 839 (May 2018)
  - Research: 162
  - Development: 506
  - Administrative: 171
- Fellows PCI - 128
- Graduate students - 633
- Trainees – 119
- Scientific initiation fellows - 100
- Outsourcing ~40



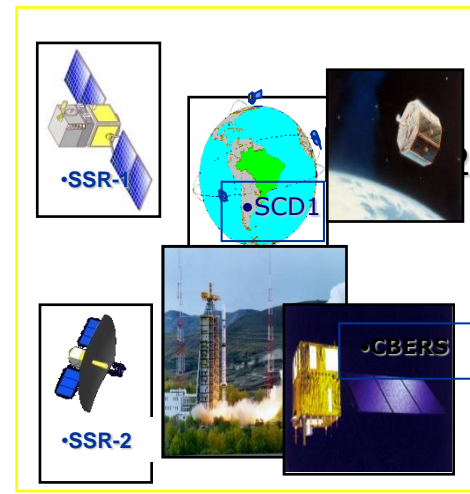
# Areas of Activities



Space Science



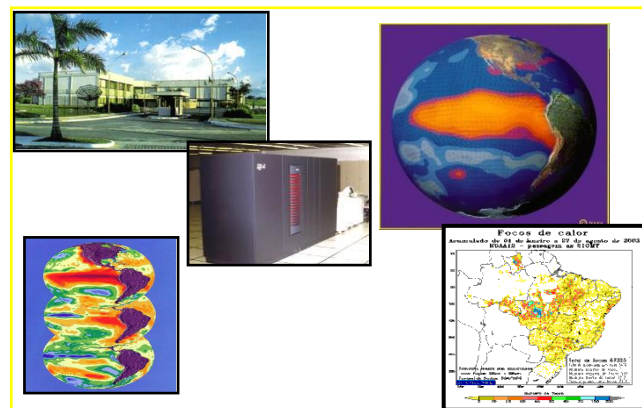
Earth Observation



Space Technology



Earth System Sciences



Meteorology and Climate

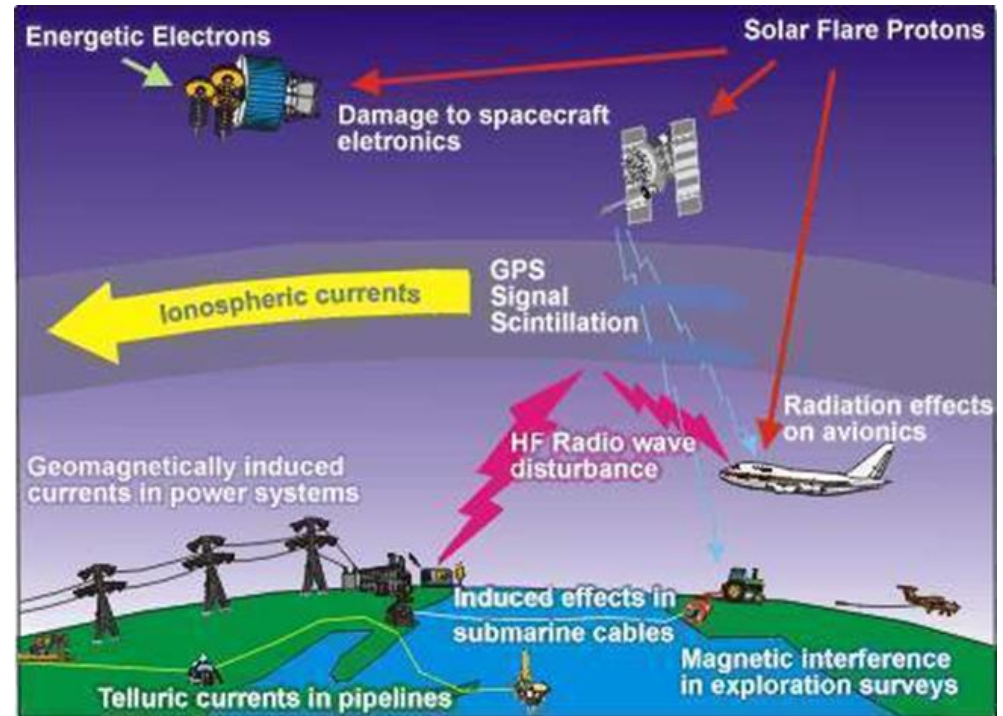
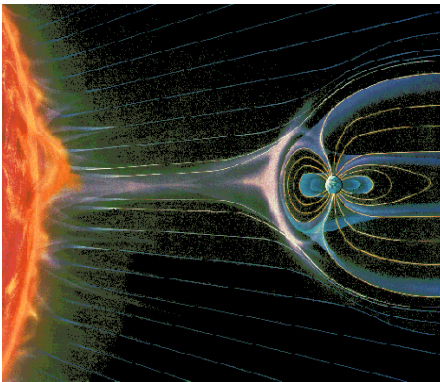
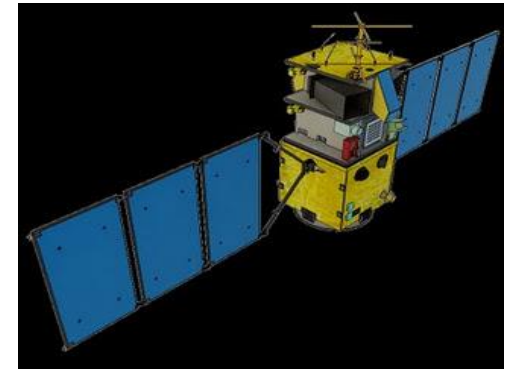
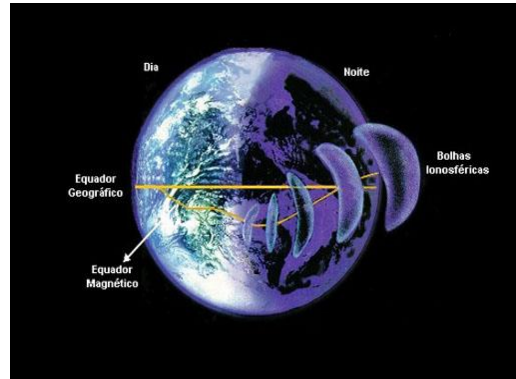


# Services Provided by INPE

- Numerical weather forecasting and climate change studies conducted by CPTEC. Make available the necessary data for practically all the meteorological forecasts made in the country, with great relevance for several applications, such as agriculture, prediction of natural disasters and periods of drought, sea and air navigation, etc.
- Satellite monitoring of deforestation and burning in the Amazon and other biomes, in particular the cerrado, providing the data essential for the control actions carried out by IBAMA.
- Monitoring of lightning incidence throughout the country, providing essential data for the actions of the National Electric System Operator.
- Monitoring the effects of solar flares related to the so-called "Space Weather", which, under adverse conditions, can affect telecommunications systems, GPS, etc.
- Design, development and control of artificial satellites for applications in remote sensing and scientific missions, with satellites Amazônia 1, CBERS 4A, NanosatC-Br1, UbatubaSat, SPORT satellite, in collaboration with NASA, among others. Through this activity, INPE allows the country to have the sovereign dominion of a technology of great relevance for the society.

# Space and Atmospheric Sciences

- Aeronomy
- Astrophysics
- Space Geophysics
- Balloon Launching Sector



# Earth System Science

- Development of Earth System models, especially of the climate system and land surface processes and applications;
- Applied studies to regional environmental change over South America;
- Make available routine future scenarios of environmental changes, notably over Brazil.



# Associated Laboratories

- Plasma
- Sensors and Materials
- Computing and Applied Mathematics
- Combustion and Propulsion





# Tracking and Control

Alcântara

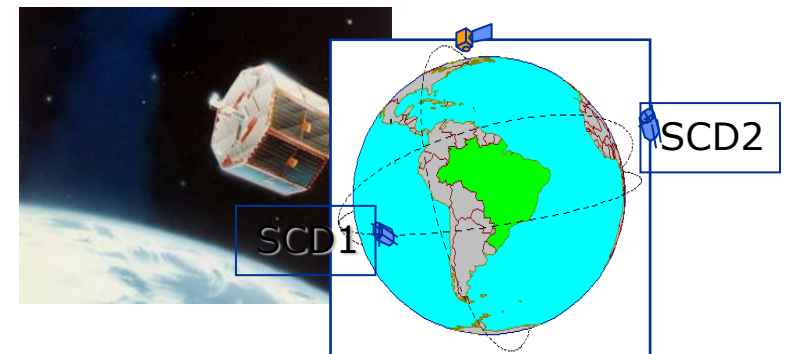
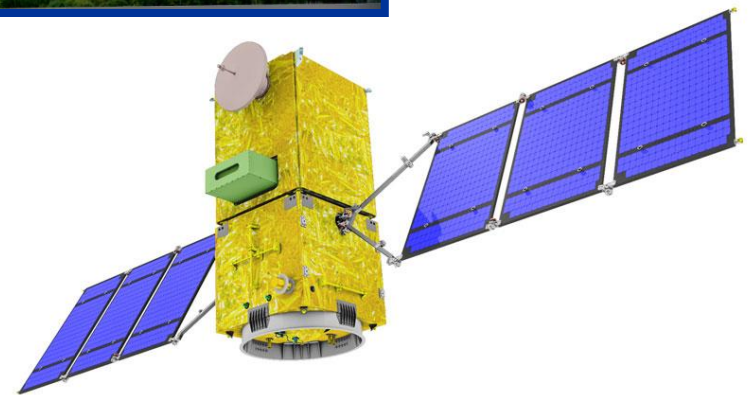


Cuiabá



# Space Engineering and Technologies

- Technological development and industrial policy
  - ✓ Sino-Brazilian Program
    - ✓ CBERS 4 & 4A
  - ✓ Application Satellites
    - ✓ Amazonia-1
  - ✓ Brazilian Data Collecting System



# Laboratory of Integration and Testing

- Contribute to the country's progressive autonomy in strategic areas;
- Provide technical support to the efforts of the national productive sector in developing its competitiveness in the international market;
- Create the necessary environment for the promotion of national space programs and in cooperation with other countries, providing high quality services, low cost and timely and
- Provide testing and metrology services to the Industry.



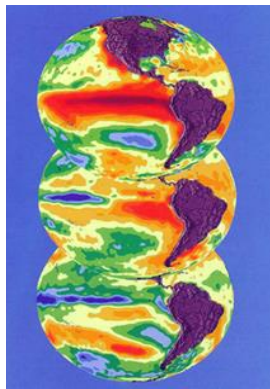
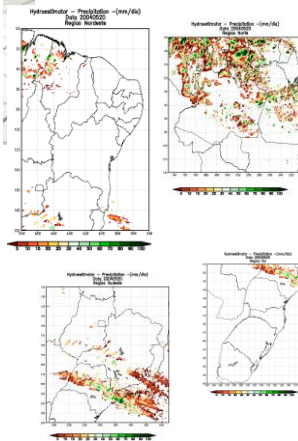
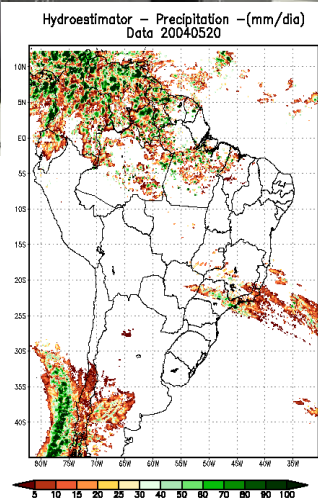
CBERS4A



Amazonia 1



# Center for Weather Forecasting and Climate Studies - CPTEC



- Modelling physical processes relevant to the atmosphere and oceans
- Operational Weather & Climate Forecasting
- Meteorology and ocean monitoring using satellite
- High performance computer modelling
- High level graduate education and capacity building (*currently with more than 60 PhD students*)

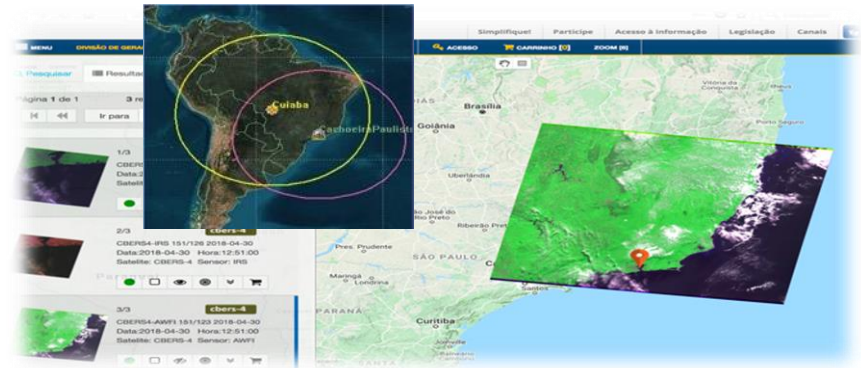




# Earth Observation Activities at INPE



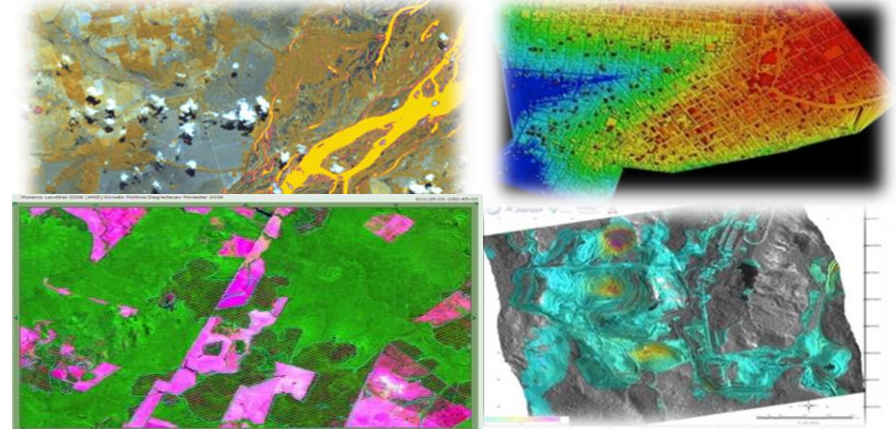
- Satellite engineering: CBERS 1, 2, 3, 4 and 4-A, Amazonia-1



- Reception, processing and delivering of images to users. Free and open access policy: [www.dgi.inpe.br/catalogo](http://www.dgi.inpe.br/catalogo)



- Applications and services to fulfill national demands
- Example: deforestation monitoring in the Amazonian Forest

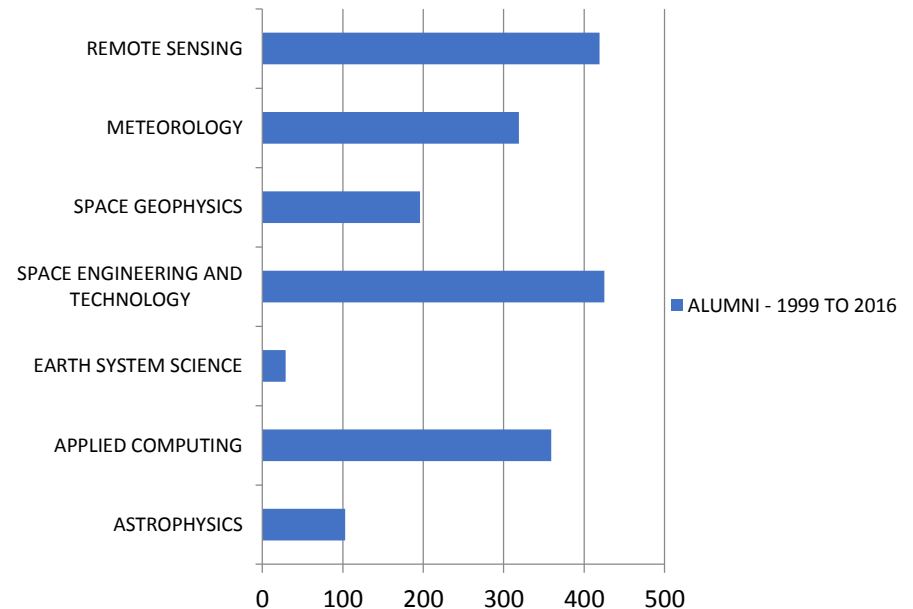


- R&D in remote sensing and geoinformatics.
- Capacity building

# Capacity Building at INPE: current activities

- Graduate Courses;
- Between 1968 and 2016, 2816 master's and doctoral degrees were awarded;
- Short and Medium Term Courses;

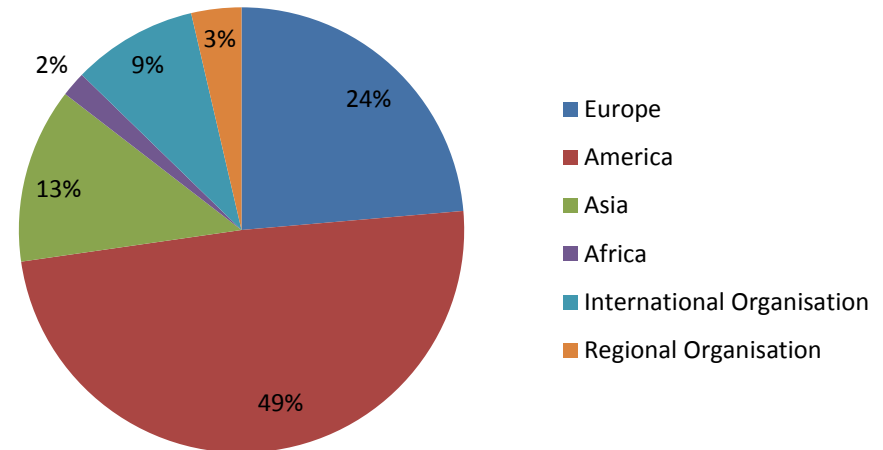
Course	Master	Doctorate
Astrophysics	X	X
Space Engineering and Technology	X	X
Space Geophysics	X	X
Applied Computing	X	X
Meteorology	X	X
Remote Sensing	X	X
Earth System Science		X



# International Cooperation

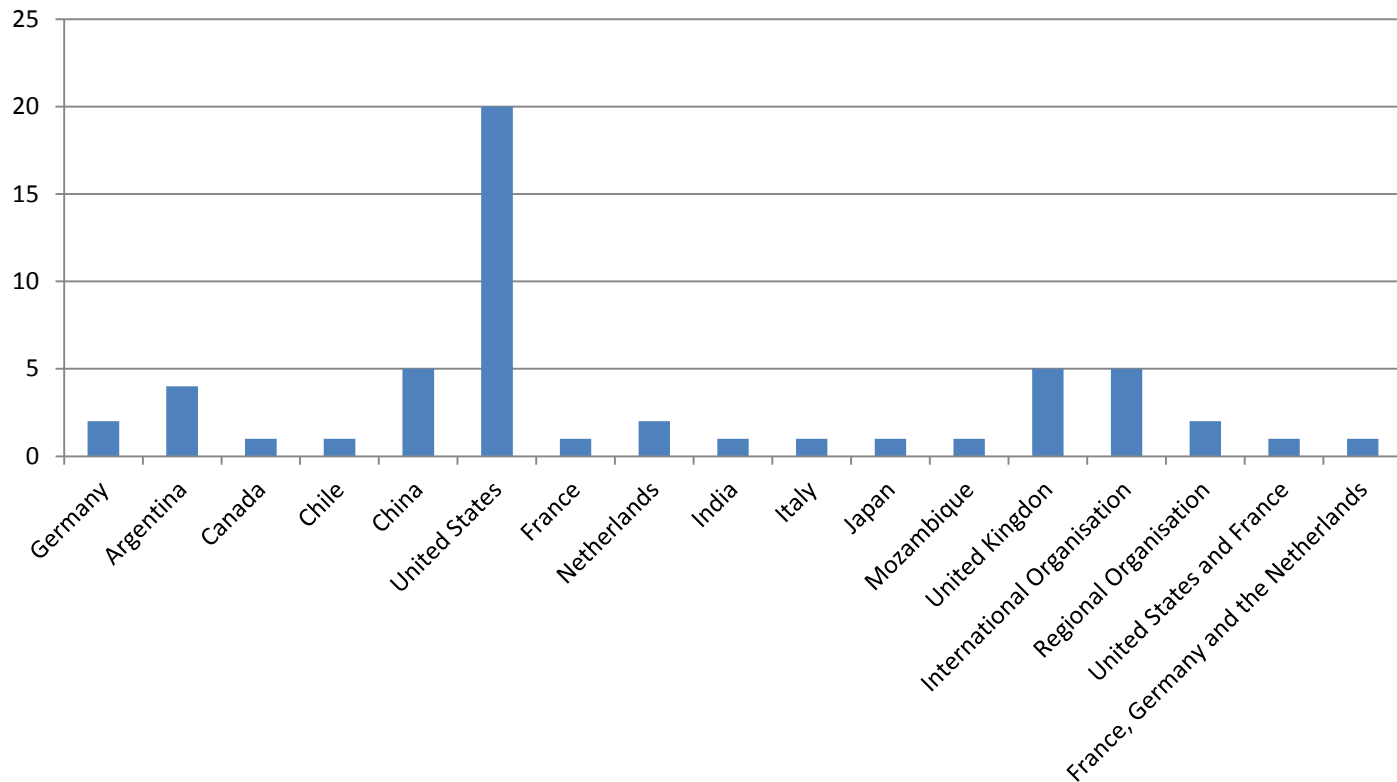


- 54 formal agreements in force (July 2018);
- Types:
  - Scientific and Technological;
  - Academic;
  - Training and Education;
  - Specific projects and
  - Data and Infrastructure sharing.
- [http://www.inpe.br/institucional/sobre\\_inpe/relacoes\\_internacionais/cooperacoes\\_vigentes.php](http://www.inpe.br/institucional/sobre_inpe/relacoes_internacionais/cooperacoes_vigentes.php)





# Bilateral and Multilateral Agreements



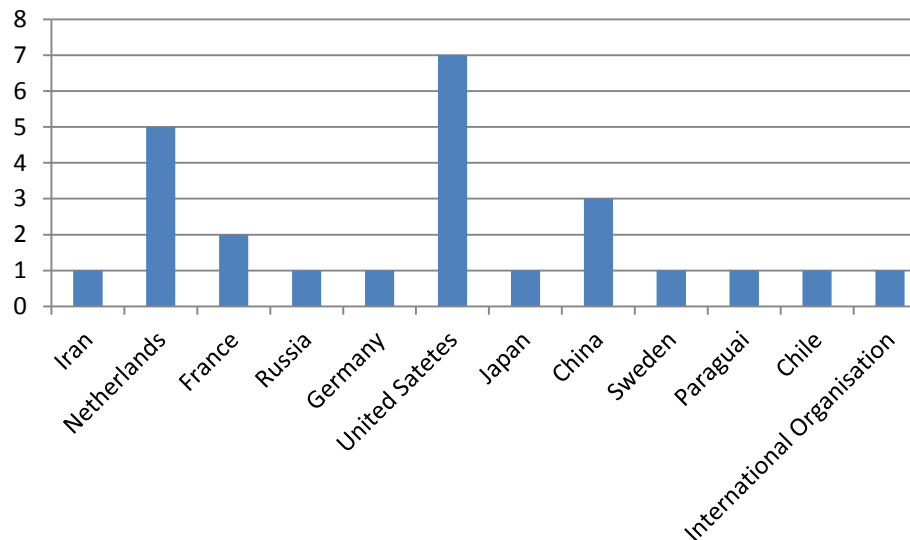
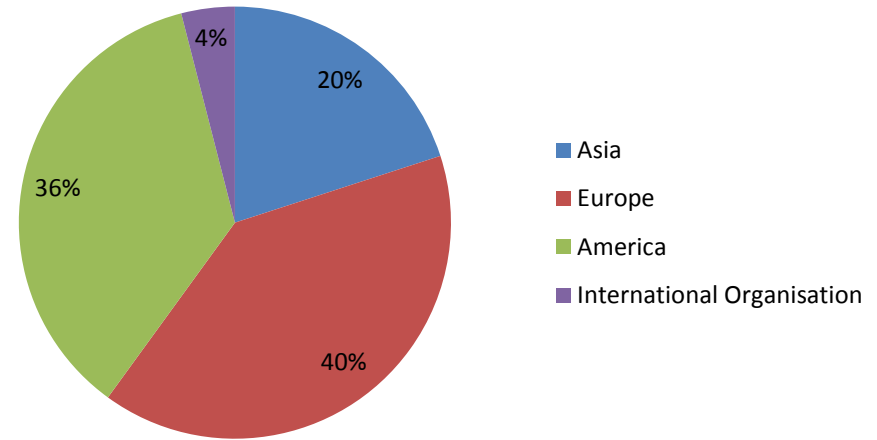
• Data from July of 2018





# International Visits

- 25 formal visits in 2017;
- [http://www.inpe.br/institucional/sobre\\_inpe/relacoes\\_internacionais/visitas.php](http://www.inpe.br/institucional/sobre_inpe/relacoes_internacionais/visitas.php)





# Capacity-Building: International Cooperation

17 PARTNERSHIPS  
FOR THE GOALS



Organization	Project	Period	Courses	Languages	Countries	Technicians
<b>Food and Agriculture Organization of the United Nations through its representation in Brazil (FAO/Brazil)</b>	Use of remote sensing data for monitoring and forest cover	2014 to 2015	9 Forest Monitoring Courses	Portuguese + English + Spanish + French	24	136
<b>Organization of the Amazon Cooperation Treaty (OTCA)</b>	Forest Coverage Project in the Regional Amazon	2014 to 2016	8 Forest Monitoring Courses + 1 Forest Fire Course +1 Radar Course	English + Spanish	OTCA (Bolivia, Brazil, Colombia, Ecuador, Guiana, Peru, Suriname, Venezuela)	195
<b>Japan International Cooperation Agency (JICA)</b>	Training Program for Third Countries (TCP)	2010 to 2013	9 Forest Monitoring Courses	Portuguese + English + Spanish + French	35	98



**THANK YOU!**