

# Latin America Aerospace History

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# Latin America

Population: 605 353 428

Gross Domestic Product: **9,517,000** millions of dollars

Countries: 21 countries

Argentina, Bolivia, Brasil, Chile, Colombia, Costa Rica, Ecuador, Guatemala, Haití, Honduras, México, Nicaragua, Panamá, Paraguay, Perú, República Dominicana, Uruguay, Venezuela and Cuba.

Languages: Spanish and Portuguese



# Languages



Main languages:  
Spanish and Portuguese

## North America

Mexican Spanish

Spanish language in the United States

## Central America

Costa Rican Spanish

## South America

Bolivian Spanish

Chilean Spanish

Colombian Spanish

Ecuadorian Spanish

Paraguayan Spanish

Peruvian Spanish

Venezuelan Spanish

# Population in Latin America

Rank	Country	Population	Average relative anual growth (%)
<u>1</u>	<u>Brazil</u>	<u>204,519,000</u>	<u>0.86</u>
2	Mexico	121,006,000	1.08
3	Colombia	48,218,000	1.16
4	Argentina	43,132,000	1.09
5	Peru	31,153,000	1.10
6	Venezuela	30,620,000	1.37
7	Chile	18,006,000	1.05
8	Ecuador	16,279,000	1.57

Rank	Country	Population	Average relative anual growth (%)
9	Guatemala	16,176,000	2.93
10	Cuba	11,252,000	0.25
11	Haiti	10,994,000	2.31
12	Bolivia	10,520,000	1.73
13	Dominican Republic	9,980,000	0.98
14	Honduras	8,950,000	2.29
15	Paraguay	7,003,000	1.58
16	Nicaragua	6,514,000	2.37
17	El Salvador	6,460,000	0.92
<u>18</u>	<u>Costa Rica</u>	<u>4,851,000</u>	<u>1.63</u>

# Gross Domestic Product 2015

Country	GDP PPP(millions)
<i>Brazil</i>	<i>3,259,000</i>
<i>Mexico</i>	<i>2,224,000</i>
<i>Argentina</i>	<i>953,029</i>
<i>Colombia</i>	<i>682,977</i>
<i>Venezuela</i>	<i>550,226</i>
<i>Chile</i>	<i>431,802</i>
<i>Peru</i>	<i>403,322</i>
<i>Ecuador</i>	<i>192,728</i>
Dominican Republic	144,052
Guatemala	125,318

Country	GDP PPP(millions)
Panama	83,421
<i>Costa Rica</i>	<i>75,138</i>
<i>Bolivia</i>	<i>74,836</i>
Uruguay	73,056
Paraguay	61,587
El Salvador	52,776
Trinidad and Tobago	43,914
Honduras	40,895
Nicaragua	31,618
Jamaica	25,162

Country	GDP PPP(millions)
Haiti	19,576
Suriname	9,766
The Bahamas	9,394
Guyana	5,814
Barbados	4,621
Belize	3,034
Antigua and Barbuda	2,060
Saint Lucia	1,955
Grenada	1,286
Saint Kitts and Nevis	1,282
Saint Vincent and the Grenadines	1,252
Dominica	780

<b>Latin America</b>	<b>9,517,000</b>
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# Top G.D.P.

Rank	Countries	2016 GDP (PPP) billions of USD
1	China	20,853
2	United States	18,558
3	India	8,642
4	Japan	4,901
5	Indonesia	3,010
5	South Korea	1,848
6	Saudi Arabia	1,720
7	Turkey	1,665

## R&D Support for the Aerospace Industry

Countries	Investment in Aerospace Industry USD (2006)
United States	50 billions
Japan	2,46 billions



# Mexico

[https://upload.wikimedia.org/wikipedia/commons/thumb/f/fc/Flag\\_of\\_Mexico.svg/840px-Flag\\_of\\_Mexico.svg.png](https://upload.wikimedia.org/wikipedia/commons/thumb/f/fc/Flag_of_Mexico.svg/840px-Flag_of_Mexico.svg.png)



Population: 119 530 753

GDP: *2,224,000 millions of sollars*

R&D: *5.10 millions of dollars*

Aerospace institutions:

**Mexican Space Agency**



[https://upload.wikimedia.org/wikipedia/commons/thumb/2/24/Mexico\\_in\\_North\\_America.svg/597px-Mexico\\_in\\_North\\_America.svg.png](https://upload.wikimedia.org/wikipedia/commons/thumb/2/24/Mexico_in_North_America.svg/597px-Mexico_in_North_America.svg.png)



# Mexico

- **1957, October 4 :Sputnik I**
- 1957, December : The first mexican rocket launch . Main purpose to study the atmosphere, “El Física I”. Mexico started the aerospace studies just for knowledge and science. The academy is the main supporter.
- 1959-1960: assemble rockets with liquid fuel same as germany rockets . (Max alt. 4km and 25 km).
- 1962, the president Lopez Mateos thought It was esencial that Mexico has some initiative for space exploration. Then, the national outer space commission (Conee) was created.
- 1968, for the olympic games in mexico was posible to transmit by satellites since telecommunications satellites and the ground station in Tulancingo.
- 1977, Conee disappears since there were not enough financial support and any future visión for this.
- 1980, Mexico launched satellites Morelos I and II.

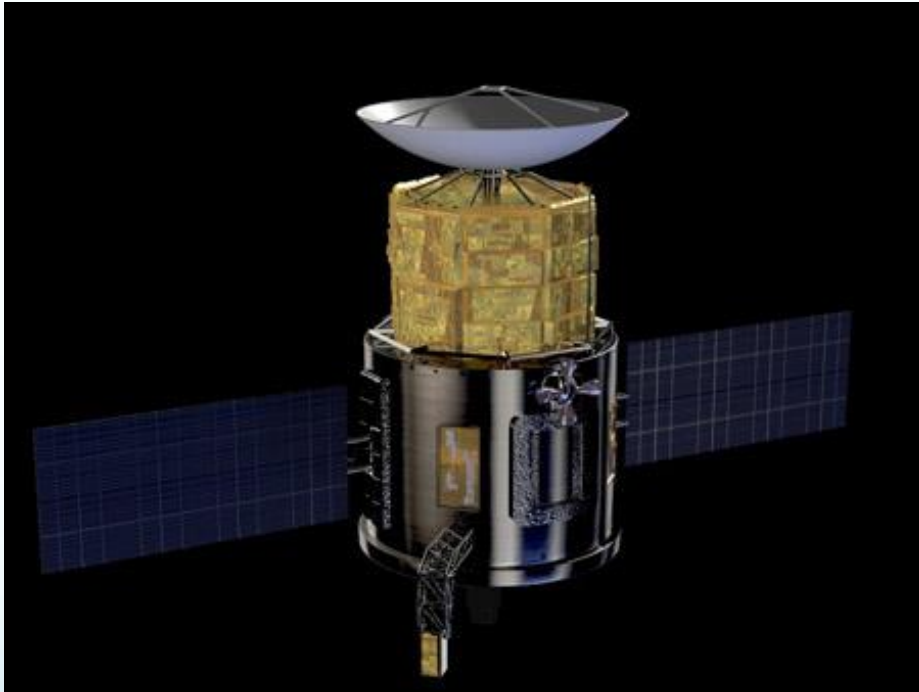
- 1990, UNAM students developed a microsatellite, UNAMSAT B. The first one exploded with the rocket.
- 1993-1994, Mexico bought Solidaridad I and II and trained many professionals in other universities.
- 1994-2010: 6 years of debating for the Mexican Space Agency
- Nowadays: Mexico have sent 12 satélites , 7 of them don't work (Morelos I, Morelos II, Solidaridad I, Solidaridad II, Satmex 5, Satext1 and Unamsat)

<b>Satellites</b>	<b>Launched</b>
<b>QuetzSat 1</b>	<b>2011</b>
<b>MexSat 1 (Centenario)</b>	<b>2013</b>
<b>MexSat 2 (Morelos III)</b>	<b>2014</b>
<b>MexSat 3 (Bicentenario)</b>	<b>2012</b>
<b>Satex1</b>	<b>No concluded</b>
<b>Ulises 1</b>	<b>Still working</b>



# Mexico

## Morelos I



<http://reportemexico.mx/wp-content/uploads/2014/12/MORELOS-II.jpg>

# 30 años del SATÉLITE MORELOS

El 17 de junio de 1985, el gobierno mexicano puso en órbita el satélite Morelos 1, con el objetivo de relacionar las zonas rurales y urbanas del país. Ese día inició la historia satelital mexicana. Conócela.

 **Morelos 1**

**Lanzamiento**

- Cabo Cañaveral, Florida, EUA
- 17 de junio de 1985
- 07:33 UTC (12:33 hrs Tiempo de México)
- Transbordador Discovery, NASA

**Servicios**

Datos, telefonía y televisión



512kg peso en operación

Fue desactivado en 1993

2.2m. Diámetro

**Mexsat 1 (Centenario)**

Mayo 2015.  
Falló el lanzamiento

**Satmex 8 o Eutelsat 117 west A**

Marzo de 2013.  
Activo

**QuetzSat 1**

Septiembre 2011.  
Activo.

**Mexsat 3 o Satélite bicentenario**

Diciembre de 2012.  
Activo.

**Satmex 6 o Eutelsat 113 west A**

Mayo de 2006.  
Activo

**LOS QUE SIGUIERON**

**Morelos 2**

Noviembre de 1985  
Desactivado en 2004

**Solidaridad 1**

Noviembre de 1993.  
Se descompone en 2000

**Solidaridad 2**

Octubre de 1994.  
Desactivado en 2013

**2do.** país latinoamericano en enviar un satélite al espacio.

**SABÍAS QUE...**

Brasil, Colombia, México, Venezuela y Argentina, son los únicos países latinos que tienen proyectos para construir sus propios satélites.

**UNAMSAT**

Marzo de 1995.  
Destruído en su lanzamiento.

**UNAMSAT-B**

Septiembre de 1996.  
Se descompone 46 días después

**Satmex 5 o Eutelsat 115 west A**

Diciembre de 1998.  
Sustituido por "Samex 8"

Fuente: rue.unam.mx, gaxtec.com.mx, sistemaspea.info, satmex-garcialara.blogspot.mx, mexicoinespacio.blogspot.mx, etcetera.com.mx, quademdigital.net, bitacora.ingenier.com.mx  
Investigación y redacción: Jennifer Rosado Martínez. Edición: Mónica I. Fuentes Pacheco. Diseño y arte digital: Alberto Nava Consultora



# Costa Rica



Population: **4,851,000**

GDP: *75,138 millions of dollars*

Satellite:

Cubesat “Irazu” (?)

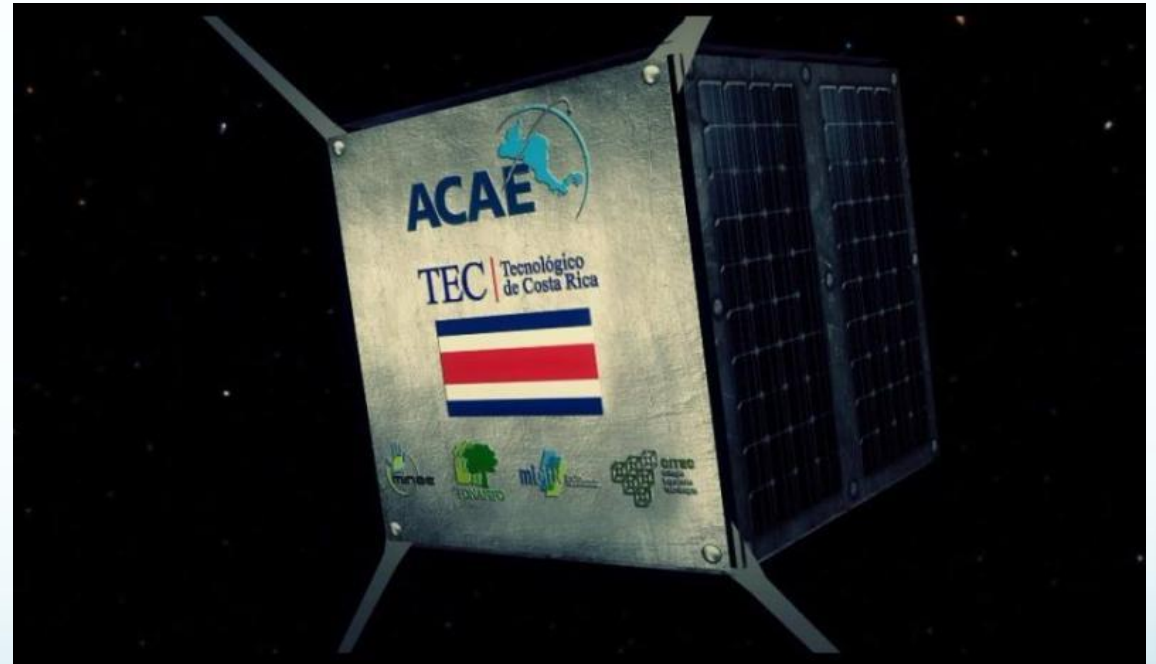
Aerospace Institutions:

ACAE (CentroAmerician Asociation of Aeronautics and Space)



- 1957, October 4 :Sputnik I
- By 1988: ACIDE (Costa Rican Association of Research and Space diffusion) is created . This is the former institution of ACE. It was leading by Dr. Franklin Chang.
- By 1990 decade: ACIDE disappears.
- By 2010: ACAE was funded by Ronald Chang
- April 2014 :Irazu Project started





Satellite Irazu



# Brazil

[https://upload.wikimedia.org/wikipedia/en/thumb/0/05/Flag\\_of\\_Brazil.svg/1280px-Flag\\_of\\_Brazil.svg.png](https://upload.wikimedia.org/wikipedia/en/thumb/0/05/Flag_of_Brazil.svg/1280px-Flag_of_Brazil.svg.png)



[http://old.wordtravels.com/images/map/Brazil\\_map.jpg](http://old.wordtravels.com/images/map/Brazil_map.jpg)

Population: **204,519,000**

GDP : **3,259,000 millions of dollars**

R&D aerospace: **100 millions of dollars**

Aerospace Institutions:

Brazilian Space Agency (1994)





- **1957, October 4 :Sputnik I**
- From 1961 to 1994 “Brazilian Spacial program”
- From 1964, brazil developed many rockets called “Sonda I, II, III, IV.”
- In february 9 1993, SCD-1 was launched . Main objective to collect information about the Natural Enviroment.
- In 1994, the Brazilian Space Agency was created..
- CBERS-4(China- Brazil Earth Resources Satellite 4) is a satellite created by Chin and brazil . It was launched on December 7, 2014



# Brazil



- Lifespan: 3 years.
- Geo Satellite
- Period 100.32 minutes

CBERS-4



# Colombia



Population: **48,218,000**

GDP: *682,977 millions of dollars*

Main institution:

Colombian SPACE cOMMISSION

- Libertad 1, was one cubesat built by Space program of the Sergio Arboleda University.(2007).
- There is a Project to launch Libertad 2, but the Project is not finish and its unknow if this project will continue.





# Venezuela

<http://1.bp.blogspot.com/-YKnhYlskzMA/UKu2eAAblII/AAAAAAAAACVY/1lwwUp3gj1U/s1600/BANDERA%2BDE%2BVENEZUELA%2B%2BOCHO%2B%2BESTRELLAS.jpg>

Population: **30,620,000**

GDP : *550,226 millions of dollars*

Aerospace Institution:

Bolivarian Spce Agency (ABAE)



<http://www.sciencekids.co.nz/images/pictures/maps/venezuela2.jpg>

- 2008, Vensat 1 was launched from China. The main objective is provide an easy acces to the internet , phone, televisión, telemedicine and tele education.
- This satellites also promotes the unión between contries that can not support its own satellite.  
Uruguay
- In 2012, The satellite Miranda (VRSS-1) was launched from China. It has two cameras with high resolution to track the agricultura, forest and the develop a plan for an urbanism project



**Venesat1**

- Designed by China Republic
- Lifespan 15 years
- Weight: 5100 kg
- Geo Satellite.
- There 3 ground stations in Venezuela.



# Argentina

<http://argentinaflag.facts.co/argentinaflagimage1.png>

Population: 43,132,000

GDP : *953,029 millions of dollars*

R & D aerospace: *180 millions of Dollars*

Main institution:

Before:  
CNIA

Now:  
CONAE

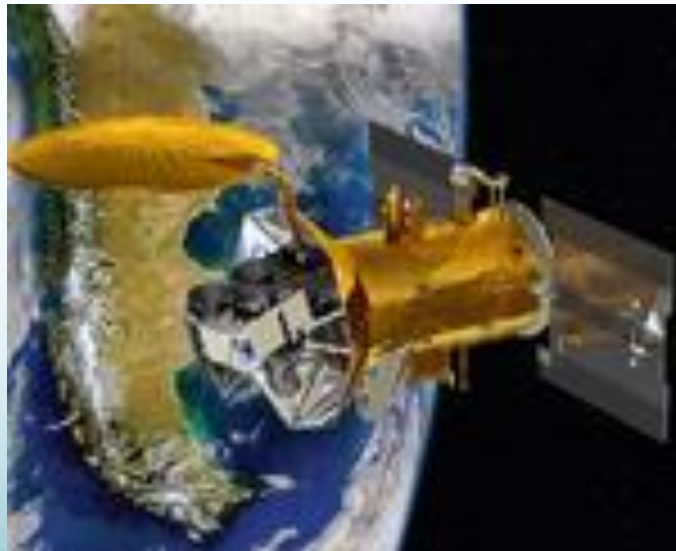


<http://southamericadrive.com/wp-content/uploads/2015/09/argentina-map.jpg>



# Argentina

- Probably Argentina could have a rocket launcher since the Project “Condor Misil “ could complete the goal.
- CNIE disappears and CONAE is then established as the former Argentina Space Agency.
- In 1998, Argentina was invited to participate by NASA to join the construction of ISS, however, the government thought it was expensive and declined.



Satellite SAC - D

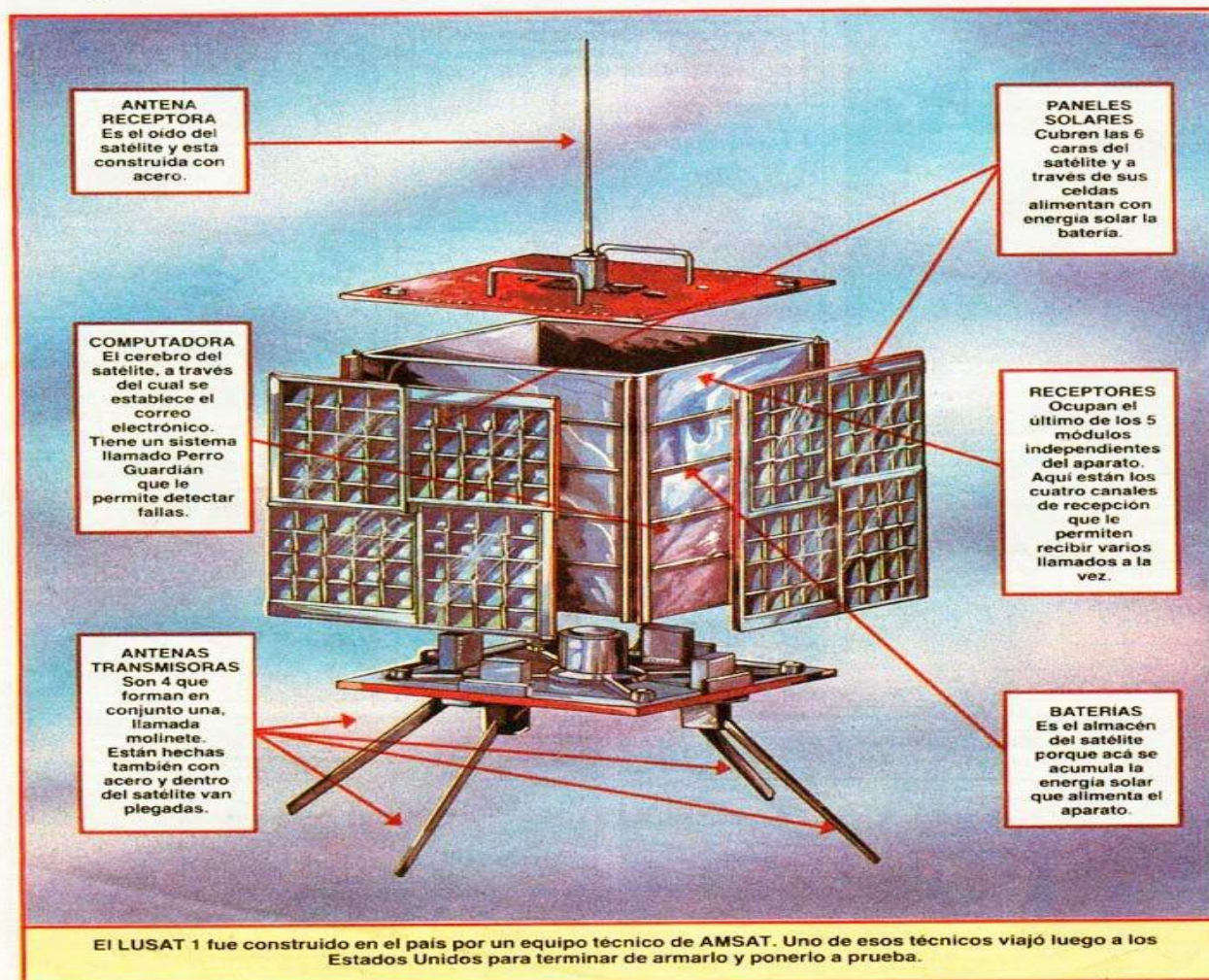


Kyutech

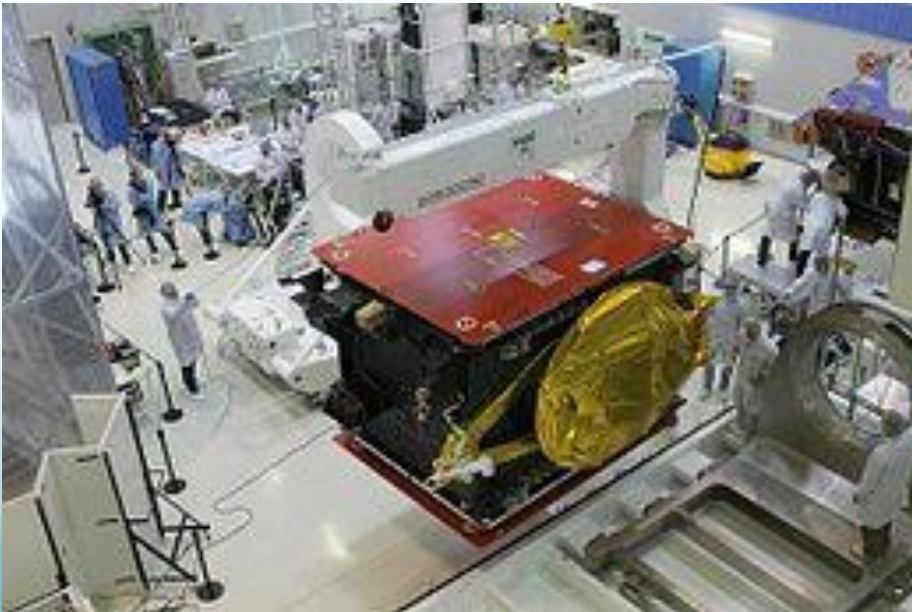


# ARGENTINA EN EL

LUSAT-1 in the newspaper



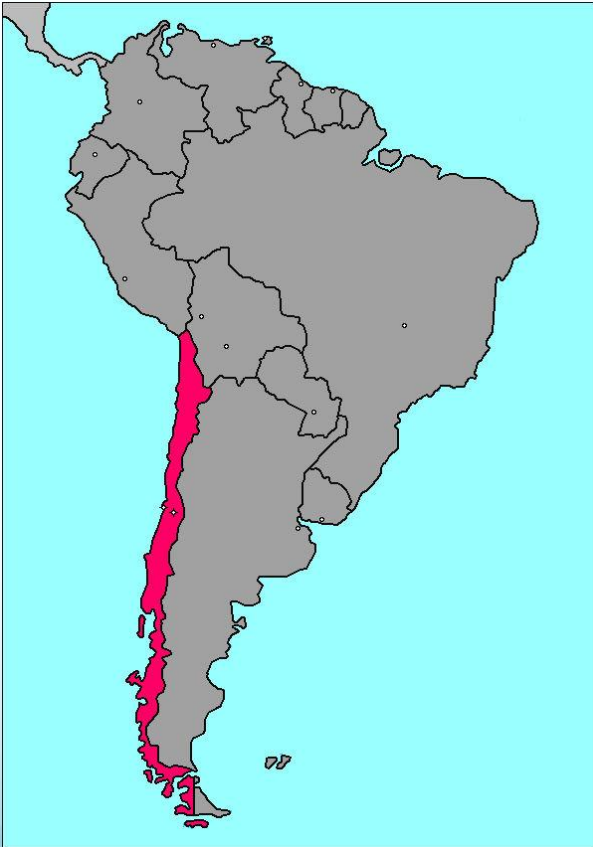
- In 1996, satellite Sac –B was launched, Main objective to study astrophysics and solar flares.
- In 2000, SAC-C which carries a multispectral mid resolution camera (HRTC).
- In 2014, ARSAT1 was launched. A Geo satellite made in Argentina





# Chile

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Population: **18,006,000**

GDP : **431,802 millions of dollars**

R& D aerospace: **13 millions of dollars**

Main institution:

Chilean Aerospace Agency (ACE)

<http://www.globalsecurity.org/military/world/chile/images/map-chile-location.jpg>

- ACE was created in 2001. It was mainly attached with the air force of Chile and the President palace.
- In 2013, By a constitutional law, the agency stop all their functions.
- In 1995, Fasat-Alfa was the first satellite proposed by Chile, however It was not concluded.
- In 2011 December 16, the FaSat-Charlie was launched to the space. Until now it is main satellite of Chile and the only one.
- Chile univeristy wants to launch their own cubesat, (called SUCHAI “Satllite of the University of Chile for Aerospace Invetigation”). Maybe It will lunched by 2018.



# Perú

[https://upload.wikimedia.org/wikipedia/commons/thumb/d/df/Flag\\_of\\_Peru\\_\(state\).svg/2000px-Flag\\_of\\_Peru\\_\(state\).svg.png](https://upload.wikimedia.org/wikipedia/commons/thumb/d/df/Flag_of_Peru_(state).svg/2000px-Flag_of_Peru_(state).svg.png)



Population: **31,153,000**

GDP : *403,322 millions of dollars*

Successful Launched satellites:

Chasqui1 (cubesat)

PUCPsat-PocketPUCP (cubesat-femtosat)

UAPSat

PeruSat1

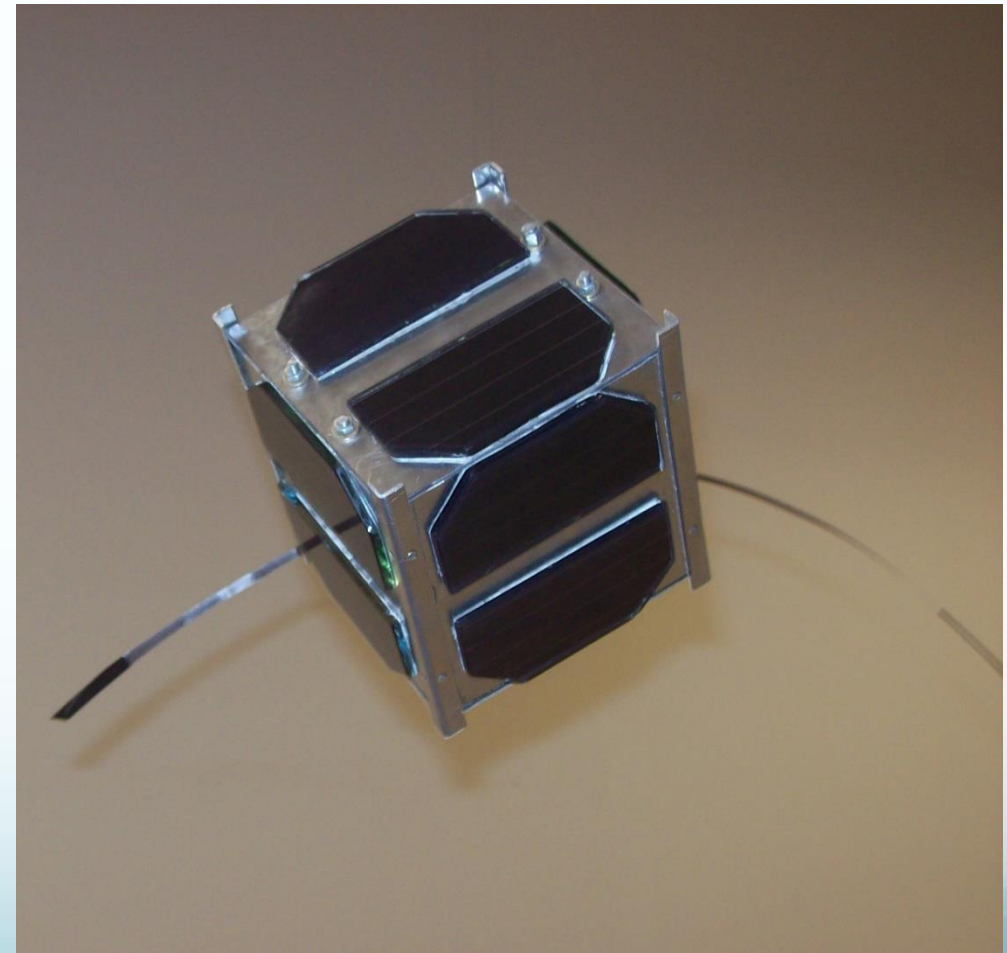
Aerospace Institution:

CONIDA

- **1957, October 4 :Sputnik I**
- 1996: a Project CONIDAsat started with peruvian engineers
- 2003: CONIDAsat was cancelled since the Budget and the time spent were too long.
- 2013 November 21: PUCSat was launched
- 2014 september 1:UAPSat – was launched
- 2014 August 18: Chasqui 1 was launched
- 2016 september 15: PeruSat1 was launched

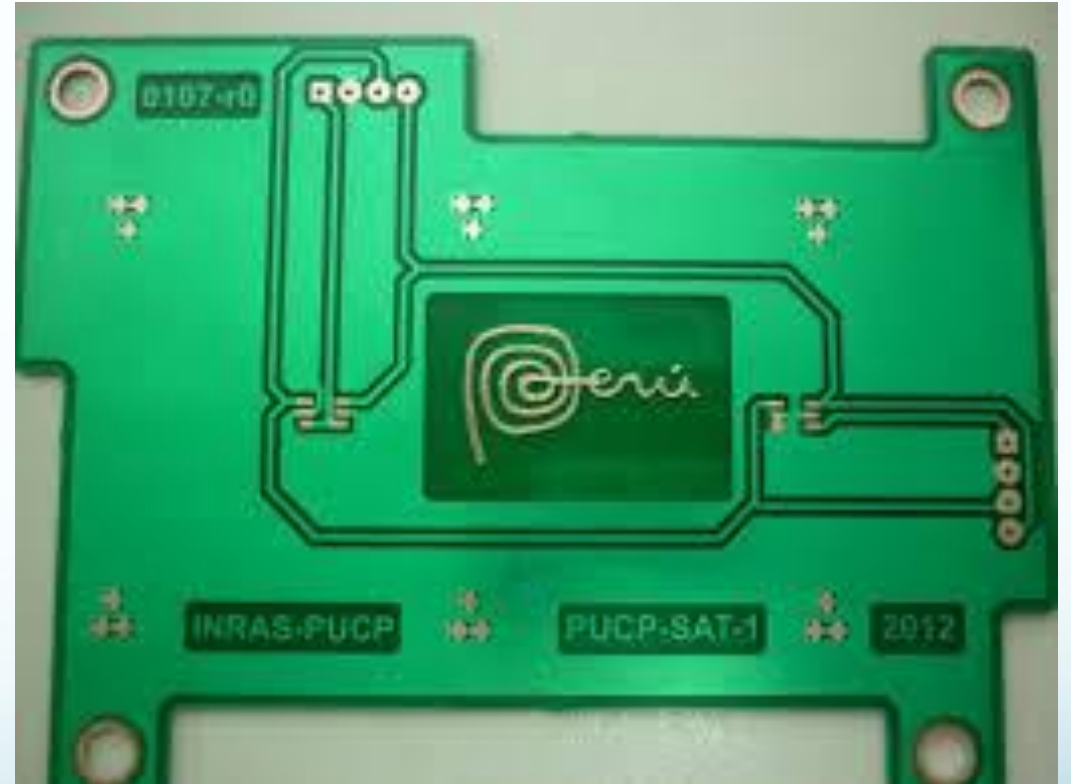
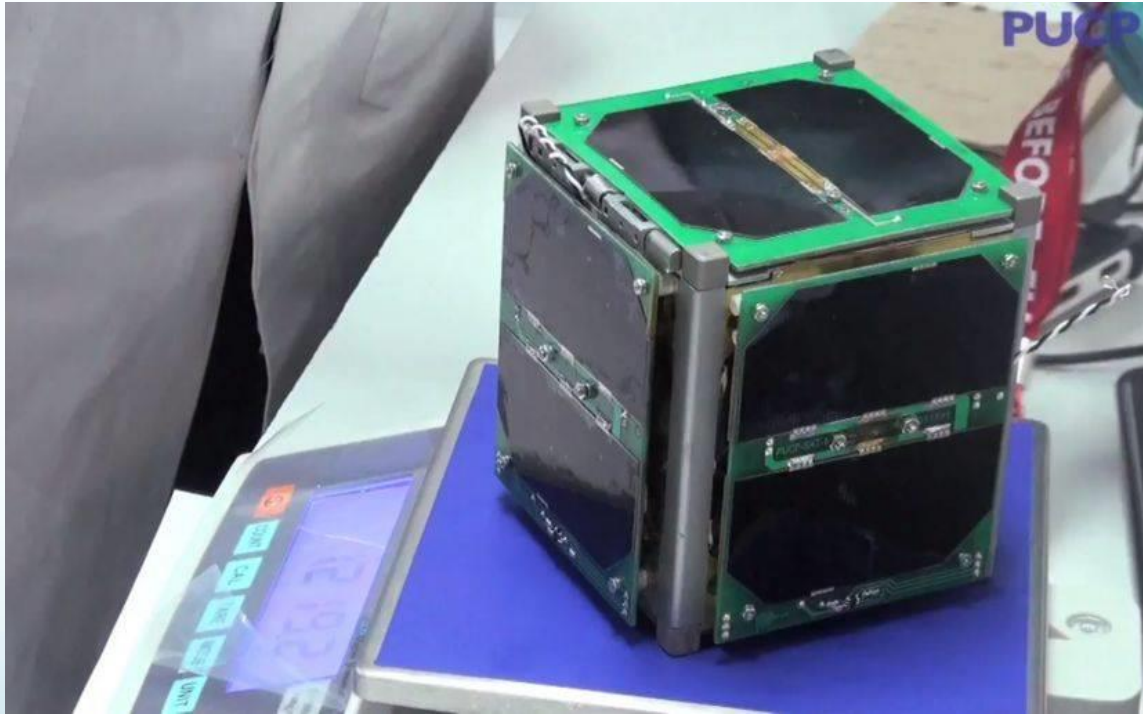


# Chasqui 1

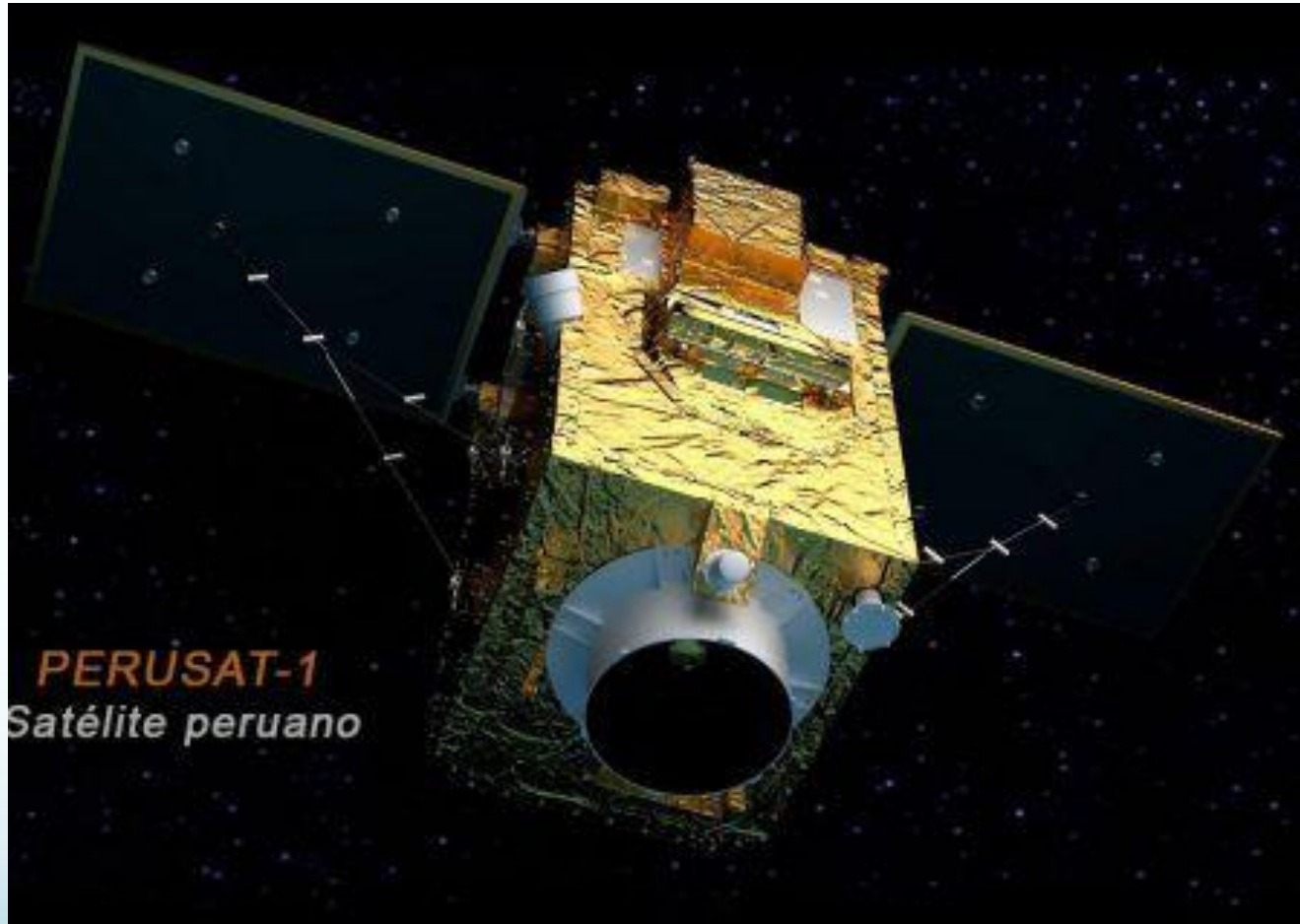




# PUCPSat1

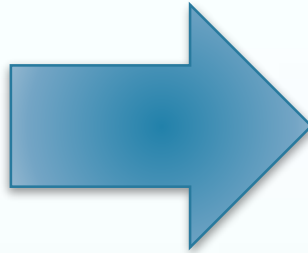


# PeruSat1



# Other countries

- Uruguay 2014: cubesat Antelsat- 700,000 dollars from the Republic University.
- Paraguay: no satellites yet. Now, It has a satellite Project with Argetina.
- Bolivia:2013 satellite TKSAT (Tupac Katari) geo satellite for communications.
- Ecuador:Pegaso1 cubesat-LEO (April 2013)-Transmit video in real time  
(broke-collision)  
cubesat Krysaor (November 2013)



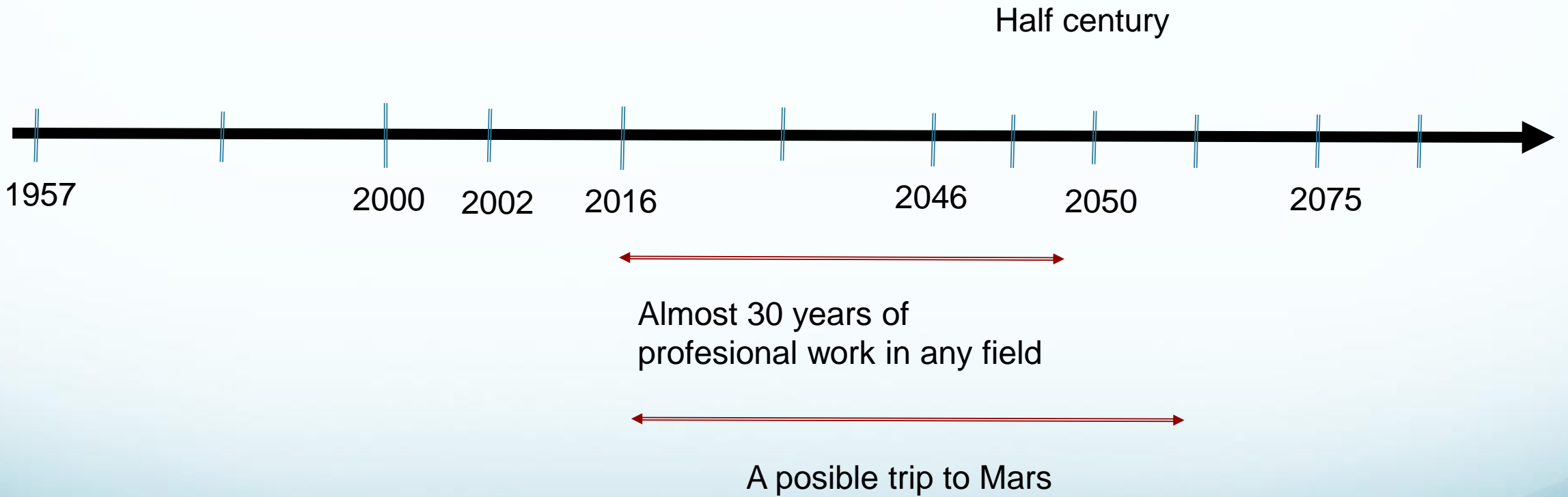
SOUTH AMERICA



# Near economic future for Latin America

- Actually, The GDP for almost all the countries are low compared to other countries.
- The aerospace research is mainly focus on agricultura, minerals, pictures and wheather changes on southAmerica.

# Future in Aerospace



Thank you

Q & A