

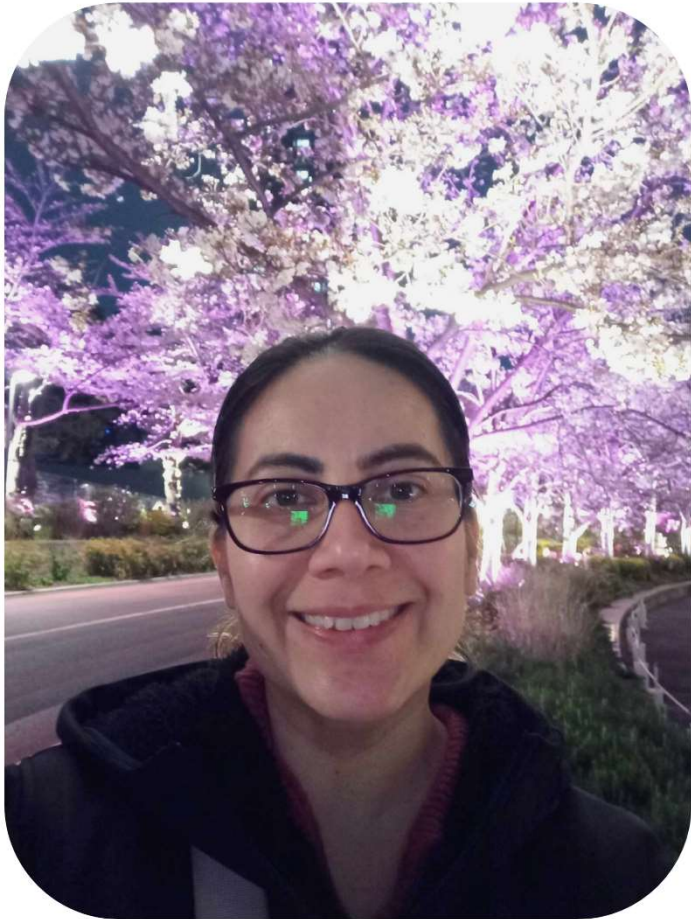
An overview of the current state of national legislation, policy and regulation in Mexico

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1. Introduction: a brief overview of nano satellite missions in Mexico.
2. Space Law in Mexico: National Legislation.
3. Current Policy and Regulation.



About me



Education

- International Studies (IDEAS), Institute of Developing Economies, Japan External Trade Organization (IDE-JETRO), Japan
- Master degree in Law, University of Granada, Spain
- Bachelor degree in Law, Autonomous University of Coahuila, Mexico



Experience

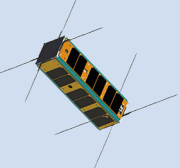

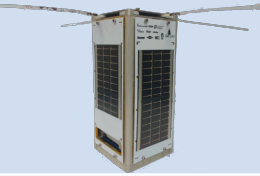

- Japan Chapter-Mexican Professionals Network
- Nihon University, Japan
- Federal Telecommunications Institute, Mexico
- Mexican Space Agency (AEM), Mexico

1. Introduction: a brief overview of nano satellite missions in Mexico.



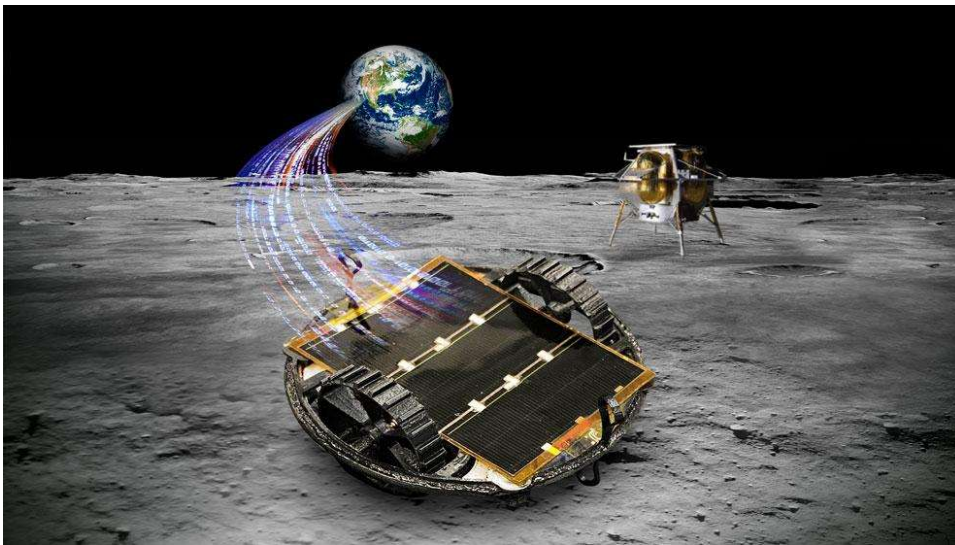
Note: *Nanosatellites completely or partially developed/integrated in Mexico and launched into orbit.*

1. Introduction: nano satellites developed in Mexico and launched

Mission	Developers	Interesting facts	Launching date
1. Painani-1 	SEDENA, CICESE, and AEM	<ul style="list-style-type: none"> • 3U CubeSat • First mexican nanosatellite launched into orbit • Launched by Rocket Lab 	June 26, 2019
2. AztechSat-1 	UPAEP, AEM and NASA-AMES	<ul style="list-style-type: none"> • 1U CubeSat • First mexican nanosatellite launched from ISS 	December 5, 2019
3. Nano Connect-2 	LINX-UNAM, CITNOVA Hidalgo and SME's	<ul style="list-style-type: none"> • 2U CubeSat • First nanosatellite completely developed in Mexico (as indicated by the developers). • Launched from India 	February 27, 2021
4. Painani-2 	SEDENA, CDA-IPN, PEU-UNAM, FI-UNAM	<ul style="list-style-type: none"> • CubeSat 3U • Launched from Cape Cañaveral by Falcon 9 Space X rocket 	June 30, 2021

1.2 Colmena Mission: first mexican project launched to the Moon

LINX-UNAM



<https://linx.nucleares.unam.mx/linx-english/>

- **Launch date:** January 8th, 2024
- **Vehicle:** Vulcan Centaur (ULA) & Peregrine lunar lander Mission One (Astrobotic)
- **Mission:** to deploy and operate **five autonomous micro-robots** on the lunar surface. Once on the lunar surface, robots would navigate and cooperate to form a single solar panel, as well as perform a series of measurements to characterize the regolit environment that covers the surface of the Moon.

1.3 Current projects: K'OTO, PAKAL, IXAYA, XGIBA



<https://www.ingenieria.unam.mx/k-oto/proyecto.php>

K'OTO

Project under development by the UAT-FI, UNAM

- **Mission:** Technology demonstration and human resources development
- **Size:** 1U CubeSat
- **Launch:** expected from the ISS



<https://www.colibrimission.com/en/projects-6>

PAKAL (Colibrí mission)

Project under development by the Panamerican University (UP)

- **Mission:** Debris assessment in LEO and human resources development
- **Size:** 3U CubeSat
- **Launch:** TBD

1.3 Current projects: K'OTO, PAKAL, IXAYA, XGIBA



<https://ixaya.cic.unam.mx/>

IXAYA

Project under development by the University Space Program PEU-UNAM

- **Mission:** Forest and Mexico City environment monitoring
- **Size:** 3U CubeSat
- **Launch:** TBD



XGIBA

Project developed by the Popular Autonomous University of the State of Puebla (UPAEP)

- **Mission:** Monitoring of active volcanoes in Mexico
- **Size:** 1U CubeSat
- **Launch:** KiboCUBE

https://www.unoosa.org/oosa/en/ourwork/access2space4all/awardees/mexico_upaep.html

1.4 Future projects: AztechSat Constellation

The **AztechSat Constellation** project is a joint initiative between **AEM** and **NASA**, in which five Mexican universities are participating:

- the National Autonomous University of Mexico (UNAM)
- the Aeronautical University of Queretaro (UNAQ)
- the Panamerican University (UP)
- the Polytechnic University of Queretaro (UPQ)
- the Popular Autonomous University of the State of Puebla (UPAEP).

The project consists of designing, building, testing and operating at least four CubeSats for animal telemetry applications, i.e., to track and monitor marine species.

<https://mexicobusiness.news/aerospace/news/mexico-nasa-collaborate-satellite-project>



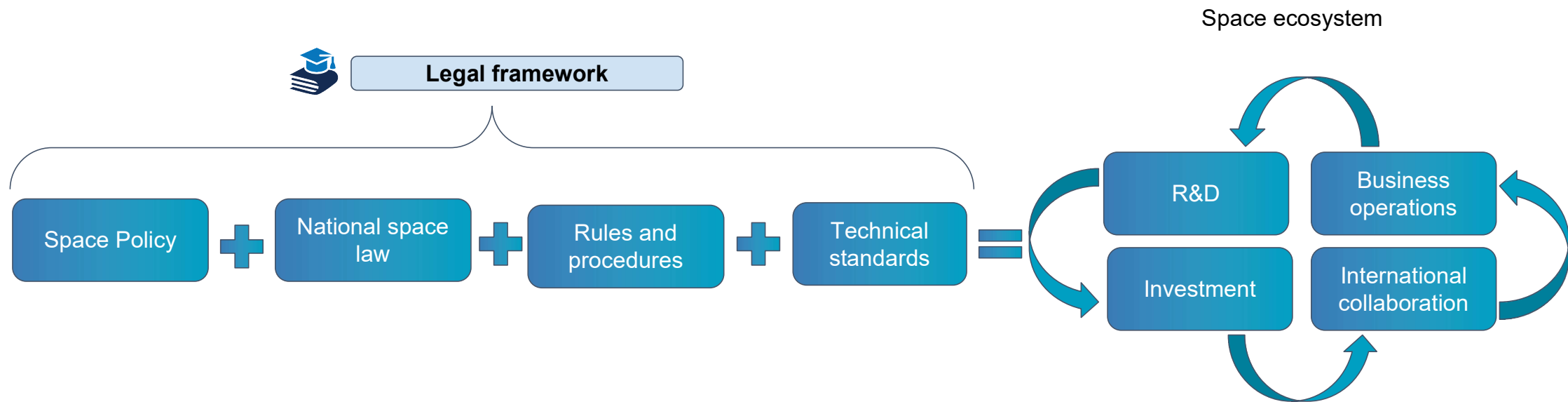
2. Space Law in Mexico: National Legislation.

Having a national legal framework is essential. Although Mexico has a space policy and a Mexican Space Agency (AEM) that represents the entity of the Mexican government in this area, it lacks a legal framework to regulate the country's space activities.



*Font: Ramos Barba, Valeria B. ***La necesidad de crear una Ley Nacional de Actividades Espaciales para México.*** Revista Electrónica “Hacia el Espacio” de la Agencia Espacial Mexicana. Septiembre 2017. Disponible en: <http://haciaelespacio.aem.gob.mx/revistadigital/articul.php?interior=566>

Why a legal framework is important?



Mexican Space Agency (AEM)

Based on Article 2, Sections VIII and XI of the Law that creates the AEM (LAEM), the Agency's purpose is: "... *to serve as an instrument of the State's leadership in this field, in order to strengthen sovereignty and receive from public, private and social entities, proposals and observations in the space area for their study and consideration...*"

AEM

AGENCIA ESPACIAL
MEXICANA

National constitutional reform proposal

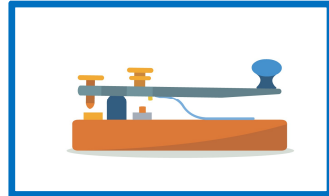
Article 28 of the Political Constitution of the United Mexican States establishes that ***satellite communication is a priority area for national development.***

Strategic Areas include, among others:

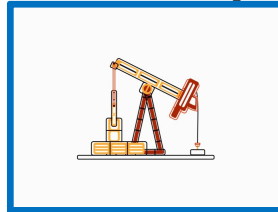
Postal service



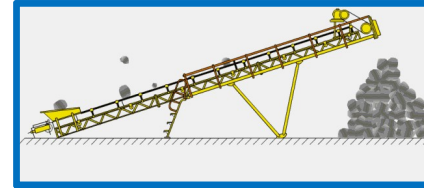
Telegraphs



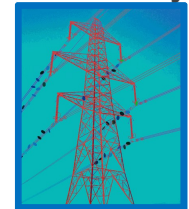
Oil industry



Minerals extraction



Electricity



Priority Areas include:

- Satellite Communications
- Railroads



National constitutional reform proposal

Amendments to Articles 28 and 73 of the political Constitution of the Mexican United States so that the congress has the power to legislate on outer space activities and that these are considered **priority areas** for national development under the terms of Article 25 of the national Constitution.

As part of its transitory articles it is proposed to generate the **National Law on Space Activities** and the secondary regulation in the space field.



3. Current Policy and Regulation.

3.1 Mexico's outer space policy

Mexico's policy on outer space comprises:

1. **The General Guidelines of Mexico's Space Policy (LGPEM).** These are the outcome of consultation forums ordered in the third transitory article of the Law that creates the Mexican Space Agency (LAEM). *The guidelines establish nine strategic objectives and thirteen General aspects of the Mexican Space Policy.*
2. **The National Space Activities Plan (PNAE).** It establishes the policy guidelines, objectives, strategies and lines of action aligned with the National Development Plan (PND) 2019-2024 and the Sector Program of the Ministry of Communications, Transportation, and Infrastructure.
3. **The Federal Government's Satellite Policy (PSGF).** This instrument only considers the Sector Program of Communications, Transportation, and Infrastructure, the National Infrastructure Program and the National Digital Strategy. *It makes no reference to the LGPEM and PNAE, instruments that constitute Mexico's outer space policy.* It mentions the AEM as the national entity that has the objective of developing space science and technology, without recognizing it as the national organization in charge of outer space, which leaves the space policy disarticulated.

3.2 Regulation

- **Federal Metrology and Standardization Law (LFMN)**, published in 1992 with the intention of standardizing metrology processes, services and laboratory tests.



- **Quality Infrastructure Law.** On July 1, 2020, a new Law was issued to replace the previous one and its purpose is to establish and develop the bases for industrial policy within the scope of the National Quality Infrastructure System, through the activities of normalization, standardization, accreditation, conformity assessment and metrology.

The new law has the purpose to promote economic development and quality in the production of goods and services. It is intended to:

- Expand productive capacity and continuous improvement in value chains
- Promote international trade and to protect the legitimate objectives of public interest described by the new law

With the support of the General Directorate of Standards of the Ministry of Economy (SE-DGN), on March 22, 2016, the **Technical Committee for National Space Standardization (COTENNE)** was created. It has the purpose of developing **Mexican Standards (NMX)** for materials, component and equipment for the development and operation of aircrafts and space vehicles.

So far, 3 Mexican standards have been published in the space sector:

Designation	Standard name
NMX-AE-001-SCFI-2018	Space systems – CubeSat design, requirements and classification
NMX-AE-002-SCFI-2019	Space systems – Risk management
NMX-AE-003-SCFI-2021	Space Systems – Electromagnetic compatibility requirements

Currently, there are 5 drafts of NMX being reviewed by the Committee, which are briefly described in the **National Quality Infrastructure Program 2023:**

Category	Subcategory
Space Systems	Harnesses - Crimping
Space Systems	Structural Assemblies and Components (ICS: 49.140)
Space Systems	Design, qualification, and acceptance testing of small space vehicles and units (ICS: 49.140)
Space Systems	General test requirements for launch vehicles (ICS: 49.140)
Space Systems	Structural design – loads and induced environment (ICS: 49.140)

Conclusion

- It is essential that the **national constitutional reform** to be approved so that outer space activities are considered priority areas. This will enable the creation of the **National Law on Outer Space Activities** and secondary regulation of the sector.
- It is important to foster a better regulatory environment for outer space sector in Mexico to promote **competitiveness, quality, innovation** and **technological development**, which will provide new opportunities to enter **international trade and business**.

Thank you!

