

SATELLOGIC<sup>®</sup>

BRINGING SPACE DOWN TO EARTH

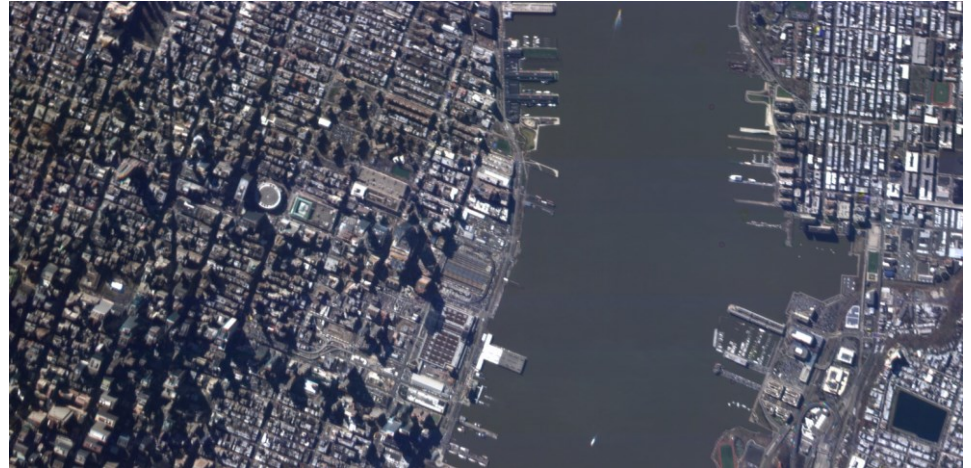
Commercial-grade Affordable Earth Observation in Real-time



Bringing Space Down to Earth

# Mission Overview

Adrian Sinclair  
Satellites Operation Manager



# Some figures

Current status...

Headquarters in Buenos Aires, Argentina for  
Ops R&D, finance, 100 employee's

Manufacturing Plant in Montevideo, Uruguay

Sales in USA, Image processing in Tel Aviv,  
Science in Barcelona.



# Launch History

## Cubebug 1, Capitan Beto

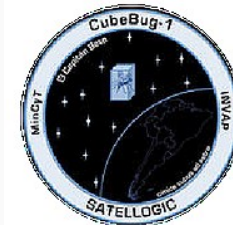
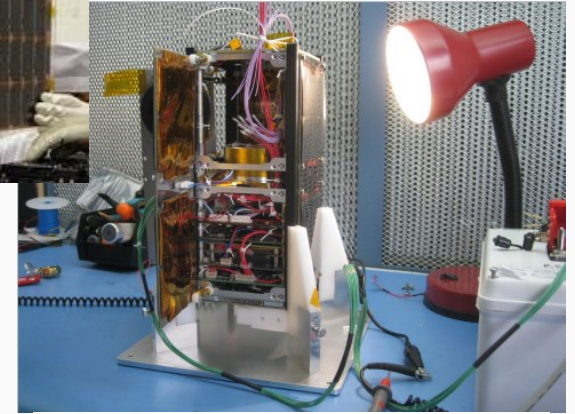
2U Cubesat, April 26th 2013  
Built in 10 months, open architecture,  
documented and public domain

## Cubebug 2, Manolito

2U Cubesat, 21st November 2013  
Reaction wheels, Star tracker, attitude  
Control

## Bugsat 1, Tita

New platform, 22 Kg launched on 19th June 2014  
from Dombarovsky Russia by Dnepr rocket.



# Aleph-1 Constellation

Real-time imaging of the entire planet on a daily basis

One-meter resolution multispectral imaging

Precision agriculture, food production

O&G Pipelines monitoring

Cartography Urban planning

Natural resources / Climate change

Disaster response

Infrastructure monitoring

Hyperspectral data for science, for free

AGRICULTURE



PIPELINE MONITORING



CRITICAL INFRASTRUCTURE  
MONITORING



BUSINESS INTELLIGENCE



DISASTER RESPONSE



AND A WORLD OF NEW  
APPLICATIONS



# Payload description

ALEPH 1 - PAYLOADS	Panchromatic	Multispectral	Hyperspectral	Thermal Infrared
Ground Sampling Distance	1m	1m	30m	90m
Swath	5km	5km	150km	92km
Spectral Bands	400-900nm	400-690nm 400-510nm 510-580nm 580-690nm 750-900nm	400-900nm up to 600 spectral bands 5nm FWHM	8 $\mu$ m-14 $\mu$ m 0.01K resolution
Modulation Transfer Function at the Nyquist	> 15.00%			
Dynamic Range	54dB raw / 66dB HDR			
Signal-to-Noise Ratio	43dB			
Boresight	25 deg			
High Definition Video	720p, 1080p, 4K, in every spectral band			

# Aleph Constellation

## **TT&C:**

Uplink in S band

Downlink in X Band @100 Kb/s custom protocol

## **Payload:**

Downlink in X Band DVBS-2

Also has a semi duplex UHF Ham frequencies @ 20Khz BW for experiments and linear transponder UHF/VHF @30 Khz BW



# Ñusat 1 (Fresco) and Ñusat 2 (Batata)

Launched in May 30th 2016 from China  
40 cm × 43 cm × 75 cm, 37 kg mass  
Orbit is 500 km sun synchronous orbit with an inclination of 97.5° with a 10:30 LTAN.





# Future launches

Nusat-3:

Orbit 500 km 43 deg

Launch on June 2017

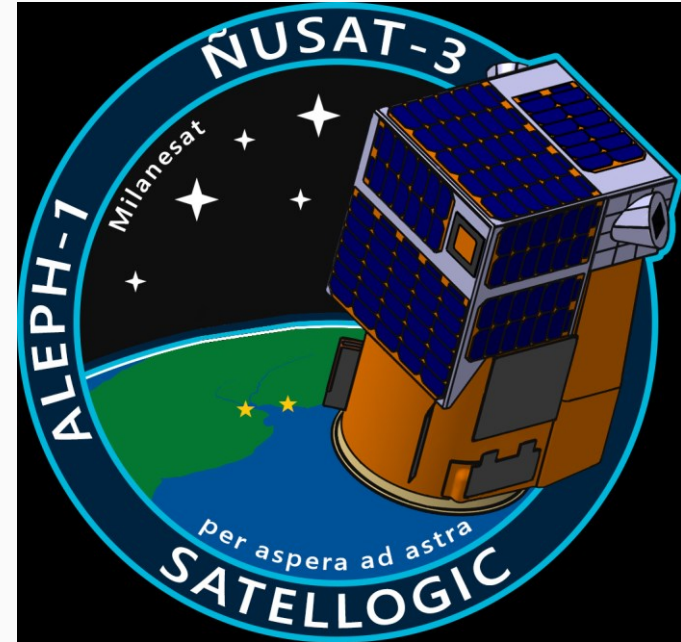
Nusat-4/5

Orbit 500 km 43 deg

Launch on Aug 2017

Nusat-6 Orbit 500 km SSO

Launch on TBD in 2017



# Ground Segment

Downlink telemetry in X band 8030 Mhz @ 1 Mhz BW RHCP (Custom Protocol)

Uplink Telemetry in S band in 2080 Mhz @ 1 Mhz BW RHCP (Custom Protocol)

Downlink Payload Data in X band 8050 to 8100 Mhz @ 40 Mhz BW RHCP in DVBS2 protocol.

## **Ground Station requirements:**

**Payload:** Downlink gain 44 Dbi, Noise figure 0.8 Db, DVBS2 Modem

**TT&C:** Uplink gain 32 Dbi, Uplink S band power 30 Dbm, USRP to our own equipment

# Ground Segment

## Svalbard, Norway

Provide more than 10 passes per day, 2 antennas to support 2 satellites at the same time on polar orbits

## Cordoba, Argentina

Located in CONAE facilities for Nusat-3  
Support for 6 passes per day (43 deg)



# Frequency Coordination

UHF channels in ham radio frequencies, were coordinated through AMSAT-LU to IARU

S/X bands via local administration with API preparation application SpaceCap

Coordination request were received from different countries to avoid harmful interference.



# Thanks for your attention

Questions ?

