

# “ITALY IN SPACE: From the Malindi Base to the Space Economy”

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SAPIENZA  
UNIVERSITÀ DI ROMA



# WE HAVE ALL GREEN LIGHTS

The launch of the first Italian Satellite  
from the Ocean Launch Base at Malindi, Kenya  
26 April 1967

**The building of the Launch Base in Malindi (Kenya) in 1966 can be considered as an epic event in the history of space activities.**

**It was the first launch base built on a sea platform, IN ONLY TWO YEARS, by a small group of professors and members of the Italian Air Force, by using very basic tools and technologies, in a wild ambient mostly unknown to them.**

**The base camp was in tents, among animals typical inhabitants of a jungle, without phone or communication media.**

# WE HAVE ALL GREEN LIGHTS

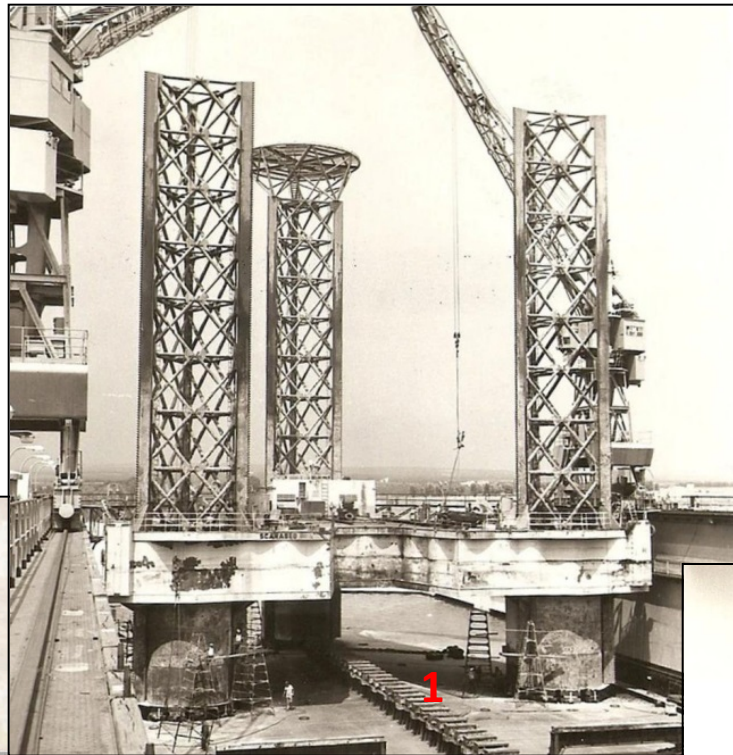
The launch of the first Italian Satellite  
from the Ocean Launch Base at Malindi, Kenya  
26 April 1967

**The Malindi Launch Base included two rebuilt rusty sea platforms:**

- *The S. Marco Platform was a 2° World War platform used by US Navy during the Normandy landing, and it was sold to Italy for 1 \$*
- *The S. Rita Platform was an ocean gas platform given for free by ENI*

**1**

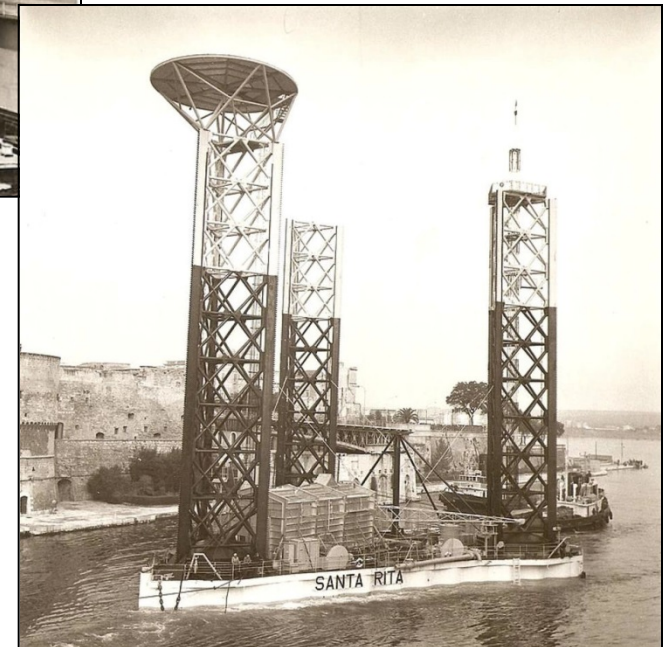
The ocean ENI gas platform  
“Scarabeo” in  
navigation in the  
Suez Channel



**1**

**3**

Santa Rita left Taranto  
on 20 December 1963,  
shipping to Mombasa

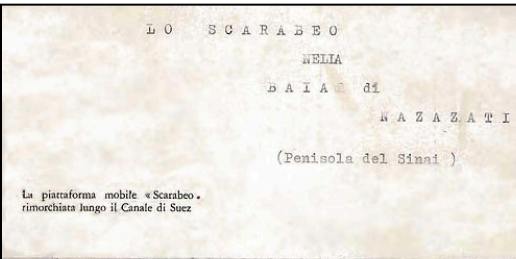


SANTA RITA

The “Scarabeo”,  
(renamed Santa Rita)  
during the  
refurbishing phase at  
in Taranto



**2**



LO SCARABEO

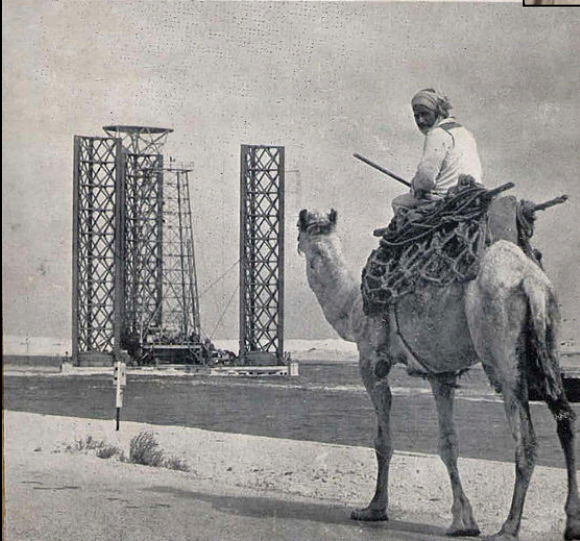
NELIA

BAIA di

RAZAZATI

(Penisola del Sinai)

La piattaforma mobile «Scarabeo»  
rimarchiata lungo il Canale di Suez





A tough adventure happened to the Santa Rita, lost in the Indian Ocean after breaking the ropes from the main-ship during a heavy storm. The event was reported in the first page of the “Domenica del Corriere” on 19 January 1964, by the drawing of W. Molino



The Santa Rita, arrival in the port of Mombasa on 1964



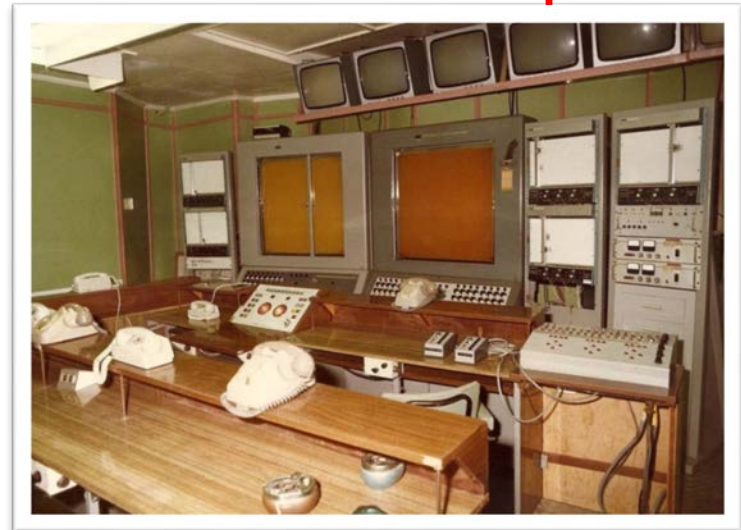
# The San Marco Base



# The Entrances



# The Control Room in the S. Rita platform



The Malindi Broglio Center is still very active today, with open collaboration with Kenya and other countries

# **AS YEARS ELAPSE THE SPACE ACTIVITY CHANGES ITS NATURE PASSING FROM THE PIONEER AGE TO SPACE ECONOMY**

## **1950-1990 The Access to Space of scientific missions**

- Motivated by Military supremacy :
  - Second World War (birth of the German missile V2)
  - USA e URSS Cold War : development of heavy ballistic missiles
- Just few actors and projects of great visibility

## **1990 -2010 The pacific collaboration age**

- Sophisticated technologies are developed to support space access, new satellite systems and space robotic applications

## **RECENT YEARS The Satellite Applications**

- Large development of satellite telecom
- Development of sophisticated sensors for deep space and earth observation
- Development of new capability to transmit and manage BIG DATA files

## **FUTURE Space will provide new business opportunities**

- Private Investments in space may result in big economic gains

# The Heritage of the San Marco Project

During the 80's also Italy fully enters in the space activity and it has been following the same roadmap.

Scientific research and national industry start collaborating in international programs that yield a multiply effect in their grow.

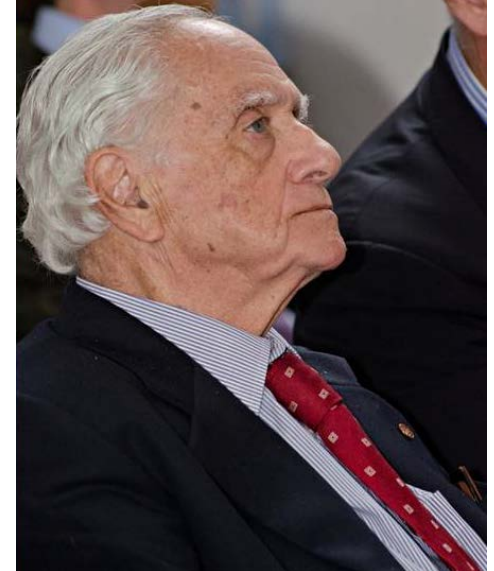
**1980:** Sapienza activates the five year Degree in Aerospace Engineering (*today 1400 studenti + 3 Professional Masters + 1 PhD Program*).



*The scientific activity passes from the initial small group of professors led by **Luigi Broglio**, and then by **Ugo Ponzi**, to an activity linked to the development of national industrial capabilities, with participation to important International Programs: SAR technology for EO, Programs like Cassini-Huygens, Mars Express, VEGA.*

**1988:** the Italian Space Agency ASI is established ...

*In all these views an important role is played by **Carlo Buongiorno**, first DG of ASI and visionary inspirational of some of the major space programs in those years.*





Many researchers of CRAS-Sapienza are Principal Investigators in International Space Programs during 80' and 90'

**This is the result of a historical integration between University and industry**

- **SAR radar development** which supports **the CosmoSkyMed Program**, the most advanced international application of dual technology for earth observation programs, led by **T. Bucciarelli** and **P.F. Lombardo**
- **Mars Exploration**, with the group created by **G. Picardi** and **R. Seu**, which first discovered trace of water under the Mars surface
- **Cassini and Titano missions** with the group led by **L. Iess**
- **Astrophysics studies** and **Stratospheric Balloons** projects by **P. DeBernardis** and **S. Masi** team
- **VEGA, Solid Rocket Motor ESA Program** in which prof **M. DiGiacinto** and **B. Favini** gave contributions highly recognized internationally
- **Liquid Rocket Engines based on LOx-Methane propellants**, with the group led by **M. Onofri**, **F. Nasuti** and **M. Valorani**
- **Materials and Smart Structure Studies**, with the groups led by **T. Valente** and by **P. Gaudenzi**
- **The support to the ESA IXV Re-entry vehicle Project** by the group led by **M. Onofri** and **R. Paciorri**
- **The robotic and artificial intelligence applications** performed by the groups of **D. Nardi**, **F. Pirri** and **S. Monaco**
- **The Earth Observation applications** led by **M. Pierdicca**, **F. Marzano**, **M. Marsella**
- **DIS-A. Ruberti** is widely recognized as one of the most important Dept in Informatics

# ITALY TOWARDS THE SPACE ECONOMY

## **A major change has been occurring in Italian Institutions**

- Higher political attention towards the development of new technologies, particularly aerospace
- New funding rules want to award enterprise skills

## **The complexity of activity in high technology sector requires capacity to make system among the principal actors:**

- Within the industrial world (synergy among large enterprises, and SME's)
- Among Industry, Research and Education.

## **The government has also started new methodologies to support more strategical activities:**

- MIUR created the National Clusters for Technology (CTN). In case of aerospace, the CTNA



**CTNA** was established by the Ministry of Education & Research (MIUR) to strengthen the **government industrial policy in the Aerospace sector**.

It aims to support the national Aerospace Stakeholders in increasing their technology levels by creating networks and collaboration among industries, universities and research entities.

CTNA Strategic Plan is aligned and consistent with EU and National Aerospace programs, **MIUR-PNR**, **MISE-SpaceEconomy**, as well as **Horizon 2020**

CTNA aims to ensure Italian Aerospace proactivity both in

- **Aeronautic Sector**, meeting the challenge of "**smart, eco-sustainable and integrated Transport System**",
- **Space Sector**, requiring a competitive **Industry-Research** collaboration



In the Space sector the **Satellite Applications** are the most important result of activity for the benefit of the planet population in the future.

- They mostly rely on satellite operations of Earth Observation, performed at LEO orbits. They in fact facilitate:
  - *Emergency management*
  - *Safety and Security*
  - *Control of agriculture*
  - *Meteorology*
  - *Communications*
  - *Control of human and good mobility*

The Main Strategic Goals of the Italian Space Policy are thus:

- To make EASIER the **ACCESS to LEO** Orbit
- To perform **Satellite Applications** in LEO Orbit
- Scientific Exploration in Interplanetary Programs & EXOMARS

## EASIER ACCESS to LEO by:

- New ESA LAUNCHERS with development of the SRM P120 for ARIANE 6 and VEGA C
- FUTURE DEVELOPMENT of the small VEGA Launcher, based on a new upper stage using LOX Methane propellants
- Re-entry Vehicles with the SPACE RIDER Program

## SATELLITE APPLICATIONS by

- COPERNICUS / GALILEO for monitoring Earth ambient, Security, Meteorology
- New Management tools & infrastructures for handling Big DATA files
- EARTH OBSERVATION, with
  - new SAR (CosmoSkyMed)
  - Multispectral Optical Technology
  - Development of Mini-satellite and Constellations
  - Stratospheric Platforms

# CTNA – The Regional Specialization Strategy

The close collaboration among Italian Regions, MIUR, and MISE has assigned to

**CTNA** the responsibility to build a **Regional Specialization Strategy**, able to harmonize the different regional interests with the national strategic government goals.

In this view **CTNA** mission is also **to coordinate entities operating in Regional Districts** to participate to International Projects and Partnerships, where Italian Space Community can lead winning proposals.

**CTNA is thus working to activate all possible synergies for offering widespread opportunities of collaboration for growing collaborative space activity also in other countries**

