

Cosmic Exploration: Leonardo and Mars Exploration

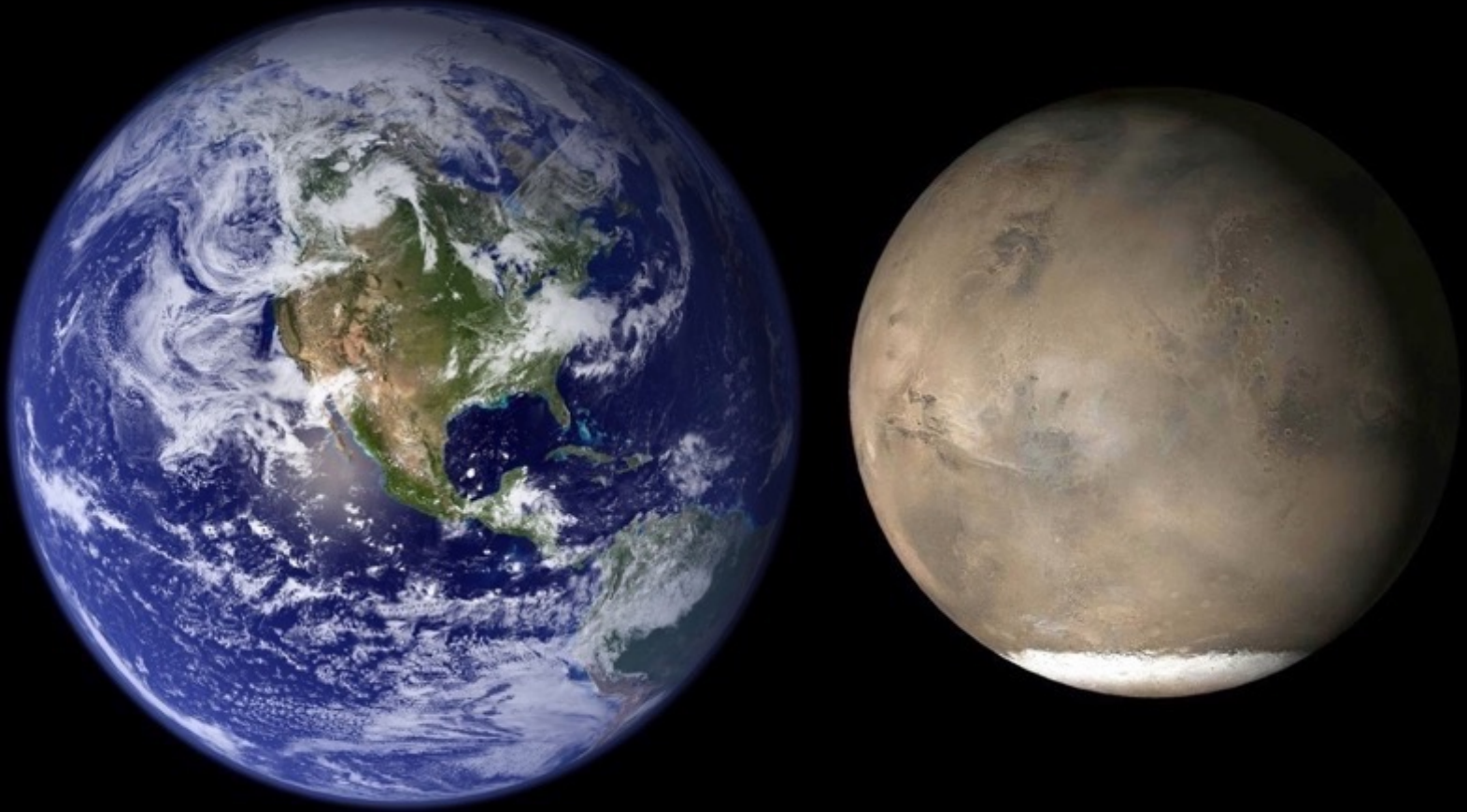
presented by

Dr. Charles Elachi

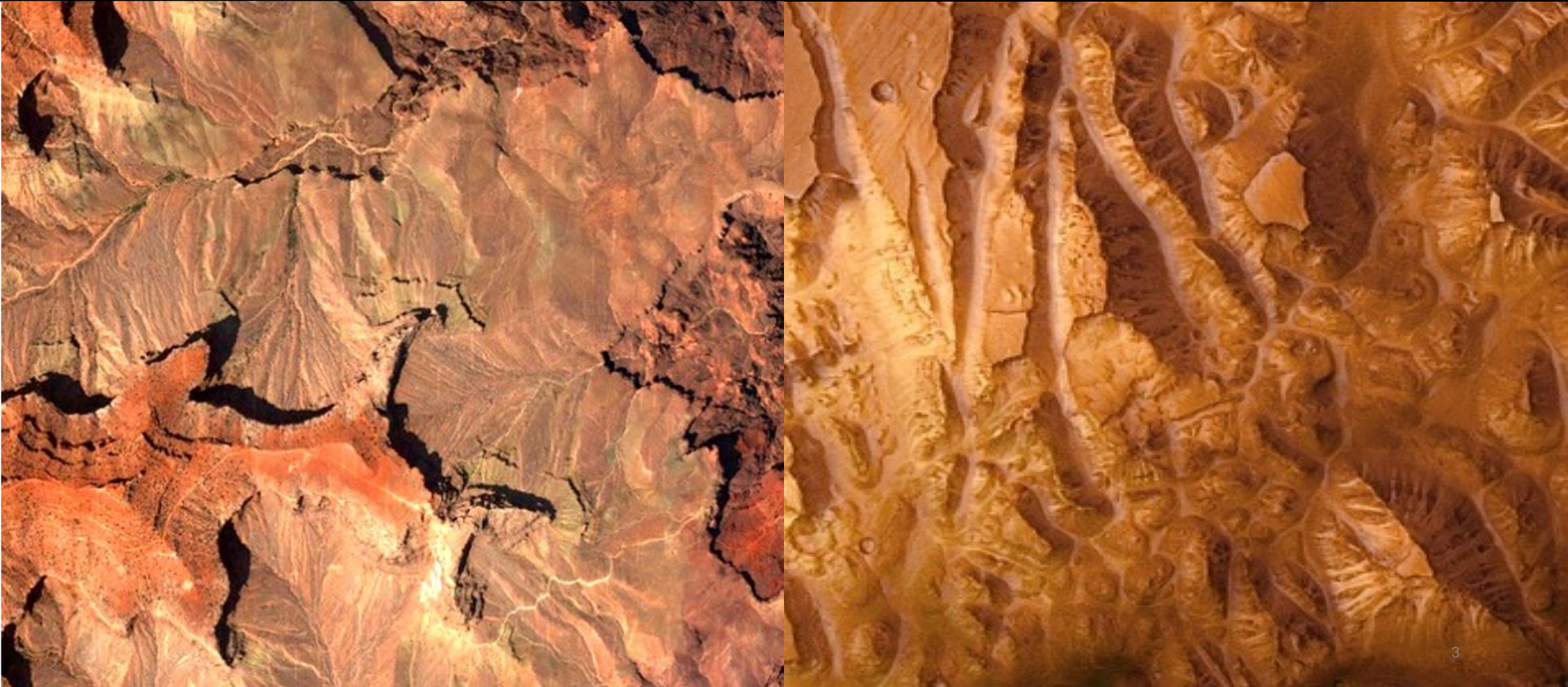
Professor, Electrical Engineering and Planetary Science, Caltech
JPL Director 2001- 2016



Earth and Mars Share Several Features



Grand Canyons



Geology



Perseverance First Steps





UTC
268:07:31:07
CASSINI PLUNGE
-000:04:24:09
JUNO J01
+438:04:12:02

CHARLES ELACHI MISSION CONTROL CENTER



Landing on Mars

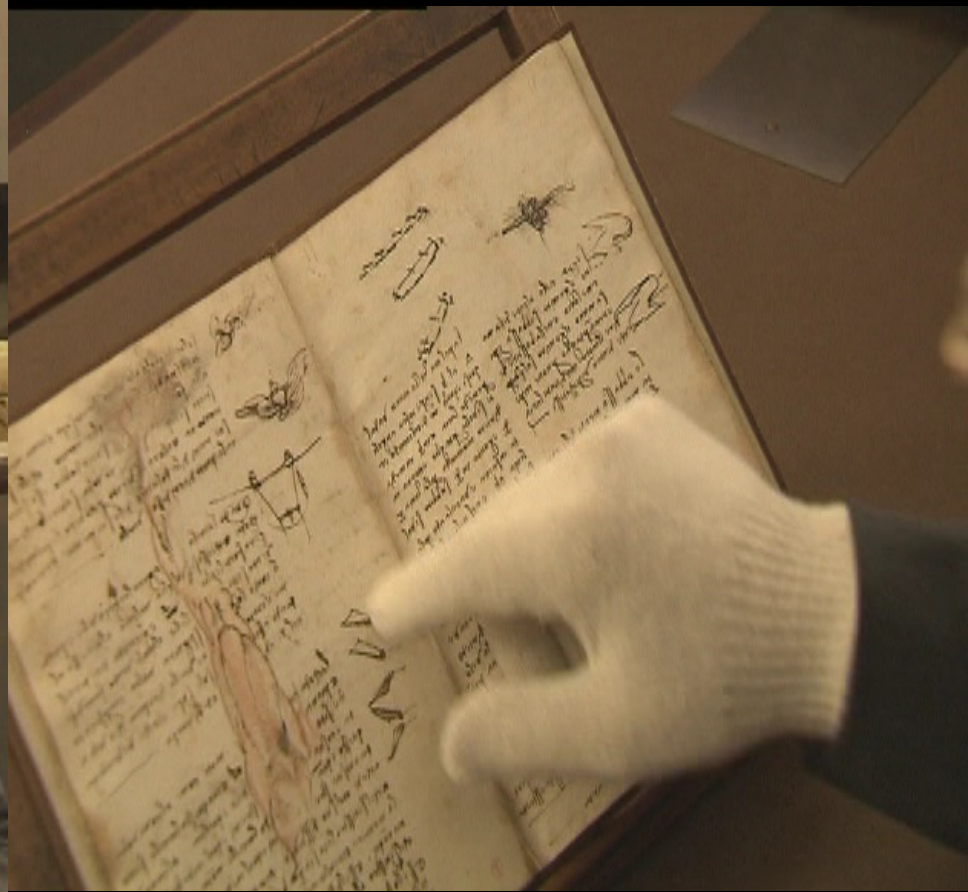
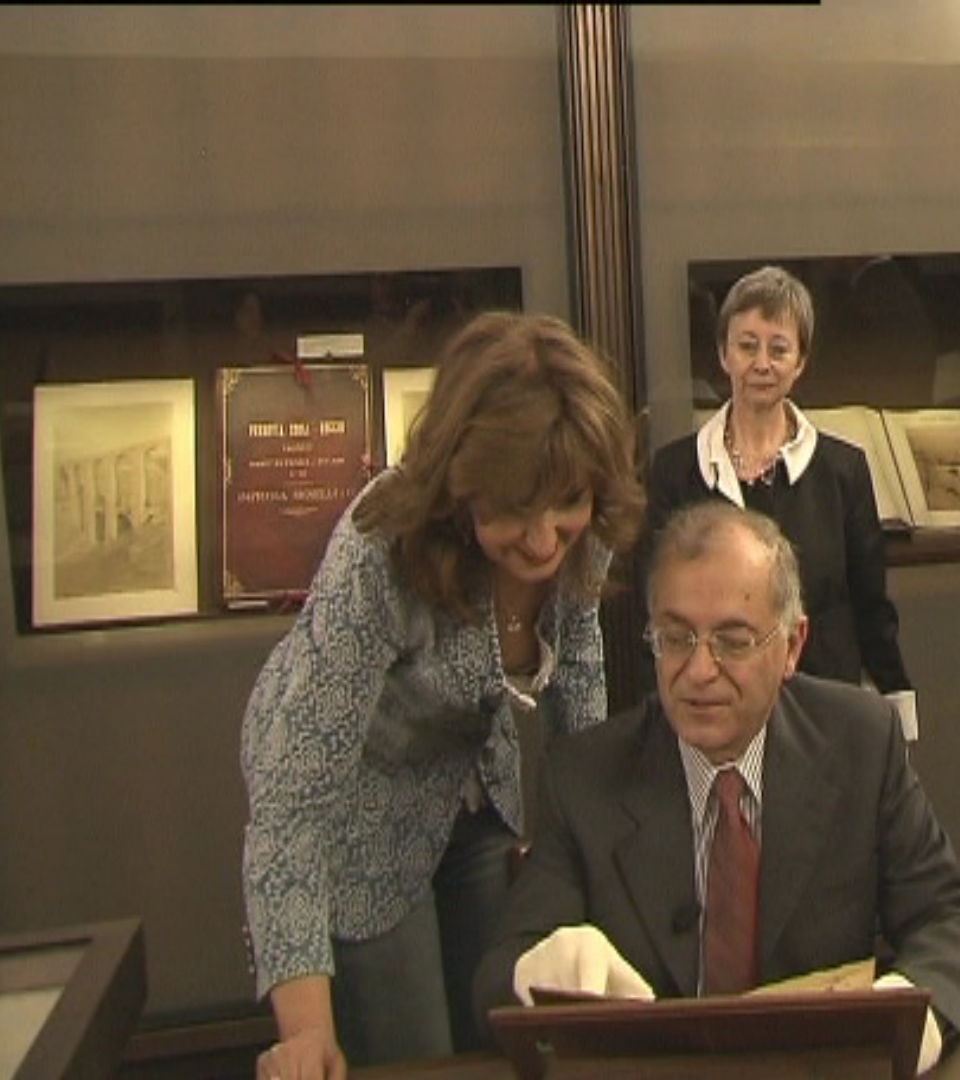


Ingenuity



Third Flight on Mars



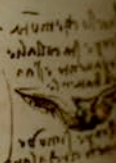


Handwritten text in Arabic script, likely a preface or introductory section of a manuscript.

Handwritten text in Arabic script, continuing the manuscript's content.

Handwritten text in Arabic script, including a section with a red heading.

Handwritten text in Arabic script, concluding the page's content.

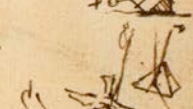


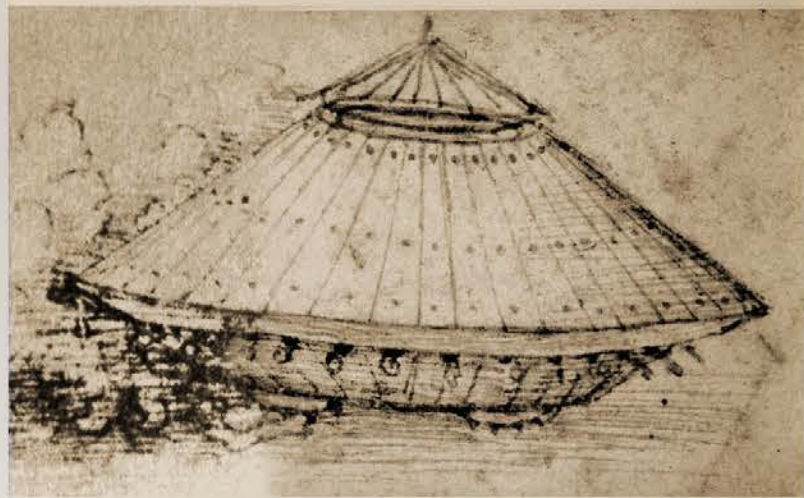
Handwritten text in Arabic script, starting with a page number '1' at the top right.

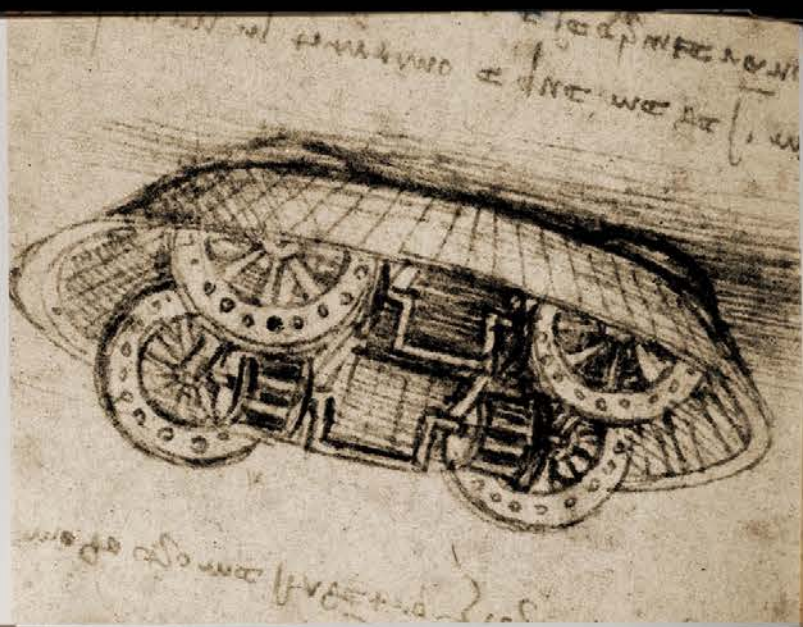
Handwritten text in Arabic script, featuring several diagrams of geometric shapes.



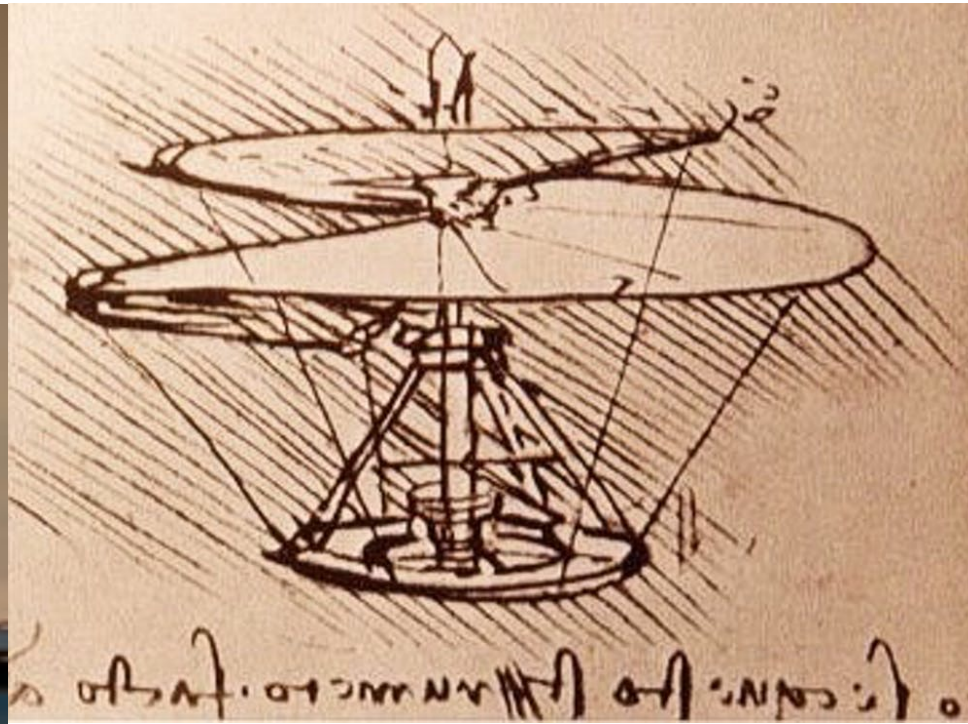
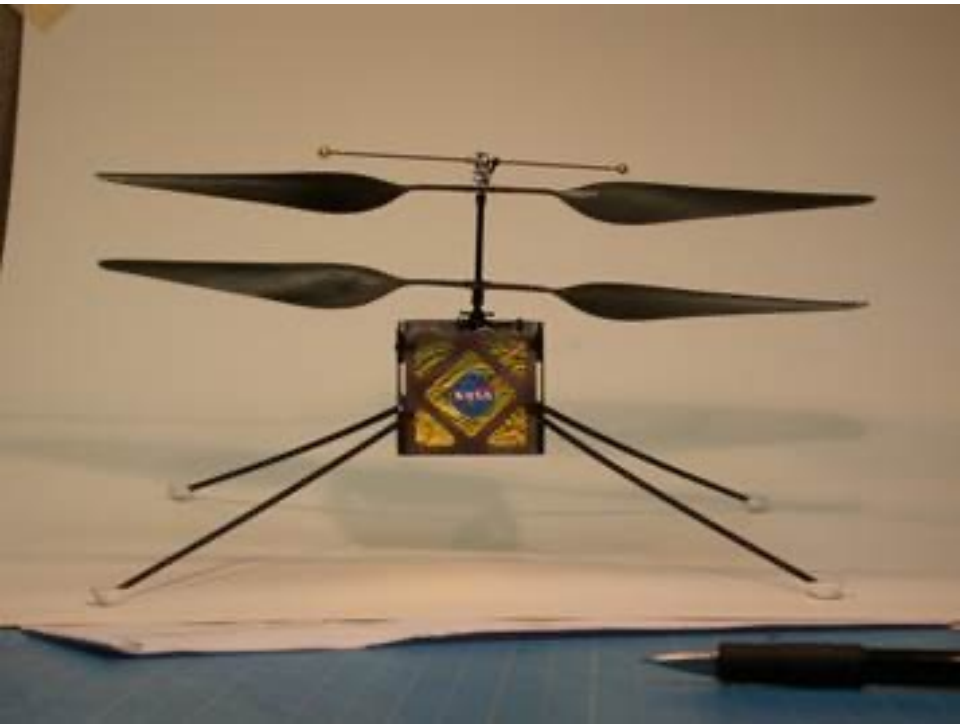
Handwritten text in Arabic script, including a section with a red heading and a drawing of a bird.







Mars Helicopter





Handwritten text in Italian, likely describing the anatomy of the hand and forearm. The text is written in a cursive script and is arranged in several lines.



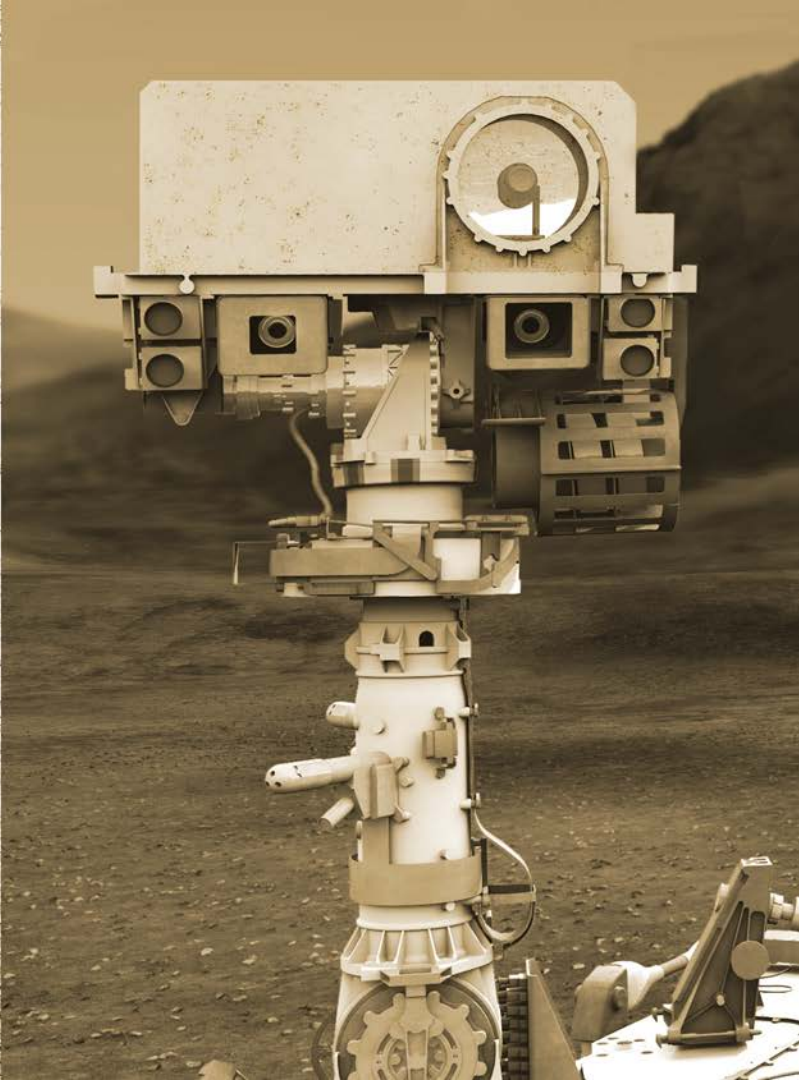
Handwritten label for the anatomical drawing, possibly identifying the bones or the view.

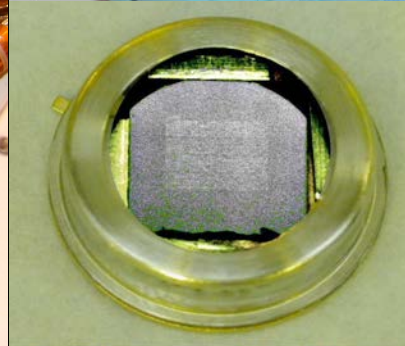
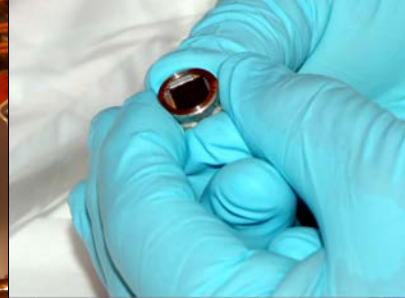
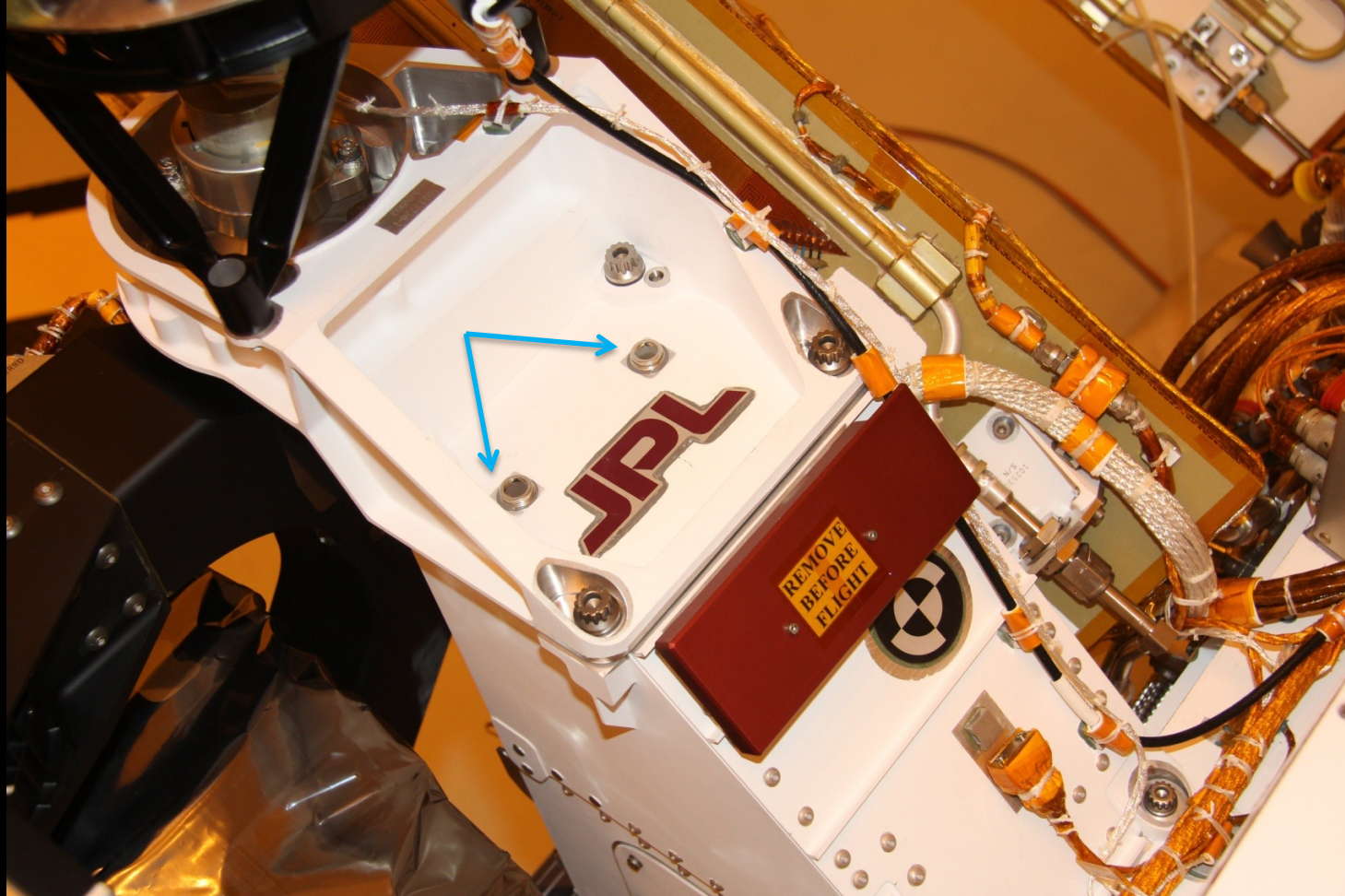
Handwritten text in Italian, likely describing the anatomy of the hand and forearm. The text is written in a cursive script and is arranged in several lines.



Handwritten text in Italian, likely describing the anatomy of the hand and forearm. The text is written in a cursive script and is arranged in several lines.







Chips Also Contain 1.25M+ Names of People from around the World

Apollo 11 & Curiosity Rover



*"Do not go where the path may lead. Go instead
where there is no path and leave a trail."*

- Ralph Waldo Emerson





Dare Mighty Things