

# General Nobile and the Airship *Italia*: No Second-In-Command



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# Disclosure Information

*88<sup>th</sup> Annual AsMA Scientific Meeting*

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# Umberto Nobile: Aeronautical Engineer

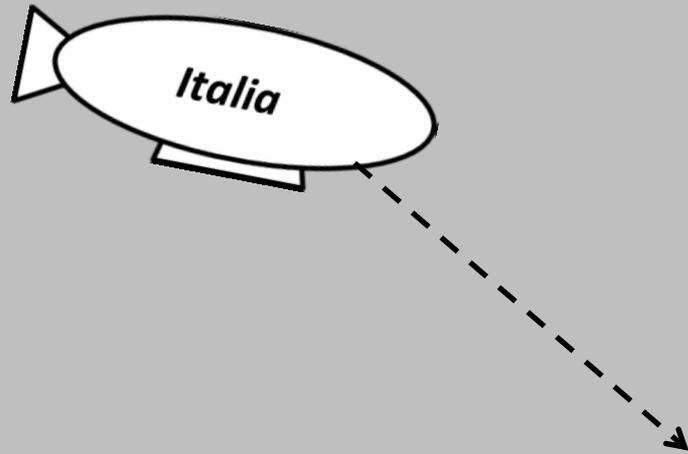
- May 11-14, 1926: Flies airship *Norge* over North Pole
  - Raould Amundsen (Norwegian) & Lincoln Ellsworth (American) on board
- May 23-25, 1928: Flies another airship, *Italia*, to North Pole
  - During return crashed in the Arctic on May 25, 1928
  - Multi-national search & rescue effort; Amundsen (not on the flight) is killed during rescue effort



# The Mishap Sequence (May 25, 1928)

# 9:25 AM: Airship makes uncommanded descent, due to frozen elevator control

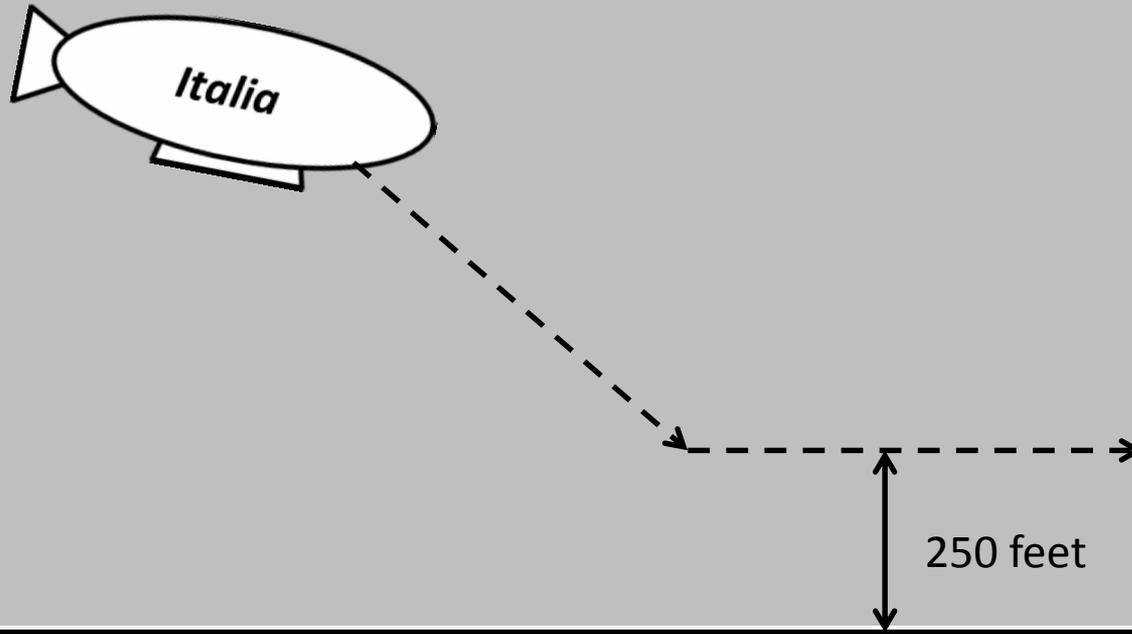
Cloud Cover



Ice Cover

> 9:25 AM: Descent halted when Nobile orders motors stopped

Cloud Cover



Ice Cover

> 9:25 AM: Airship starts to rise (due to static lift)

Cloud Cover



Ice Cover

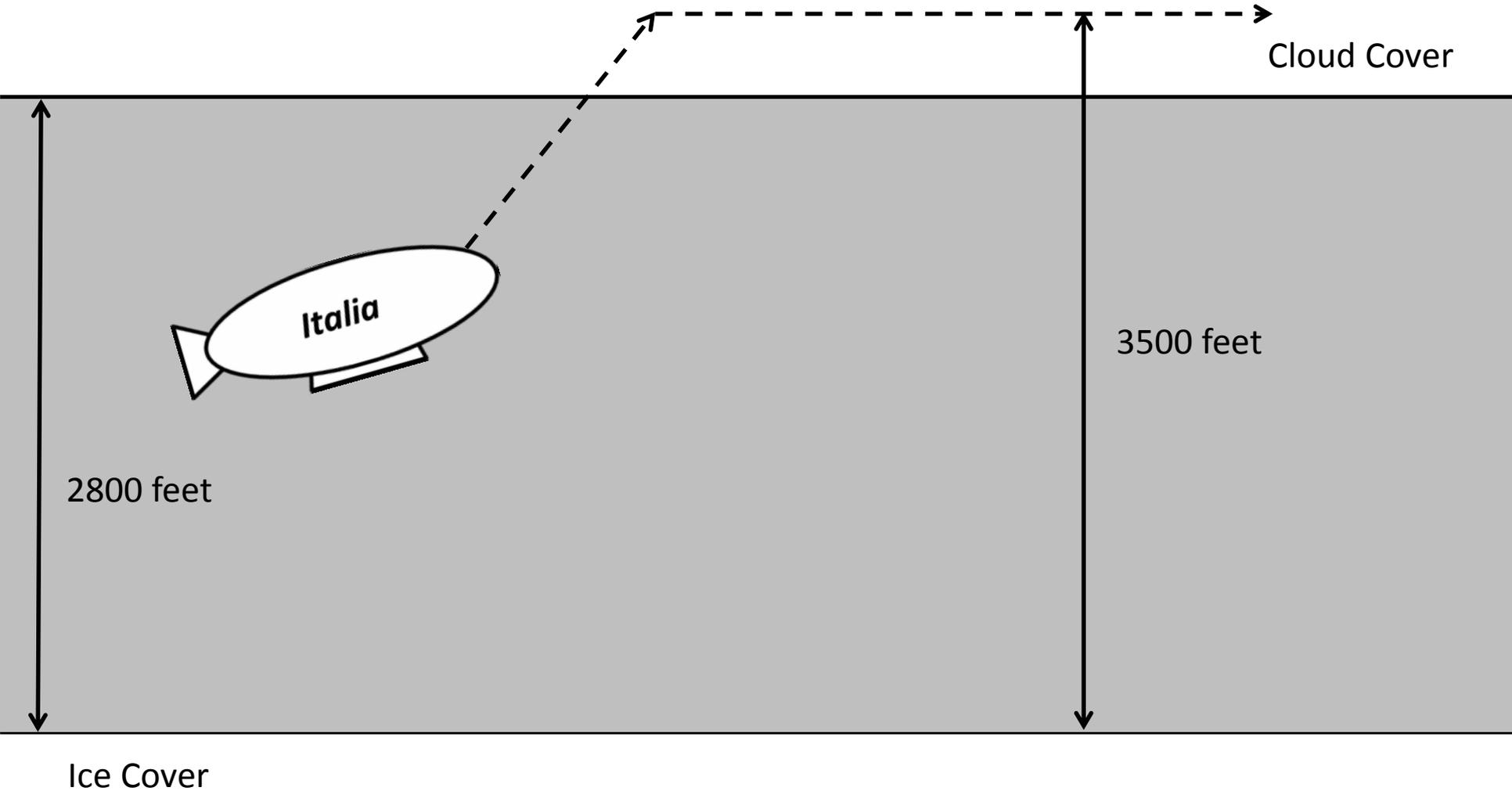
> 9:25 AM: Nobile orders release of gas to slow/halt the ascent (due to static lift)

Cloud Cover



Ice Cover

< 9:55 AM: Nobile orders ship (in continued ascent)  
above clouds to get a navigational fix on the sun



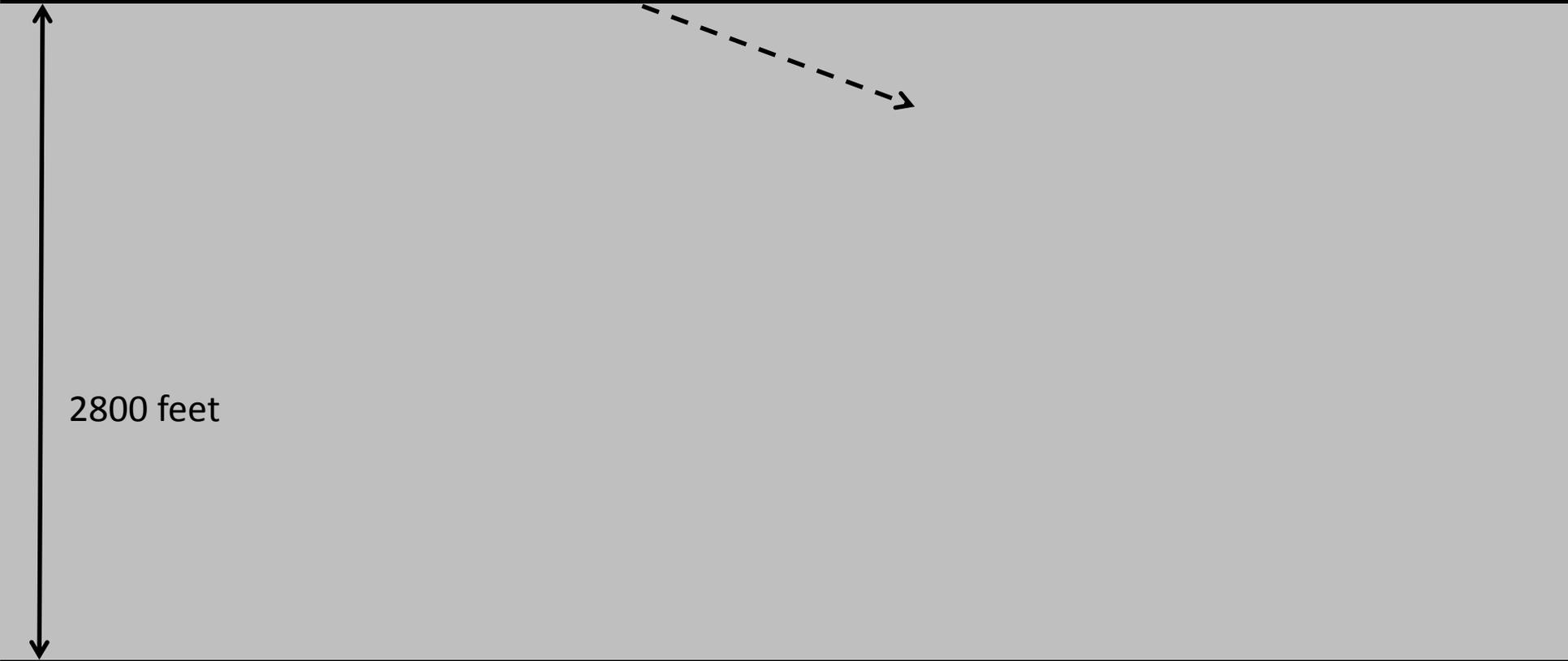
Approximately 10:20 AM: Nobile orders two motors started, and begins descent below clouds



Cloud Cover

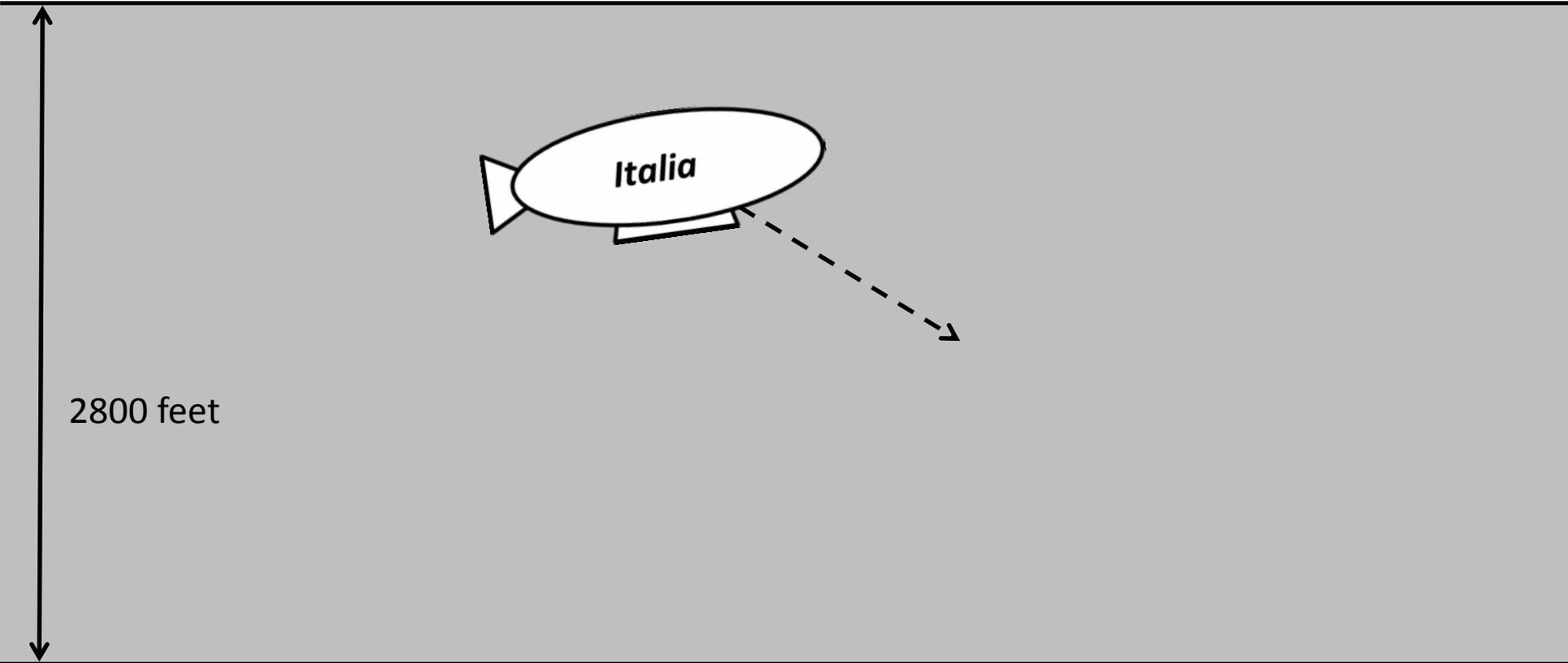
2800 feet

Ice Cover



10:27 AM: “We are heavy”;  
Descent rate  $> 1$  foot/second

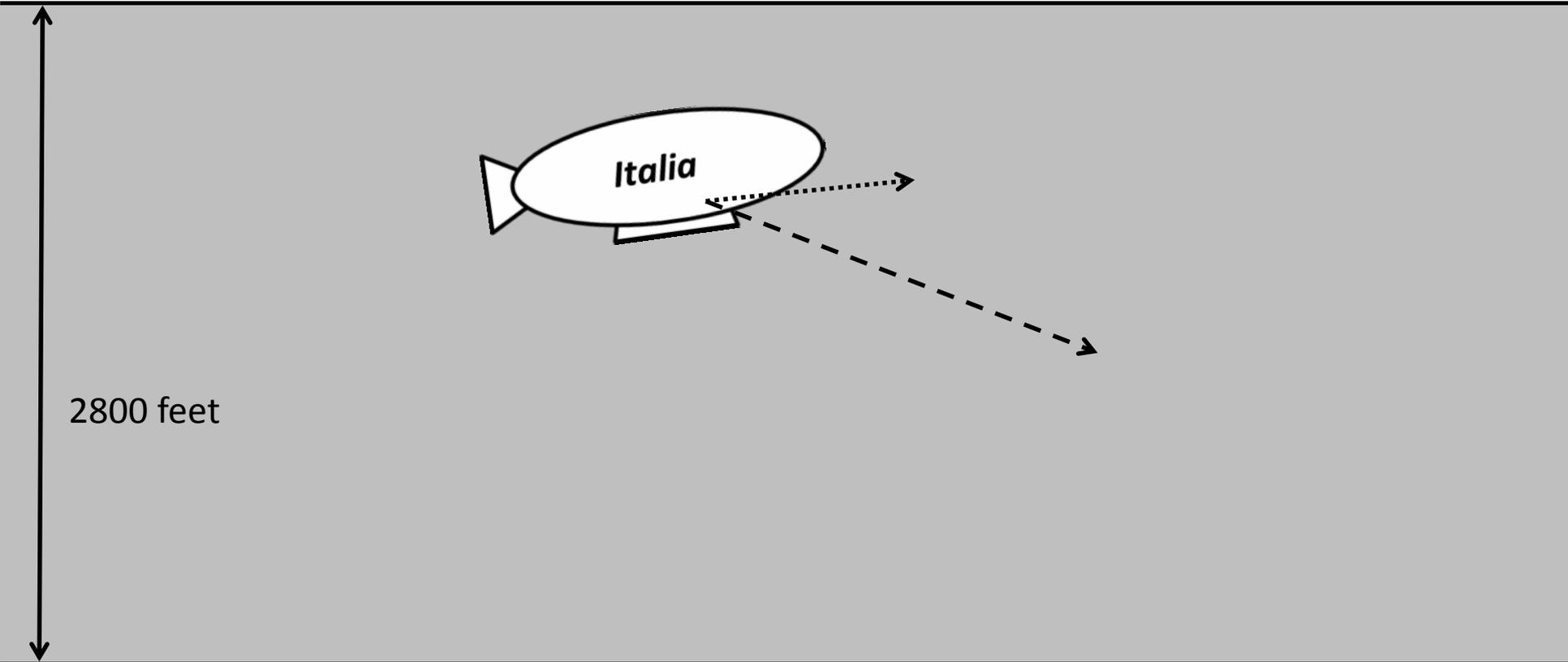
Cloud Cover



Ice Cover

10:27 AM: Nobile orders all motors to full speed (to generate dynamic lift); he orders ballast to be dropped

Cloud Cover

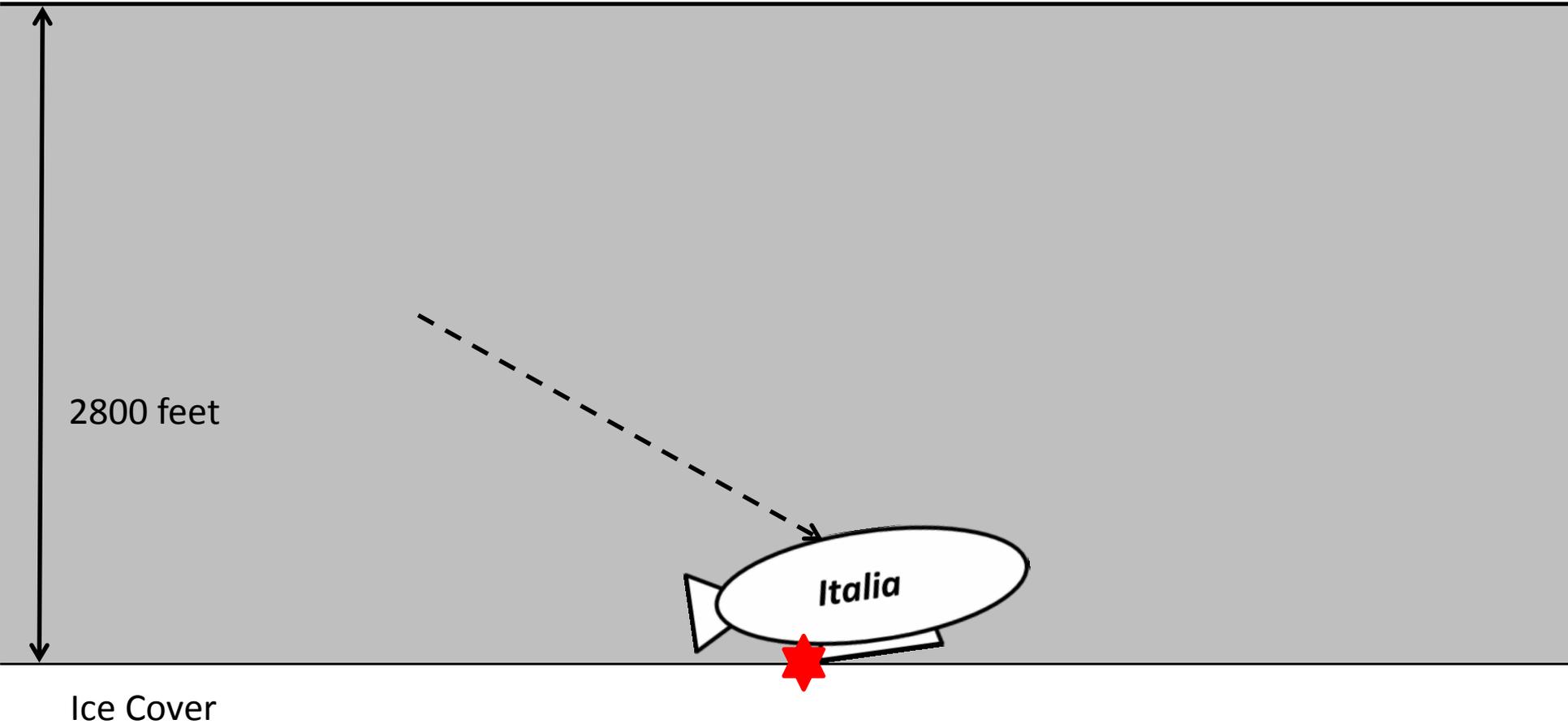


2800 feet

Ice Cover

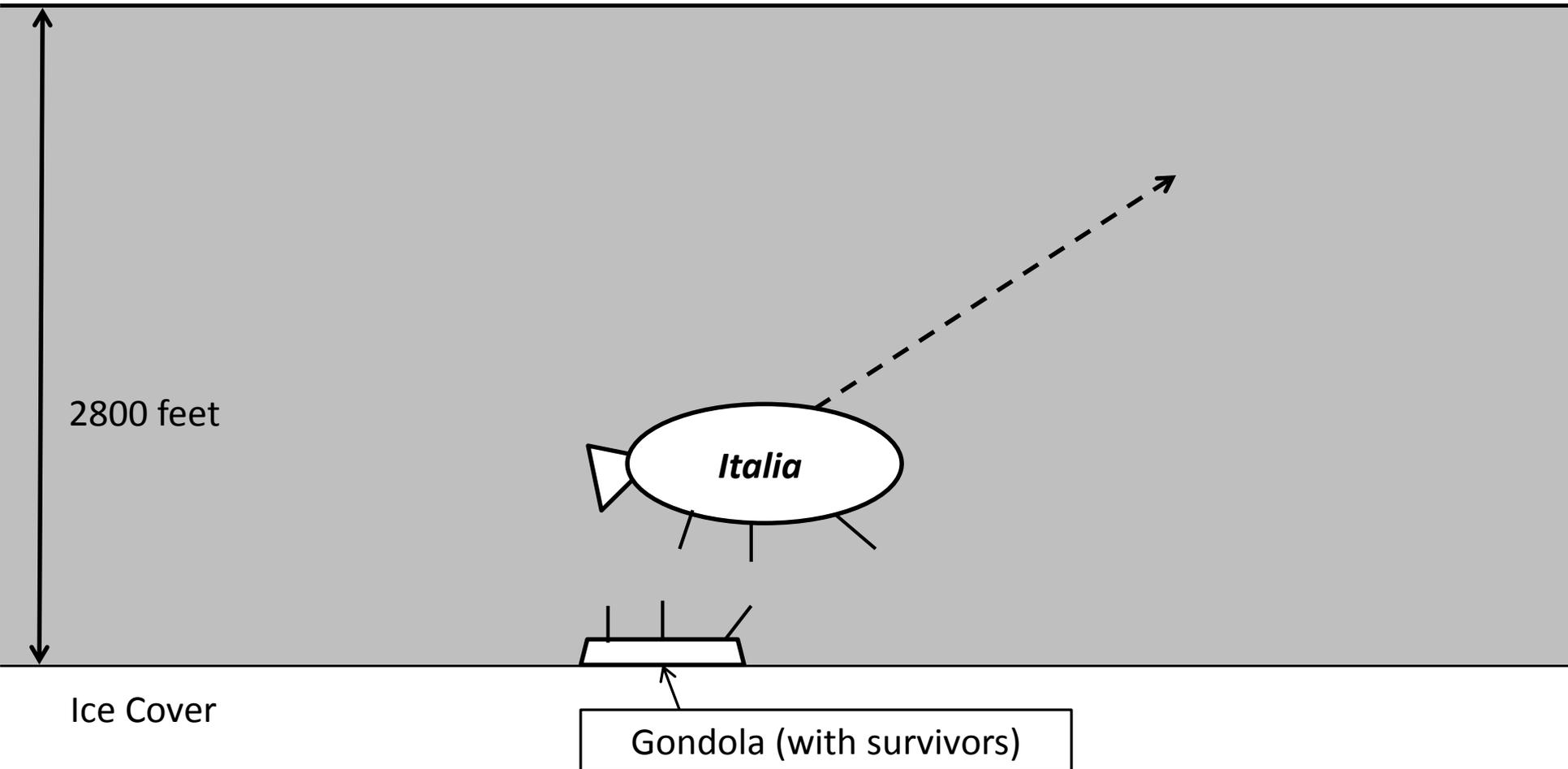
# 10:33 AM: Impact Onto the Ice

Cloud Cover



# 10:33 AM: Gondola breaks off; envelope flies away (and is lost)

Cloud Cover



# Fatigue-Relatedness of Cause



Polar Research

RESEARCH/REVIEW ARTICLE

## **Human fatigue and the crash of the airship *Italia***

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# Fatigue-Relatedness of Cause

- Nobile awake continuously at least 72 hours at time of mishap
- Cognitive functioning & overall human performance very low
- Arguably made at least two fatigue-related errors that led directly to a loss of hydrogen lift-gas, and an overall loss of lift

# Why So Fatigued?

- Question: Why was Nobile so sleep-deprived at the time of the mishap?
- Answer: Because he did not have a Deputy (i.e. a “Second-In-Command”) to relieve him for periods of rest & sleep

# Was a Second-In-Command Needed?

- A Second-In-Command was an official office designated by the Commander to make decisions and/or handle emergencies while Commander not available
- A standard practice for airships at the time, likely reflecting the practice on Navy ships
- Realization that a single person cannot function for long periods of time without sleep
- Need for decisions (e.g. emergencies) can occur at any time

# Nobile Saw the Need for a Deputy

- Nobile himself noted that a designated Second-In-Command would be a necessary crew position for an airship
- 1921: He wrote two separate Technical Memoranda (TMs) for the National Advisory Committee on Aeronautics (NACA), the precursor to NASA

# Nobile 1921, Page 12

“The minimum crew needed consists of

1 Commander

1 Pilot

1 Mechanic

1 Wireless operator.

With increased cubature of the airship, we may, generally speaking, assume that the journeys undertaken will be ***longer and more fatiguing***, and that, ***therefore, double shifts will have to be provided for***”.

# Nobile 1921, Page 29

Each crew would consist of the following:

1 Commander

***1 Second Commander***

2 Steersmen

1 Chief Motorist

3 Motorists

1 Radio Operator

1 Laborer

1 Rigger

1 Mechanic

Total: 12 Persons

However, by 1926 and the expedition of the *Norge*, he seems to have changed his opinion

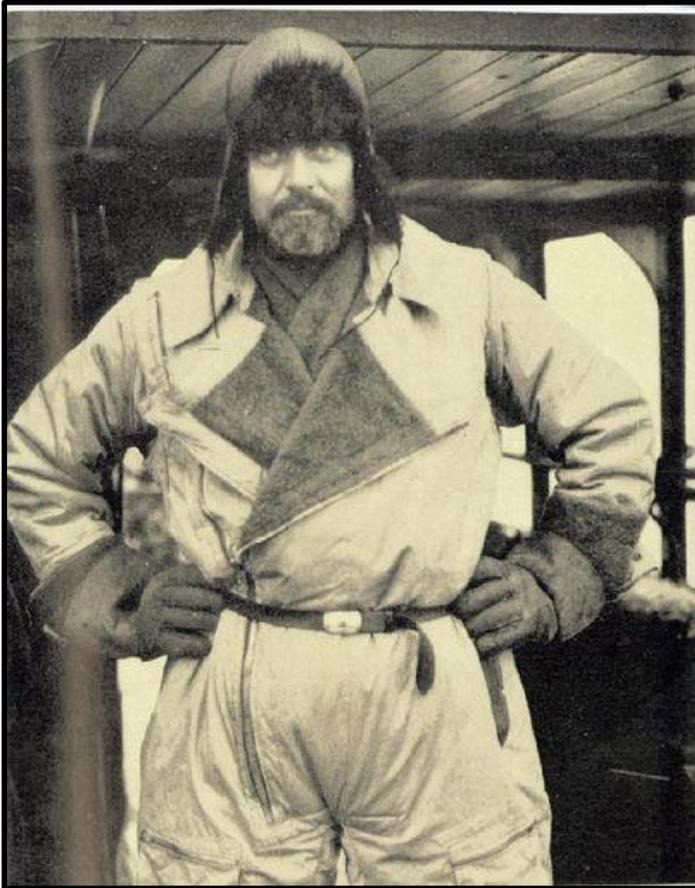
## *Norge* (1926)

“Certainly, the presence of another expert pilot would have enabled me to rest from time to time, sparing me an uninterrupted vigil of 32 hours ... But, all things considered, I do not regret it. When responsibility is concentrated in a single person ... his attention is sharpened, his decisions are made swiftly and swiftly carried into effect” (Nobile 1961, p. 23).

# *Norge's* Second-In-Command

- In Amundsen's memoirs Hj. Riiser-Larsen (who held the rank of Captain in the Norwegian Navy Flying Corps) notes that he himself was the official Second-In-Command of the *Norge* expedition (Amundsen p. 270), a fact also acknowledged by Nobile (Nobile 1961, p. 99).
- Therefore, the reason that Nobile did not pick Second-In-Command for the *Norge* expedition was because it already had a Second-In-Command—Hj. Riiser-Larsen

# Hjalmar Riiser-Larsen



[www.frammuseum.no](http://www.frammuseum.no)

# Riiser-Larsen: *Italia's* Second-In-Command?

- While still recovering from the *Norge* flight Nobile conceived the idea of the *Italia* expedition; he discussed it with Riiser-Larsen, stating, “The expedition would be called the Nobile-Riiser-Larsen, and would fly the Italian flag” (Nobile 1961, p. 100)
- Thus, Riiser-Larsen was presumably to be the Second-In-Command of the airship, this time under the command of Nobile
- Nobile states: “We promised each other that we would discuss it further. But we never did” (Nobile 1961, p. 100).

# Oscar Wisting: *Italia's* Second-In-Command?

“Obliged definitely to give up any idea of collaborating with Riiser-Larsen ... I thought of securing the collaboration of Wisting, who, with his vast experience of the Arctic and his sterling qualities, would certainly have proved an ideal companion. I met him one day in the streets of Nome, and spoke to him of this. He declared that he would very willingly take part in the new expedition ... but later he was unfortunately prevented by other engagements from joining me”  
(Nobile 1931, p. 24).

JAN INGAR HANSEN

# OSCAR WISTING

Amundsens betrodde mann



SCHIBSTED  
FORLAG

# Mariano: *Italia's* Second-In-Command?

- It is interesting to note that Nobile had assigned Commander Adalberto Mariano as the First Officer, in charge of navigation & astronomical observations
- Mariano was not, however, given the formal title of Second-In-Command
- Thus he would answer to Nobile, but would never replace him—not even for a period of rest by the Commander

# Providing Rest to Critical Crewmembers

- Nobile was inclined to bring on additional staff in order to allow other critical crew members to rest
- Commander Filippo Zappi, for example, was assigned as the Second Officer—not the Second-In-Command—and was available to relieve Commander Mariano when necessary

# Providing Rest to the Airship's Engine Mechanics

- Likewise, with regard to the engine mechanics, Nobile states:
- “With Arduino, a chief motor engineer of great merit, and Caratti and Pomella, exceptionally able mechanics, the engines would undoubtedly be looked after in the best possible manner. It was only necessary to add a fourth man to allow adequate rest during our flights to this very important part of the crew” (Nobile 1961, p. 103).

# Characteristics of the Crewmembers

- During the selection process for the *Norge Nobile* described the specific characteristics he was looking for in his crewmembers:
- They must also possess the necessary physical and mental qualities to stand up to the discomforts, risks and unknown factors of our voyage. ***They must be hardened against fatigue***, indifferent to danger, calm, resolute, and at the same time enthusiastic about the enterprise. I must have the most complete confidence in them and they in turn must have the blindest faith in me, who had prepared the flight and would now have to lead it (Nobile 1961, p. 25).

# Nobile's Self-Perceived Characteristics

- It is fair to assume that Nobile was looking for those same qualities in his crewmembers when he was making his selections for the *Italia*
- It is also fair to assume that he saw in himself the very qualities he looked for in others, and perhaps he felt he possessed these qualities to an even greater than the others
- After all, if he was to be their leader, he should be the one to demonstrate such qualities to an ever greater degree.
- It seems to be in this context that Nobile decided he himself could handle the role of Commander of the *Italia* without a Second-In-Command.

# Conclusion

- General Umberto Nobile proceeded with the *Italia* expedition without an official Second-In-Command, who could command the airship while Nobile took rest & slept
- The *Italia* crashed arguably because of fatigue-related errors in command
- Nobile's willingness to proceed without a SIC may arguably be viewed as the root cause of the fatigue-related errors

# References

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# Acknowledgments

Christian Gelzer PhD (NASA AFRC Historian)



<http://biografieonline.it/biografia.htm?BioID=1343&biografia=Umberto+Nobile>

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Questions?