

# Development process of the Ariel Space Telescope



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Elisa Guerriero on behalf of Ariel Telescope Assembly Team

# Overview

## Atmospheric Remote-Sensing Infrared Exoplanet Large Survey

- ▶ Optical/Infrared ESA mission - 0.5-7.8  $\mu\text{m}$  -
- ▶ It will observe  $\sim 1000$  transits
- ▶ Chemical composition of atmospheres and ephemerides
- ▶ Main Italian contribution: the construction of the telescope



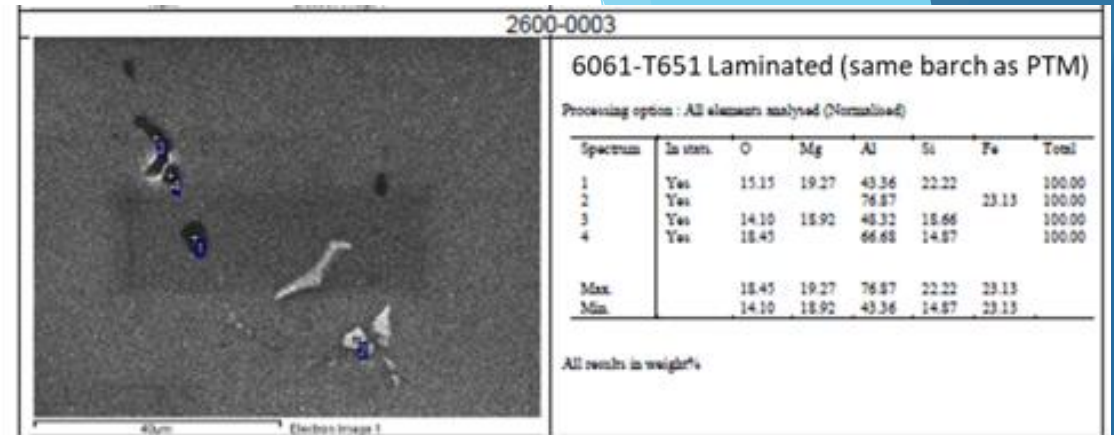
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- ▶ Main Italian contribution: the construction of the telescope
- ▶ M1 will be an off-axis paraboloid mirror 1.2 x 0.7 m
- ▶ **Entirely in Al6061T651 alloy**



# Aluminum

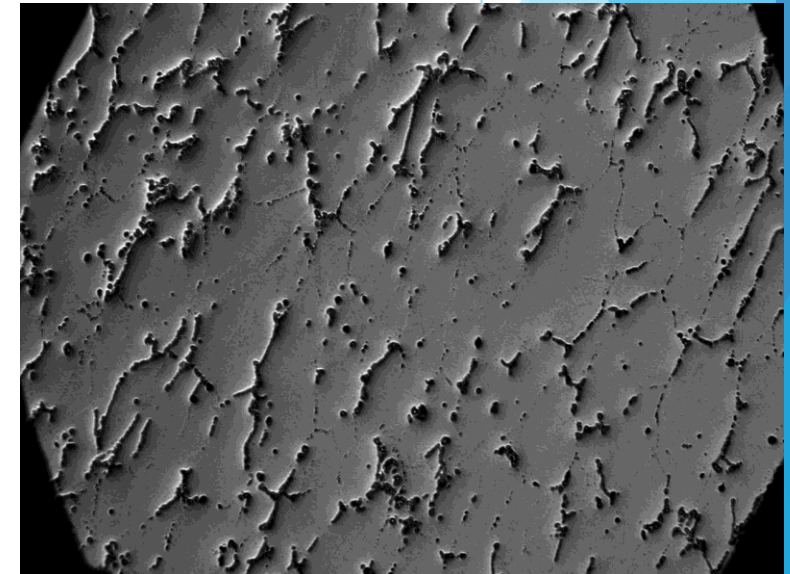


## Pro

- ▶ Thermo-mechanical properties
- ▶ Lightness
- ▶ Reduced costs (pre-Covid19!!!)

## Cons

- ▶ Si-Mg aggregates in the laminated alloy of the M1 mirror
- ▶ Heat Treatment
- ▶ Polishing



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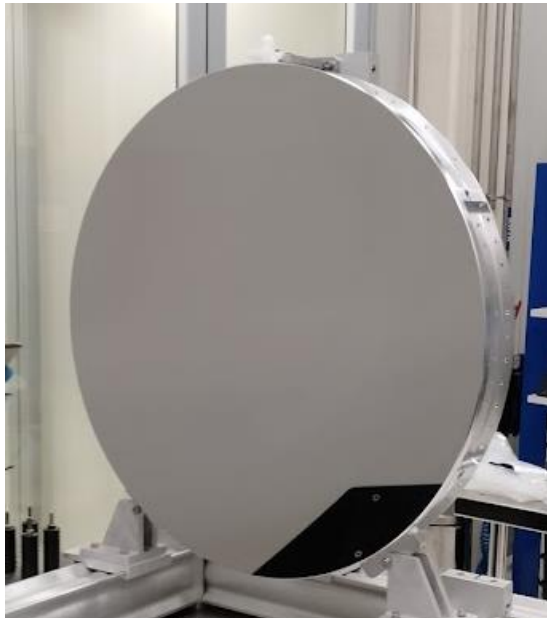
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Raymond G Ohl et al.  
by NASA/Goddard  
Space Flight Center

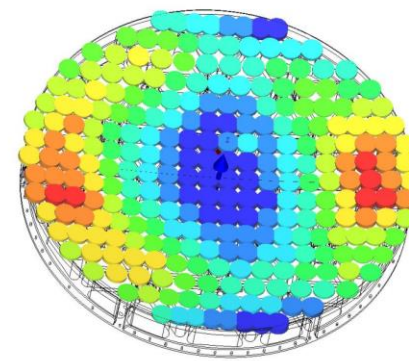
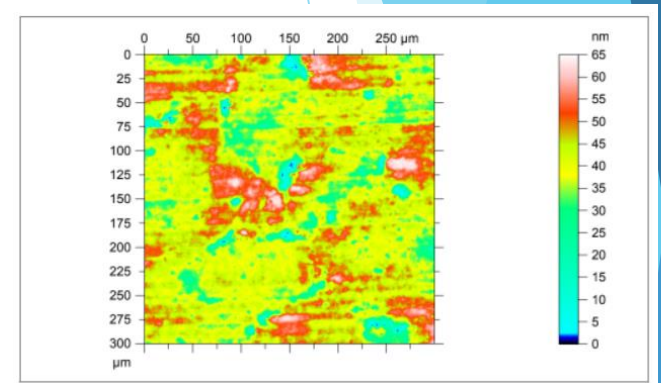
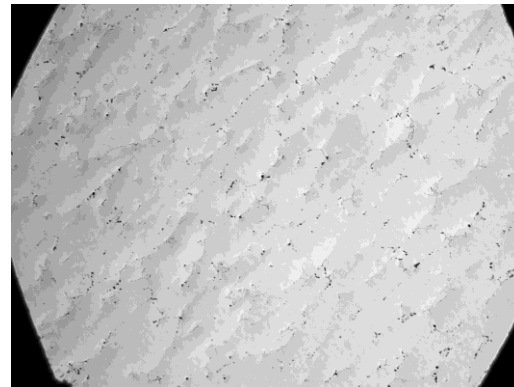
From scratch  
INAF-Media  
Lario S.r.l.

# Application of Heat Treatment and Results

BB1 mirror 0.7 m



- ▶  $S_q = 8.54 \text{ nm RMS}$
- ▶  $SFE = 838 \text{ nm RMS}$



Next Step

# Polishing Process

# Grazie per l'attenzione