



# Development of hyperspectral cameras for atmospheric plasma observation

Martin Ferus

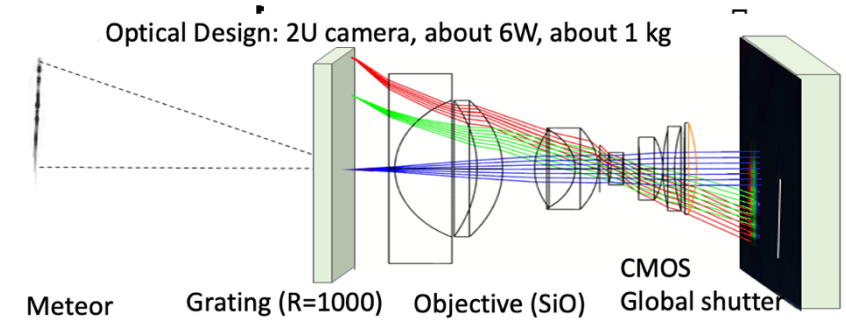


M20241214\\_001855 GEM

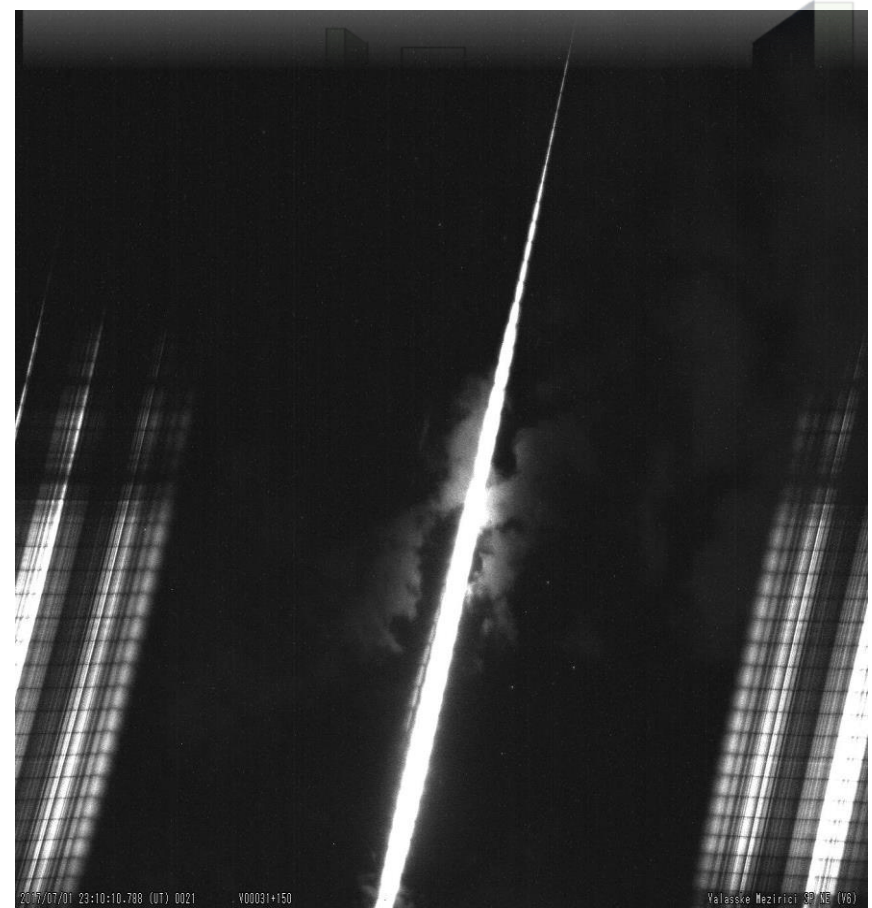
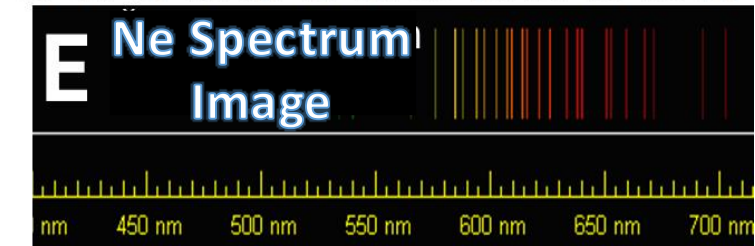
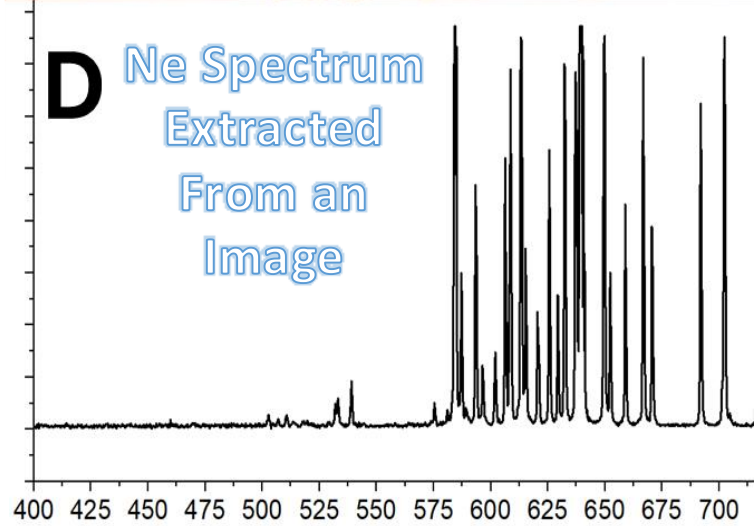
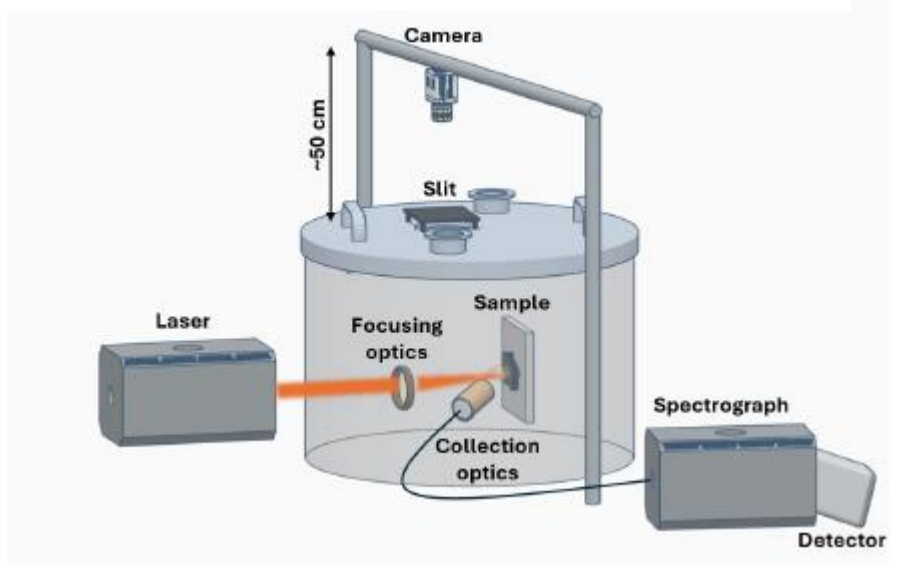
Picture 1: 0,1 sec.

Picture 2: 0,1 sec.

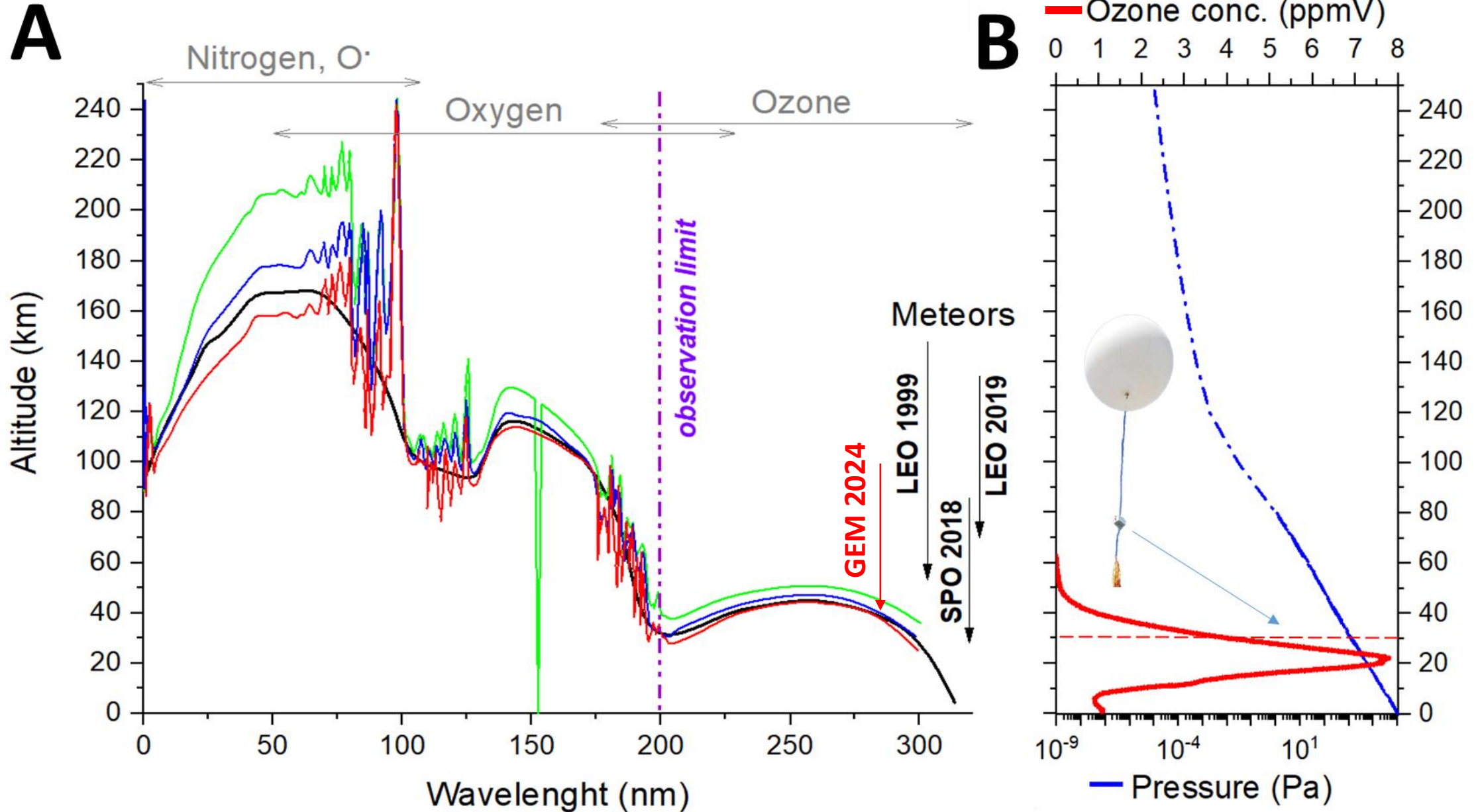
# How does the Hyperspectral Camera Work?



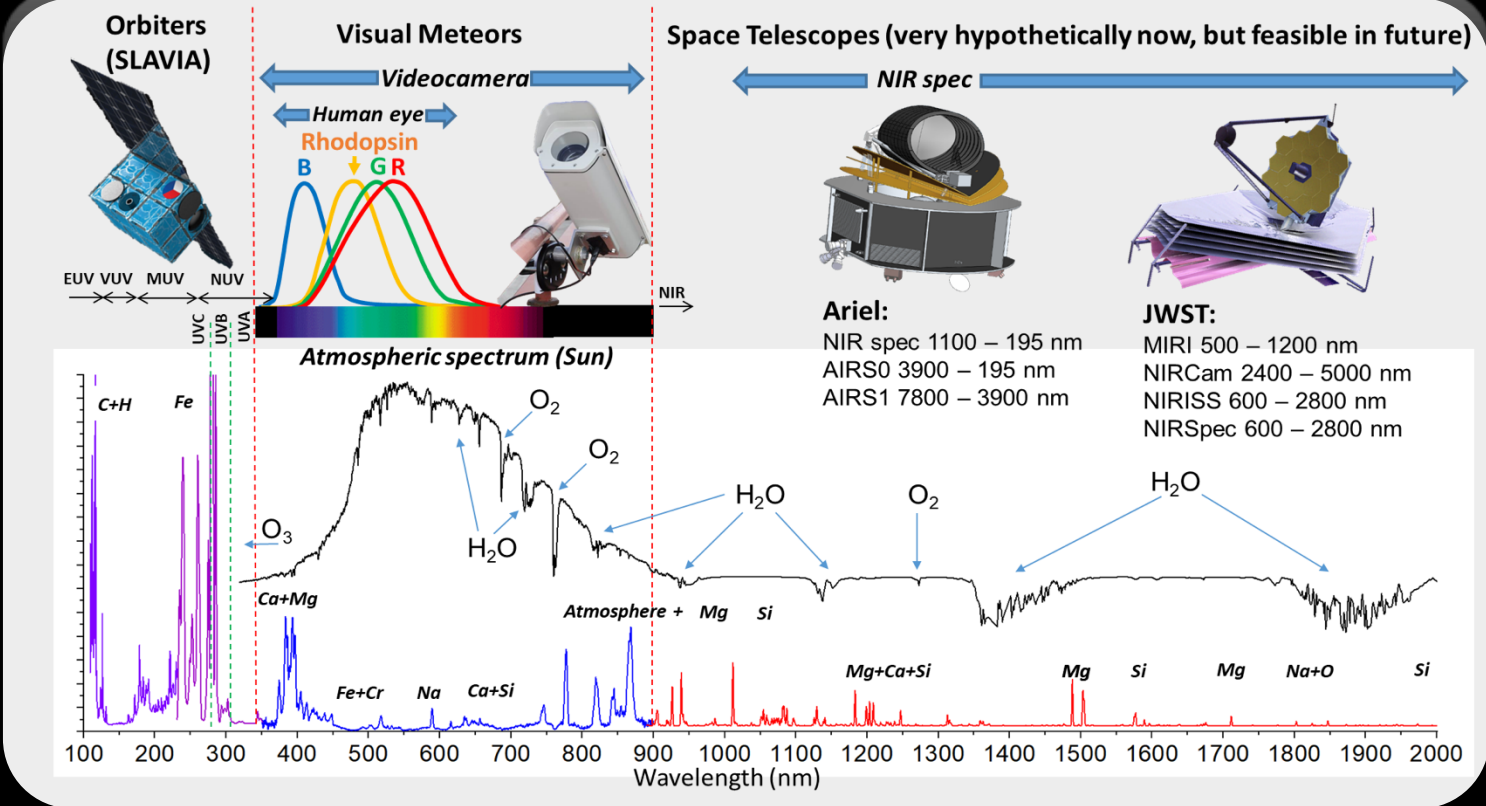
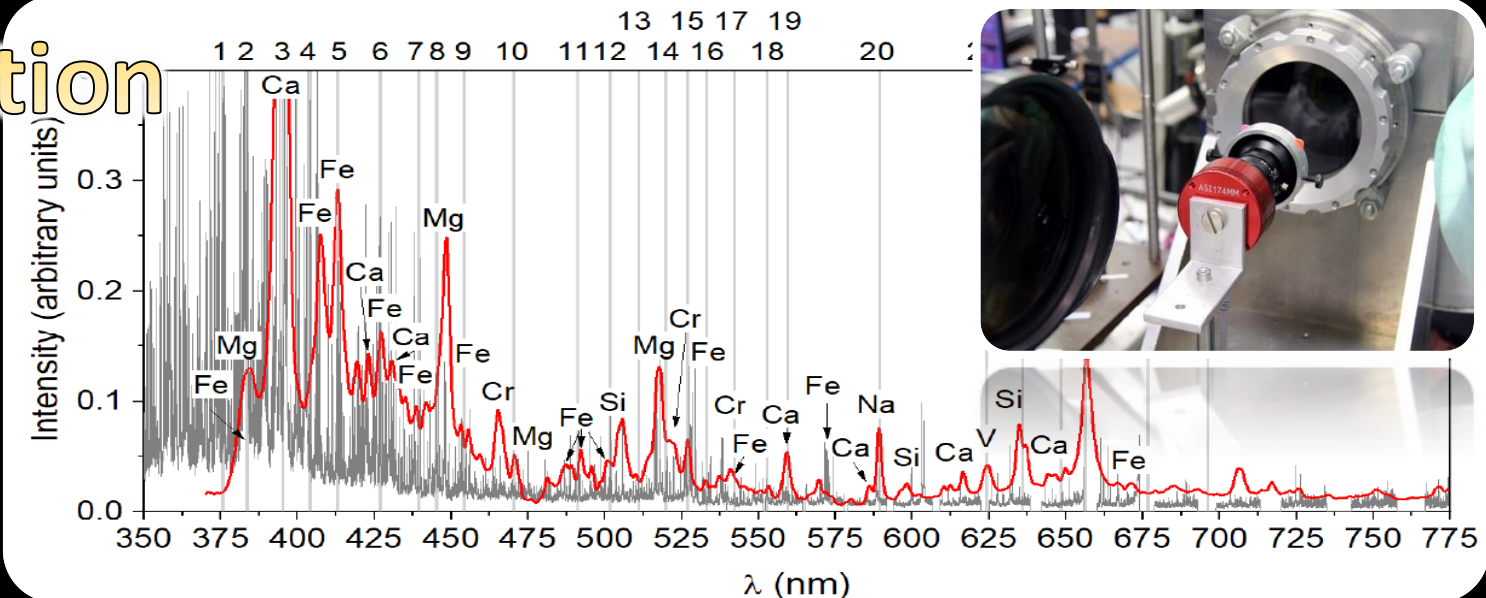
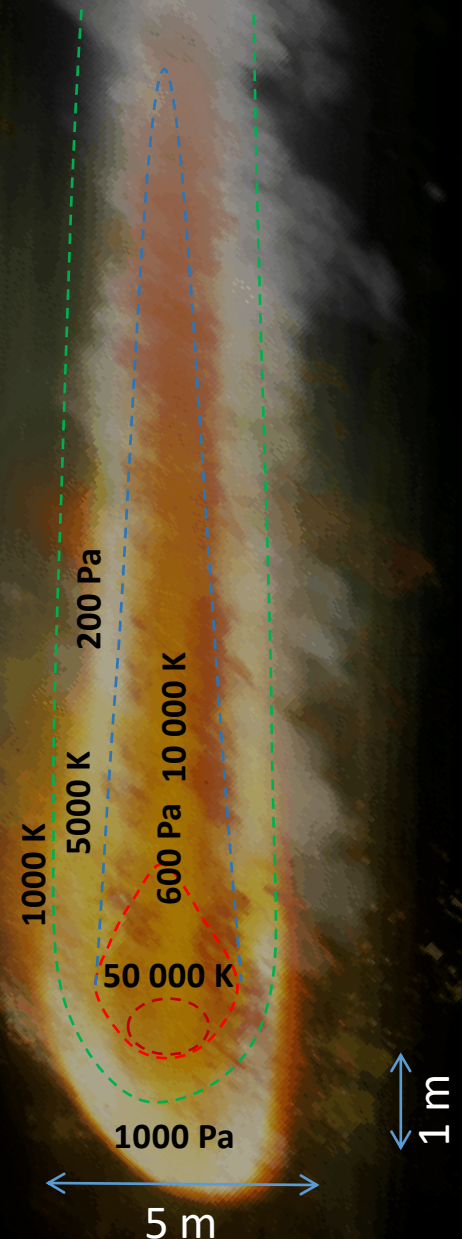
## Camera Performance Testing using LIBS



# Meteor and other Atmospheric Phenomena in the UV Range



# Meteor Spectra Simulation





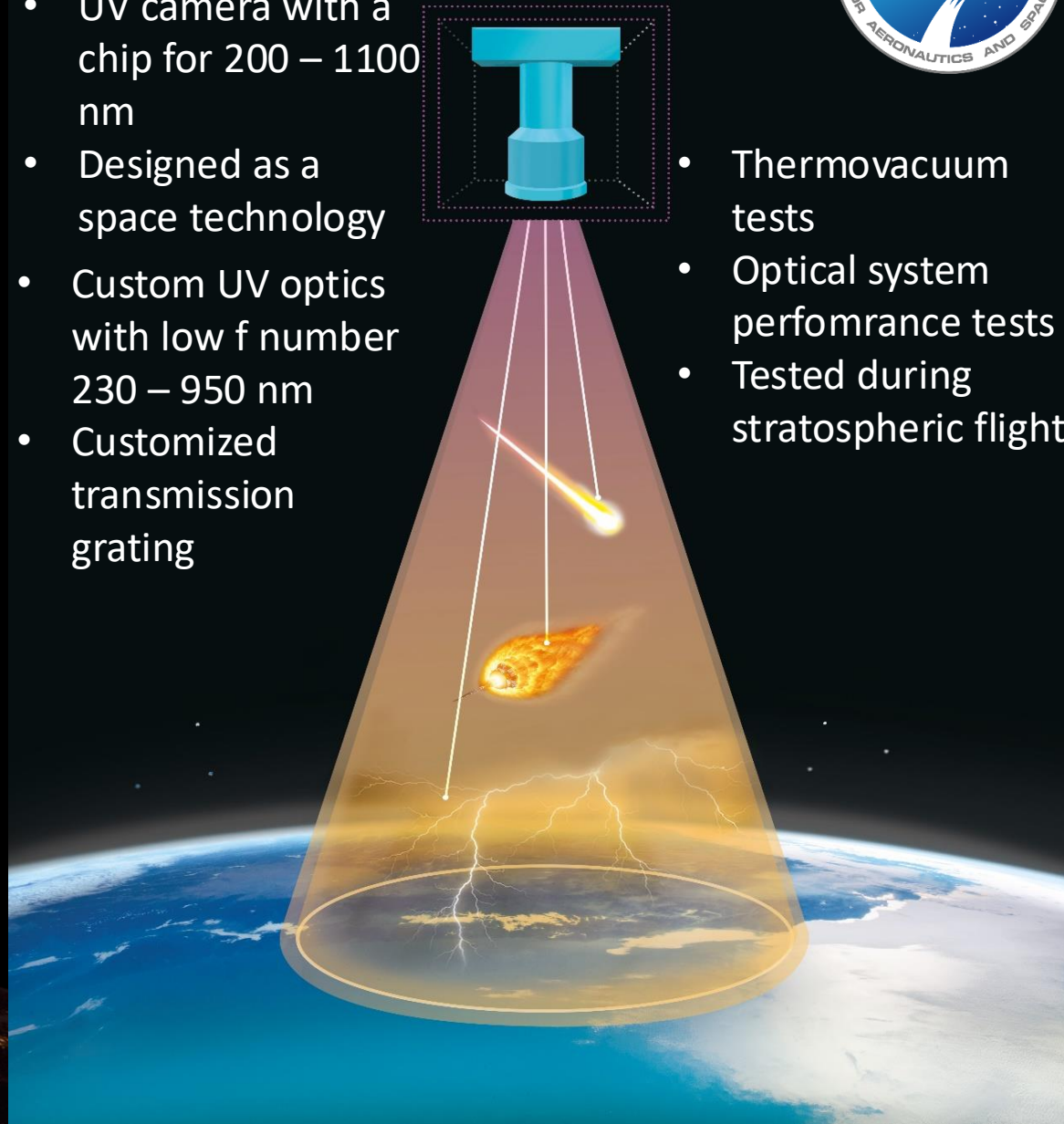
# Hyperspectral Camera Freya



- UV camera with a chip for 200 – 1100 nm
- Designed as a space technology
- Custom UV optics with low f number 230 – 950 nm
- Customized transmission grating



- Thermovacuum tests
- Optical system performance tests
- Tested during stratospheric flight



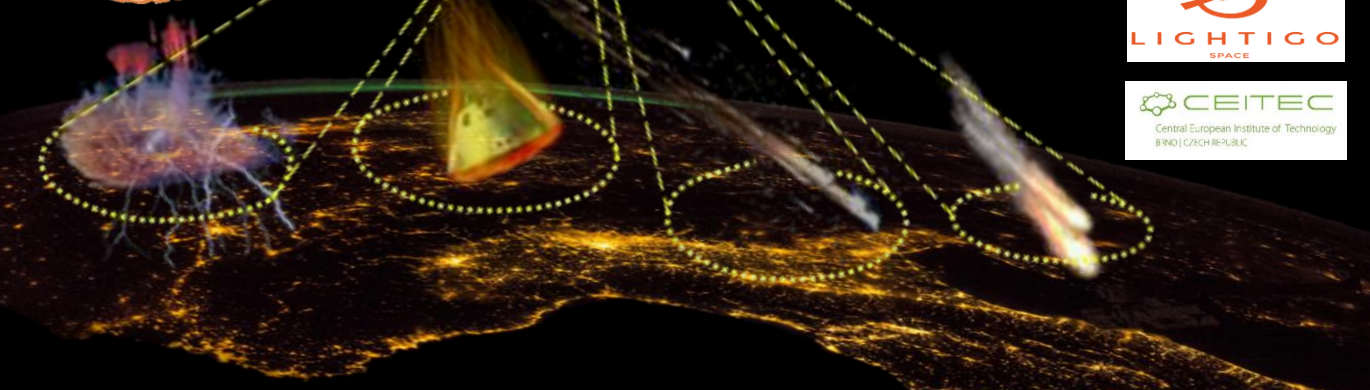
MORANA



FREYA



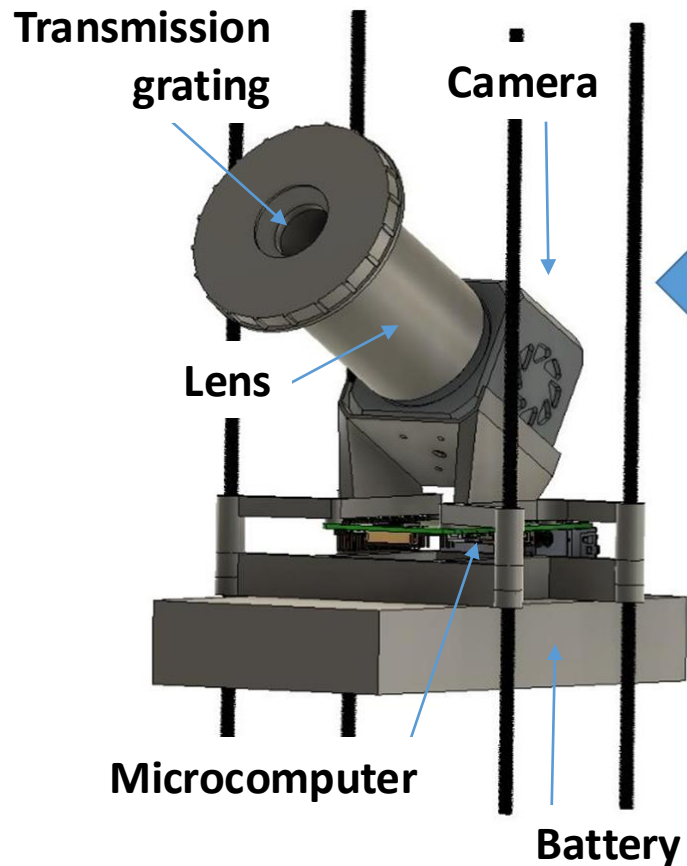
VESNA



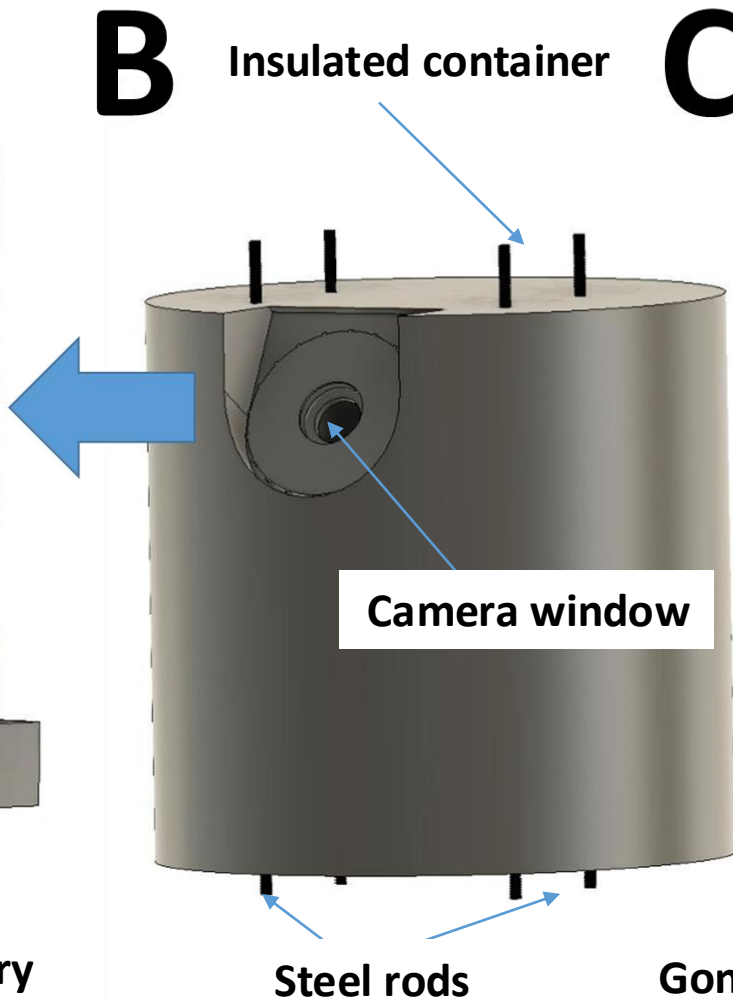


# Balloon Flight Testing (2024)

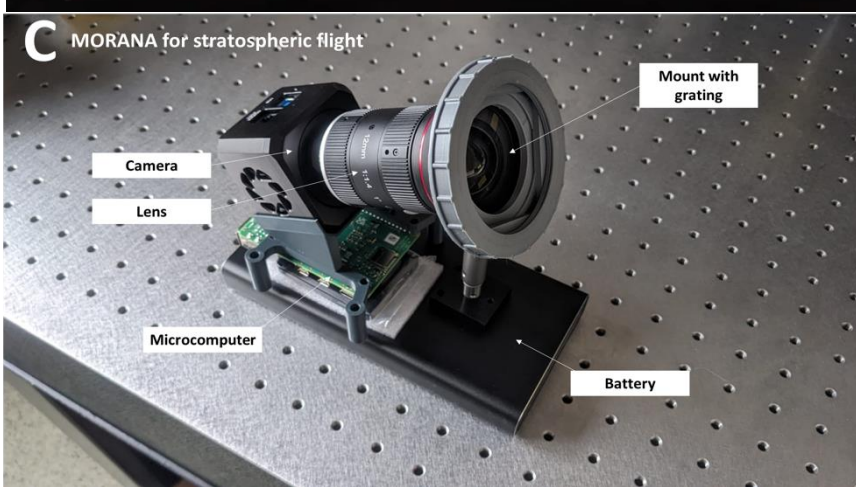
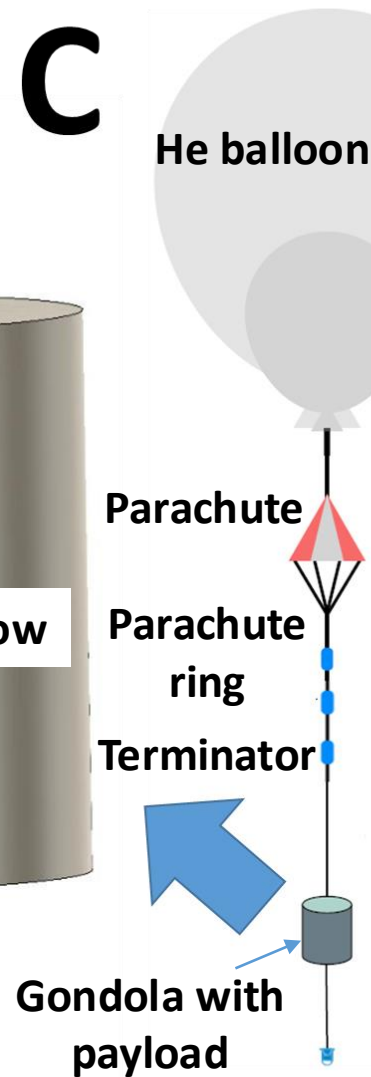
## A



## B



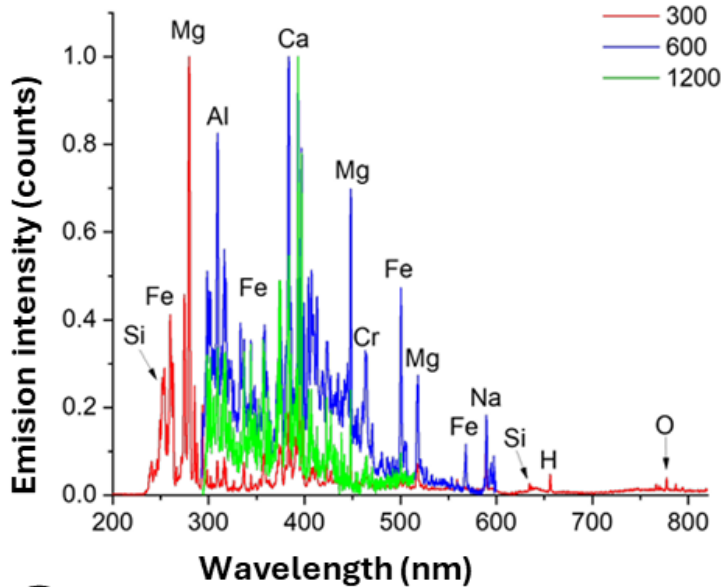
## C



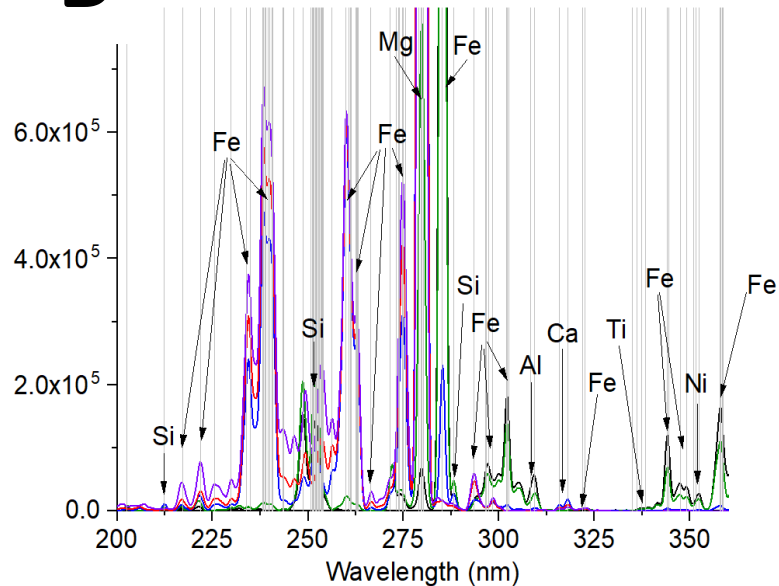
From disaster to success...

# Balloon Flight Testing (2024)

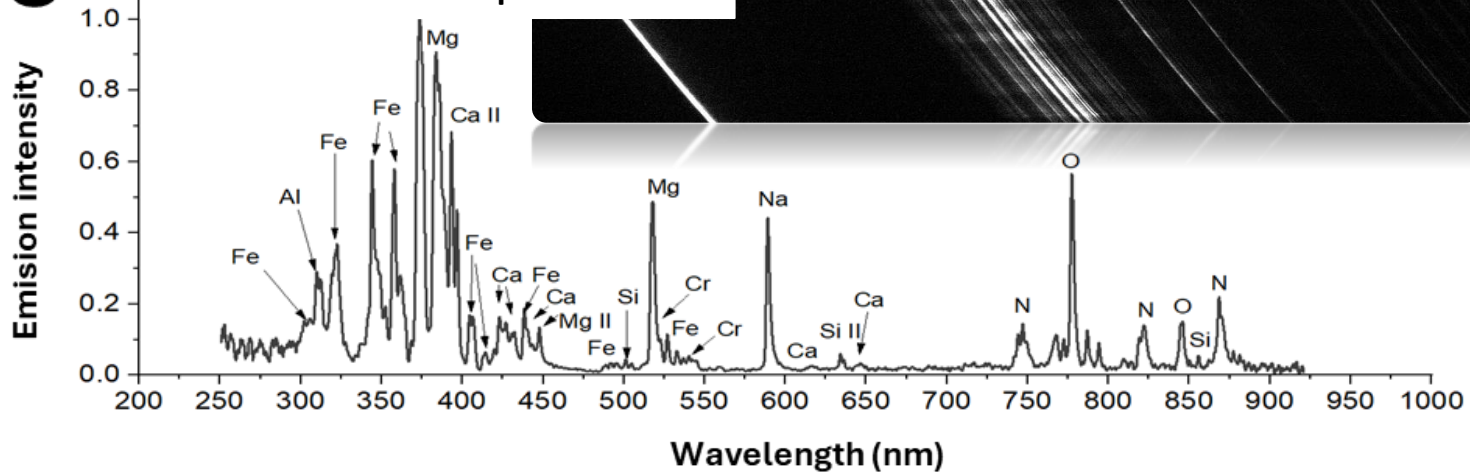
**A** Laser Ablation (Test of UV Camera FREYA)



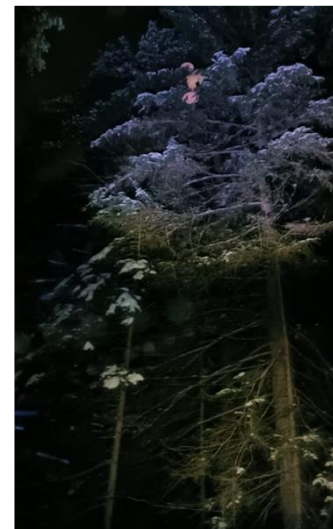
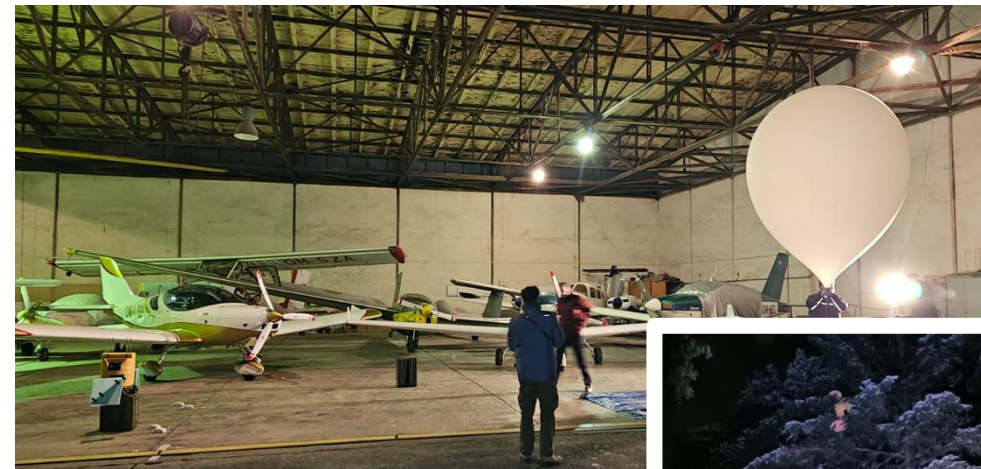
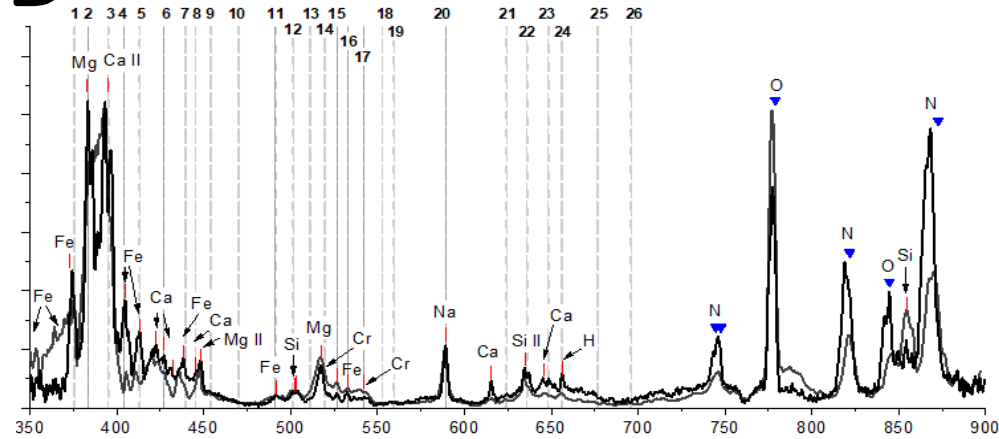
**B** Spectral simulation of UV Range

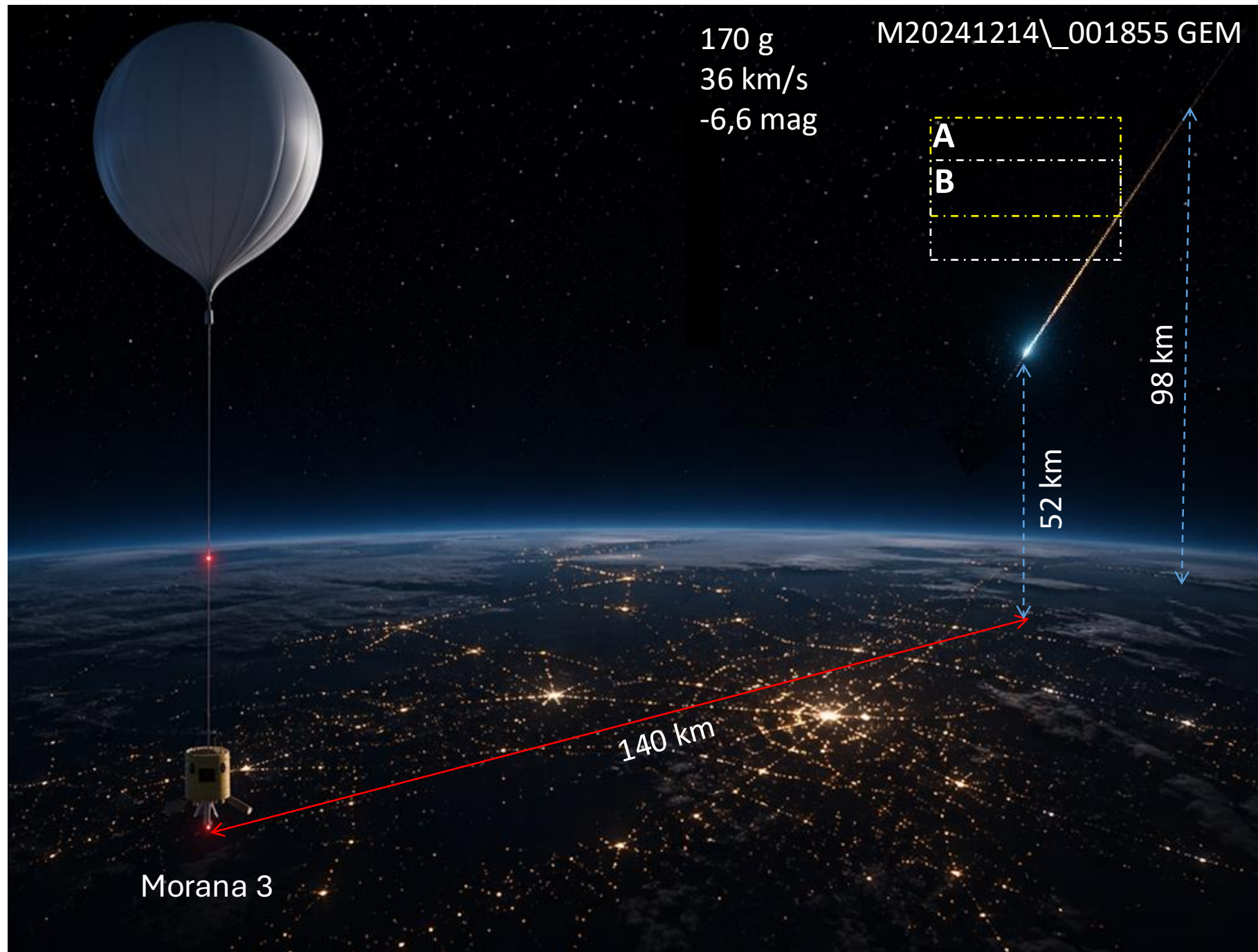
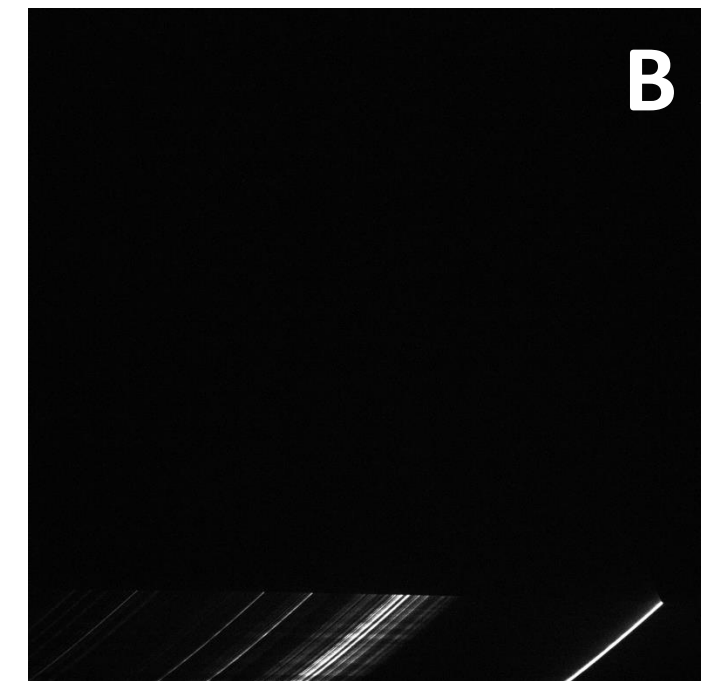
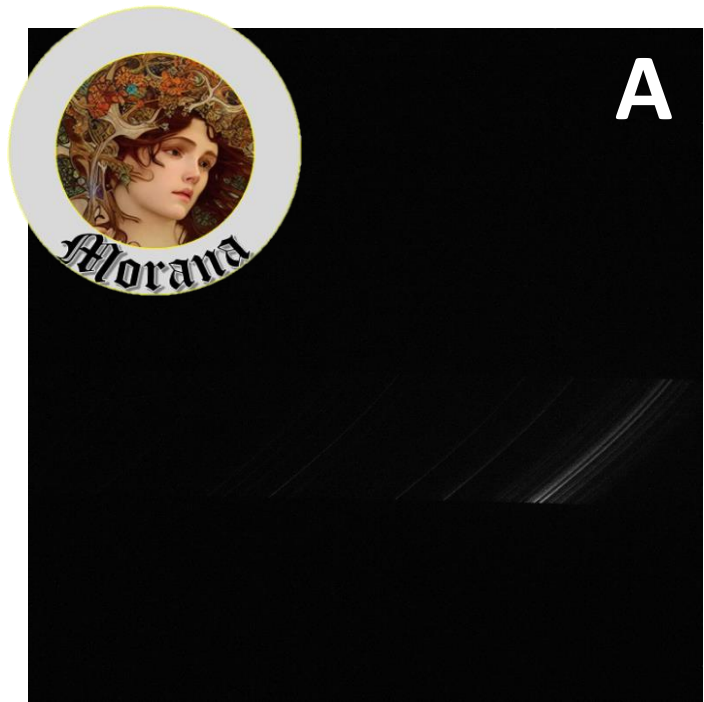


**C** Balloon Geminid UV Spectrum

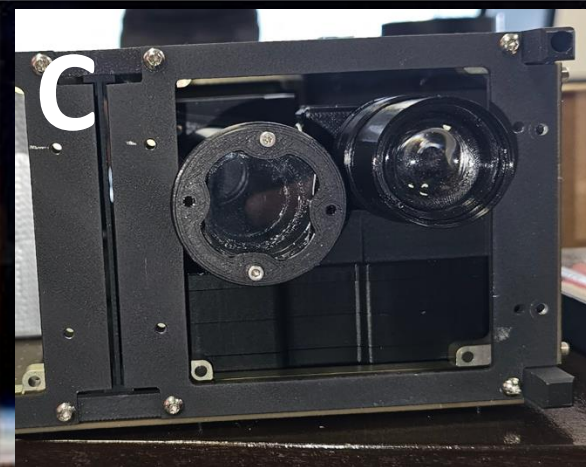
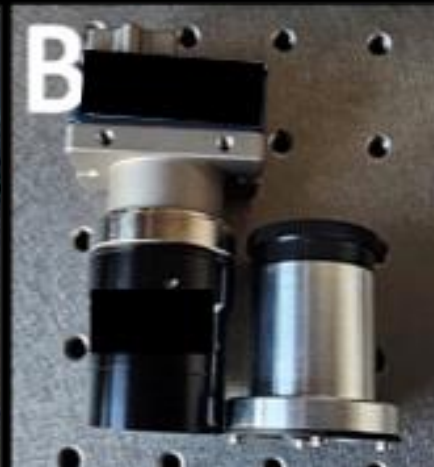
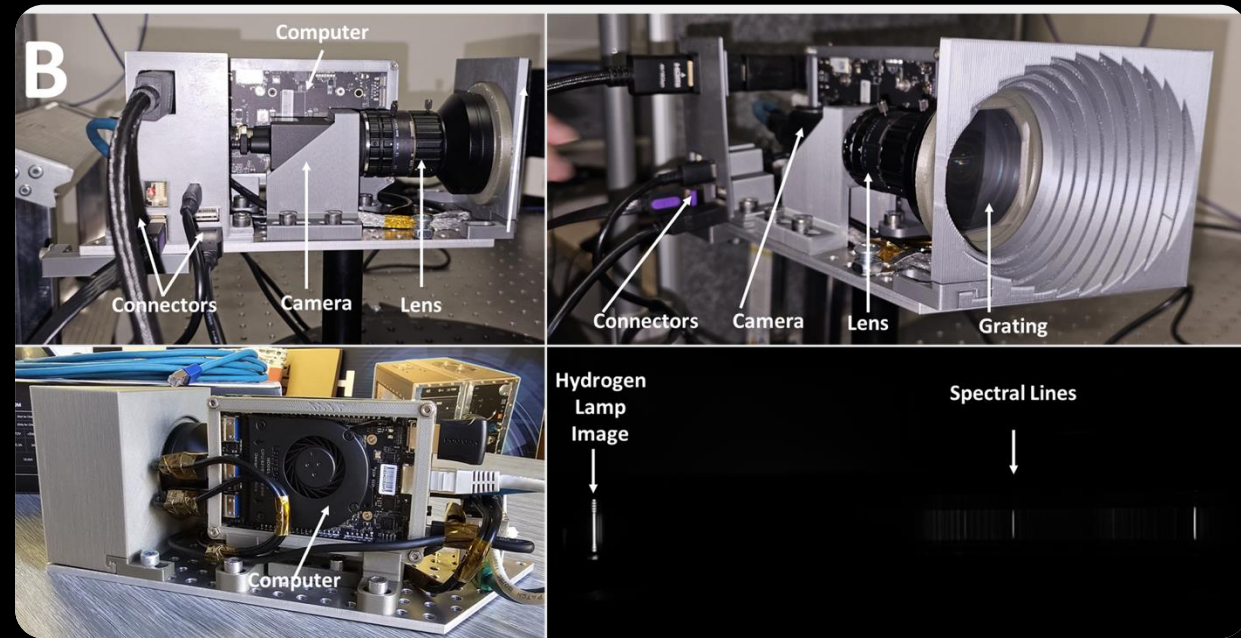
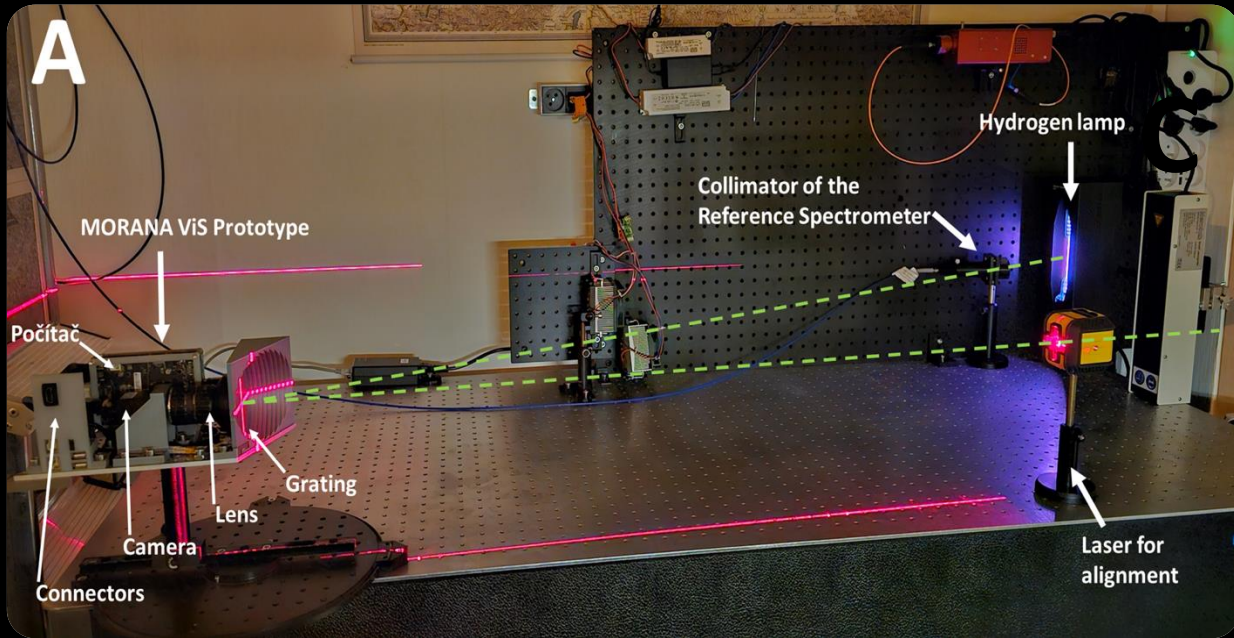


**D** Ground Based Observation of Leonid Meteor





# HyperSpec Technology – From Breadboard to Space



T A  
Č R

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České republiky**

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**VESMÍR  
PRO LIDSTVO**

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