



## ON THE METEORITE FALL IN CROATIA

**Damir Šegon**

Croatian Meteor Network

Višnjan Science and Education Center

Astronomical Society "Istra" Pula

[damir.segon@pu.htnet.hr](mailto:damir.segon@pu.htnet.hr)

[www.astro.hr/hmm/index.html](http://www.astro.hr/hmm/index.html)

[www.adip.hr](http://www.adip.hr)

# Introduction

2011.02.04, an very interesting day (night):

- asteroid 2011 CQ1 missed Earth by less than its radii
- NASA's CAMS project captured February Eta Draconids shower
- Javor Kac visually observed - a possible meteorite fall???

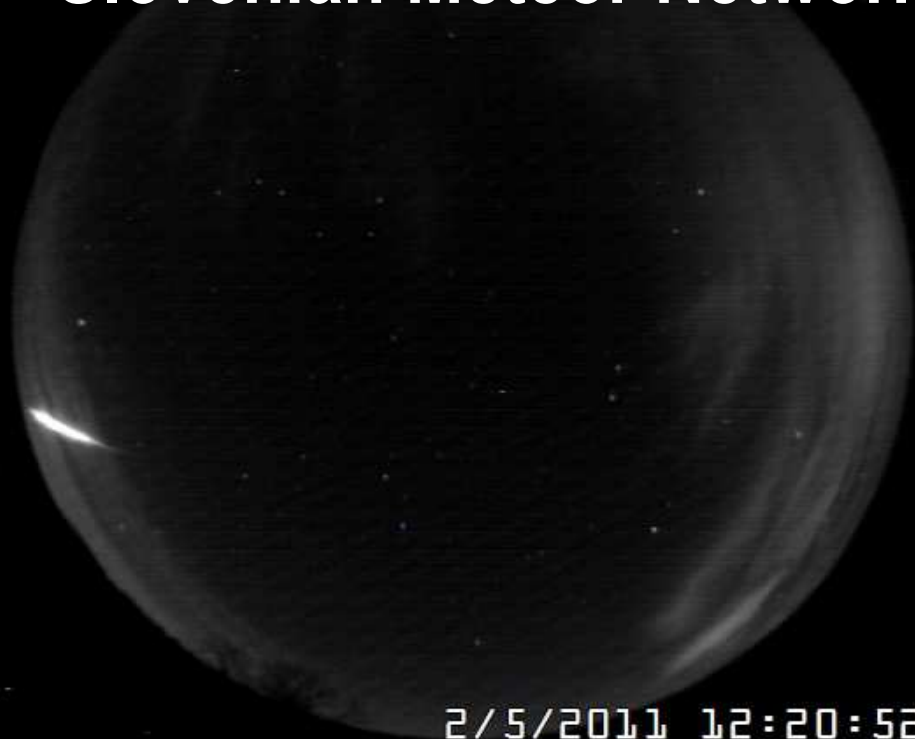


# Slovenian Meteor Network sky coverage





# Slovenian Meteor Network images



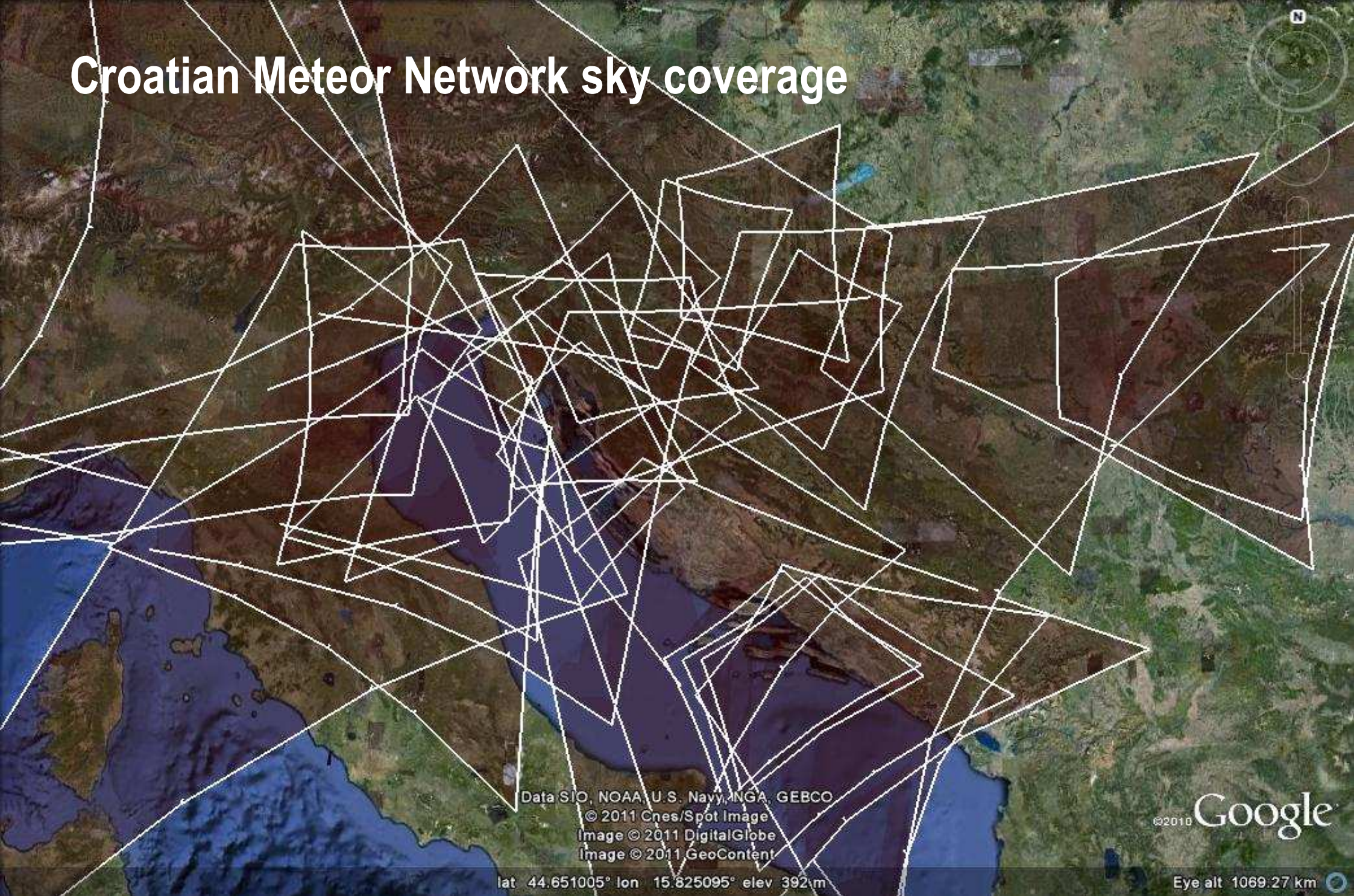
2/5/2011 12:20:52 AM



- very promising, alerting CMN



# Croatian Meteor Network sky coverage



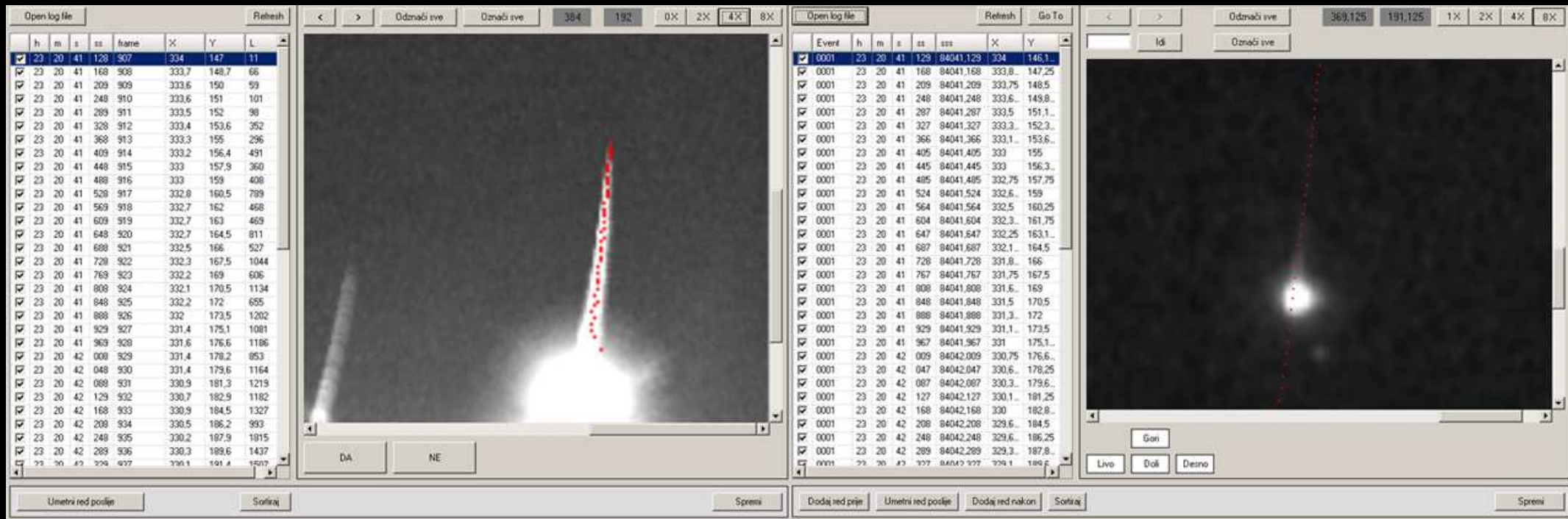


# Croatian Meteor Network images



- very lucky to have complete meteor captured from at least one station

# Data analysis: automatic and manual on train (wake) samples



- method described at IMC2010
- significant difference in resulting trajectory
- only frames containing clearly visible train/wake used

# Preliminary results

- beginning height ~95km
- entrance velocity ~18km/s

- entrance angle 66 degrees

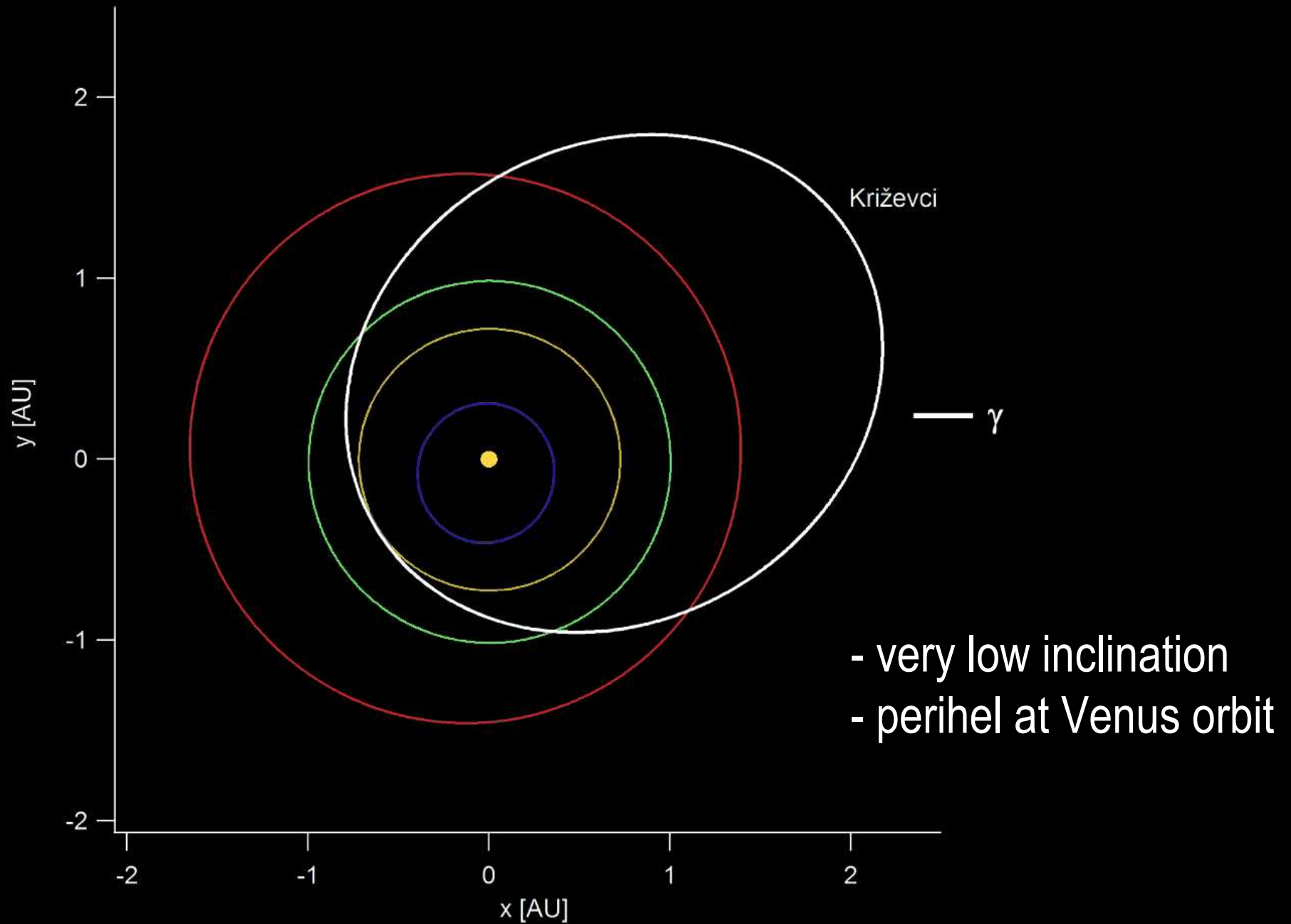


- terminal height 21.9km
- terminal velocity ~4km/s

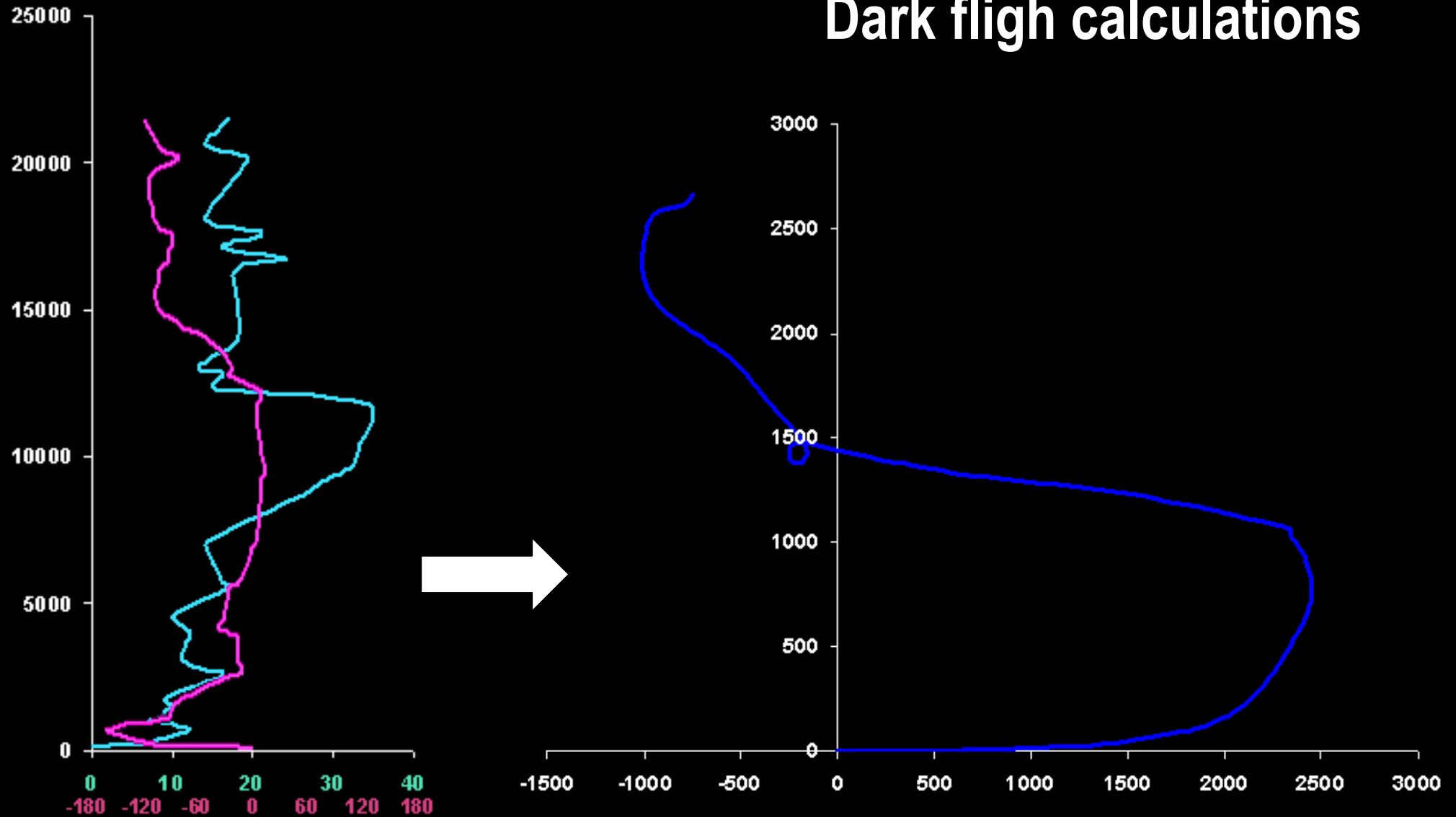
- terminal point below 22km
- terminal point velocity/deceleration estimations -> meteorite fall!!!



# Preliminary orbit



# Dark flight calculations



- high wind's speeds from station ~40km away, simultaneous



# Strewn field search



- unpleasant surprise – vast part of strewn field recently ploughed!



# Searching...





... and finding!



# Proud explorers





# Križevci meteorite – most probably an ordinary chondrite



# Important circumstances that lead to meteorite finding

- terminal part of meteor trajectory has been captured
- terminal point dynamics could be estimated
- \* important regarding terminal mass estimation
  
- high altitude winds data from station only 40km from terminal point
- simultaneous meteorite dark flight and data collecting
- \* important regarding dark flight calculations
  
- search expeditions almost immediately after meteorite fall
- \* important regarding changes on the search area (ploughing)

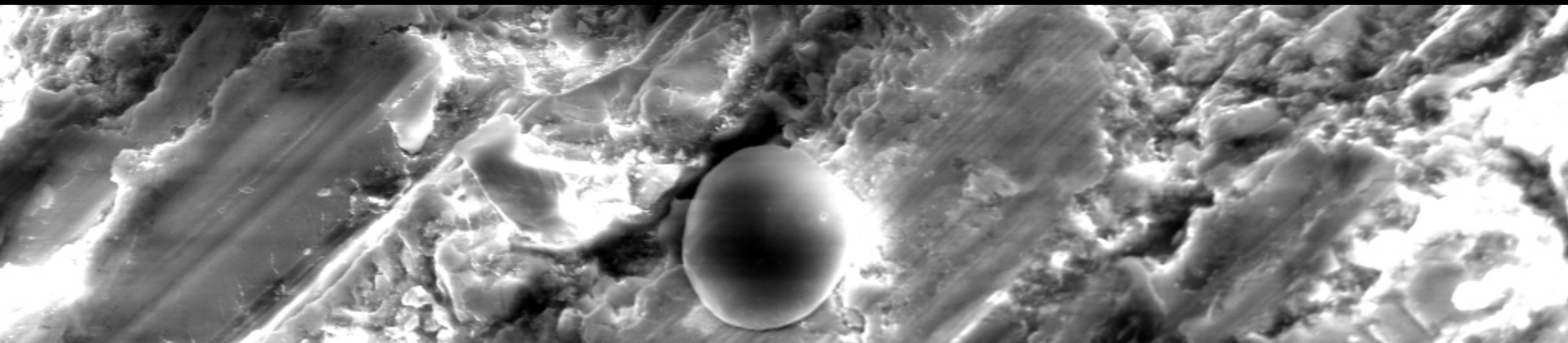


# What have we learned from this event?

- meteorite findings possible from video meteor observations only
- important to have good sky coverage at lower heights (30km?)
- video observations preferable to still all-sky images
- high wind models necessary for dark flight calculations
- data collecting and processing as soon as possible
- international collaboration!
- search expeditions should be organized as soon as possible
  
- and much, much more...

# What can still be learned from this event?

- precision of video observations
- is it possible to find reasonably fair solutions from meteor observations which do not cover its whole trajectory
- how precise can be orbits calculated from video observations only
- all about meteorite itself, of course – this will be done in collaboration with eminent world experts on respective fields of interest





# Acknowledgements

All the CMN members for their devoted work and persistence

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Astronomical Society "Istra" Pula, Croatia



**Thank you for your attention!**

**Questions?**