

# The 2011 Draconids meteor shower

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in collaboration with:

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P. Kotten (Ondrejov obs)

EUFAR, DLR Falcon 20

D. Koschny (ESA), J. McAulliffe (INSA/ESA)



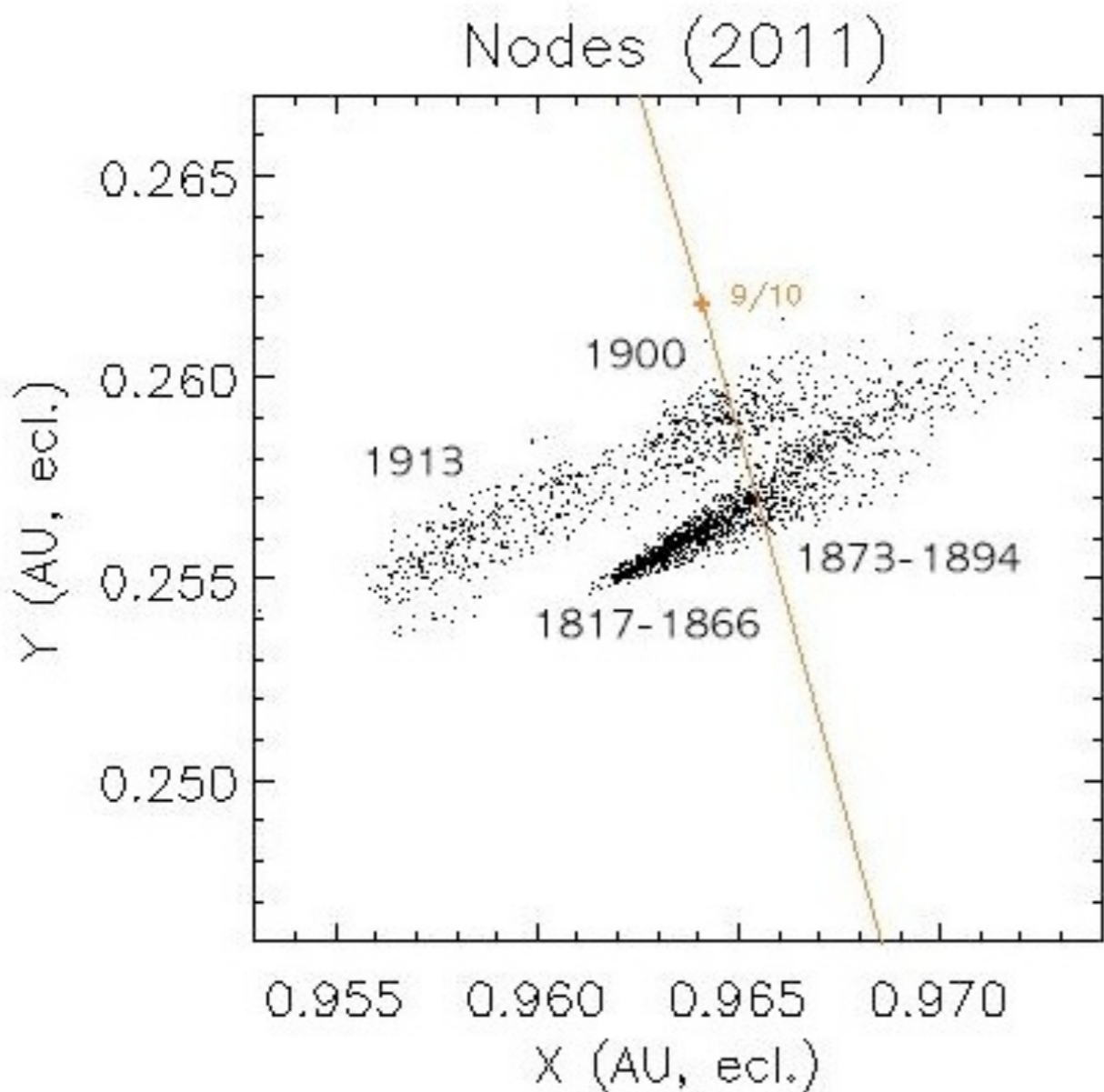
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# Outline

- The forecasting
- The first European meteor observation airborne campaign
- A joint effort!

# The 2011 Draconids

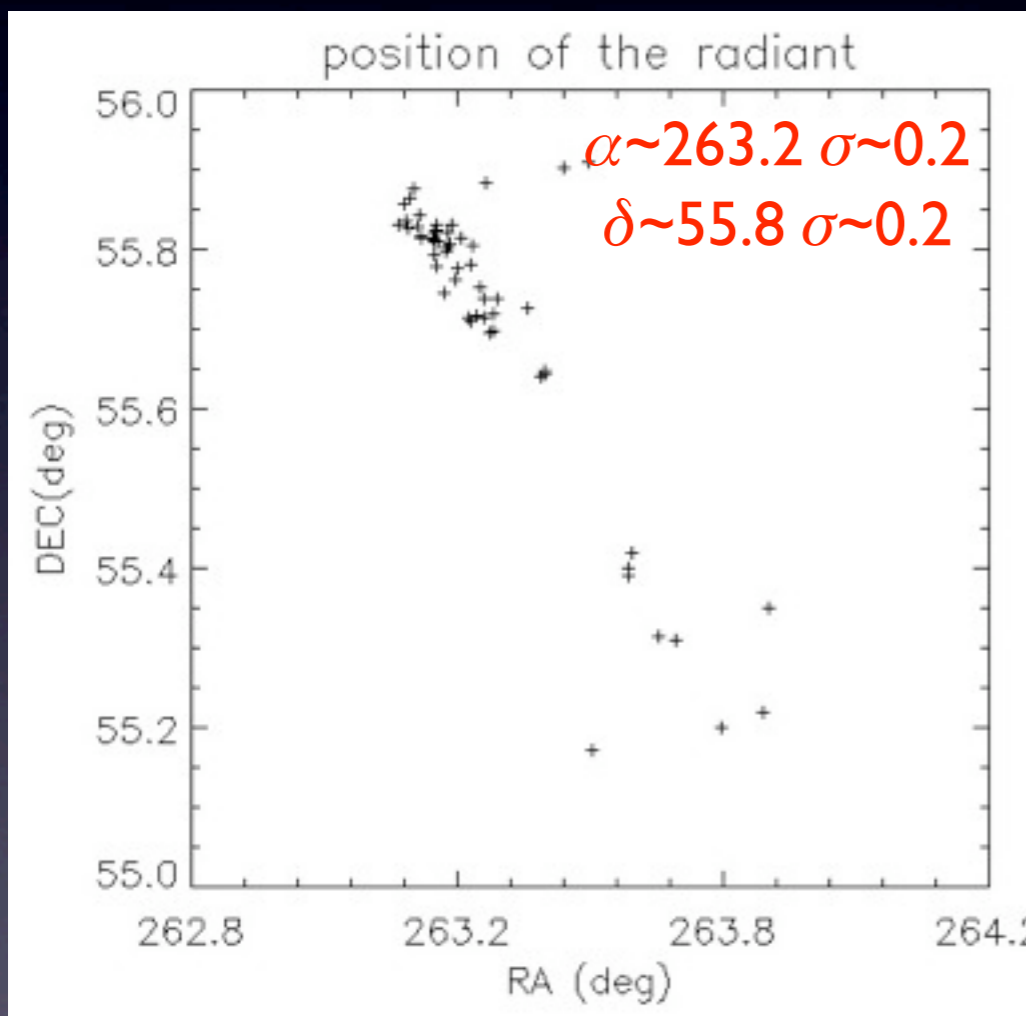


model	time on Oct 8th (UT)	ZHR (/hr)
Sato, Watanabe (2008)	17:05	100
Sato, Watanabe (2008)	20:36	500
MSFC (Moser 2007)	19:11	800
Maslov	20:42	40-50
1900 trail (Vaubaillon)	19:57	~600
1873-1894 trails	17:09	~60 (?)

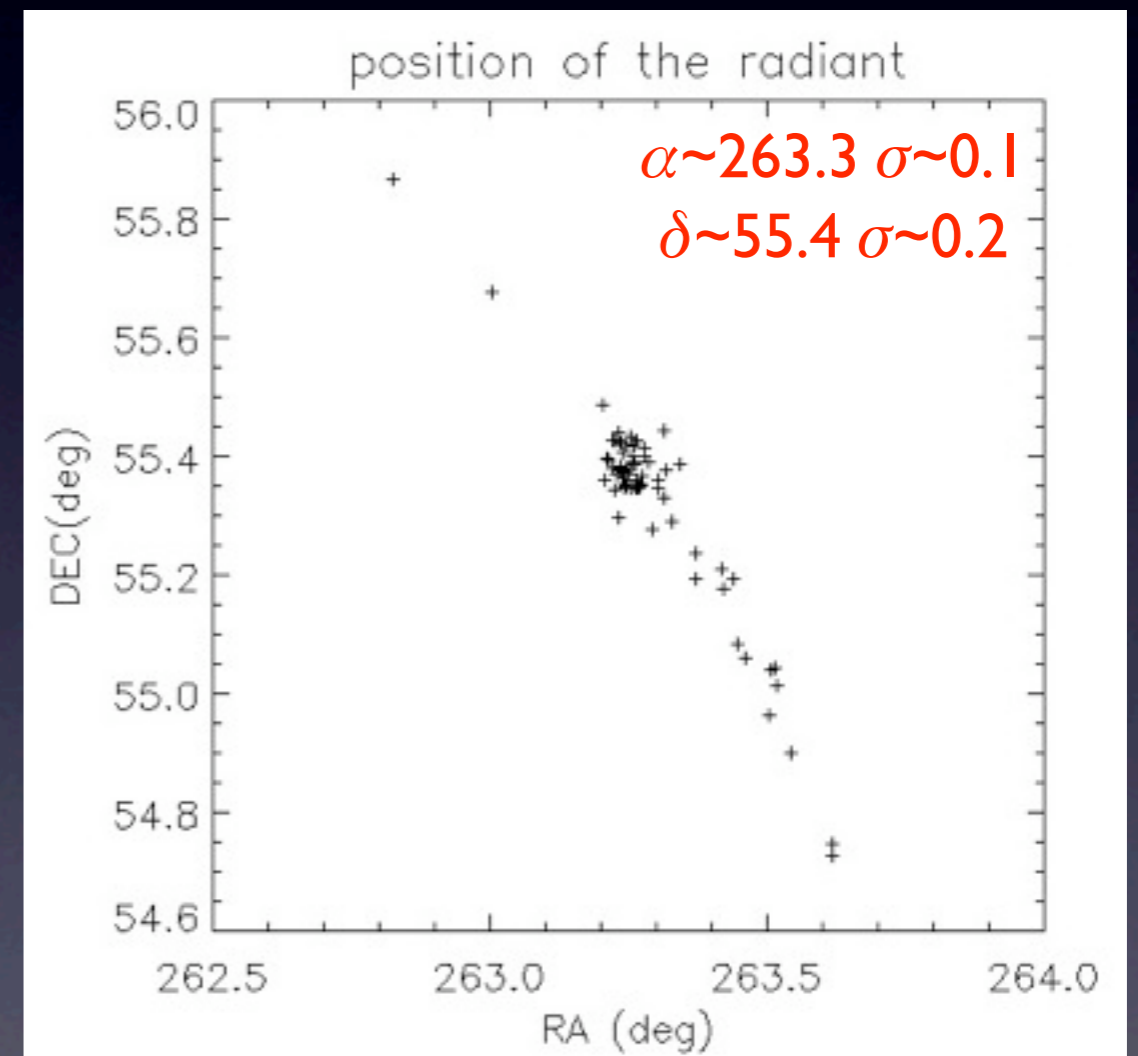
[www.imcce.fr](http://www.imcce.fr)

See also David's presentation

# Expected radiant



1900 trail



1887 trail

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- **What** really was the **level** in 1933 & 1946? => Can we rely on past reports?
- **How** is the comet dust spread out in the solar system?
- **What** happened to comet 21P before 1900?
- **Quantify** the number of large grains

# The first European meteor observation airborne campaign

J. Vaubaillon (IMCCE, PI)  
J. McAulliffe (INSA/ESA)  
D. Mautet (USU)



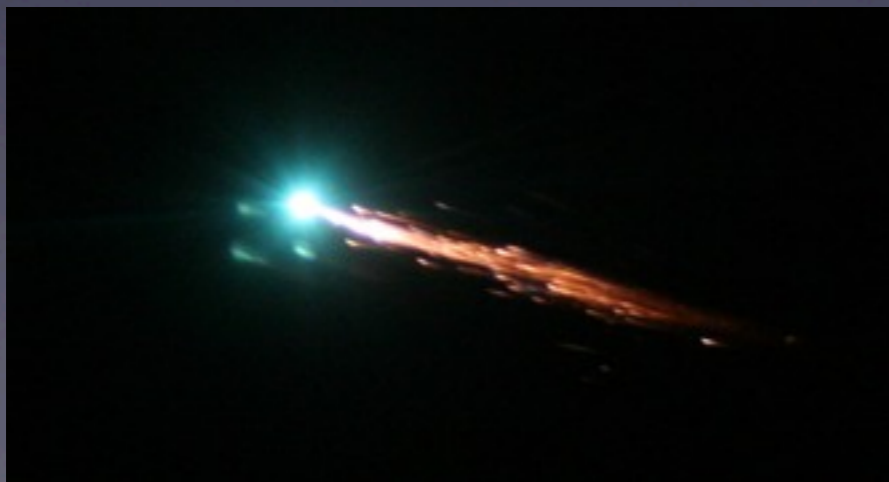
P. Koten (Ondrejov obs, PI)  
J. Zender (ESA)  
J. Toth (Univ. Bratislava)



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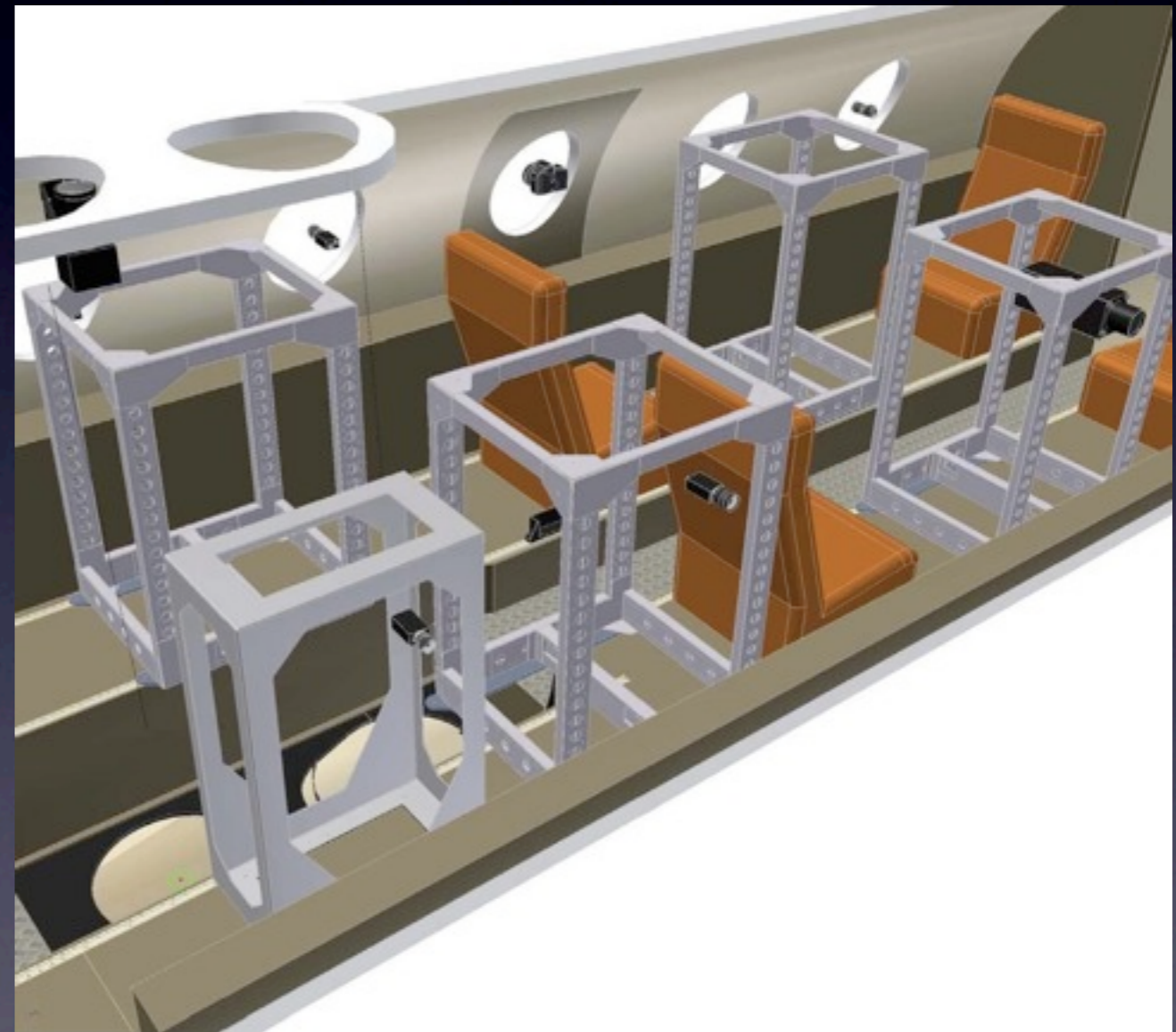
# Why would you fly?

- Guarantee to detect the meteors
- able to move under the radiant
- much more meteors visible
- joint efforts of many specialist altogether
- Past European experience: participant to NASA MAC (PI: P. Jenniskens - SETI), 2008 ATV reentry (PI: J. Hatton - ESA)



# Instruments

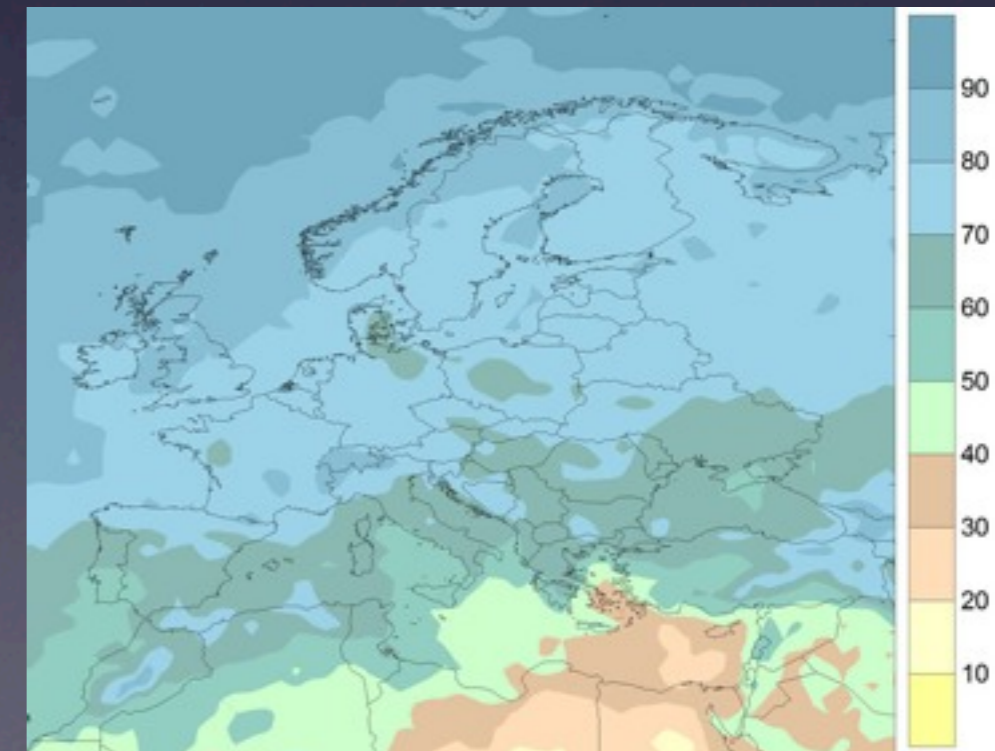
- Wide field of view camera: Count
- narrow Field of view camera: orbit
- intensified camera: population index
- near infrared camera: atmospheric science
- spectroscopy: chemical composition



Safire instruments configuration. R. Caillou (SAFIRE)

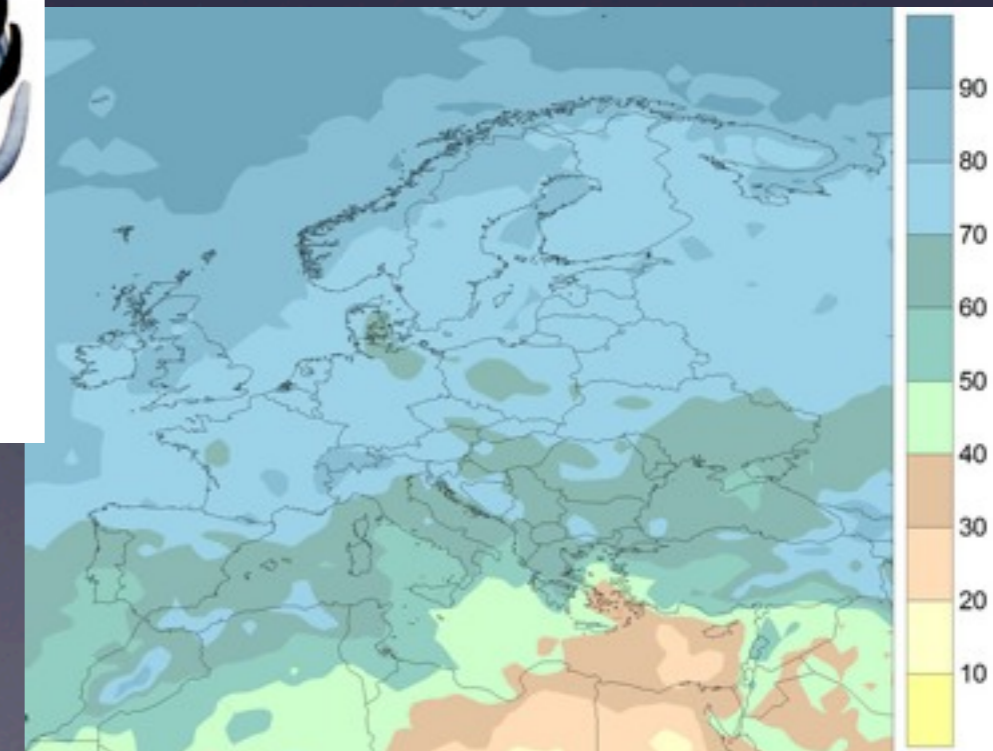
# A joint effort

- 2 aircraft
- EISCAT radar observation (N. Brosch, A. Pellinen-Wannberg)
- Multiple station in Greece (IMCCE, Armagh Observatory)
- Multiple station in France and Spain (DMS, IMCCE, Pic du Midi), Germany (SETI, DMS), Uzbekistan (NAOJ)
- and hundreds more!



# A joint effort

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- EISCAT radar observations  
A. Pellinen-Wannberg
- Multiple stations in the UK  
Armagh Observatory
- Multiple stations in France  
(DMS, IMCCE, Pic de Dôme)  
(SETI, DMS), Uzbekistan
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# After the campaign...

- Collaboration for data analysis (Ondrejov observatory, SETI Institute, Univ. Lomonosov etc.)
- workshop organizing France in September 2012 (waiting for confirmation)

# conclusion

- 2011 Draconids: a unique outburst
- the first European meteor observation airborne campaign
- see: [www.imcce.fr](http://www.imcce.fr)
- we need you!



# Acknowledgment

- P. Jennsikens (SETI Institute)
- SAFIRE team
- P. Kotten (Ondrejov Observatory)
- D. Koschny, J. McAulliffe, D. Pautet, I. White
- EUFAR & DLR aircraft team
- Ville de Paris, Programme National de Planétologie, Observatoire de Paris