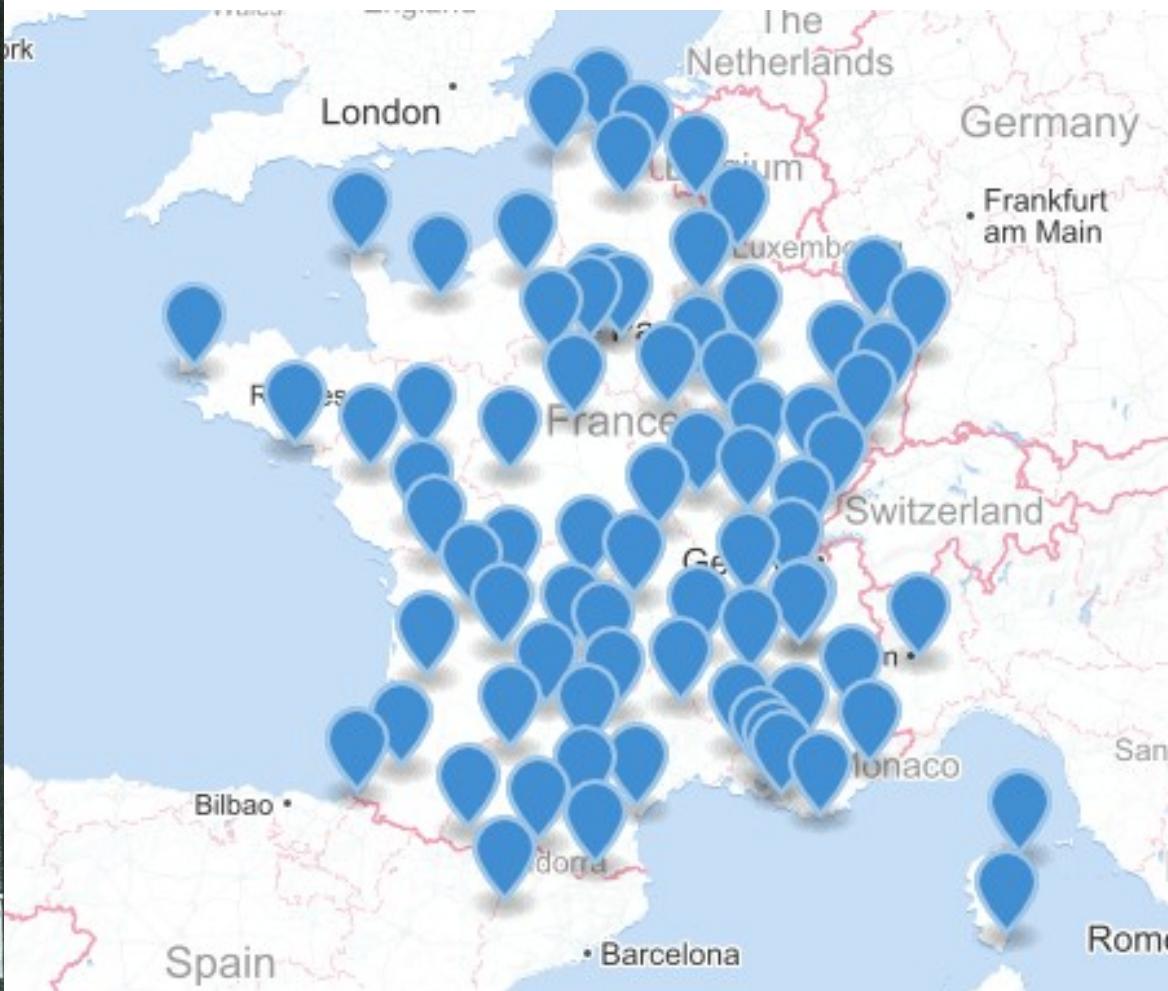
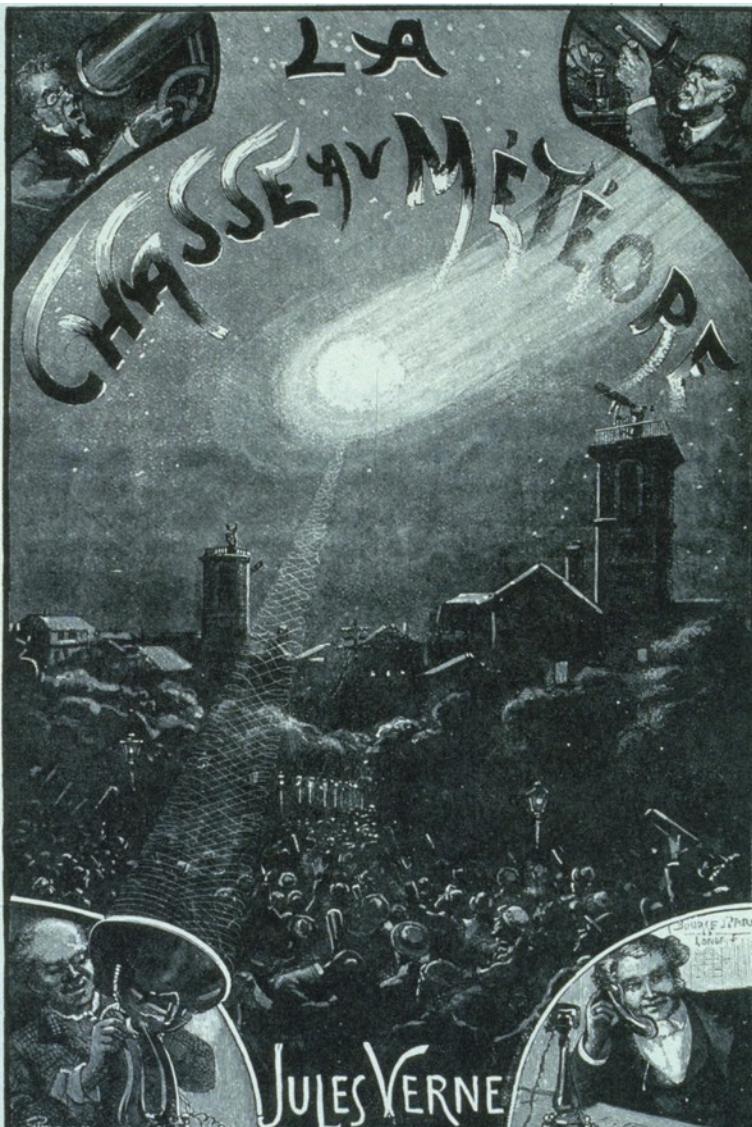


# F RIPON - PRISMA – Vigie Ciel

*F. Colas, C. Marmo and the F RIPON team*



*PRISMA day , Firenze, 2017 may 16th*



# Fripon

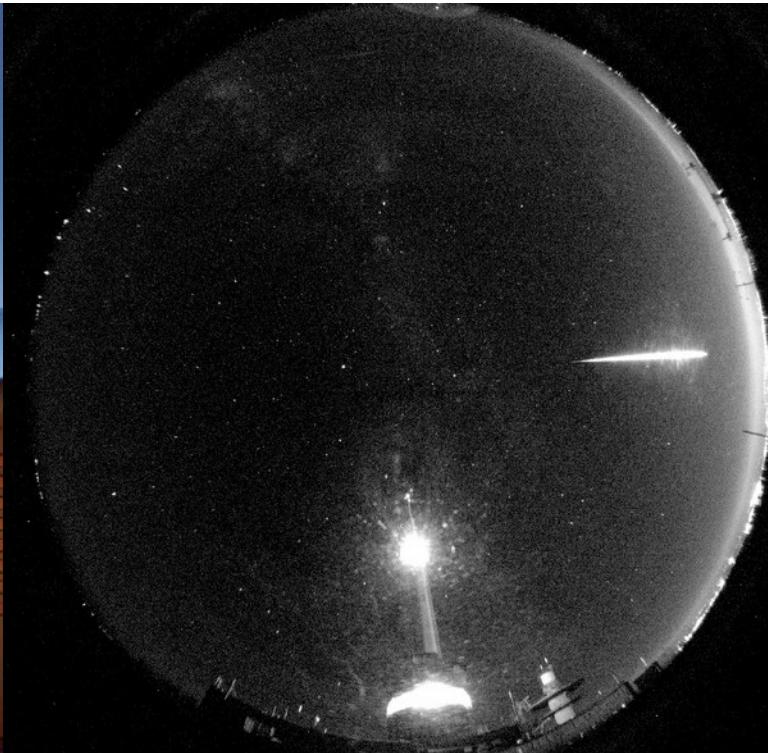
(*Fireball Recovery and Inter-Planetary Observation Network*)

# Prisma

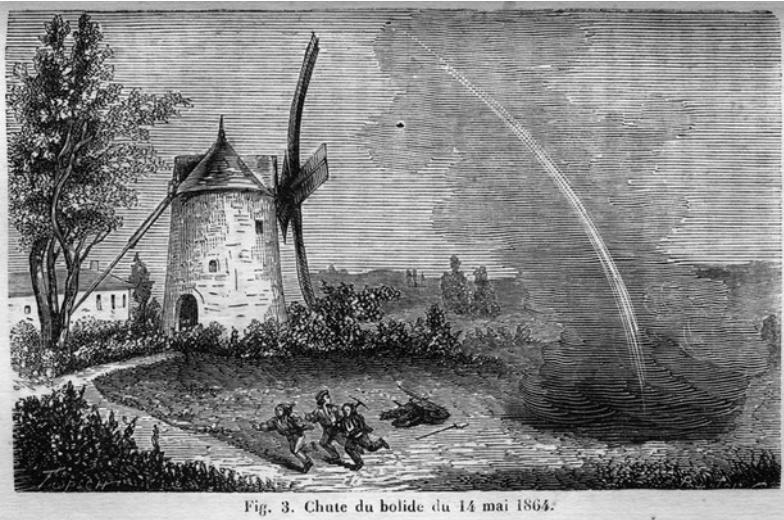
(*Prima Rete Italiana per la Sorveglianza sistematica di Meteore ed Atmosfera*)

# Vigie Ciel

(*Citizen science program*)



# F RIPON - PRISMA : origin of meteorites



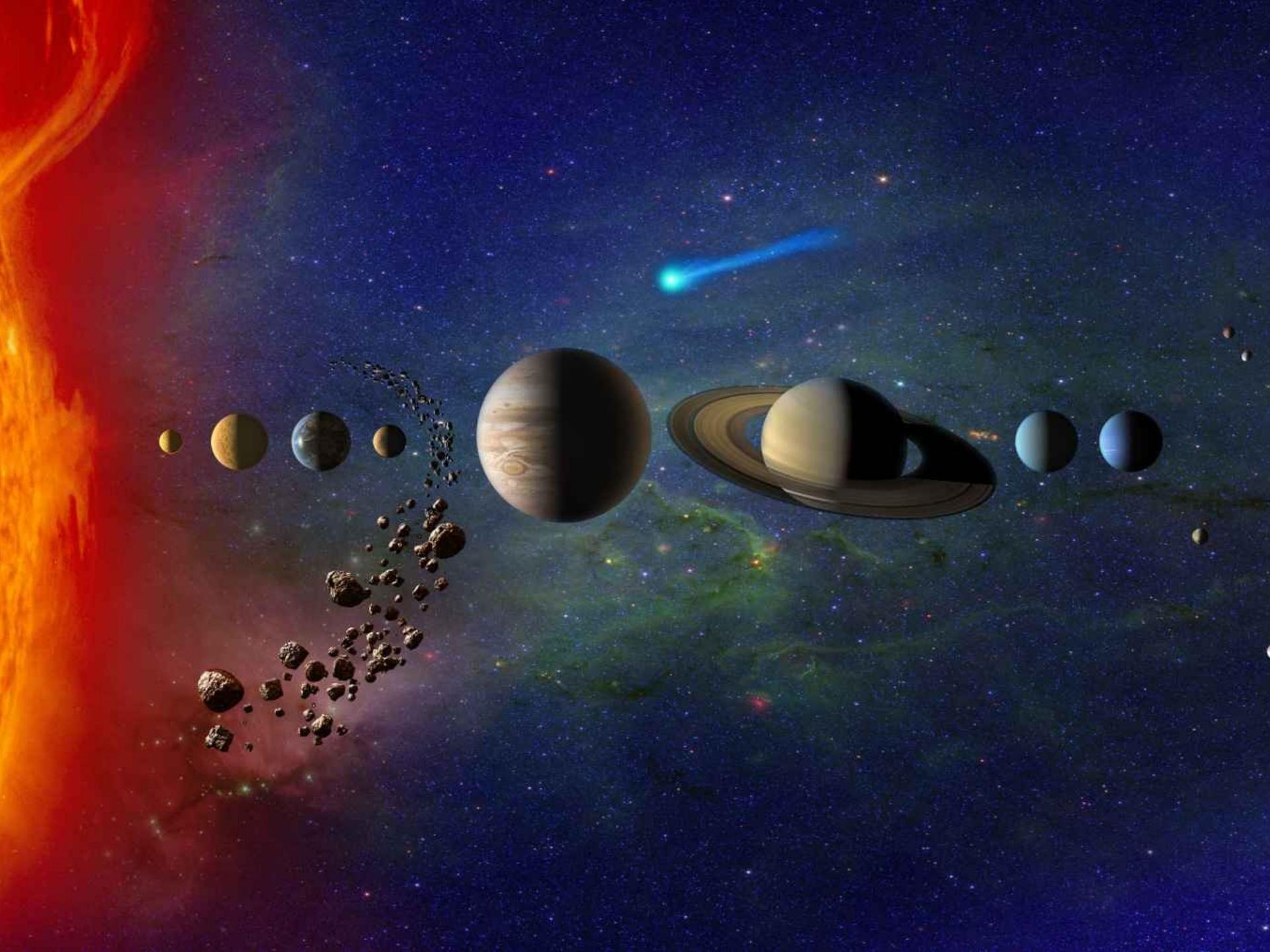
Orgueil 1864



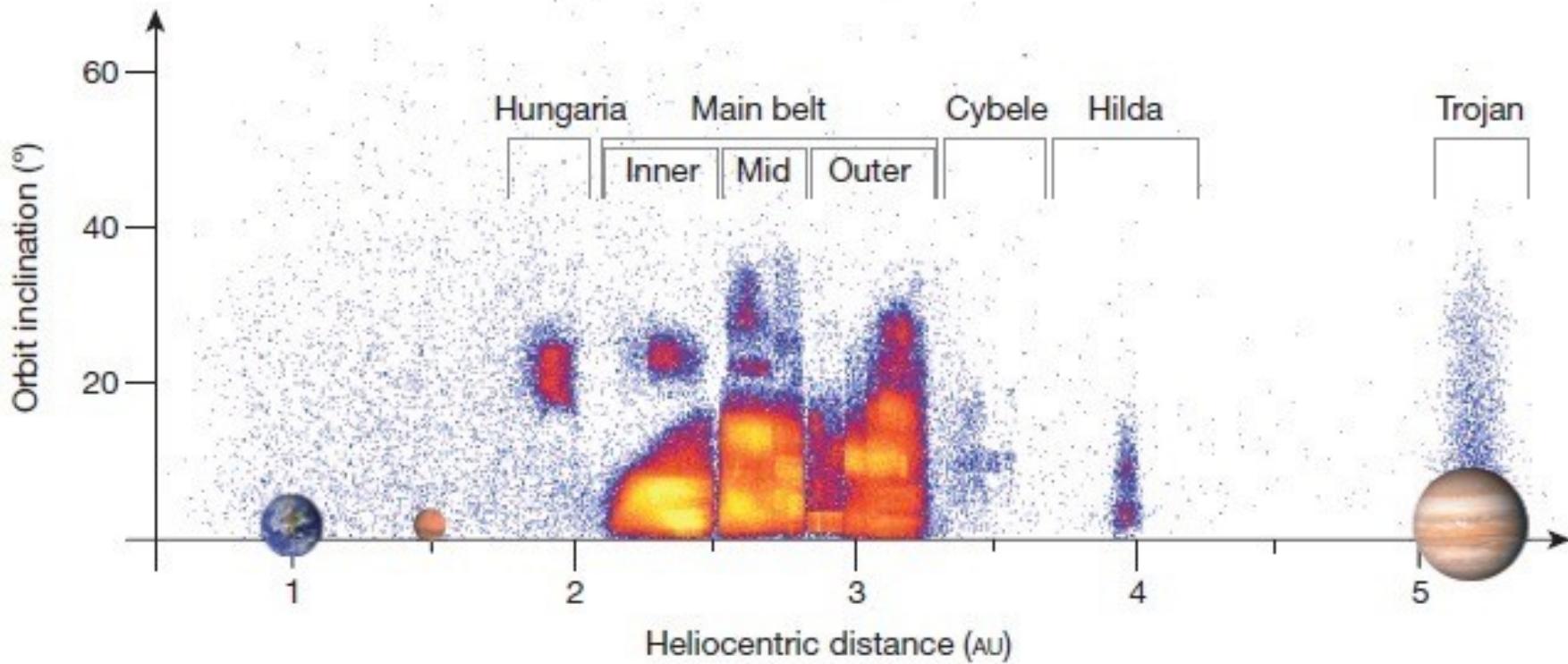
Alby sur Chéran 2002



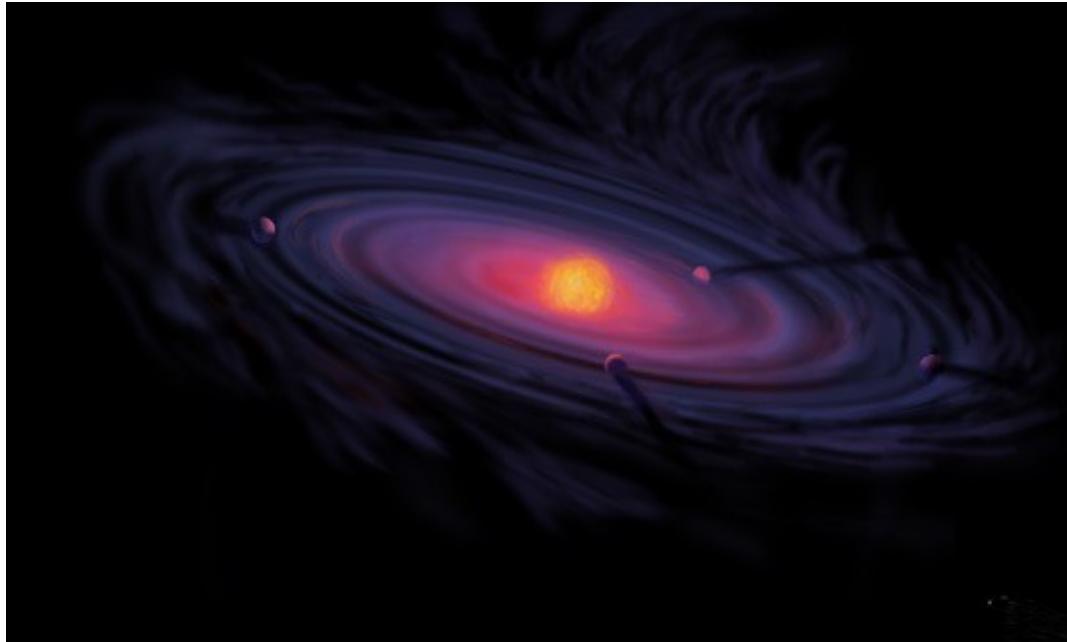
Chelyabinsk 2013



## View of the astronomer



## View of the geologist



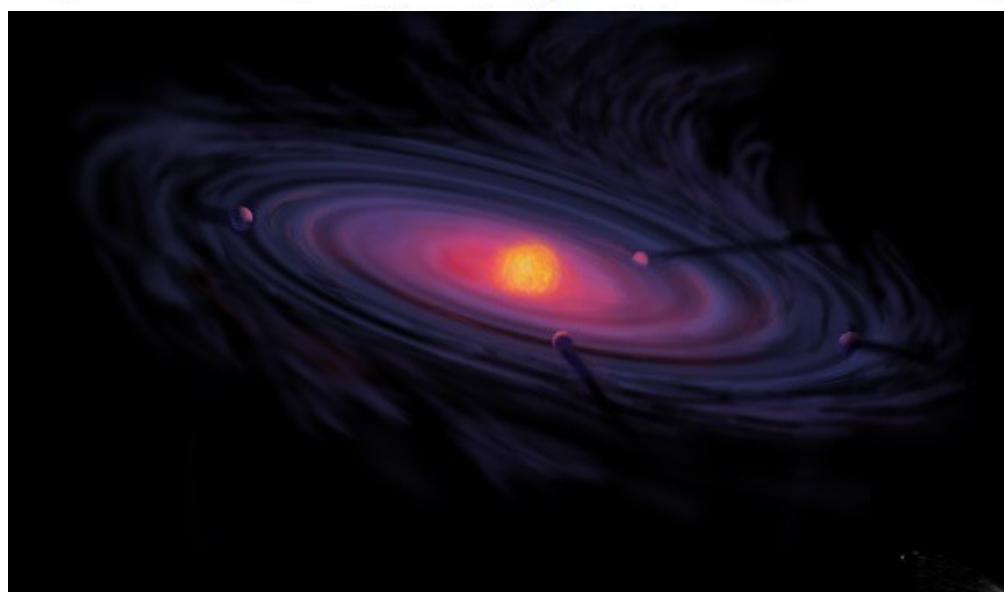
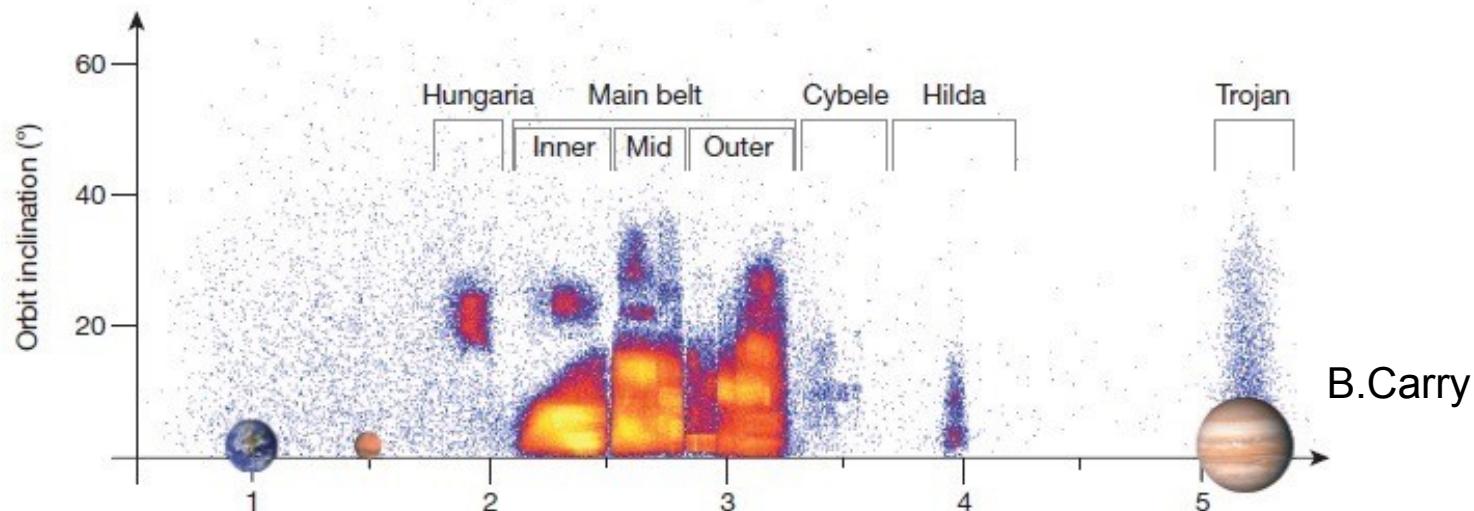
Primitive nebula



Orgueil Meteorite

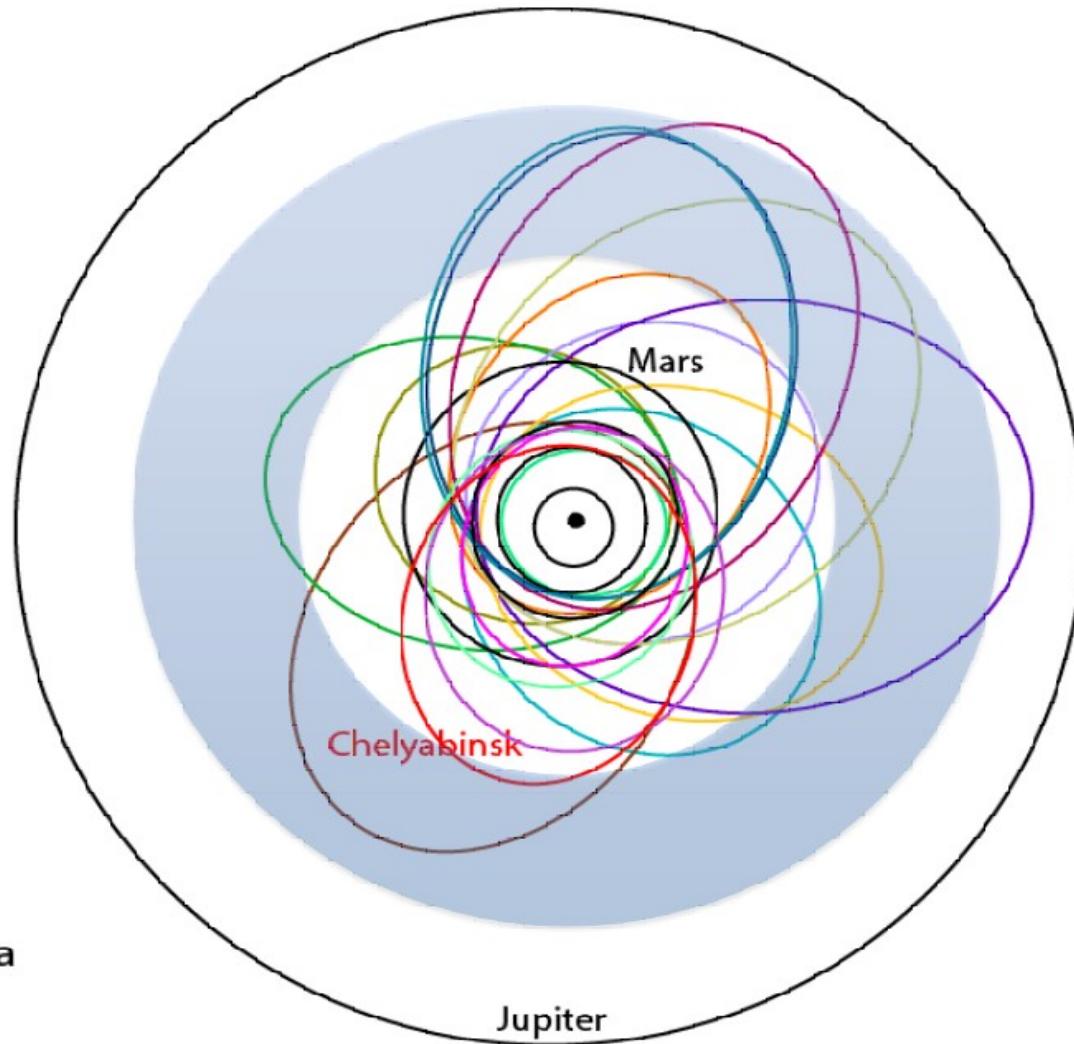


Link between the actual solar system state and its origin.



We need to know the orbits of the meteorites

- Almahata Sitta
- Bunburra Rockole
- Buzzard Coulee
- Chelyabinsk
- Grimsby
- Innisfree
- Jesenice
- Kosice
- Lost City
- Mason Gully
- Moravka
- Neuschwanstein
- Park Forest
- Peekskill
- Pribram
- Tagish Lake
- Villalbeto de la Pena

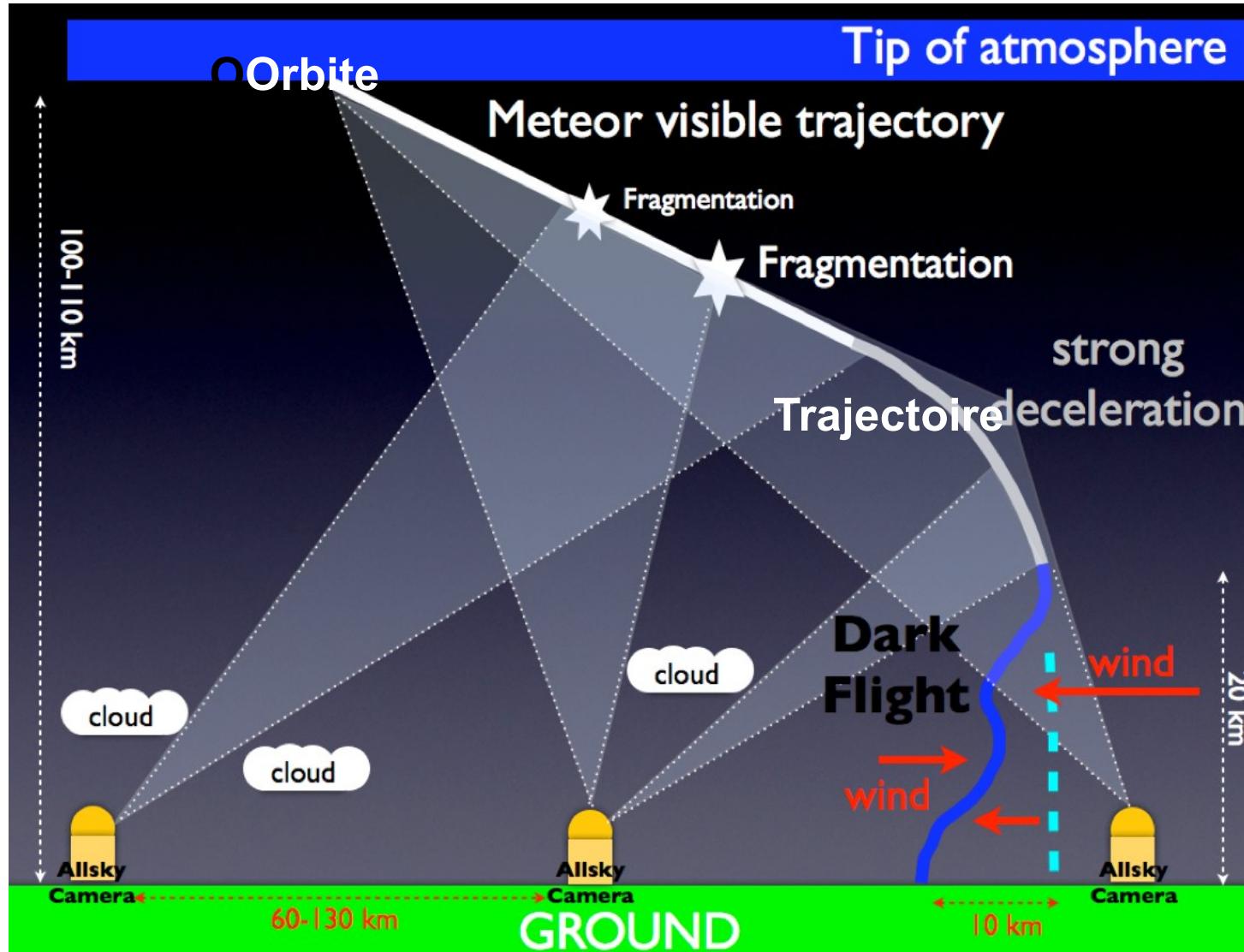


# Orbit and trajectory

bit



100 cameras and 25 radio stations.

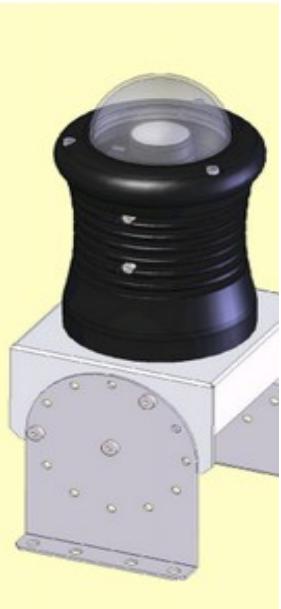


# FRIPOON camera design

- Digital cameras (chip Sony ICX 445)
- 1.2 mega pixels
- Fish eye lens : 1.25mm F/2.0
- $10^{-6}$  sec min exp => day time observations
- 30 fps
- GigE Vision protocol
- PoE power : cable 100 m



# FRIPOON ~ 90 Cameras installed



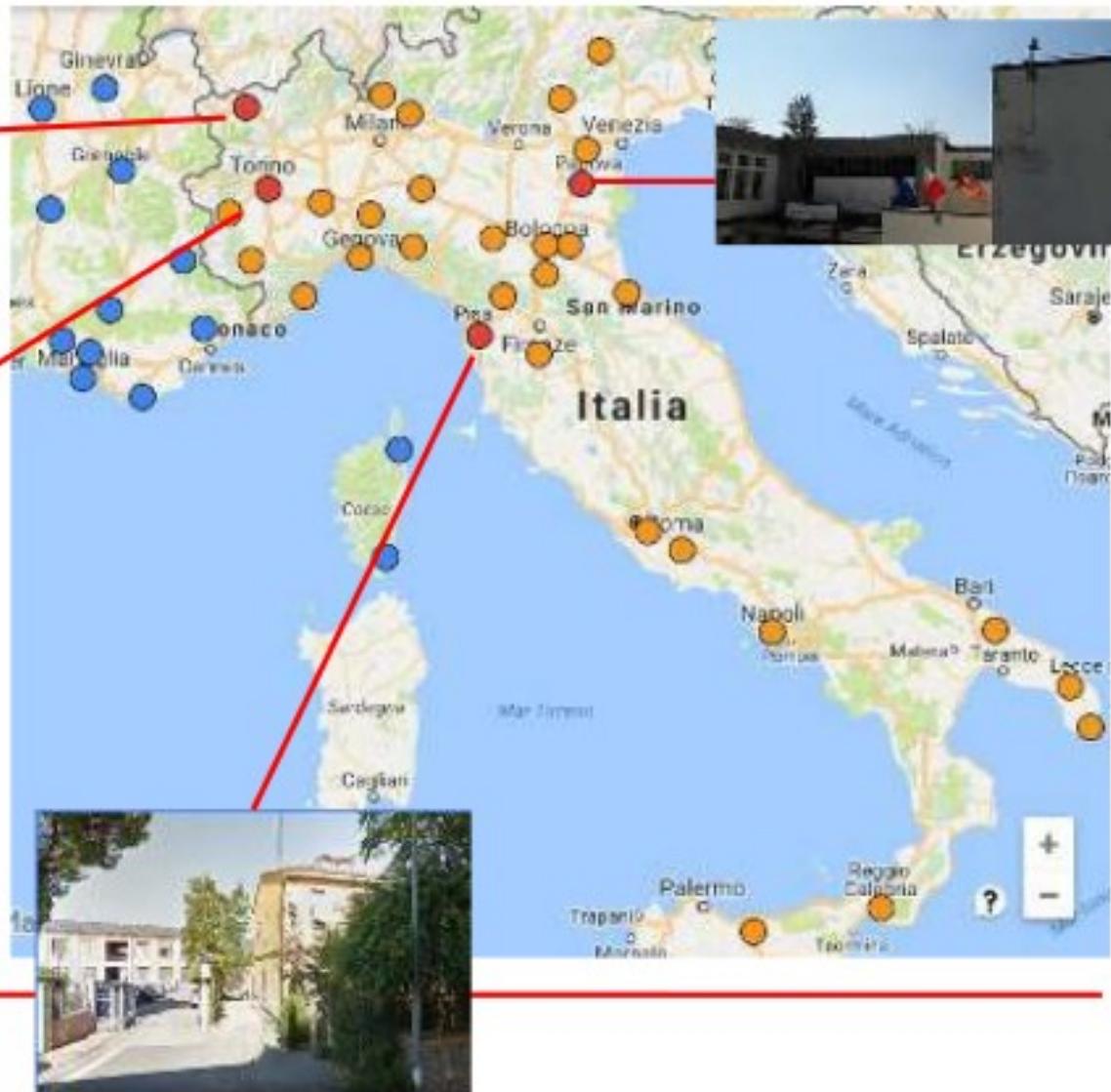
# FRIPO + PRISMA !



***PRISMA stations***

- \* *Connected*
- \* *Under deployment*

***FRIPO stations***



# FRIPON it is a lot of persons, including Italian of PRISMA

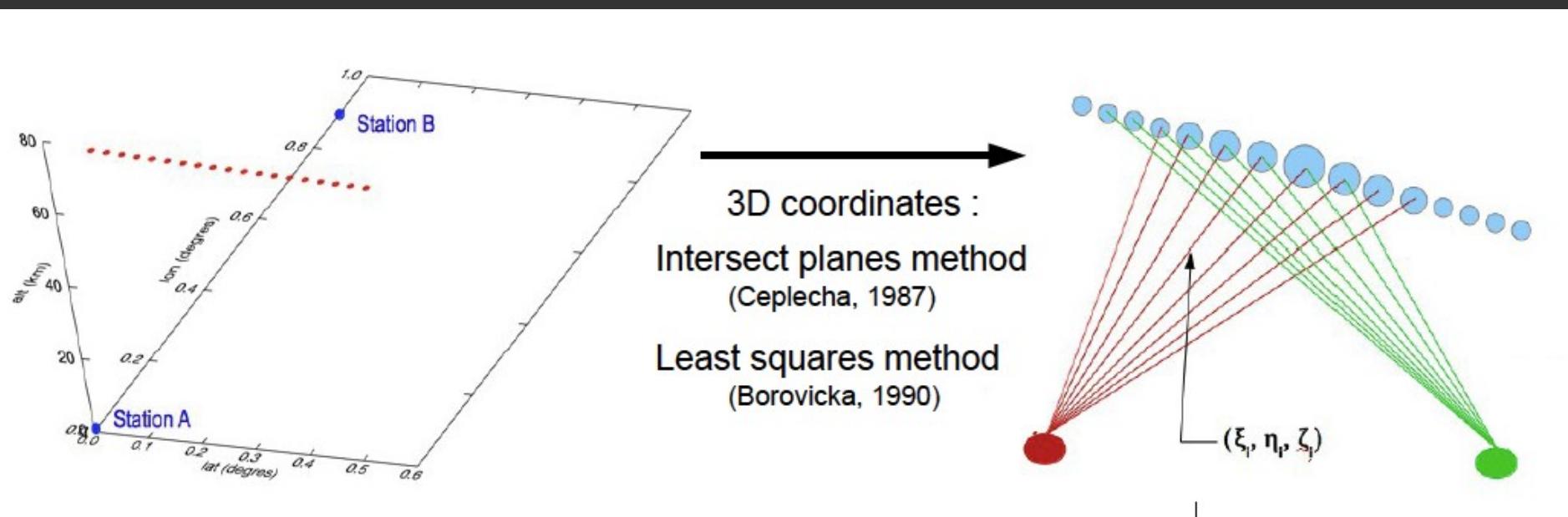
## The FRIPON meteor survey: one year of operation

F. Colas<sup>1,41</sup>, B. Zanda<sup>2,1,41</sup>, S. Bouley<sup>3,1,41</sup>, C. Marmo<sup>3</sup>, J. Vaubaillon<sup>1</sup>, J. Gattacceca<sup>4,15,27</sup>, P. Vernazza<sup>5,27</sup>, L.Jorda<sup>5,27</sup>, A. Steinhauer<sup>2,41</sup>, M. Rotaru<sup>2,41,42</sup>, C. Birnbaum<sup>41,42</sup>, S. Jeanne<sup>1</sup>, A. Egal<sup>1</sup>, A. Drouard<sup>5</sup>, J.L. Rault<sup>6,41</sup>, M. Birlan<sup>1,17</sup>, L. Maquet<sup>1,22</sup>, C. Blanpain<sup>5,27</sup>, A. Malgoyre<sup>5,27</sup>, J. Lecubin<sup>5,27</sup>, Y. Audureau<sup>3</sup>, M.K. Kwon<sup>1</sup>, S. Caminade<sup>7</sup>, K. Antier<sup>41,43</sup>, J. Vergne<sup>8</sup>, M. Wendling<sup>8</sup>, Y. Marchal<sup>8</sup>, P. Wilhelm<sup>8</sup>, P. Finitzer<sup>8</sup>, T. Bouman<sup>8</sup>, B. Tregon<sup>9</sup>, J.P. Ruguet<sup>9</sup>, C. Davadan<sup>9</sup>, P. Dupouy<sup>9</sup>, J. Cresson<sup>9</sup>, O. Bautista<sup>9</sup>, M. Herpin<sup>9</sup>, J. L. Froger<sup>10</sup>, S. Leibrand<sup>10</sup>, L. D. Bayle<sup>10</sup>, E. Huet<sup>10</sup>, J. Prezeau<sup>10</sup>, A. Dardon<sup>10</sup>, V. Boudon<sup>11</sup>, J. P. Defaix<sup>11</sup>, R Moreau<sup>11</sup>, J.M. Jouvard<sup>11</sup>, P. Janeux<sup>11</sup>, J. Sivignon<sup>11</sup>, P. Abraham<sup>12</sup>, J. A. Barrat<sup>12</sup>, T. Appere<sup>12</sup>, Pl Le Du<sup>12</sup>, M. Piquel<sup>12</sup>, J. P. Thomas<sup>12</sup>, F. Westall<sup>13</sup>, M. Tagger<sup>13</sup>, J. P. Lebreton<sup>13</sup>, El Laisné<sup>13</sup>, G.I Auxepaules<sup>13</sup>, J. L. Dumont<sup>13</sup>, P. Le Poupon<sup>13</sup>, M. Rotger-Languereau<sup>14</sup>, P. Bergamini<sup>14</sup>, F. Peth<sup>14</sup>, D. Gerard<sup>14</sup>, P. M. Nicolai<sup>15</sup>, G. Ferrant<sup>15</sup>, L. Luciani<sup>15</sup>, P. Rousselot<sup>16</sup>, F. Meyer<sup>16</sup>, M. Bardy<sup>16</sup>, N. Esseiva<sup>16</sup>, M. Schieffer<sup>16</sup>, A. Leroy<sup>17</sup>, J. F. Julien<sup>17</sup>, M. Garmier<sup>17</sup>, J. Laskar<sup>1,17</sup>, Olivier Alard<sup>18</sup>, S. Rochain<sup>18</sup>, E. Coustal<sup>18</sup>, G. Herbreteau<sup>18</sup>, G. Varennes<sup>18</sup>, V. Pic<sup>18</sup>, K. Chevrot<sup>18</sup>, R. Vuillemin<sup>18</sup>, M. Groc<sup>18</sup>, P.I Rougier<sup>19</sup>, N. Parisot<sup>19</sup>, G. Pallier<sup>19</sup>, M.I Champenois<sup>20</sup>, D. Mathieu<sup>20</sup>, R. Baldo<sup>20</sup>, Y. Marrocchi<sup>20</sup>, D. Baratoux<sup>21</sup>, G. Quitté<sup>21</sup>, P. Defives<sup>21</sup>, B. Caillier<sup>21</sup>, A. Foucault<sup>21</sup>, B. Monflier<sup>21</sup>, L. Corp<sup>21</sup>, F. Delefie<sup>1,22</sup>, A. Vienne<sup>1,22</sup>, D. Schreiner<sup>22</sup>, S. Groult<sup>22</sup>, P. Notez<sup>22</sup>, M. Verlinden<sup>22</sup>, D. Boust<sup>23</sup>, S. Jouin<sup>23,43</sup>, M. Leblanc<sup>23</sup>, E. Mandon<sup>23</sup>, P. Francois<sup>24</sup>, N. Luft<sup>24</sup>, N. Herrmann<sup>24</sup>, L. Portois<sup>24</sup>, N. Mangold<sup>25</sup>, L. Ledeit<sup>25</sup>, O. Sauzereau<sup>25</sup>, J. Galard<sup>25</sup>, R. Mourques<sup>25</sup>, M. Benammi<sup>26</sup>, E. Barbotin<sup>26</sup>, J.J. Hillairet<sup>26</sup>, S. Carreau<sup>26</sup>, P.Tanga<sup>27</sup>, A. Levansuu<sup>27</sup>, L. Arnold<sup>27</sup>, L. Lombard<sup>27</sup>, J.P. Rivet<sup>27</sup>, P. Bendjoya<sup>27</sup>, X. Heny<sup>27</sup>, A. Lienard<sup>27</sup>, S. Cointin<sup>27</sup>, J. L. Marin<sup>27</sup>, J. F. Leoni<sup>27</sup>, E. Lewin<sup>28</sup>, C. Quanti<sup>28</sup>, D. Loizeau<sup>28</sup>, P. Beck<sup>28</sup>, L. Berger<sup>28</sup>, E. Ravier<sup>28</sup>, J. Y. Meyer<sup>28</sup>, B. Gautier<sup>28</sup>, F.Cochard<sup>28</sup>, O. Thizy<sup>28</sup>, A. Cellino<sup>29</sup>, D. Gardiol<sup>29</sup>, P. Bouget<sup>30</sup>, C. Nitschelm<sup>30</sup>, M. Valenzuela<sup>30</sup>, L. Ferriere<sup>31</sup>, H. Lamy<sup>32</sup>, E. Jehin<sup>32</sup>, S. Ribas<sup>33</sup>, D. Koschny<sup>34</sup>, A. Toni<sup>34</sup>, M. Pajuelo<sup>35</sup>, E. Meza<sup>35</sup>, A. Nedelcu<sup>36</sup>, Z. Benkhaldoun<sup>37</sup>, H. Chennaoui<sup>37</sup>, R. V. Martins<sup>38</sup>, J. Camargo<sup>38</sup>, K. Wimmer<sup>39</sup>, B. Poppe<sup>39</sup>, G. Drolshagen<sup>39</sup>, E. Drolshagen<sup>39</sup>, T. Ott<sup>39</sup>, M. Ory<sup>40</sup>, and R. Behrend<sup>40</sup>

(Affiliations can be found after the references)

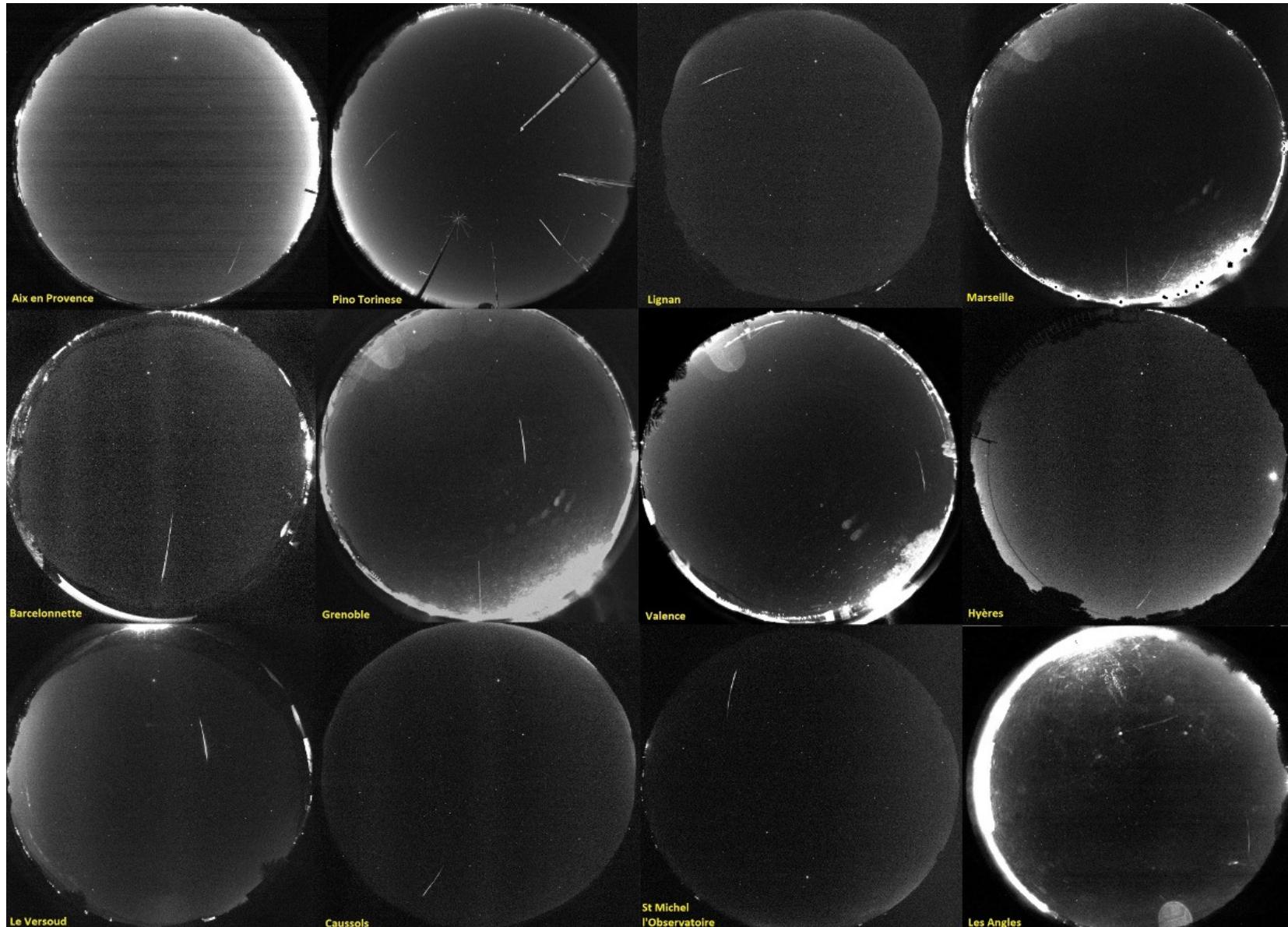
Received ...; accepted ...

~ 2000 trajectories per year



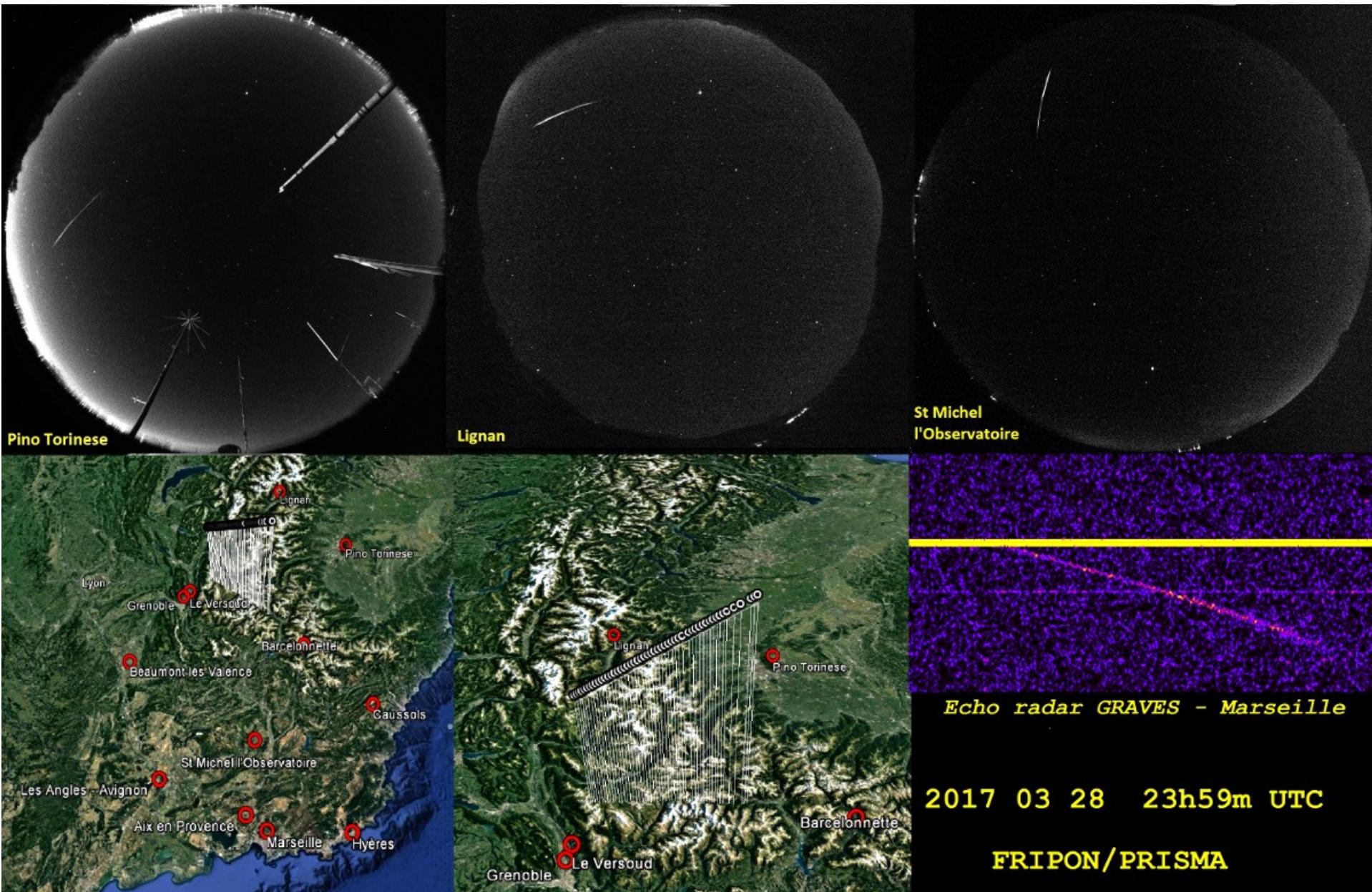
For magnitude < 0

# FRIPON-PRISMA it is not only words, it fireballs !

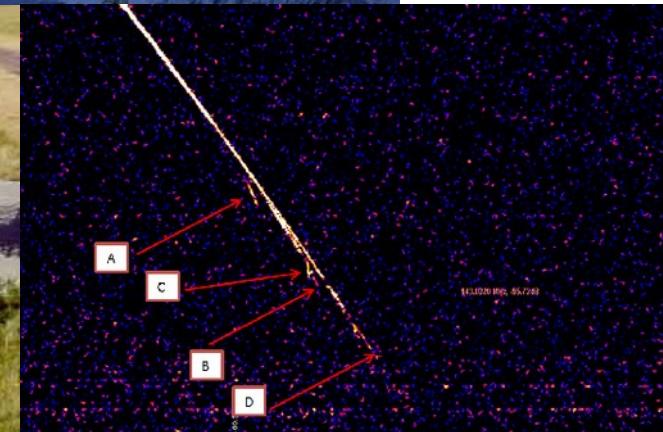
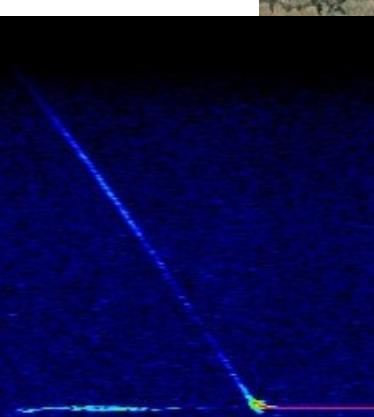


2017-03-30 23h59m UTC

# Trajectories and radar observations



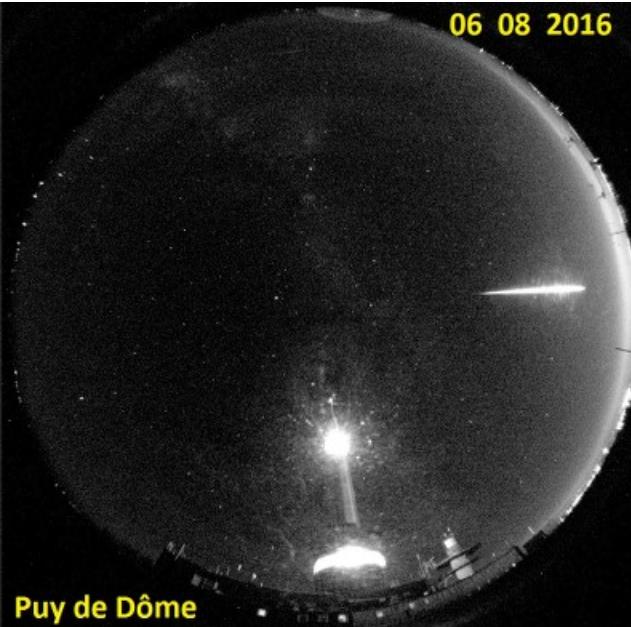
We must install radio receivers in Europe !



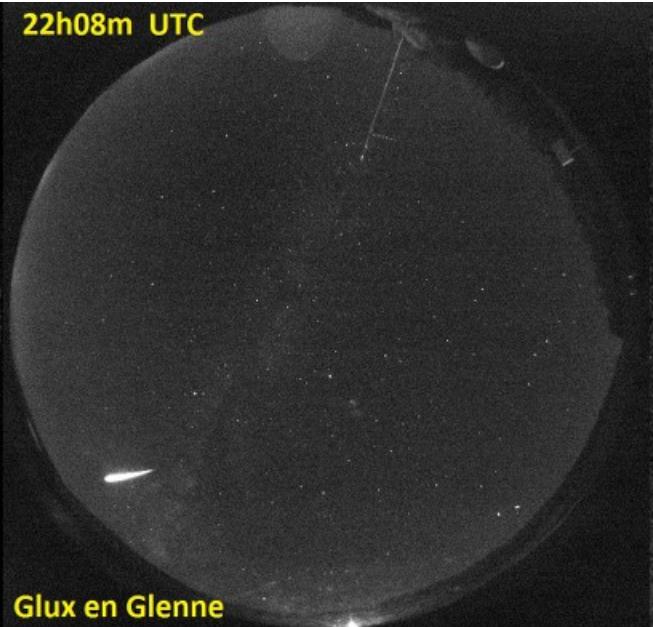
# First possible fall 2017 08 06 à 22h08m



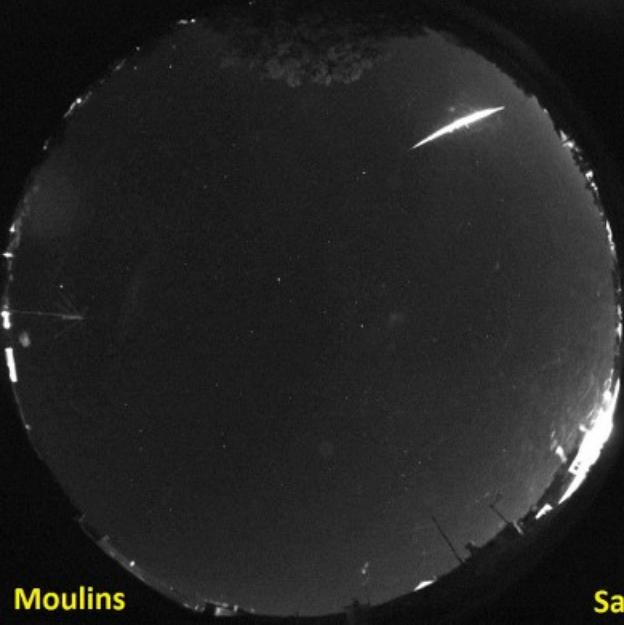
Beaumont les Valence



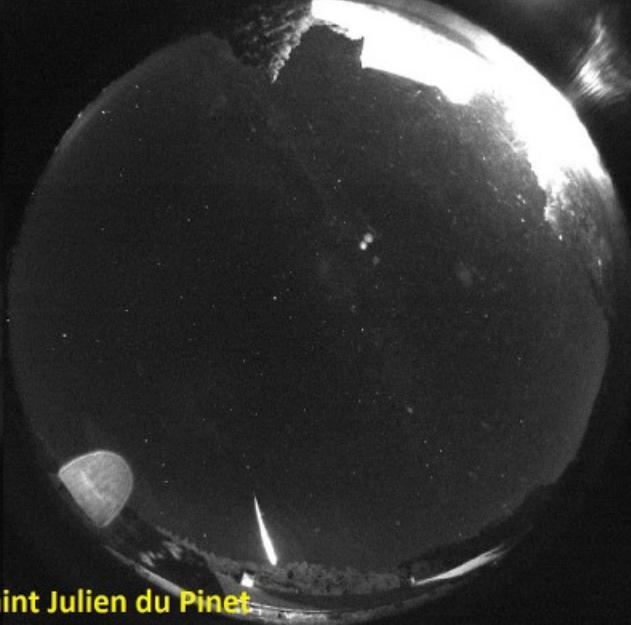
Puy de Dôme



Glux en Glenne



Moulins



Saint Julien du Pinet

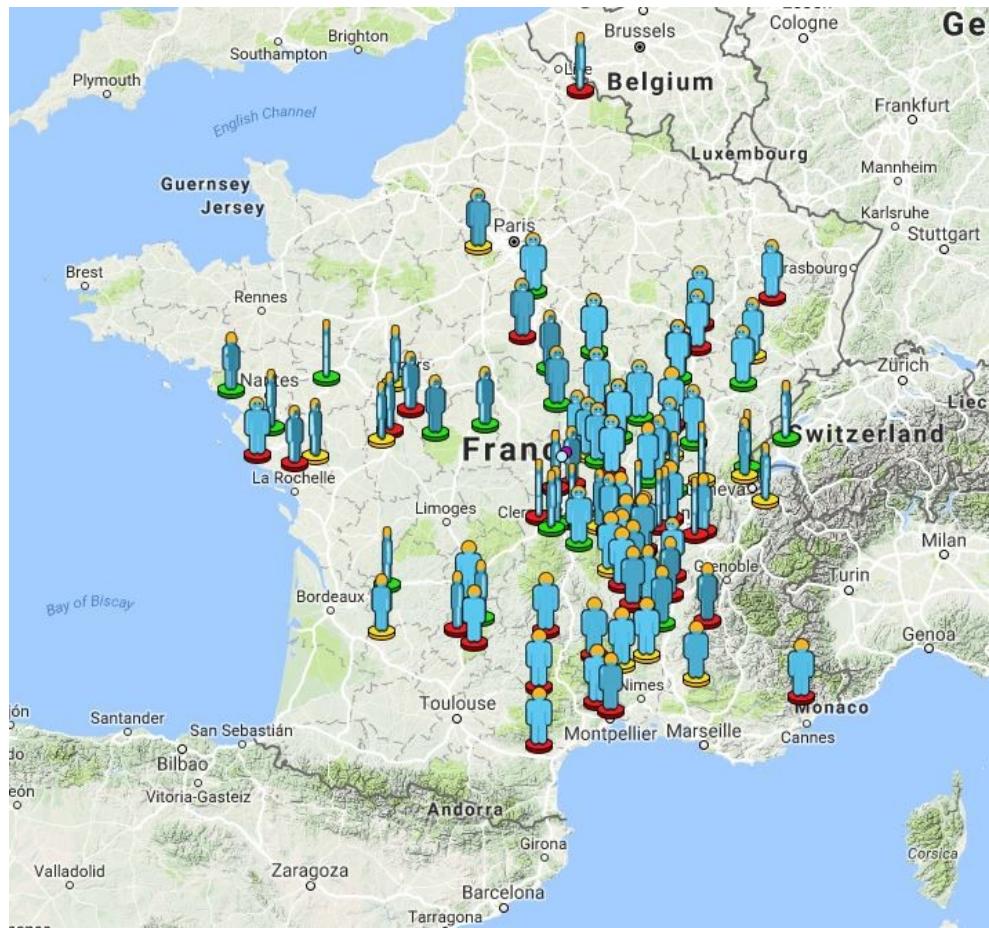


[www.fripon.org](http://www.fripon.org)



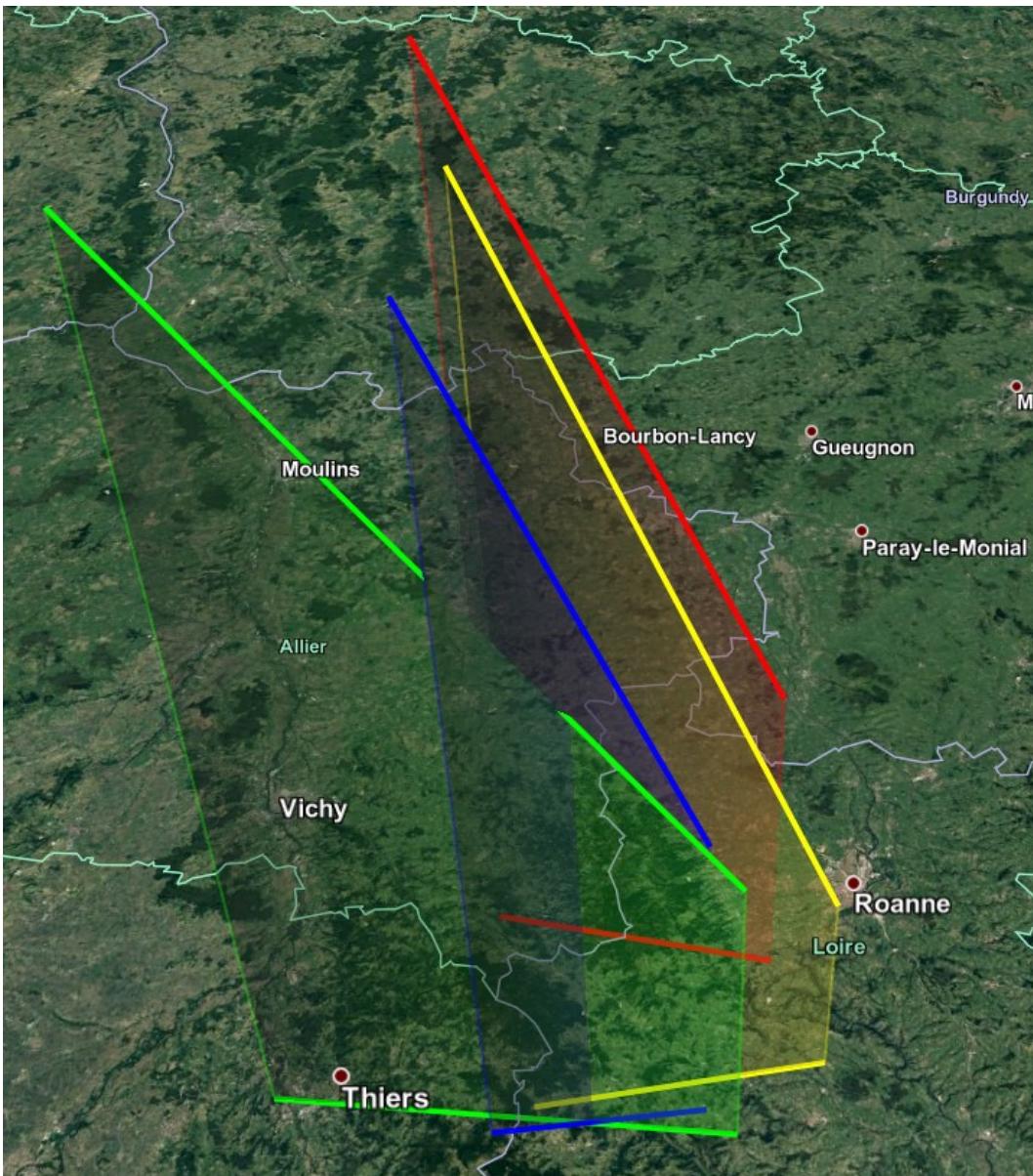
Gaël Le Bas, Céron

Bolide 2017 08 06



IMO/AMS observations

# Calcul de trajectoire



**Réduction avec toutes des informations de l' AMS/IMO**

**Sélections des données reportées moins de 4 h après la chute**

**REFORME plus BOAM (Video)**

**FRIPON**

**Egal et al (2017)**

# Bolide du 6 août 2016 – Field research



# Bolide du 6 août 2016 – Field research and contact with public



# Why Vigie-Ciel ?



## Involving the public in discoveries from meteors to craters ...

For this, there is a need for an ambitious scientific culture dissemination program

- To learn how to report
- To learn to recognize shooting stars, meteorites and impact craters
- To better understand the interest of studying all these objects and preserving meteorite
- And for those who go to the field: to learn how to manipulate meteorites and to know the legal aspects of the quest



## **involving the public in discoveries from meteors to craters ...**

- ⇒ Web site for the end of 2017
- ⇒ Educational suitcase in progress (expected delivery July 2017)
- ⇒ Other teaching materials (e.g. exhibitions, books ...) and animations

General access to meteorite research campaigns simulation



# Vigie-Ciel tools

