CANS OF JAM²

issue 14, back from England, April 2012

CANS OF JAM²

From the editors

There we go again for a new issue of *cans of jam²*!
Most of our pupils-reporters were with us in England for a week at the end of April, before their school holidays, but it did not prevent some of them from sending us their articles... These pupils were highly organized, and very serious, so here is their work.
We would like to congratulate most especially Julien D., for his involvement and for the amazing picture of the solar storm, and Jean C.C., for his work on the cover : since the pupils had the idea of a cover for the magazine, it is the first time that it is designed and realized entirely by a pupil, so well done! Enjoy your reading.

We wish you all a very pleasant spring!

Willy B. and Didier G.

Waiting for... What?

Here are some of our reporters, from left to right : Antoine, Mélissa, Julie, Robin, Thomas, Wilfried, Jean, and Julien standing in the foreground.
Can you guess what they are waiting for? The best clue is probably Julien's position...

Cans of jam² is a scientific magazine written by the pupils from the European classes of Paul Langevin High School in Beauvais, Oise. It is free, available mainly through internet, and usually published for each school holiday period.

If you want to subscribe and receive an internet copy of *cans of jam²*, all you need to do is send an email entitled '*cans of jam²*, subscription' to didier.galard@ac-amiens.fr, and you will be added to our mailing lists. And that is free as well!!

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News from Space : April 2012

by Julien D.

Tuesday, 3rd. Curiosity rover halfway to Mars. Launched in November 2011, the Mars Science Laboratory of NASA has already covered half its course, which will end in August.

More than four months after its launch, the spacecraft that transports the *Curiosity* rover to Mars is halfway to its objective. In late March, the spacecraft had traveled 326 million kilometers, out of the 567 million of its way to Mars. So far, the trip goes safely, punctuated by six trajectory corrections needed before the arrival on Mars.

Approx. size of Earth ➔
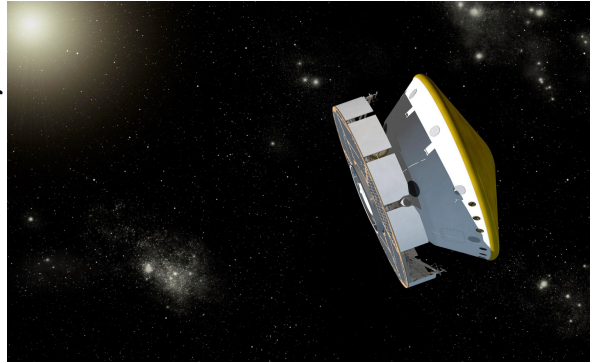
Thursday, 5th. Better predicting solar storms through mission Trio-Cinema.

To study the effects of solar storms on Earth and space, an international team this year launched three small satellites of the CubeSat* model. The mission, named Trio-Cinema, among others will help to better understand the origin and evolution of the Earth's magnetic field perturbations.

The bursts of solar activity have an impact on the Earth's magnetic field, causing geomagnetic storms that can damage satellites and power distribution systems on Earth. To better understand this environment and progress on the question of the prediction of space weather, an international team of scientists sent into space three small CubeSat to study the effects of solar storms on the radiation belts and magnetic field.

* : CubeSat satellites are cubic, small and light (1.3 kg max, for a volume of one litre). They were designed by Stanford University and the University of California to allow universities all around the world to launch their own 'low-cost' satellites.

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Clean Space One

by Robin G.

Since the first 'Sputnik 1' satellite, men have put on orbit 5,500 other satellites to improve their daily life. However these machines are not eternal and when they 'die' they continue to revolve round the Earth and they are very dangerous for astronauts, and when they go back to the Earth. That is for this reason that the École Polytechnique Fédérale of Lausanne (Switzerland) decided to invent a little satellite for the recovery and destruction of scraps of metal : it will capture and destroy old, out-of-order satellites and debris in the Earth's atmosphere.
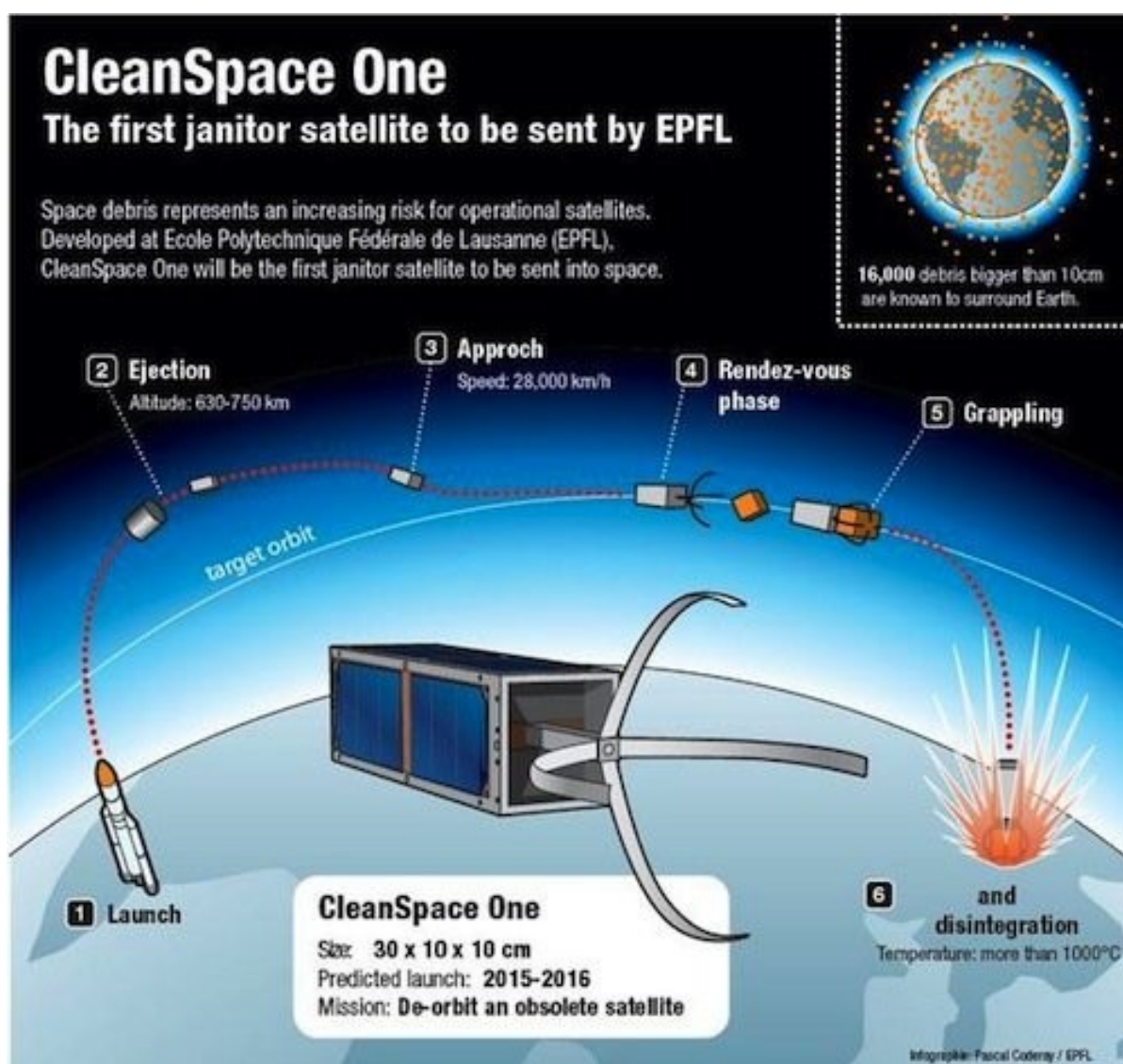
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A scientist who counted :
3- Edwin Powell Hubble

by Julien D.

Edwin Powell Hubble was born in Marshfield (Missouri) on the 20th of November, 1889. He died of a stroke on the 28th of September 1953.

Hubble was a great astronomer who allowed to improve our understanding of the Universe. He demonstrated the existence of other galaxies in space. He also demonstrated that those were moving away from each other at a speed proportional to their distance by observing a red shift of the spectrum of several galaxies. This is known as the expansion of the universe.

MOUNT WILSON 60-INCH TELESCOPE *

He studied in 1910 at the University of Chicago, where he studied mathematics and astronomy. Then, he spent three years at Oxford University where he earned a Master of Arts in Law. He returned to astronomy at the Yerkes Observatory, where he received his Philosophae Doctor Diploma in 1917. George Ellery Hale, founder and director of the Mount Wilson Observatory near Pasadena, California, offered him a research position in 1919. He continued his work until the end of his life. Not long before his death, he used the first Hale telescope (picture next page) composed of a reflector of 200 inches (5.08 m diameter), which had just been finished.

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A scientist who counted :
## 3- Edwin Powell Hubble (*continued*)

by Julien D.

His arrival at Mount Wilson coincided with the completion of the Hooker telescope of 250 cm, the most powerful telescope of the moment. Observations with this telescope by Hubble in 1923-1924, established that the "nebulae" observed by less powerful telescopes were not in our galaxy, but were other galaxies. He announced his discovery on the 30th December 1924. The first galaxy identified was the small galaxy NGC 6822 located in the Sagittarius' constellation (1925). Then followed M33 (the Triangulum Galaxy) in 1926 and M31(the Andromeda Galaxy) in 1929.

In doing distance measurements of galaxies compared with their redshift in collaboration with Milton Humason, Hubble established in 1929, thanks to spectroscopy, the relation between the distance of galaxies and their recession velocity. This relationship is known as the Hubble law, which is at the origin of the concept of the expansion of the universe. This discovery based on observation and measurement supports the theory of the Big Bang proposed by Alexander Friedmann in 1922.

Edwin Hubble established a system for classifying galaxies depending on their morphology . This system is still used today.

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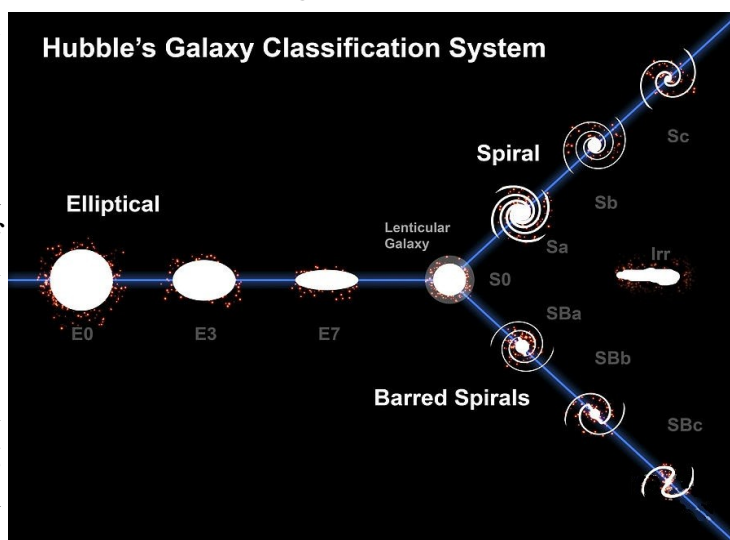
## Schmallenberg virus

by Wilfried B.

In the end of November, 2011, in Germany, teams from the Institute Friedrich-Loeffler identified a virus until then unknown. It will bear the name of the city where the sample which led to its identification was taken, Schmallenberg, in the west part of the country. What do we know about this virus?

At first it was detected in dairy exploitations. The micro-organism was associated with fevers and reduction in the production. Since then, it has spread and affects cattle, ovine races and goats today. It is present in about 3,200 locations (on April 6th, 2012) scattered in diverse countries of Western Europe : Germany, France, Belgium, the Netherlands, the United Kingdom, Luxemburg and, recently, Spain and Italy. In France, about 1,200 exploitations are affected, essentially farms of sheep and goats. Mild to the grown-up animals, the viral infection generates a significant number of congenital deformations and stillborn babies. No transmission to man has been registered. Yet...

On April 5th, 2012, 1,176 exploitations in France were affected by the virus of Schmallenberg (in red, the breedings of goats and ovine races, and in blue, those of bovine races).
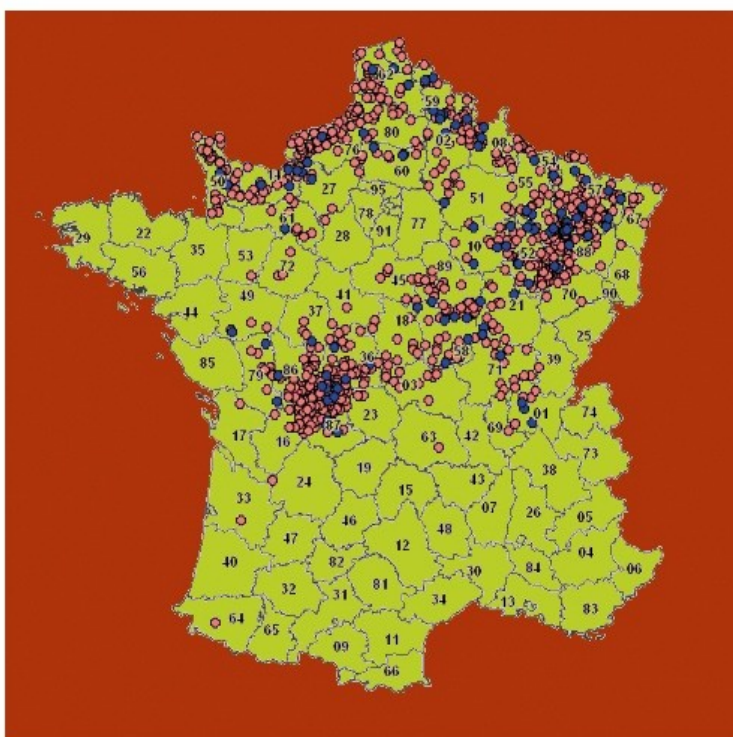
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Readers' e-mails (*only slightly corrected by the editors*)

Dear Cans of Jam²,
As usual, I read the wonderful Cans of Jam², and what did I see ? An article about Gould's life and research ??
I would like to thank Anthony M. for his article about Stephen Jay Gould. I learnt a lot of new things about his life. But what's this picture of Gould with a face of monkey ??! It's a little disrespectful, but funny :-)
Thanks a lot Anthony ! Thanks a lot Cans Of Jam² !
See you,

Julie, from Beauvais, 60

PS : If you haven't got any ideas for a new article, could you speak about Terry Hunt and his research on Easter Island and its settlement ?
PPS : forgive me for my awful English.

It's for me a pleasure to help the readers of the mag. If you want me to help you for someone or something else you just have to ask! :P

Anthony M.

Well, Julie, we are happy to know that you liked the article. As for you English, it is very good, do not be ashamed! And thank you for your support.

Editor

Game : 'the tally's good', or 'that's the right amount' (?)

by Jean C.C.

In this game, you must use the small black numbers to try to get the big red one. You can do sums, substractions, divisions or multiplications (and even sometimes square root or powers if the right symbol is given), but you are allowed to use each number only once. **HAVE A GOOD GAME!!!!**

7 – 31 – 4 – 30 – 28.25
365.25

7 – 5 – 4 – 1 – 2
287

45 – 36.2 – 30 – 10 – √
123

5 – 3 – 3.5 – 2 – 10 – 2 – ² – 5 – 2
357

2 – 12 – 5 – ² – 21 – 3 – 4 – 25
926