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Communication & EPO

Meeting Rubin-LSST France – Nov. 2022

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Did you get your LSST sweatshirt?

If not, don't worry:

- Everybody will get one
- Send me a message with your size at gshifrin@in2p3.fr
- Your lab communication officer will also identify other people who did not get one
- I will send them directly to the labs over the coming weeks



Education portal

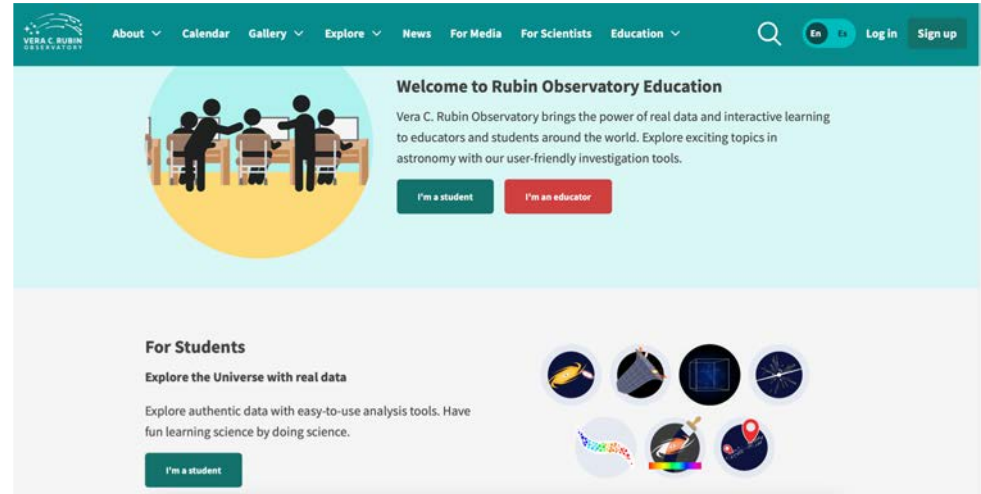
New education portal:
<https://rubinobs.org/education>

Proposing EPO tools using LSST data

Audience : advanced middle school and high school students, and college students in introductory astronomy courses

Designed to support US and Chilean national education standards

Available in English and Spanish



The screenshot shows the homepage of the Vera C. Rubin Observatory Education portal. The header is teal with the observatory logo on the left and navigation links (About, Calendar, Gallery, Explore, News, For Media, For Scientists, Education) in the center. On the right, there is a search icon, language options (En, Es), and buttons for 'Log in' and 'Sign up'. The main content area has a light blue background. On the left, a circular illustration shows a teacher and students in a classroom. To the right, the text reads 'Welcome to Rubin Observatory Education' followed by a paragraph about the observatory's mission and user-friendly tools. Below this are two buttons: 'I'm a student' (teal) and 'I'm an educator' (red). The lower section is titled 'For Students' and includes the text 'Explore the Universe with real data' and 'Explore authentic data with easy-to-use analysis tools. Have fun learning science by doing science.' Below this is a teal 'I'm a student' button and a grid of seven circular icons representing various astronomical topics like galaxies, planets, and telescopes.

The Rubin EPO team will also provide a multilingual kit

Where do we go from here?

⇒ There is an opportunity to adapt the EPO portal to the French educational system



- To propose to French middle and high school teachers to work on real LSST data
- A way to contribute to the teaching of physics in French schools
- To promote the LSST experiment and future scientific results to young people

⇒ Work in progress: **define a relevant method** to implement this French version of the EPO portal

- Gathering information on all the tools available
- Participating in workshops and conferences on astrophysics education
- Evaluating the resources needed for the project implementation

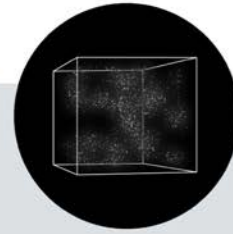
EPO portal: topics of investigation



Surveying the Solar System



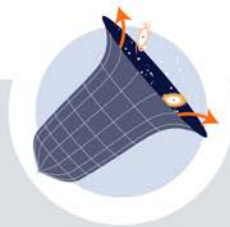
**Coloring the Universe
(Coming Soon)**



**Exploring the Observable Universe
(Coming Soon)**



**Hazardous Asteroids
(Coming Soon)**



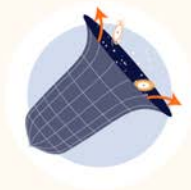
Expanding Universe



**Exploding Stars
(Coming Soon)**

A complete set of ready-to-use tools

Education | Educators | Investigations | Expanding Universe



Expanding Universe

Start Investigation



Investigation total
duration

1.5 hours

To get the most out of each investigation, here is a suggested sequence:

- 1 Read the Teacher Guide
- 2 Check out the Investigation
- 3 Use the Implementation Guide
- 4 Examine the Assessments
- 5 Examine the Phenomenon
- 6 Check out Videos and Auxiliary Content

Each investigation comes with

- A teacher guide
- Support materials
- A phenomenon
- Assessments

Available from any browser

Example of sequence

Lesson

Using Supernovae to Measure Galaxy Distance

In order to construct a Hubble plot, you need two pieces of information about each galaxy: its distance from Earth and its recessional velocity (the speed at which it's moving away from Earth).

One of the most difficult challenges for astronomers is to determine distances to faraway objects like galaxies. One way to measure the distance to a galaxy is to look for a certain type of supernova (an exploded star) called a Type Ia (pronounced "type one-a") supernova that is located within the galaxy. Type Ia supernovae are useful because they can all be standardized to determine their true peak **luminosity** no matter where they occur in the Universe. You can then use the peak luminosity to calculate the distance to the supernova. If you can measure the distance to a Type Ia supernova, then you also know the distance to the galaxy it resides in.

This picture shows a supernova that exploded in the galaxy M51. Notice that it is bright compared to the other stars in the galaxy, and even brighter than the core of the galaxy itself.

Supernovae are rare events. A supernova explodes in a large galaxy once every 50 years, but with Rubin Observatory's ability to monitor billions of galaxies, we can find 1000 supernovae every night!



SN2005cs, the supernova discovered in 2005 exploding in the spiral arms of M51 —also known as the Whirlpool Galaxy. Credit & Copyright: R. Jay Gabany

Exercise

Identifying a Supernova

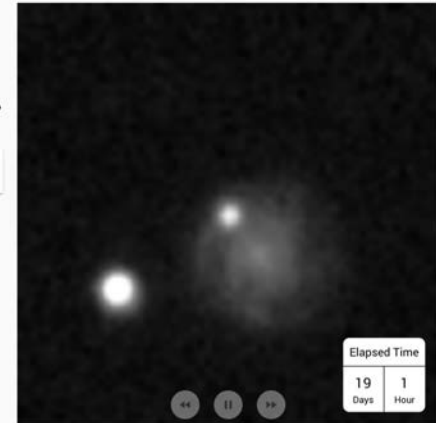
Using Rubin data, astronomers will be able to measure the distance to the supernova and determine the redshift of its host galaxy.

Because supernovae often appear where no star was previously visible, they can be spotted by comparing images of the host galaxy taken at different times.

The images on this page show a supernova discovered in a galaxy. Can you find it? When you spot the supernova, click on it. If you have identified it correctly, a circle will appear around it.

2. Click on a point on the image to select the supernova

Supernova Images



User-friendly interactive tools and engaging data visualizations

More than just a translation job

Challenges:

- ⇒ Propose tools adapted to the French educational system (curriculum, teaching methods, etc.)
- ⇒ Find teachers willing to test the tools and get their feedback
- ⇒ Establish relays in schools and academies to deploy the portal as widely as possible

- ⇒ **Will need a group of LSST experts willing to spend time on this activity**

Stay tuned!