initiation
à la recherche en
astronomie
pour les scolaires

IRIS Dome at Night, 30.3.2016

Peter Aniol @ OHP

The project

The motivation:
To enable students to become familiar with the methods and tools of astronomical research in the context of educational and scientific projects, and thus bring teaching closer to research.

The method:
To put at the service of the educational community a modern, high-performance and versatile teaching tool: a telescope whose operating mode and technical features are in every way similar to the telescopes currently used by professional astronomers.

The targeted audience:
Secondary school students (middle and high schools), as well as higher education (bachelor and master degrees).

A strong link with the rectorship

The project was designed and is managed jointly with the rectorship:

- Have been involved from the start of the project to define the technical requirements.
- Allows us to continue to adapt the system to the evolutions of the French educational system.
- Organization of training days for the teachers (typically in May).
- Organization of special events with the rectorship.
- Members of the Time Allocation Committee.
- Etc.

Two teachers participate closely to the project: J. Strajnic & G. Montagnier.

Pedagogic motivation

- Practice astronomy in conditions similar to those encountered by professional astronomers.
- Carry out scientific studies at a "professional" level: observation of variable stars, calculation of asteroid trajectories, observation of exoplanets, discovery and characterization of supernovae, ...
- Sensitize young people to a scientific approach, while learning the organization of work: preparation and implementation of an observation program, writing documents, management of a calendar, ...
- Learning how to make decisions: how to manage your observation program in case of bad weather, bad configuration, or even unexpected discovery?
- Empowering young people by letting them pilot an instrument with a certain freedom: only operations that could endanger the integrity of the system will be strictly forbidden. Errors are therefore not automatically corrected!

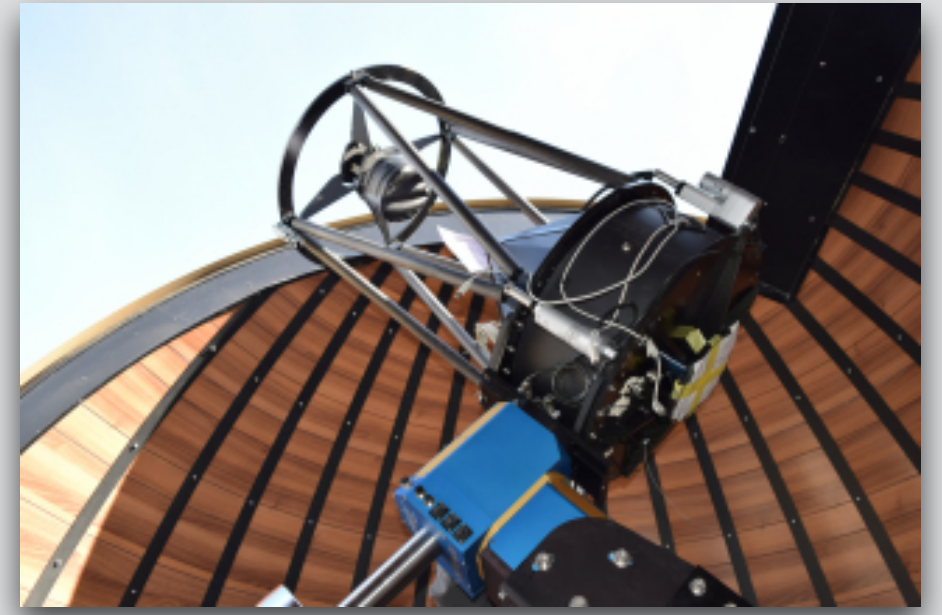
The partners

Budget: about 150 k€.

IRiS @ OHP

The telescope

Particularités	
Diamètre du miroir primaire	50 cm
Ouverture du télescope	F/8
Taille du pixel spatial	0.7 arcsec/pixel
Champ de Vue	24 arcmin
Précision du pointé	< 1 arcsec RMS
Précision du suivi sans autoguidage	< 1 arcsec/10 min
Vitesse de la monture	> 20 °/sec
Vitesse d'accélération de la monture	> 20 °/sec^2
Poids maximal de l'instrumentation	10 kg



A complete instrumentation

Focal plane:

- Professional CCD camera with an E2V sensor (E2V 4240).
- Filter wheel: Clear, SDSS filters (g, r, i and z), CH4, H-alpha and OII.

As well as:

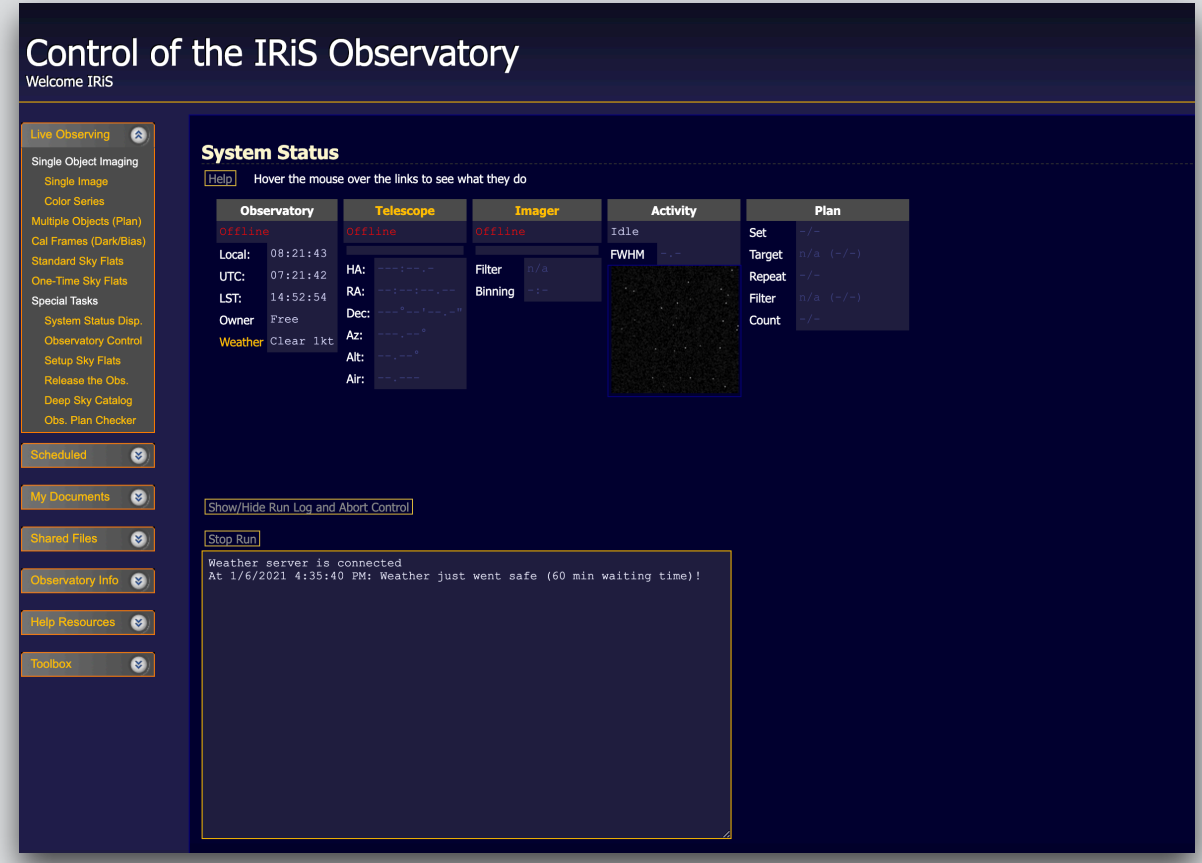
- Protected telescope and instrumentation to avoid endangering the system.
- IR webcams to permanently monitor the telescope.
- Access to the information provided by a seeing monitor.
- Access to the images provided by an All-Sky camera.
- Etc.

An automatic/robotic telescope

System remotely controlled via a simple Web interface (iris.lam.fr):

- Very high flexibility granted to the users.
- Only operations that could endanger the integrity of the system are strictly prohibited.

Robotic mode possible.



ACCESS

Access to the telescope via a call for observation time (typically in Spring), which is then analyzed by a Time Allocation Committee:

- TAC composed of researchers and teachers.
- Pressure factor: about 2.
- Proposals coming from the universities, high schools and colleges.
- A lot of goodwill from the TAC: we are here to help!

STATUS

Upgrade of the system in 2020:

- Telescope sent to Germany to change the M1 barrel (to remove a residual astigmatism) and have a new mount (to avoid meridian flip).
- Started in March 2020, just at the time of containment: everything has been frozen until early November (procurement problems for several electronic components coming from China).
- Mount and telescope are now back, but we still need 1-2 good nights to make the last adjustments: the weather is terrible since then!

When it is finished, schools will be able to access it again:

- But lower pressure this year because of the Covid: difficult for the teachers to get permission to gather the students in the evening to pilot a telescope.


TM-600