Summary

- OHP193/SOPHIE spectrograph
- OHP193/MISTRAL Spectrograph and ToO
- OHP and TNA
T193 and SOPHIE

- Replaces ELODIE (1995-2006)
- In operation since November 2006
- Res. = 70,000 - \( \Delta \lambda = 380-680 \text{ nm} \)
- RV precision 1-2 m/s
- 90 % of time for Exoplanets studies
SOPHIE took place for ELODIE (1993-2006, 51Peg b)

Major improvements since SOPHIE start of operation in 2006:

① 2012 : Octogonal fibers 5m/s to 1-2 m/s RV precision (SPIE 2012 S.Perruchot and al.)
② 2015 : New Robotic Calibration Unit, added Fabry-Perot device, in good thermal controlled room
③ 2016 : New SOPHIE container thermalization system 1/100 ° C on large timescale
④ Cassegrain Control : Programmable Logic Controller

SOPHIE spectrograph @T193

- Larger CCD sensor to get more grating orders
- Extend spectral range to RED
- Higher sensitivity
- Better efficiency
- Gain in transmission
- New complete set of octogonal fibres and light injection system
Back Illuminated Very Large Area CCD using e2v CCD231-84
Deep depleted
4096x4096 pixels, 15x15\,\mu m pixel size
SOPHIE-Red: new full set of octogonal fibers

Goals compared to current set:
- Better efficiency (>20%)
- Better transmission
SOPHIE @OHP193

Current SOPHIE

- 160 nights offered @OHP193/semester, 90% of OHP193 allocated to SOPHIE runs
- since 2018A ~50 nights/semester are dedicated to Large Programs (over 4 and 6 semesters)
- 5% of time can be performed in service mode (8 nights max /semester)

SOPHIE-RED (camera and fibers system)
- On sky: 2021A
Mistral

Multi-purpose InSTRument for Astronomy at Low-resolution

New low resolution spectro-imager for OHP T193 telescope

Design from the Liverpool SPRAT (thanks to Ian and his team)
Adapted to T193 OHP telescope
Benefits from Liverpool staff expertise, all of their mechanical, optical, electronic and SW drawings and designs.

Low cost components

SPRAT@Liverpool
MISTRAL@OHP193
Characteristics

Major operating feature: in parallel with SOPHIE and ready-to-start

2 available observing modes:

Spectroscopy:
- Wavelength range: ~3700 – ~9000 Å.
- Résolution $R=700$ (and an additional mode: ~<2000).
- Slit width: 2 arc

Imager:
- Field of view 6.5 arcmin.
- Filters UBVRI / SDSS.

Sensor: Andor iKon-L 936 series, 2048 x 2048 pixels CCD.

Calibration lamps: xenon, tungsten.

Fast switching from SOPHIE to MISTRAL <<20 minutes.
MISTRAL @OHP193

Operational mode always installed in parallel to SOPHIE:
- Standard observing mode (whole night)
- ToO fast switching to MISTRAL on alerts
Amount of time dedicated to MISTRAL < 10% of OHP193 nights

On sky : end of 2020A
OHP193 and TNA

- Search for good scientific programs for OHP193, not limited to French PI’s: EUROPEAN ASTRONOMERS COMMUNITY, QUALITY

- Money from the TNA allocated nights, helps in OHP budget: MONEY

- If TNA stop funding: no direct impact in the short term OHP193 operation or about staff Employment (main funding comes directly from CNRS).

- The nights offered for TNA and not allocated are offered to non-french astronomers (allocation on the basis of CTAC ranking): KEEP LARGE COMMUNITY
In few words

- SOPHIE-RED extended field to RED

- MISTRAL rapid and will cope with ToO and TDA

- Last CNRS-INSU prospective (2014) plans to have OHP193 in operation 2025 up to 2030 (new French CNRS-INSU prospective to come in autumn 2019)

- unfortunately:
  - no robotic (but always observers @ OHP193 they can react very fast)
  - Very few nights in service mode