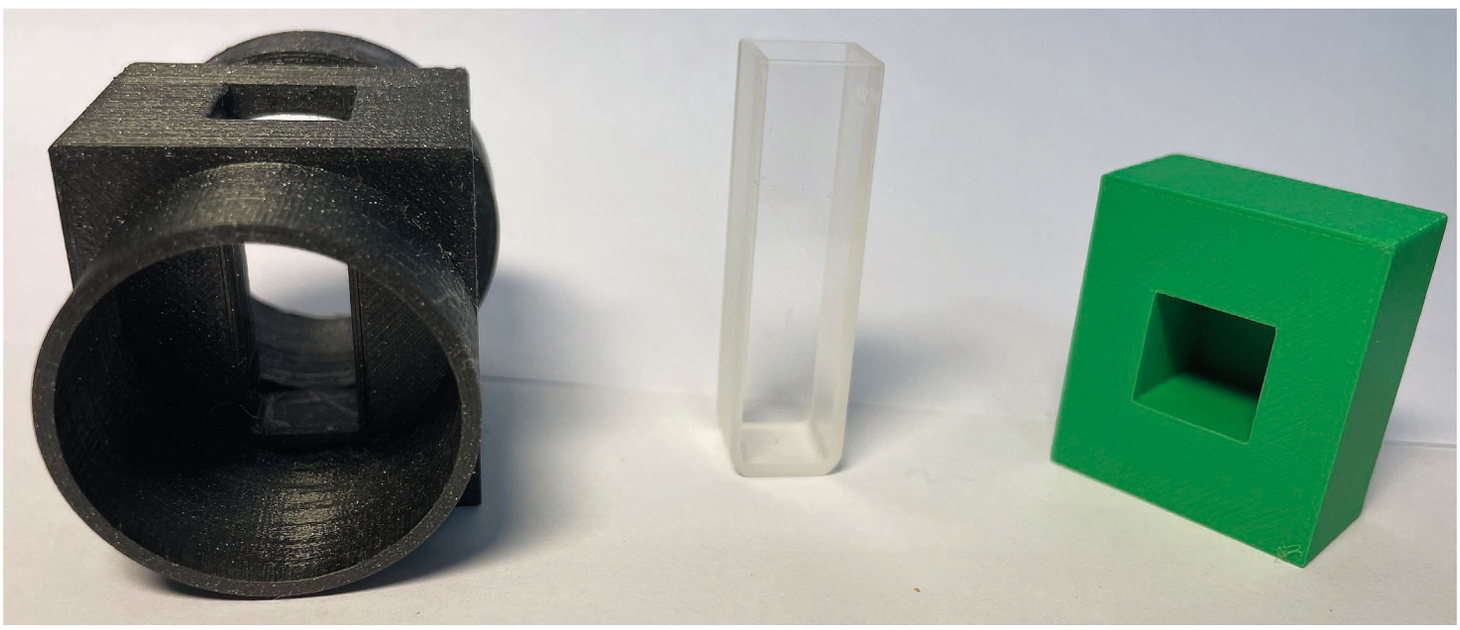
Lab'Ex



Liquid module

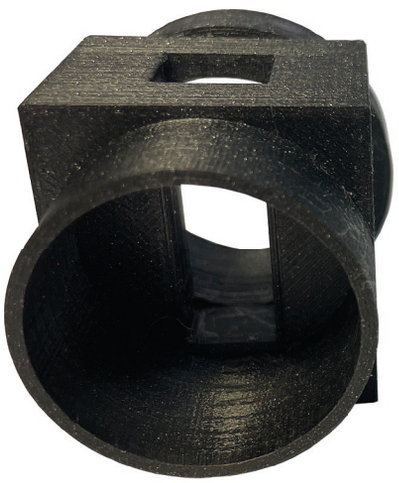
By Olivier Garde

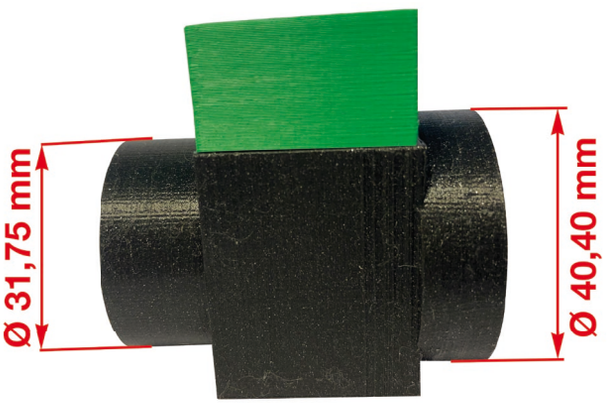
V1.0

1) Building :

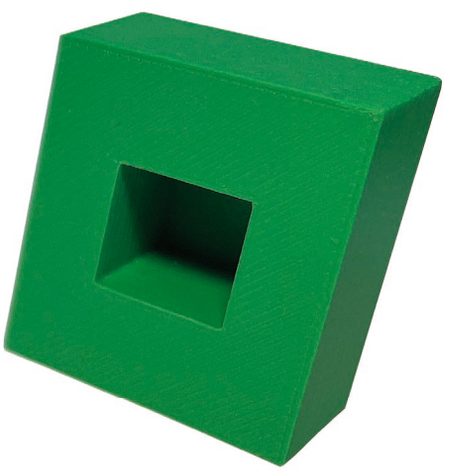
This module allows to realize spectra of liquids which are placed in a glass or plastic test tube. It consists of 3 elements:

• **The main block :** To be realized in 3D printing with the file **liquidCell#1.stl** preferably in opaque black PETG. It's designed to be attached to a Sol'Ex, Star'Ex and Alpy 600 with the 31.75mm adapter.





• **The cover :** To be realized in 3D printing with the file **liquidCell#2.stl** in PETG or PLA in the color of your choice. This cover prevents ambient light from affecting the measurement of the sample. It covers the test tube.



• **The test tube :** To be purchased from laboratory equipment retailers or optical equipment suppliers. I chose the quartz model which does not attenuate the light flux in the near UV range and which allows to reuse the test tube several times by cleaning it, but you can also use less expensive plastic test tubes.
The dimensions of the test tube are 12,7 x 12,7 x 45 mm

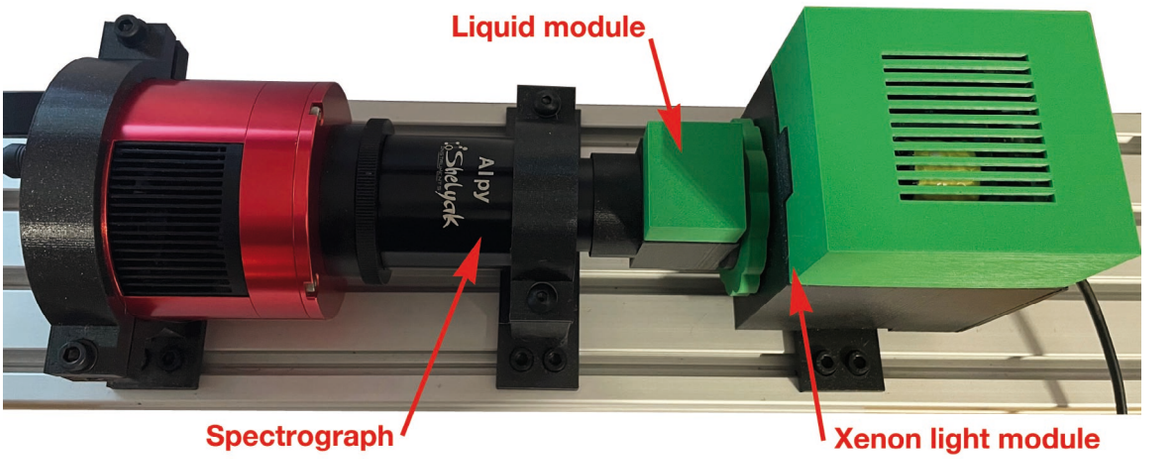
The reference at Thorlab : CV 10Q35
www.thorlabs.com/thorproduct.cfm?partnumber=CV10Q35

or plastic :
www.fishersci.fr/shop/products/polystyrene-macro-cuvettes-uv-visible-wavelengths/10349334

Lab'Ex

2) Application :

For liquid sample measurement, light from the light module must be passed through the liquid module. It is connected on the other side to the spectrograph. (Alpy 600 or Star'Ex)

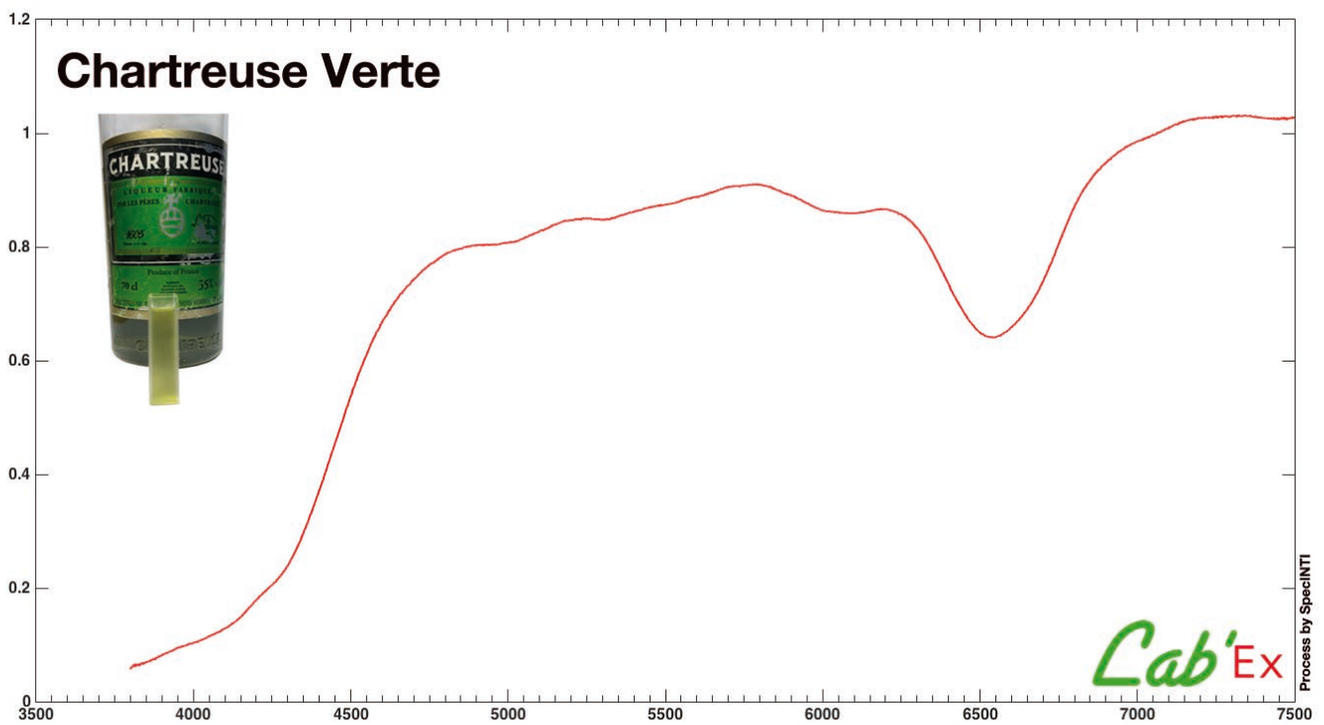


A series of spectra is made in the following order:

- The liquid to be analyzed
- A calibration lamp
- A test tube without liquid
- A calibration lamp
- A series of bias

For processing, it is done with spec INTI designed by Christian Buil and Valérie Desnoux (from V2.0.4) that can be downloaded here : **http://www.astrosurf.com/solex/specinti1_en.html**

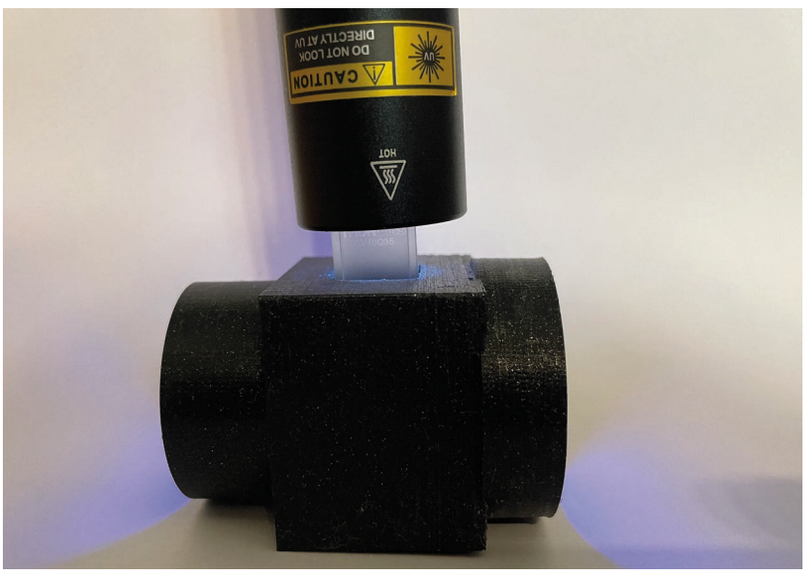
The processing technique is also described on this same link for the Lab'Ex.
An example with the spectrum of the Chartreuse Verte, a typical drink of the French Alps ....



To make fluorescence measurements, it is necessary to use a UV lamp at 365nm which can be found for example here :
www.amazon.fr/dp/B08M9KF3WS/ref=syn_sd_onsite_desktop_485?ie=UTF8&pd_rd_plhdr=t&th=1

Be careful not to point the lamp at your eyes or at other people or animals. Use UV filtering glasses for safety.

The classical light module is not used and the sample is illuminated at 90 degrees, in order to have only the light emitted by the sample through the excitation of the UV lamp.



Example of the fluorescence spectrum of olive oil.