



# 2 SPOT

Southern Spectroscopic Project Observatory Team

**Chili based remote controlled amateur telescope dedicated to spectroscopic observations**

**SF2A - Atelier Collaboration Amateurs-Professionnels (Session 13) - 7 juin 2021**





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Pascal Le Dû



Lionel Mulato



Thomas Petit

## 5 amateur astronomers « tous potes »

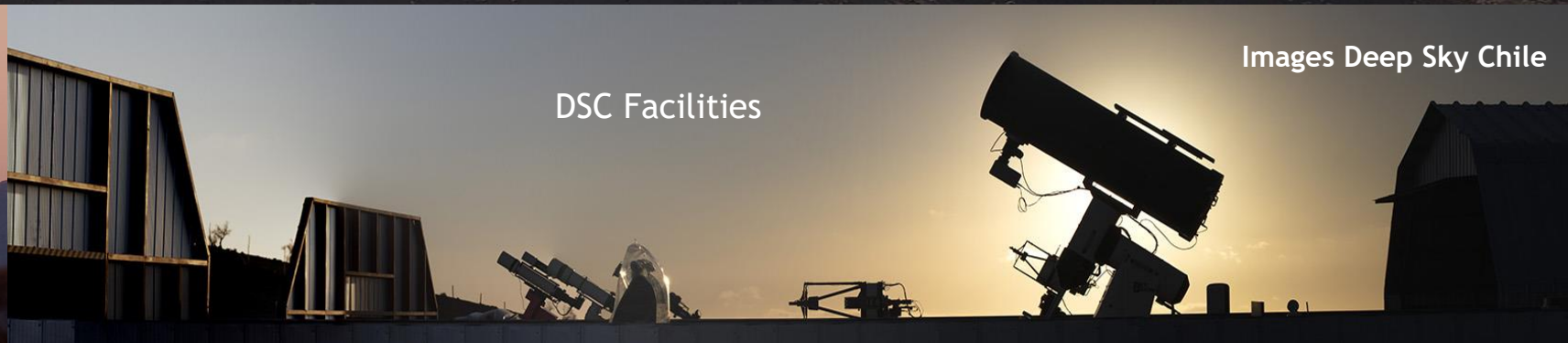
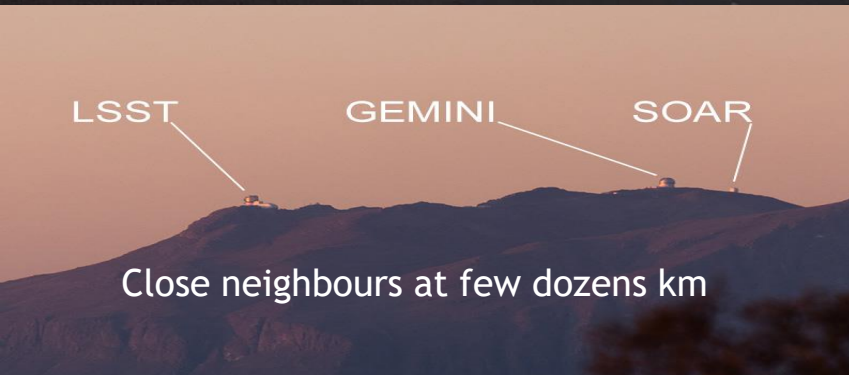
2SPOT is a not-for-profit association under the French law of 1901.

2SPOT is registered under the French administration as a “general interest” association with scientific purpose and can receive donations from individuals and companies which entitle the donor to a tax reduction.

SIRET : n°877 987 974 00012

# DeepSkyChile

RENT CHILEAN SKY

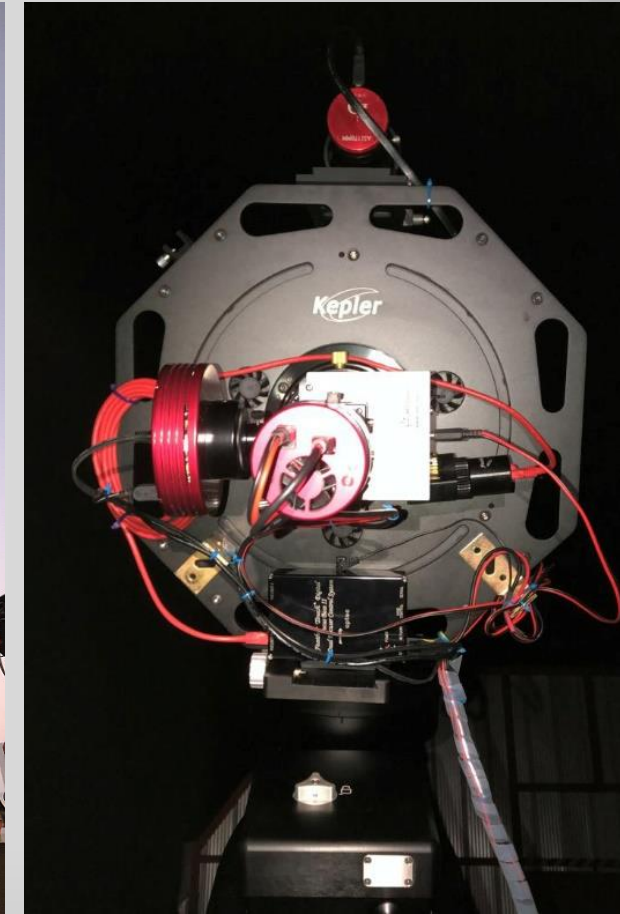
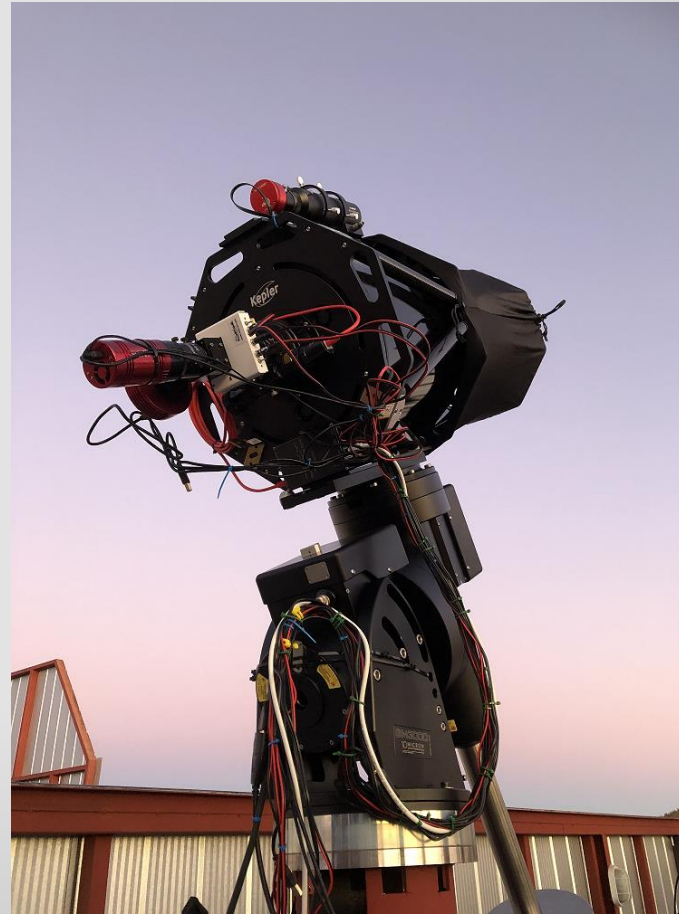


Images Deep Sky Chile

Telescope : RC GSO 0,3m F/5  
Mount : 10 $\mu$  GM 3000HPS  
Spectrograph : Alpy600 23 $\mu$  slit R=600  
CCD science : ATIK 414 EX  
Wavelength dispersion :  $\sim 3,0$  Å/pixel at 6560Å.

Equipment is fully operationnal since the end of may 2021.

Priority : getting an higher resolution spectrograph (Eshel R=11 000)



## 1. PN candidates spectral confirmation



Fe 6 PN – image P. Goodhew

## 2. Be Stars survey

## 3. Transients astronomical events observation



Comet Neowise – C/2020 F3 – image M. Drechsler

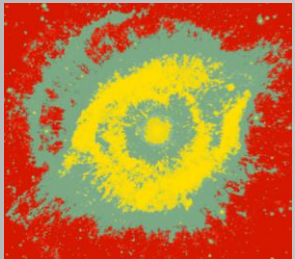
## 1. PN candidates confirmation

Planetary Nebulae .net

Members of 2SPOT are actively involved in a PN search pro-am collaboration between the Laboratory of Space Research (Hong-Kong University) led by Quentin Parker and a large amateur group composed mainly by french discoverers, astrophotographers, spectroscopists and coordinated by P. Le Dû. The amateur group has discovered more than 160 True, Likely or Possible PNe since 2010 ([www.planetarynebulae.net](http://www.planetarynebulae.net)) and registered in the HASH PN Database.



Amateurs provided more than 250 spectra of PN candidates exclusively from the northern hemisphere. Hundreds of southern candidate objects await a confirmatory spectrum.

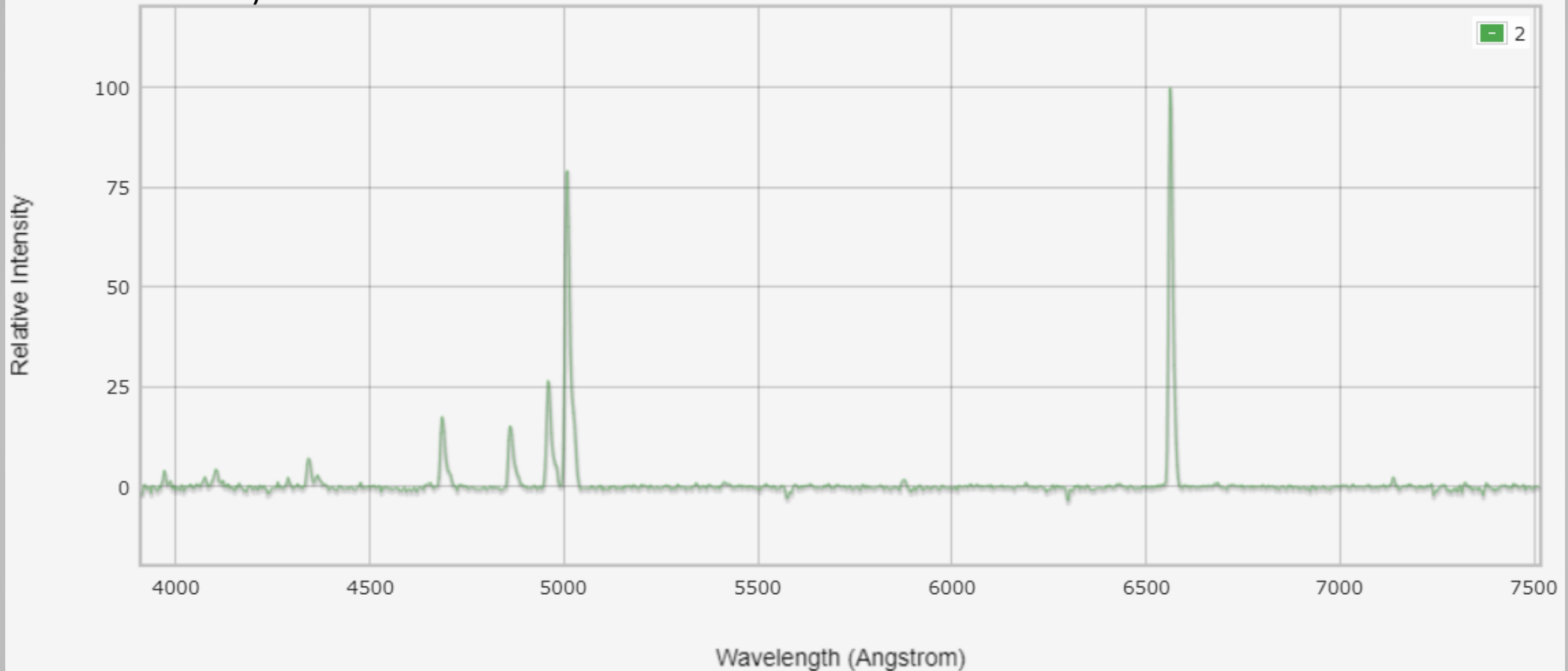


HASH PN Database

Observations are essentially focused on the detection of typical PNe emission lines and on the assessment of their relative intensities such as [O III] vs. H- $\beta$  or H-alpha vs. [N II] and H-alpha vs. [S II]. These objectives are achievable with amateur equipment for all emission line sources that can be detected on the broad-band DSS2 Red or Blue survey data (see examples on next slides).

## 1. PN candidates confirmation

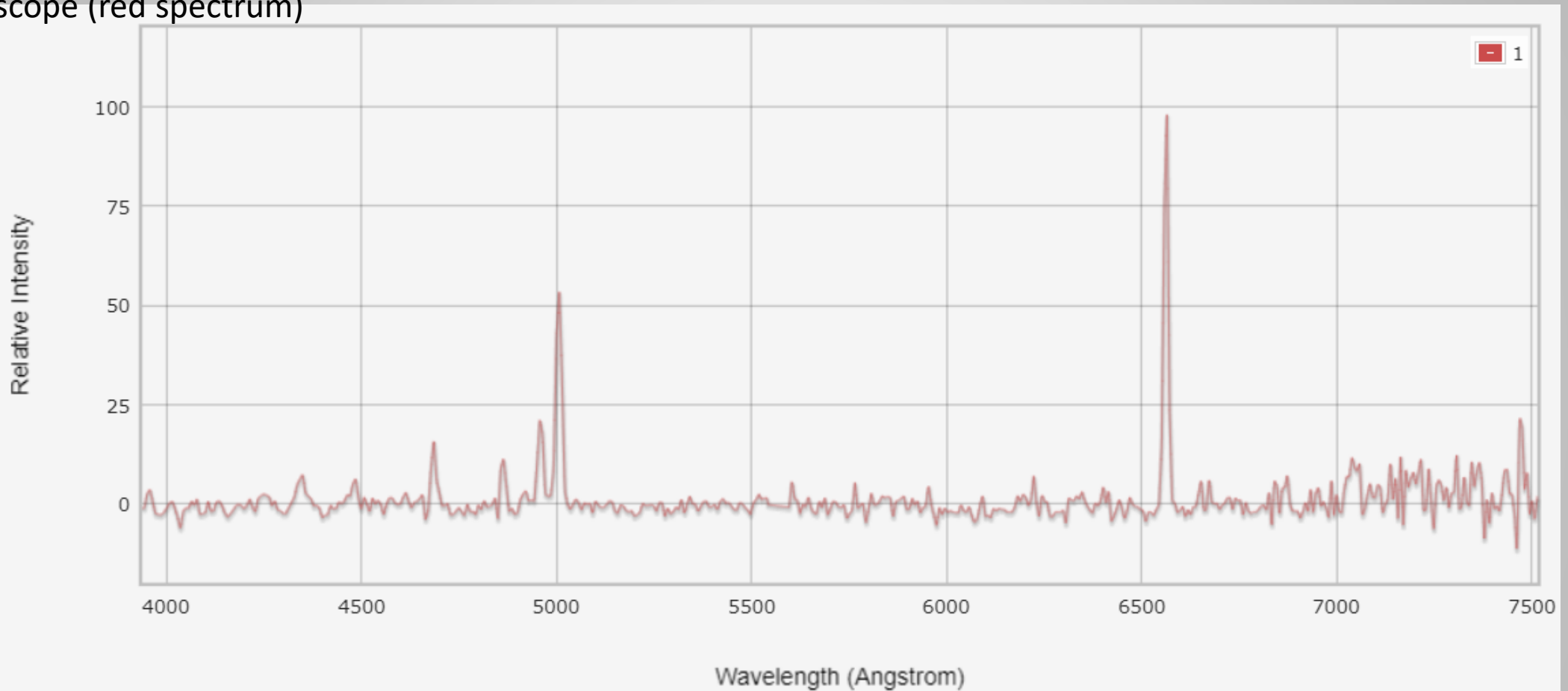
Spectra comparison of relatively bright object (Kn 42) observed both on the SAAO 1,9 m (green spectrum) and a 0,2 m telescope (red spectrum on next slide)



	No	Reference	Fits	Tel/Inst	ObsDate	Range(A)	rebin
<input type="checkbox"/>	1	<a href="#">FrenchAmateurs</a>	<a href="#">FRA_Kn42_CO17062...</a>	Newton Skywatcher ...	2020-6-17	3724 - 7787	no
<input checked="" type="checkbox"/>	2	<a href="#">SAAO_Aug2018</a>	<a href="#">SAAO201808_Kn42_...</a>	SAAO 1.9m / SpUpN...	2018-8-13	3912 - 9424	no

## 1. PN candidates confirmation

Spectra comparison of relatively bright object (Kn 42) observed both on the SAAO 1,9 m (green spectrum on previous slide) and a 0,2 m telescope (red spectrum)



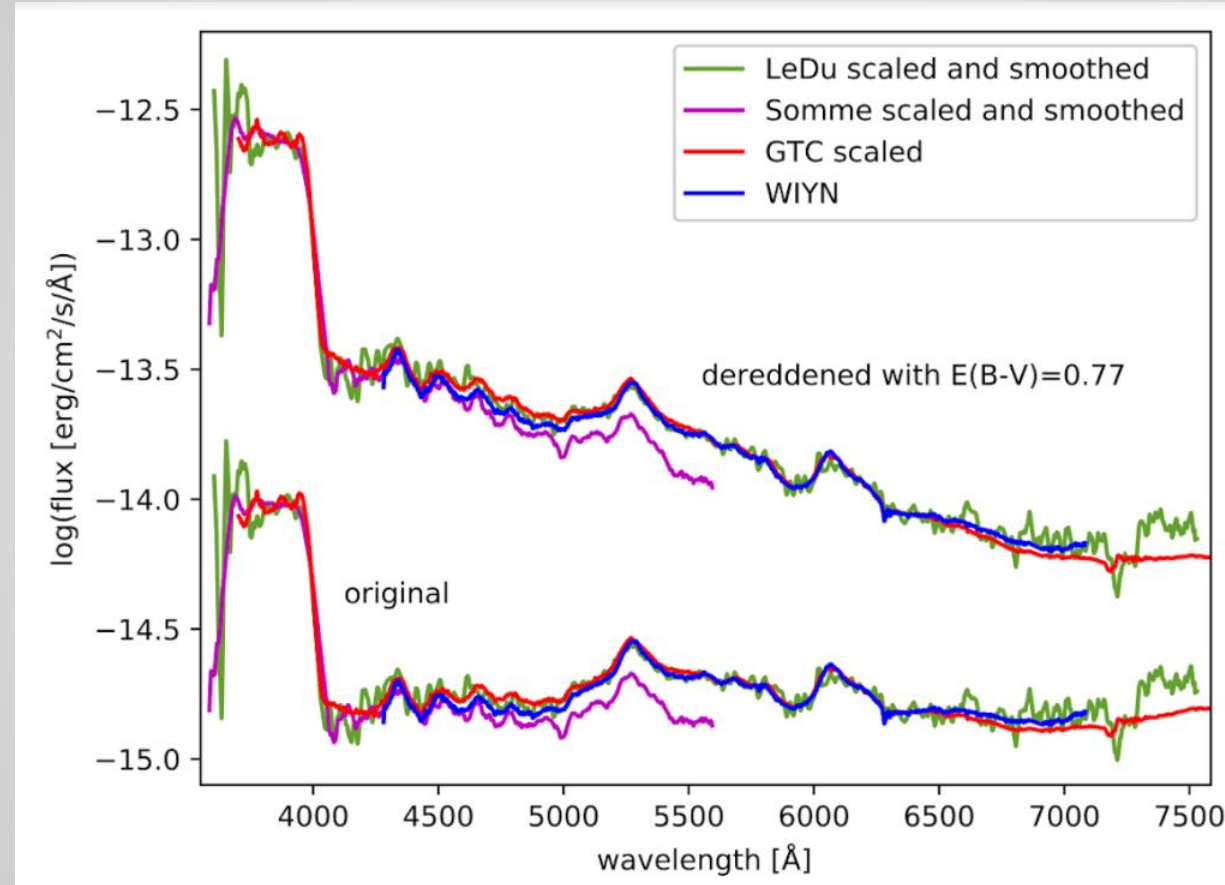
No	Reference	Fits	Tel/Inst	ObsDate	Range(A)	rebin
<input checked="" type="checkbox"/>	<a href="#">FrenchAmateurs</a>	<a href="#">FRA_Kn42_CO17062...</a>	Newton Skywatcher ...	2020-6-17	3724 - 7787	no
<input type="checkbox"/>	<a href="#">SAAO_Aug2018</a>	<a href="#">SAAO201808_Kn42_...</a>	SAAO 1.9m / SpUpN...	2018-8-13	3912 - 9424	no



# Main observation programs and achievable objectives

## 1. PN candidates confirmation

Example of amateur spectrum acquired on a 0,2 m telescope (green) compared to professional spectra acquired on GTC 10 m and WIYN 3,5 m<sup>1</sup>



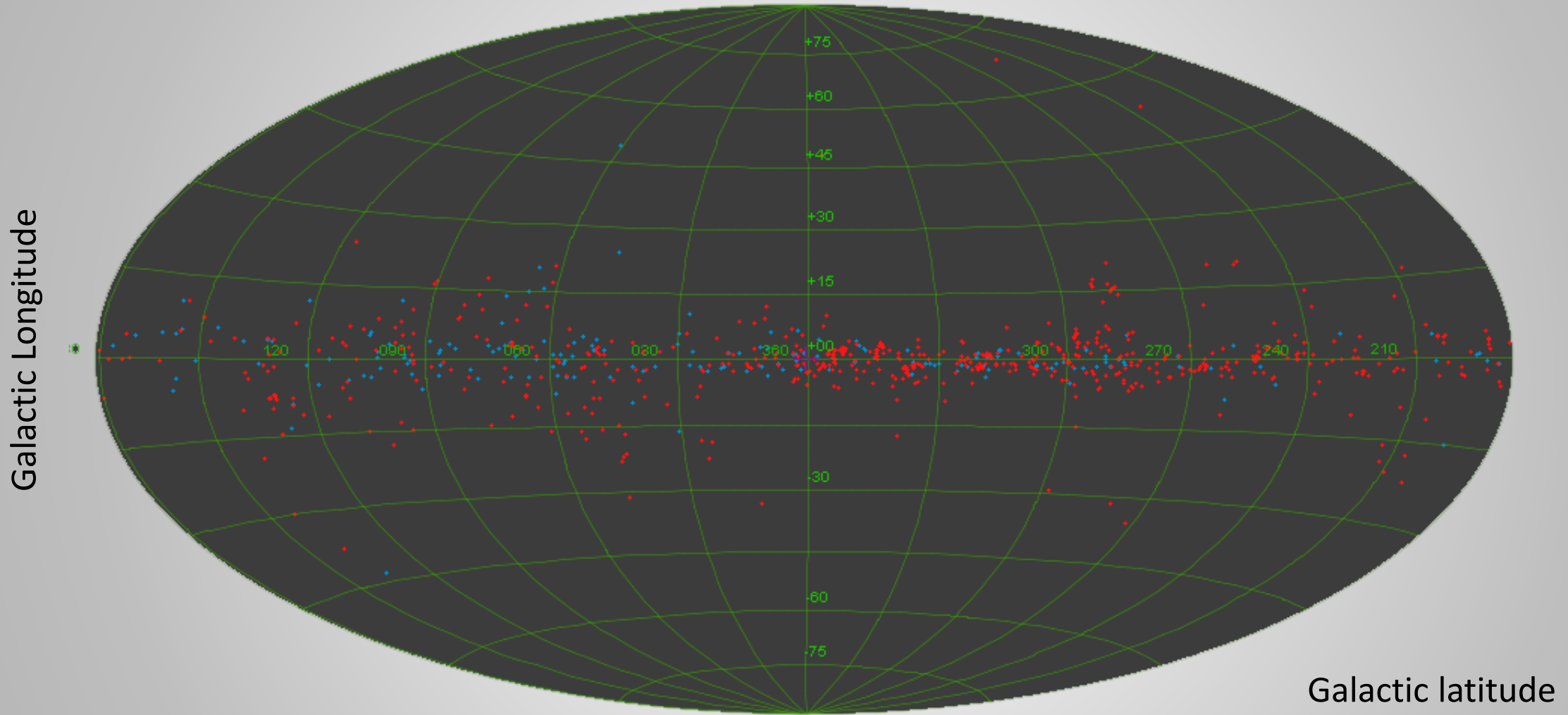
Pa 30 CSPN

<sup>1</sup>The remnant and origin of the historical Supernova 1181 AD, <https://arxiv.org/pdf/2105.12384.pdf>.

# Main observation programs and achievable objectives

## 1. PN candidates confirmation

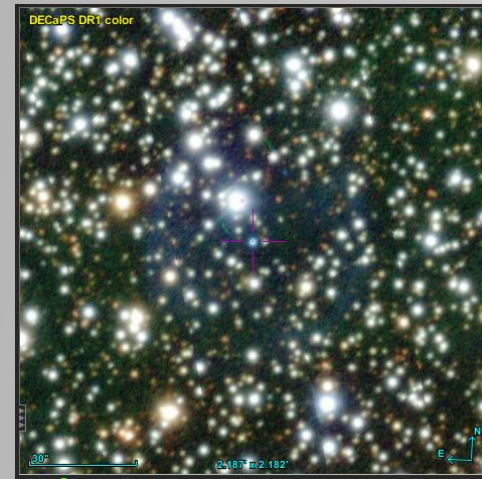
All-sky Aitoff projection in Galactic Coordinates (powered by Aladin)



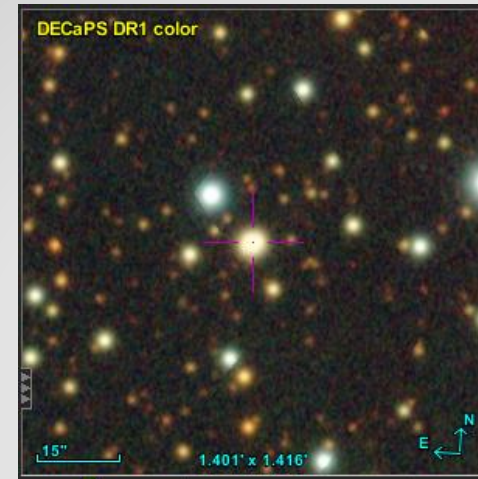
Distribution of amateur T, L, P confirmed PNe (blue dots) and candidates waiting for a spectrum (red dots).

## 1. PN candidates confirmation

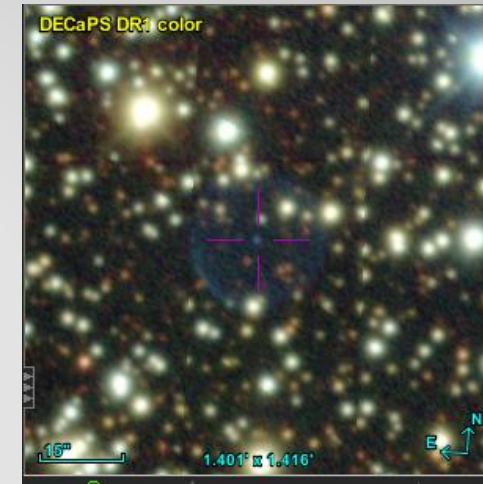
### First results acquired with our telescope on Southern PN



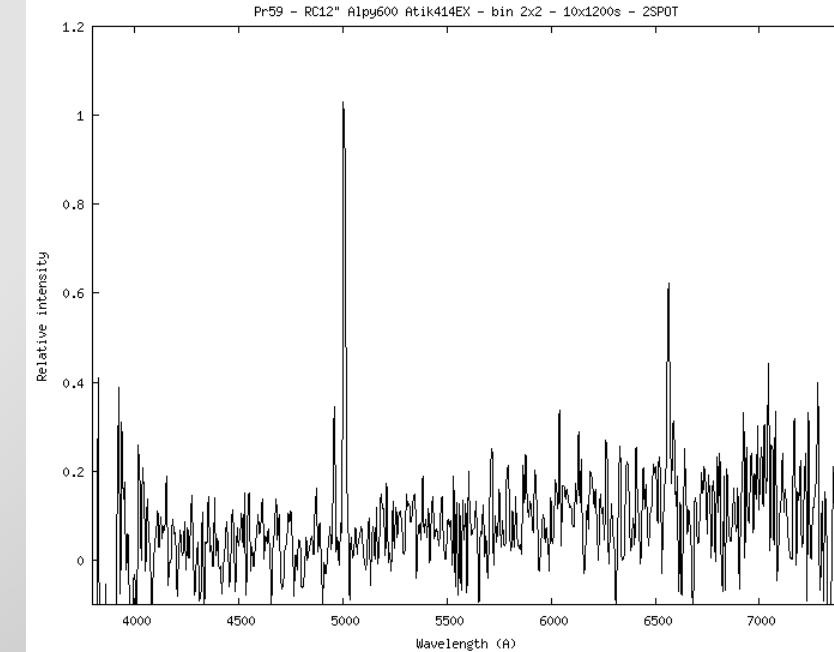
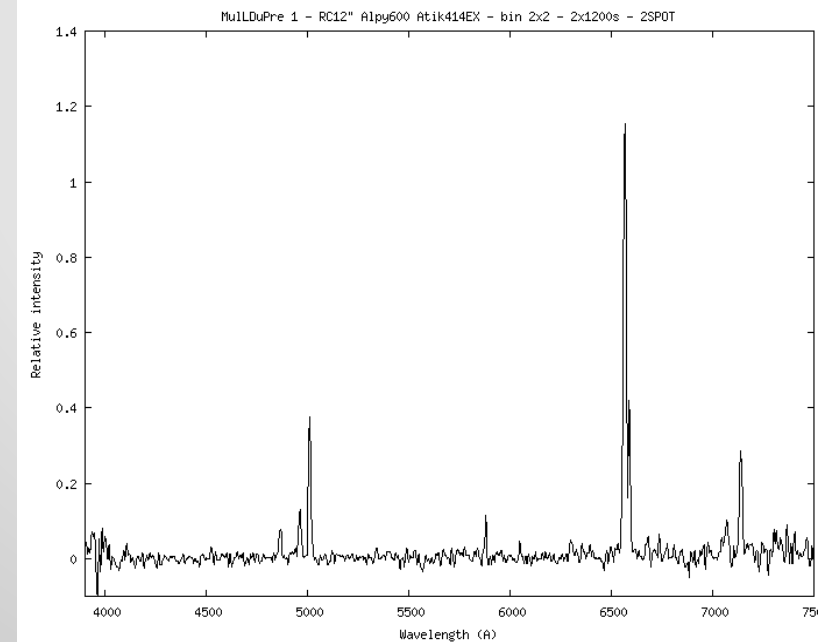
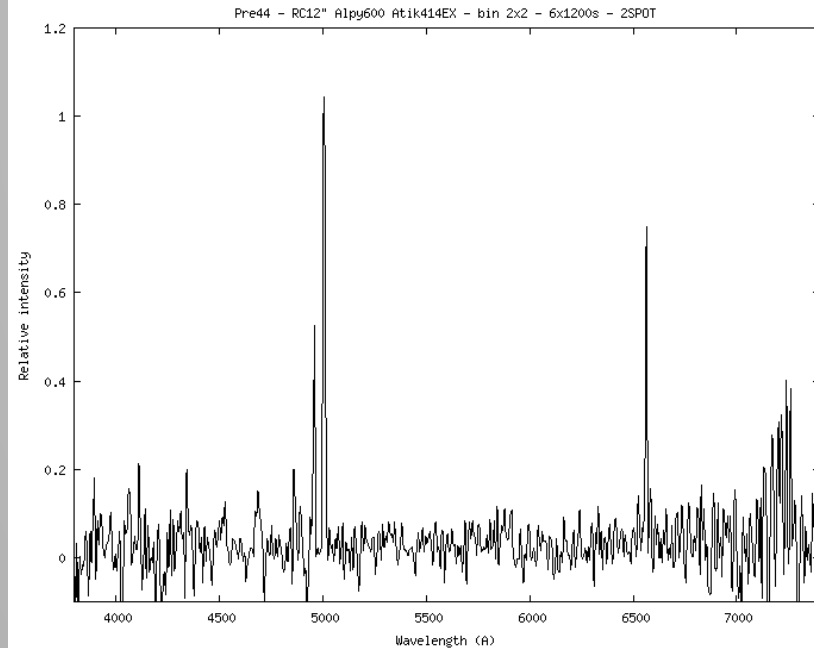
Pre 44



MulPreLDu 1



Pre 59





The pro-am collaboration for the survey of Be stars has started in 2003 with the creation of the Be Star Spectra (BeSS) database maintained by LESIA, Paris Meudon Observatory and initiated by Coralie Neiner. Surveying a large sample of Be stars regularly to detect evolutions or outbursts needs a lot of observing time that only amateurs can undertake.



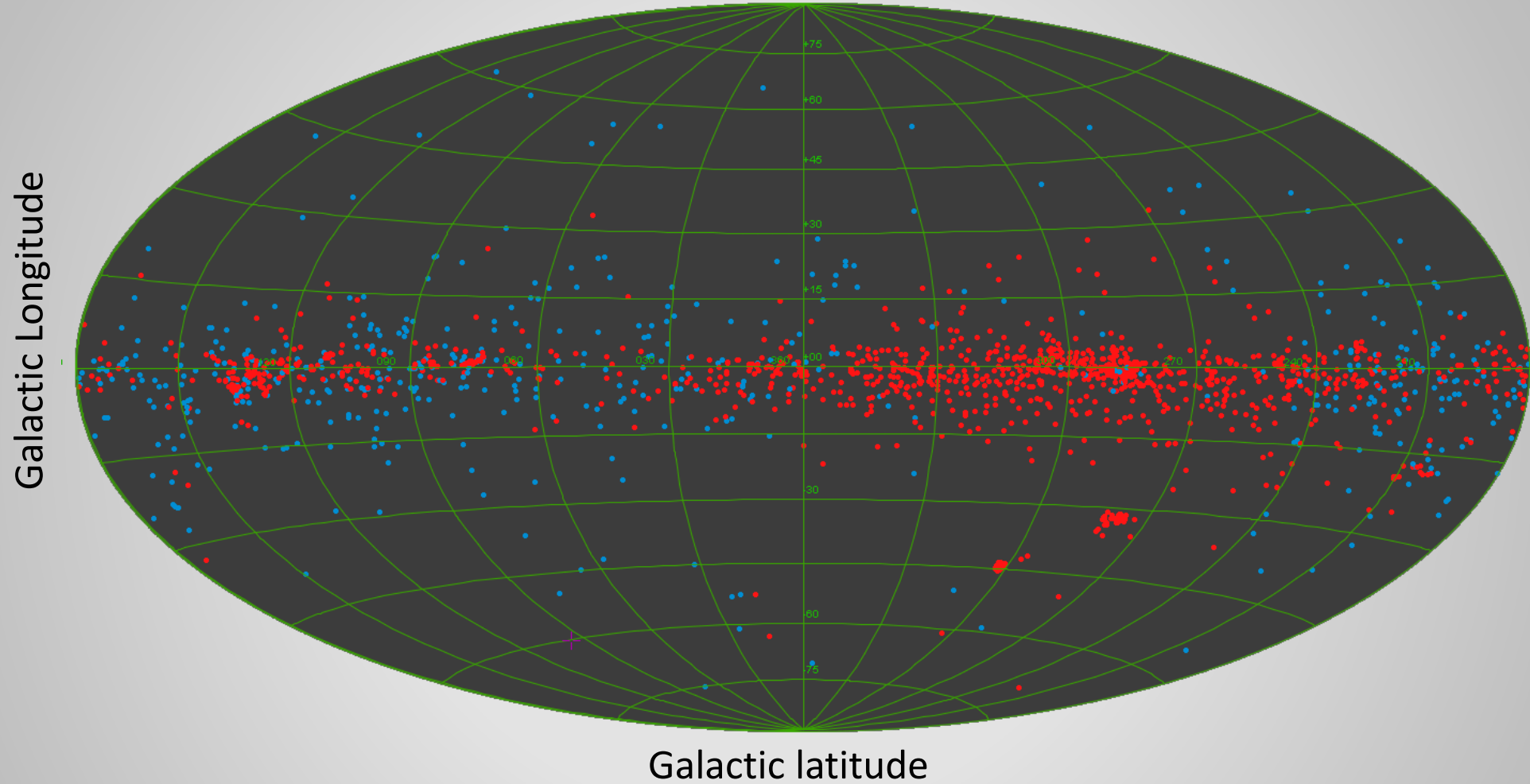
BeSS regroups the whole catalogue of known Be, B[e] supergiant and Herbig Ae/Be type stars. The database contains more than 200 000 spectra acquired by both professionals or amateurs. Amateurs have contributed up to almost ~70% of the available data.

Southern Hemisphere is poorly covered and hundreds of such stars need a periodic follow-up.

# Main observation programs and achievable objectives

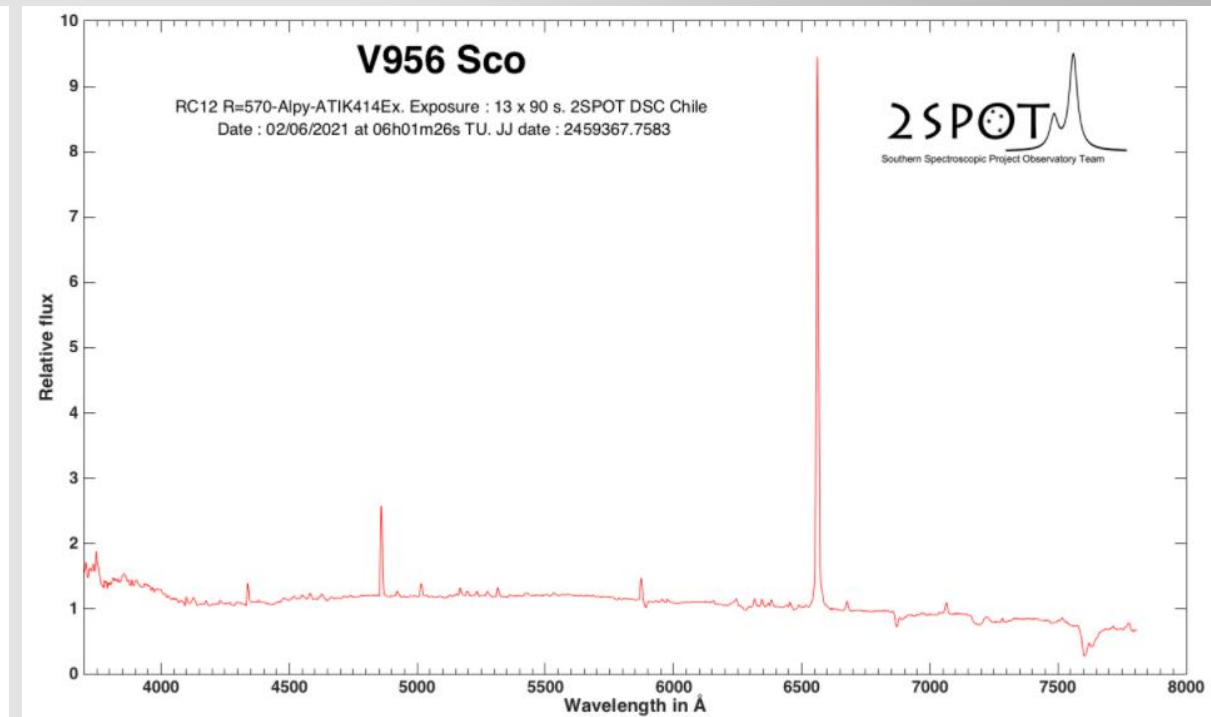
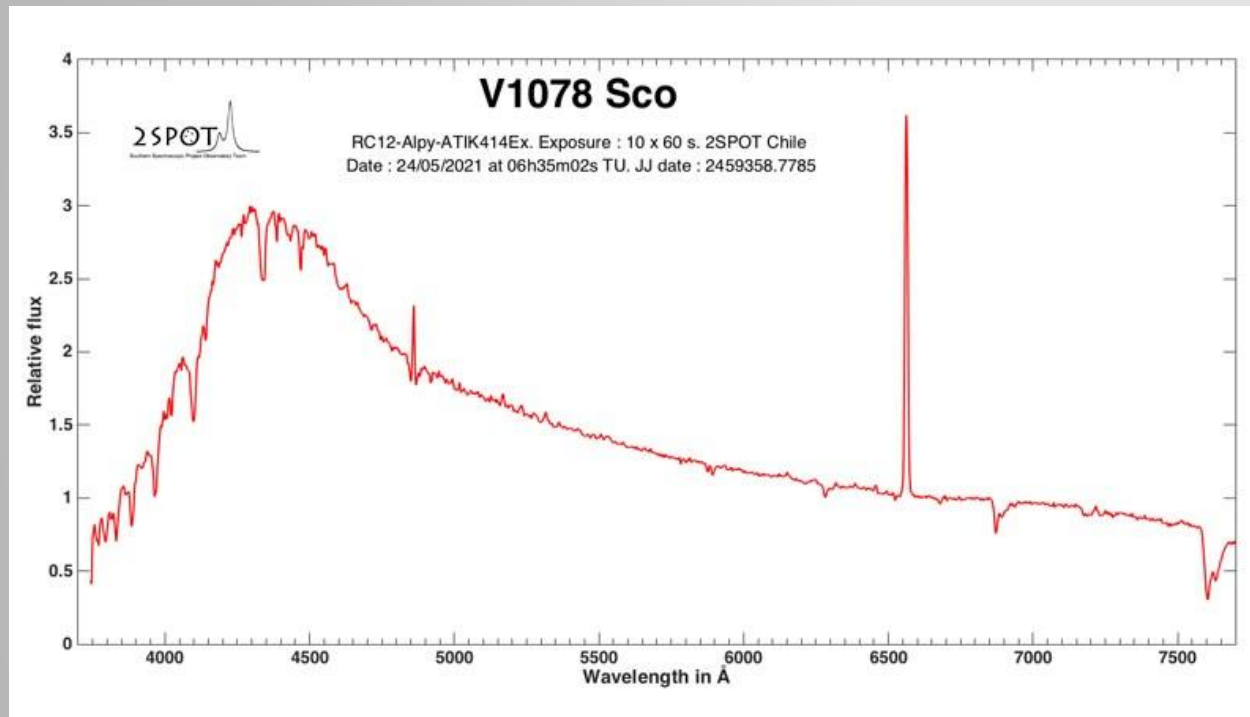
## 2. Be Stars survey

All-sky Aitoff projection in Galactic Coordinates (powered by Aladin)



Distribution of Be stars which have more than 10 spectra in BeSS in blue dots compared to Be stars which have no or less than 10 spectra in BeSS in red dots.

**First results acquired with our telescope on few Southern Be Stars which lack a follow up.  
Spectra submitted to BeSS**

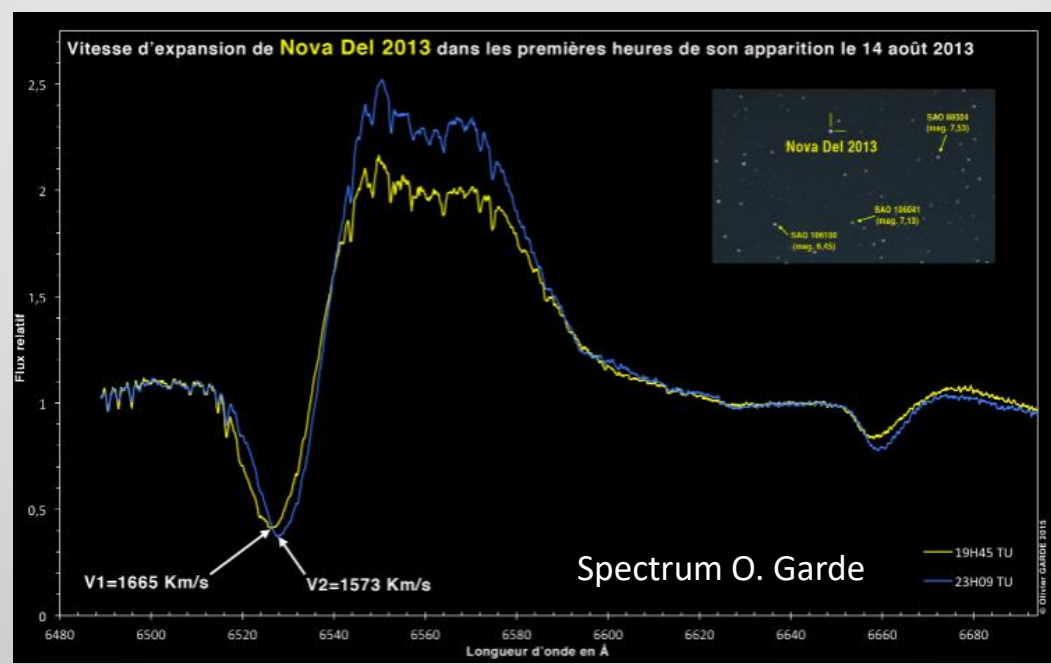


**Observation of Be stars will be soon fully automatized (~10 stars observed / night)**

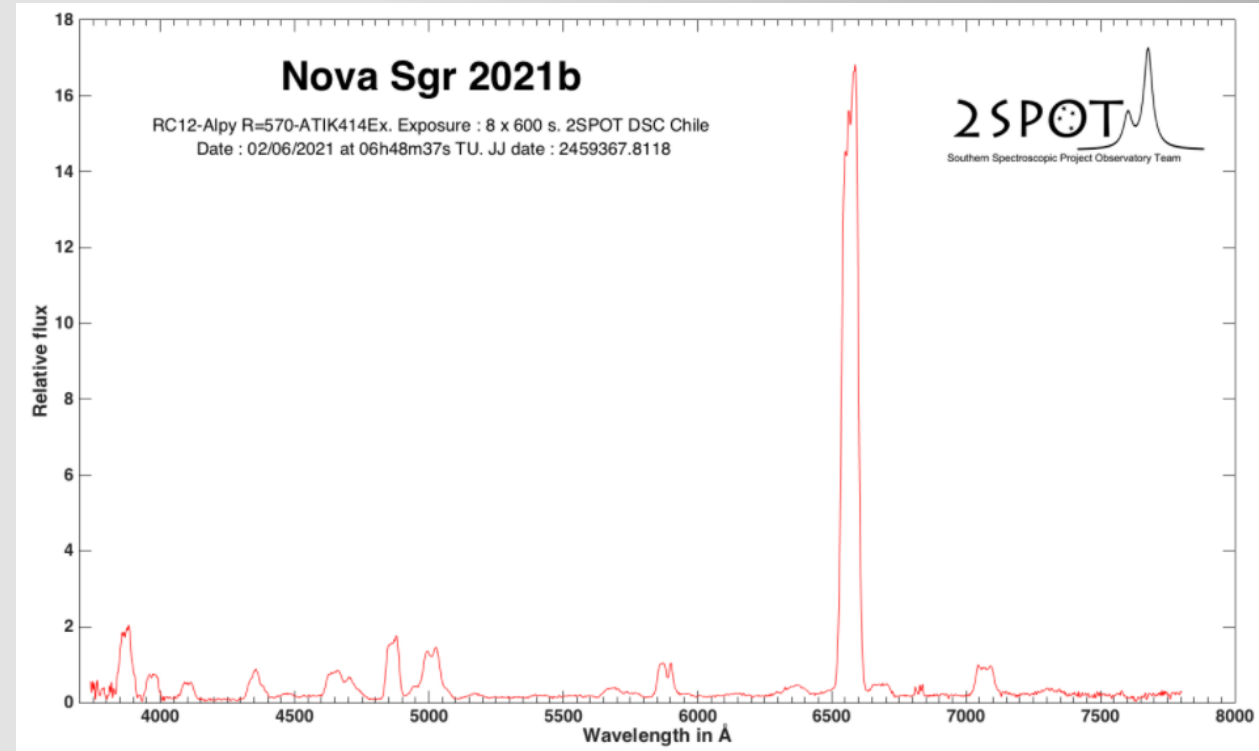
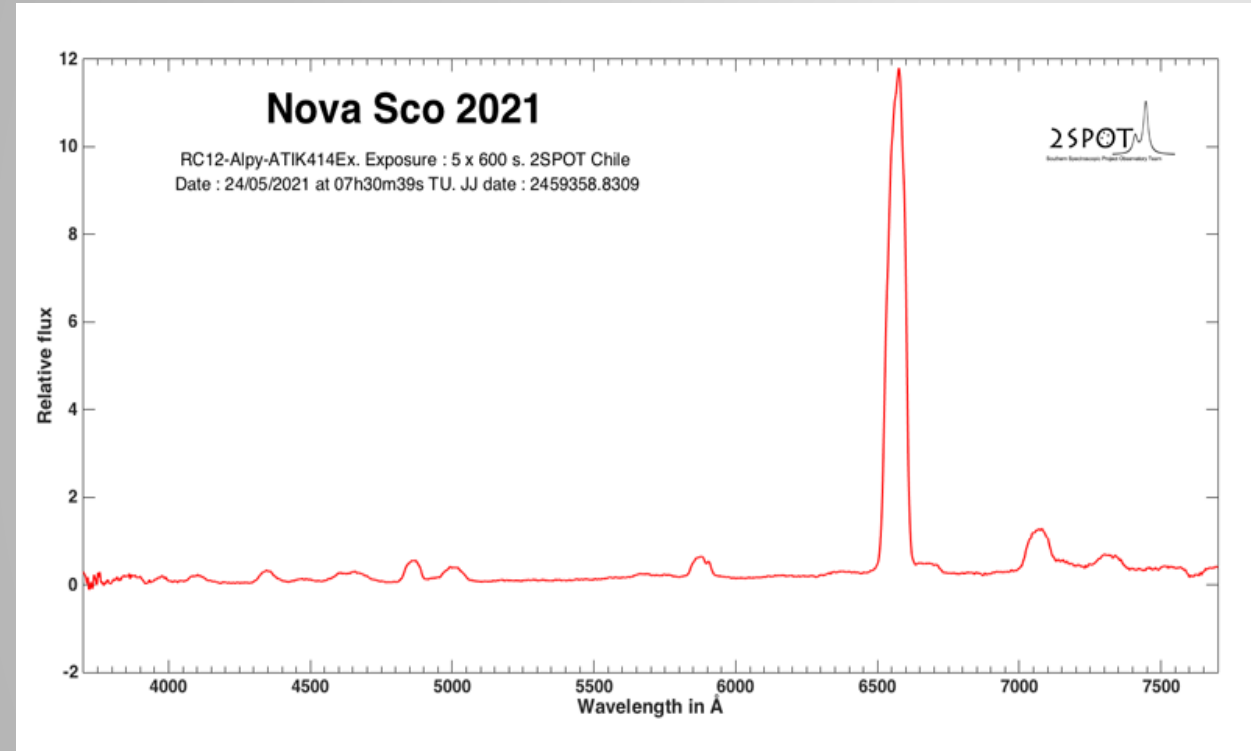
The follow up of transient astronomical events requires responsiveness, flexibility and long observing time. These are key strength of amateurs who do not have to justify their need to carry out an observing campaign on specific objects to get telescope time and do not depend on diverse program priorities.

Southern hemisphere is poorly covered by amateurs. 2SPOT will follow up southern transients with high priority and reactiveness.

Example of data that amateurs can acquire with an high resolution spectrograph - Ha line monitoring of Nova Del 2013 few hours after detection.



First results acquired with our telescope on Southern Novae and submitted to A.R.A.S Spectral Data base.





Our activities can be followed on : <http://2spot.org> or [www.facebook.com/admin2spot](http://www.facebook.com/admin2spot)

## Contact : [team@2spot.org](mailto:team@2spot.org)



ACCUEIL

ARTICLES

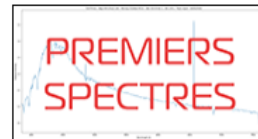
ASSOCIATION

DOCUMENTATION

NOUS SOUTENIR



ARTICLES



### Premiers spectres depuis l'hémisphère Sud

29 Mai 2021 - Thomas Petit

Nous avons pu réaliser nos premières observations ce lundi 24 mai, réunis tous les 5 pour cette grande première. Au programme: une étoile Be (V1078 Sco), une nova (Nova Sco 2021) et une candidate NP (MPA J1717-4351). Encore quelques petites choses à peaufiner mais ça y est, premiers spectres 2spot !!



### Mise en place du matériel dans les installations de DSC

15 Mai 2021 - Thomas Petit

Le travail de montage a commencé sous le toit roulant de DSC. Franck est à la manoeuvre et guidé via Whatsapp par Stéphane. La monture est en place sur son pied colonne, le tube vient d'être installé, l'armoire électrique a été montée... Encore beaucoup de choses à faire mais ça avance.



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#### CONTACTS

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#### ASSOCIATION 2SPOT

Association loi de 1901  
Déclarée à la préfecture de l'Isère le 29/09/2019  
Reconnue d'intérêt général à caractère scientifique  
Numéro de SIRET: 877 987 974 00012  
Code APE: 9499Z

We warmly thank our supports and private donators who contribute to the success of our project :



2 S P O T

Southern Spectroscopic Project Observatory Team

Thank you for your attention

