

DeGaPe 35

Amateur discovery and characterization of a new southern symbiotic star

Thomas Petit

- with J. Merc ⁽¹⁾⁽²⁾ and R. Gális ⁽³⁾
- **APO Team** with R. Galli and T. Demange
- **2SPOT** with S. Charbonnel, O. Garde, P. Le Dû and L. Mulato

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⁽²⁾ European Southern Observatory, Germany

⁽³⁾ Institute of Physics, Faculty of Science, P. J. Šafárik University, Park Angelinum 9, Košice, 040 01, Slovak Republic

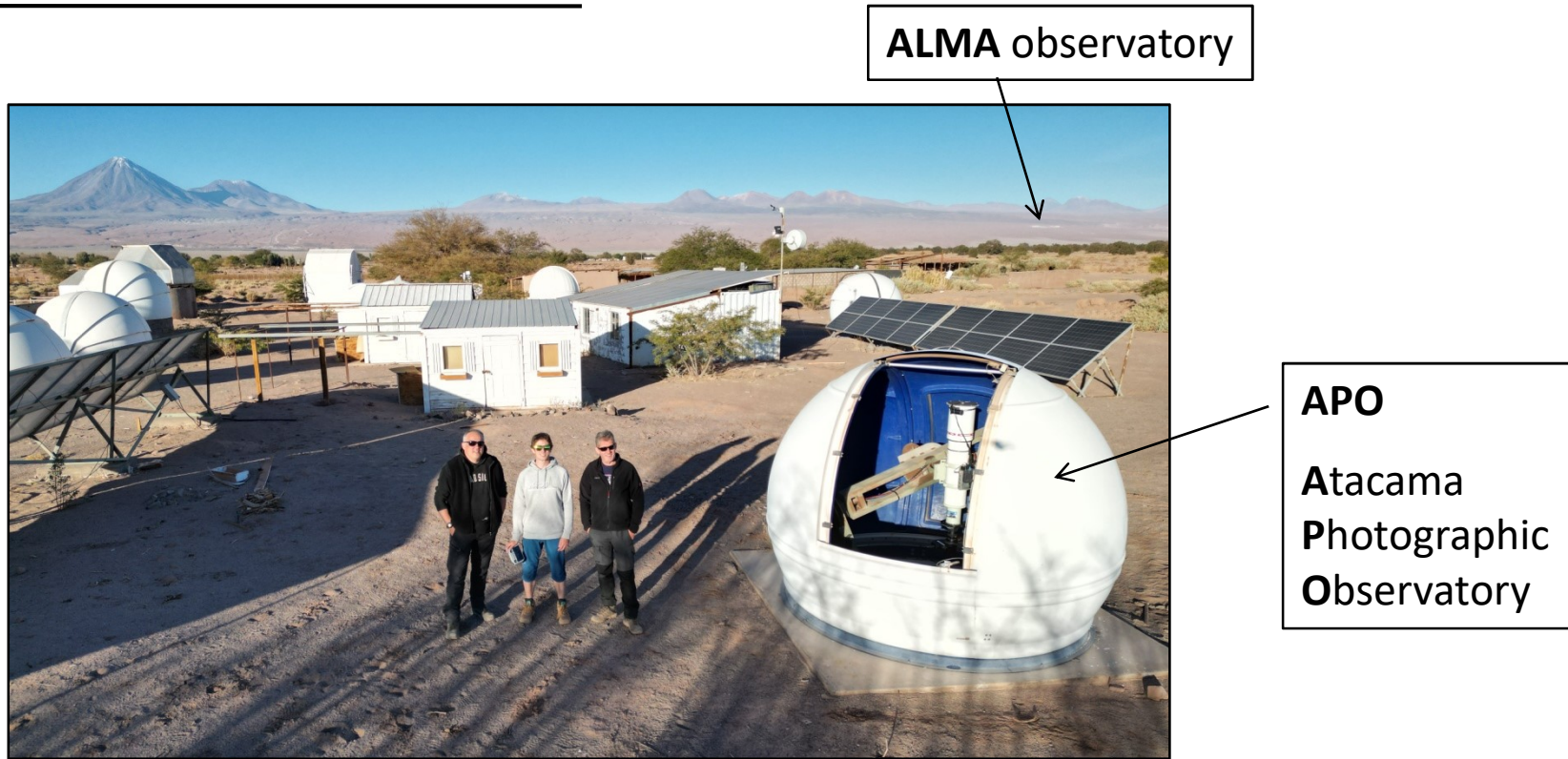


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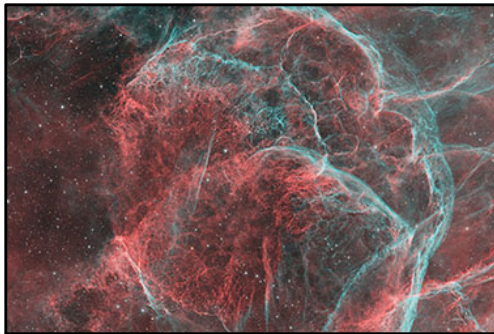
San Pedro de Atacama, Chile
Alain Maury's Space Obs



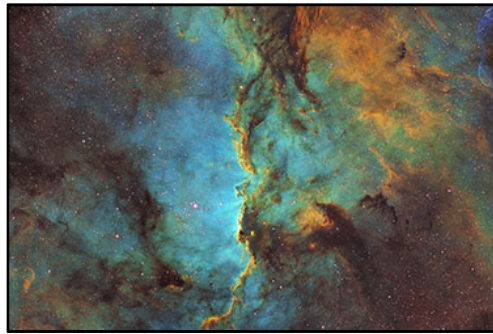
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Setup APO

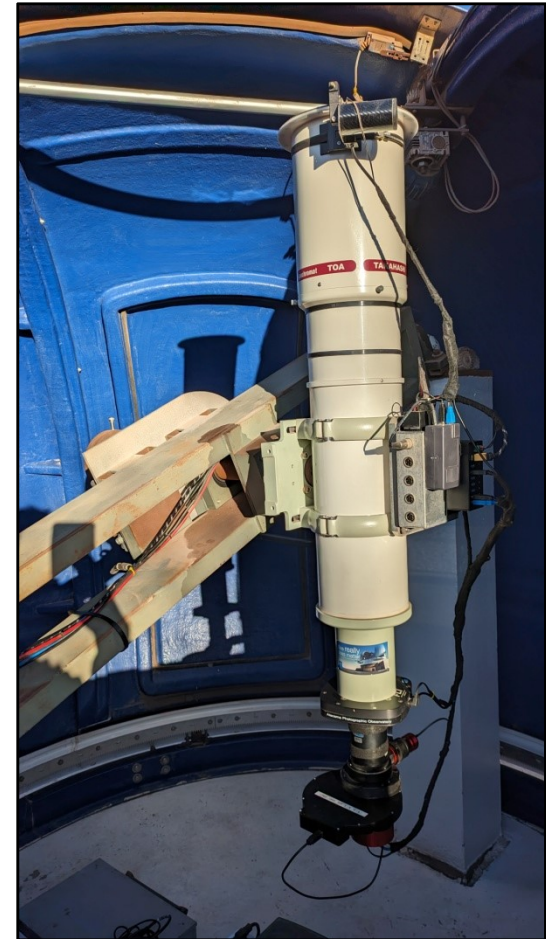
- **Main camera:** Apogee ALTA U16M (KAF16803)
+ Flattener 67 -> 1.68"/pix
- **Guiding camera:** Atik 314L+
- **Filters:** L-RGB-Ha-OIII-SII Astrodon Gen2
- **Refractor:** TAKAHASHI TOA150 - Focal length 1100mm
- **Mount:** mini-OHP with MCMT system
- **Dome:** Scopedome 3m



Vela



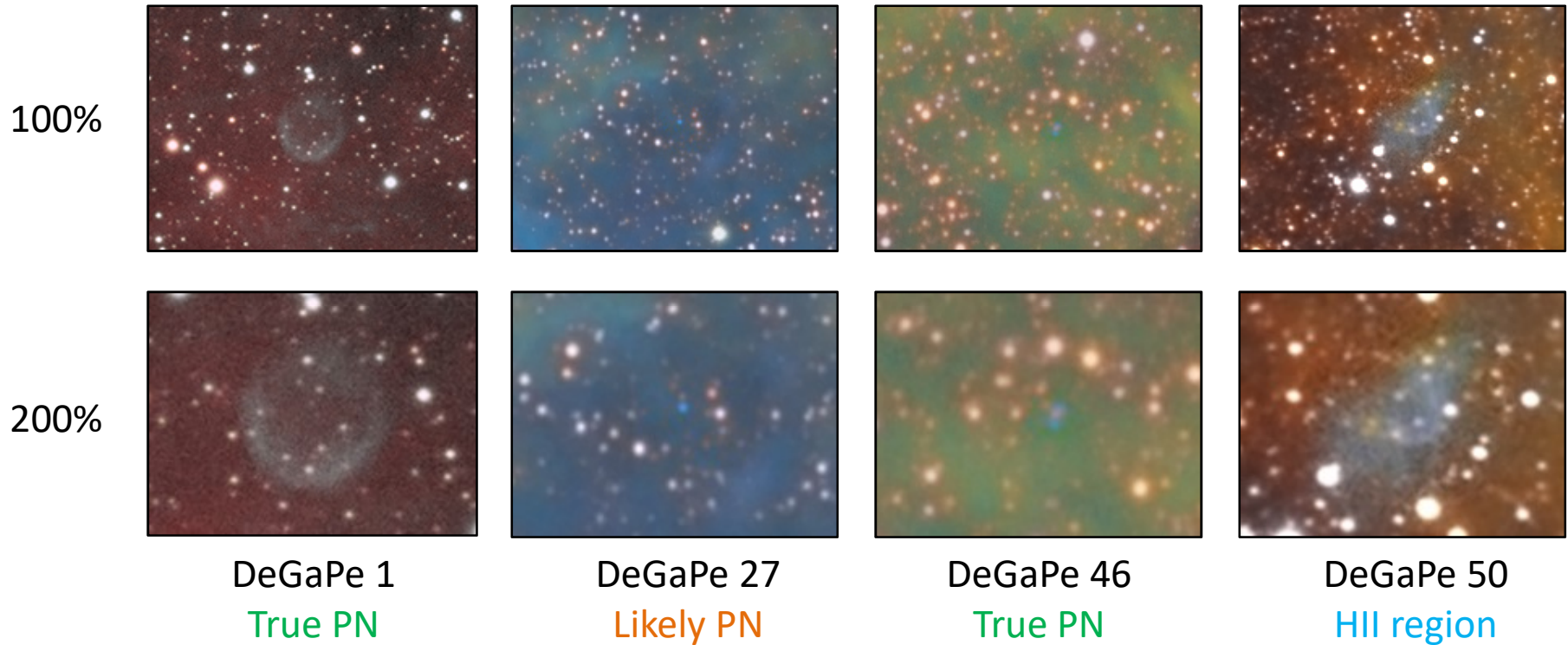
NGC 6188



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What we can discover

A few examples...



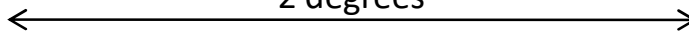
DeGaPe -> Demange – Galli - Petit

June 2017

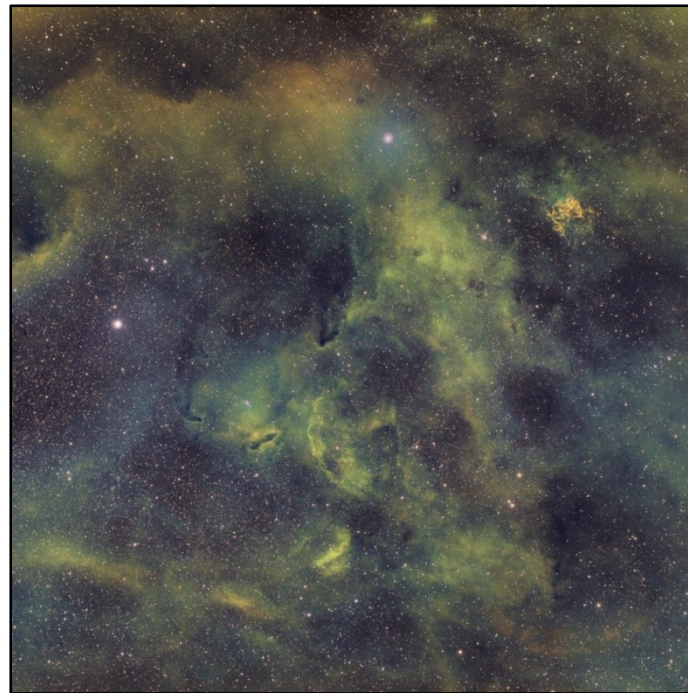
Wolf-Rayet **WR 68** and **Sandqvist 174** region



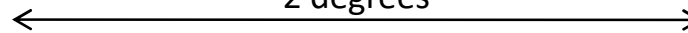
~ 2 degrees



Ha LRGB



~ 2 degrees



SHO

L = 480'

R = 120'

G = 120'

B = 120'

Ha = 800'

OIII = 600'

SII = 600'

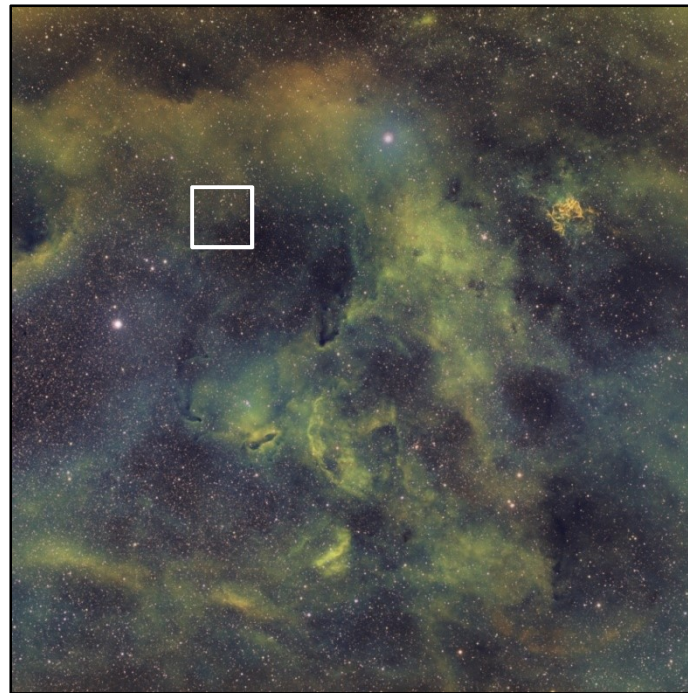
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June 2017

Wolf-Rayet **WR 68** and **Sandqvist 174** region



Ha LRGB



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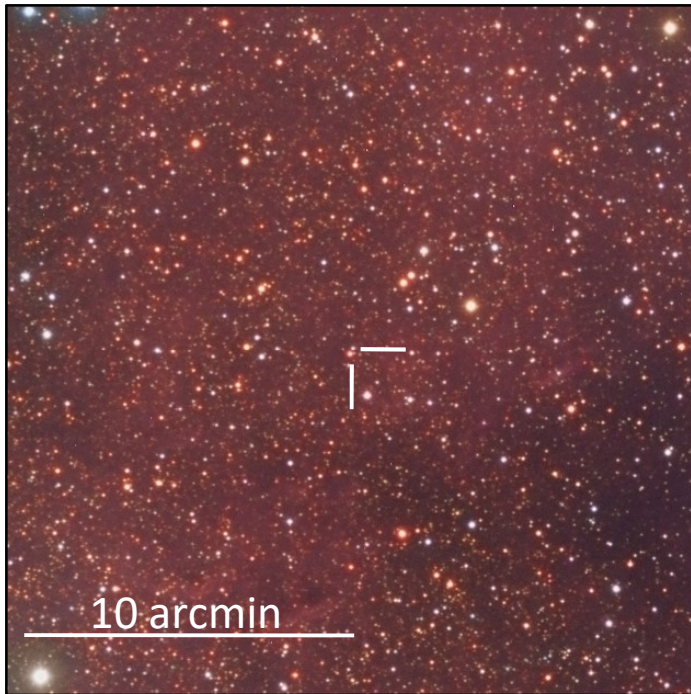
OIII = 600'

SII = 600'

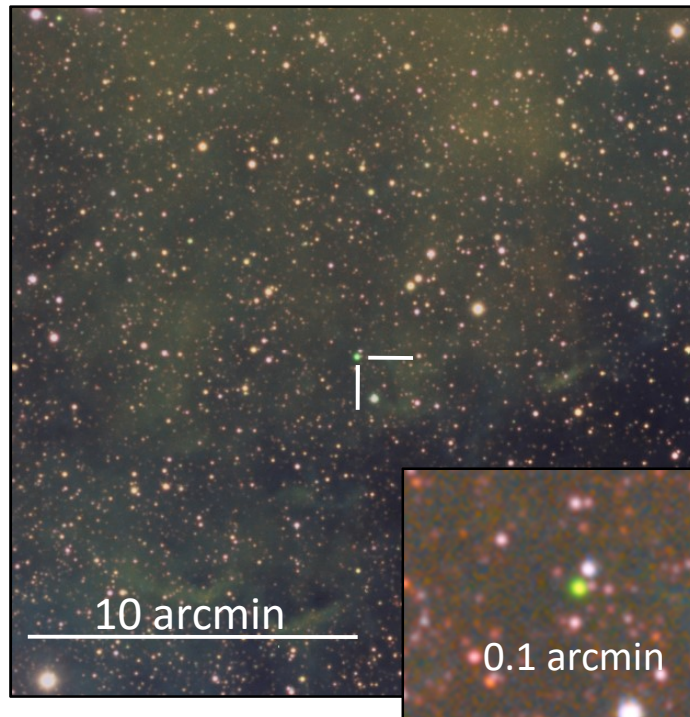
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June 2017

Wolf-Rayet **WR 68** and **Sandqvist 174** region
close up



Ha LRGB



SHO

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Ha = 800'

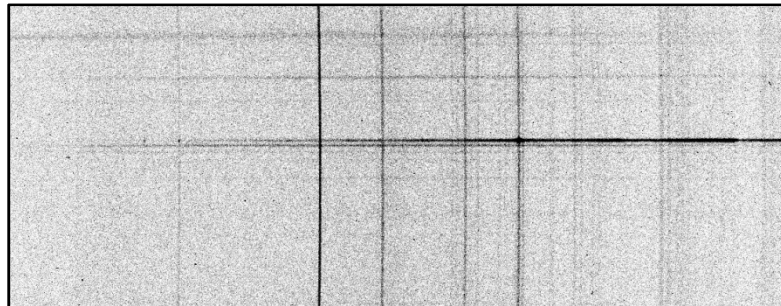
OIII = 600'

SII = 600'

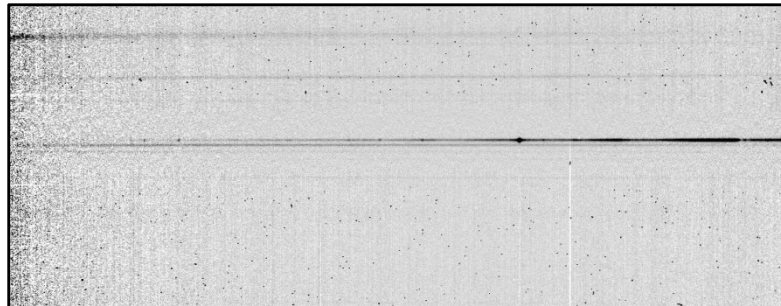
0.1 arcmin

June 11th, 2021

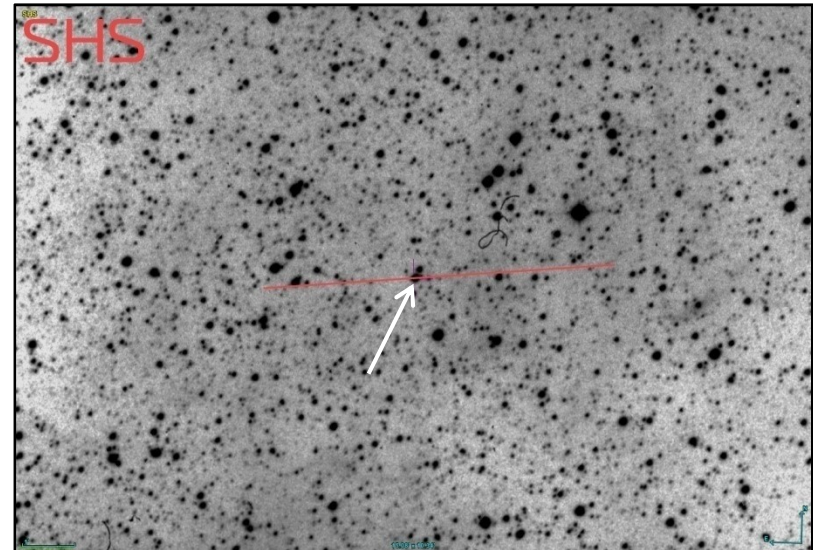
Spectroscopy on **DeGaPe 35** with **2SPOT**



2d raw spectrum



2d processed spectrum



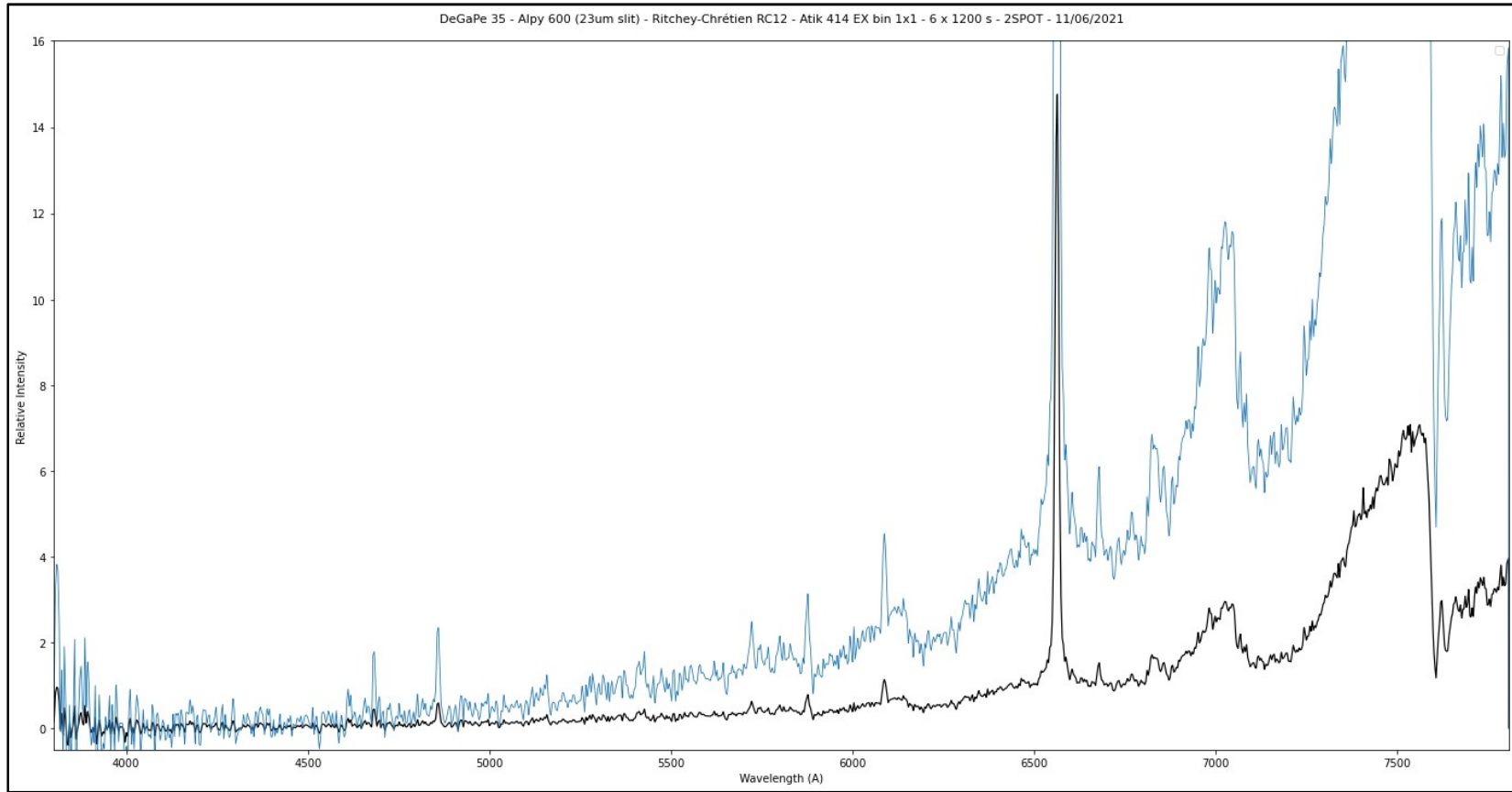
Slit position on SHS image

6 x 1200 seconds exposure time

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June 11th, 2021

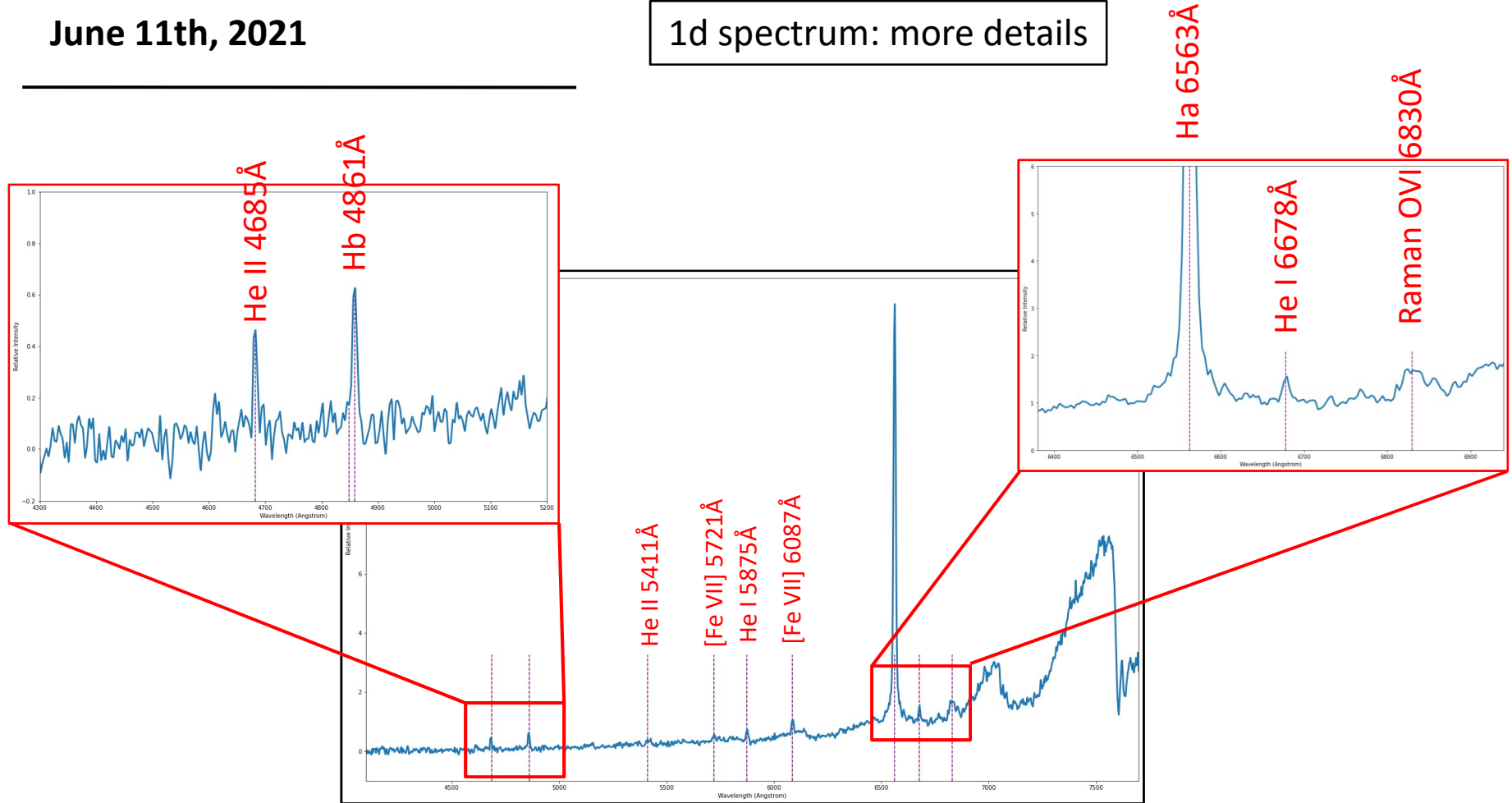
1d spectrum



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June 11th, 2021

1d spectrum: more details



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June 2021

HASH and PNnet databases

Spectroscopic Record Sheet	
Details on acquisitions	
Object	DeGaPe 35
Coordinates (J2000)	15:21:18.10 -59:00:34.20
Type	New candidate
Observation date	11.084/06/2021
Weather conditions	12°C / 17% hum
Observer	2SPOT
Location	Deep Sky Chile (CL)
Mount	10 Micron GM3000 HPS
Telescope	Ritchey-Chrétien RC12
Spectroscope	Alpy 600 (23um slit)
Resolution (bin 1x1)	~1 Å at 1656 nm
Principal camera	Atik 414 EX
Dispersion (bin 1x1)	~0.3 nm/pixel at 1656 nm
Cam temperature	-10°C
Binning	1x1
Guiding camera	Atik 314L+
Data acquisition Soft	Prism v10.4.12.911
Data processing soft	ISIS V6.1.1
Exposure on object	6 x 1200 s
Master Dark	Corrected
Master Flat	Corrected
Master Offset	Corrected
Neon-Argon calibration	Corrected
Reference star calib.	HD142139_A3V
Exposure on ref star	18 x 10 s
Ref star Sp. date	11.136/06/2021

HASH: the Hong Kong/AAO/Strasbourg H α planetary nebula database

<http://202.189.117.101:8999/gpne/index.php>

PNnet: planetarynebulae.net

Pascal Le Dû and Thomas Petit

www.planetarynebulae.net

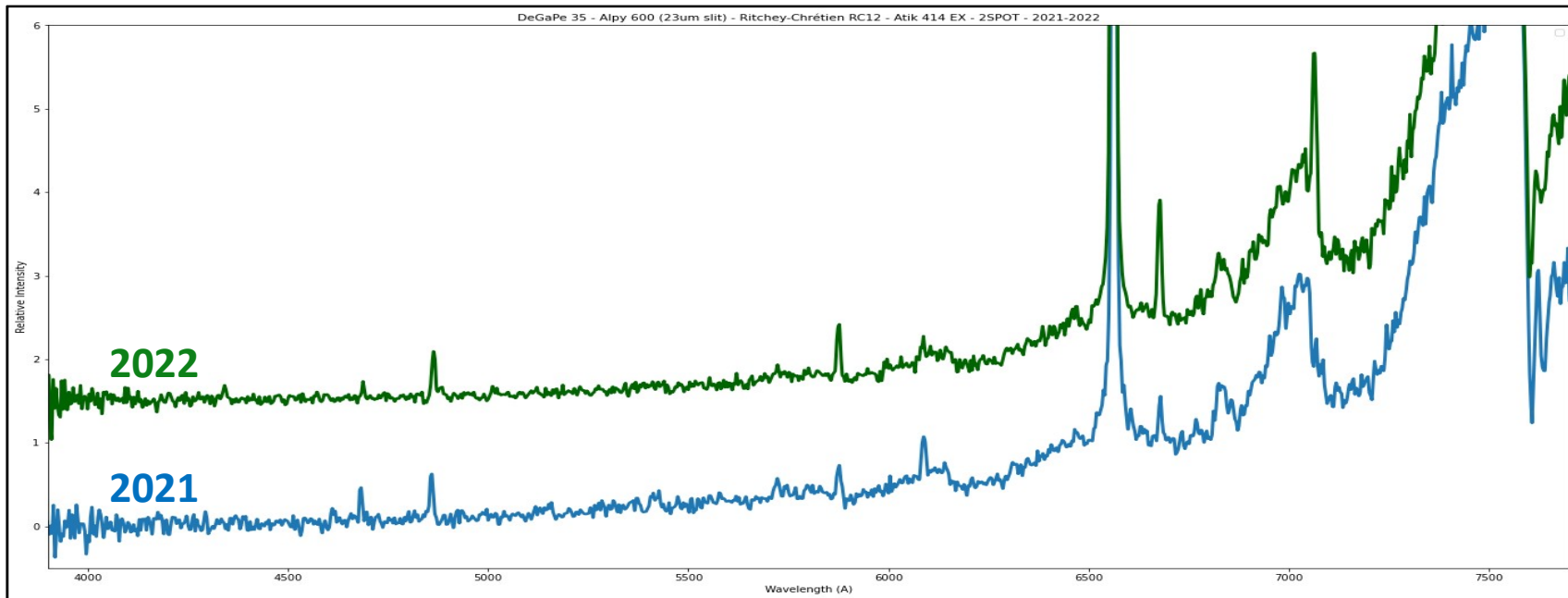
Characterized as an **emission line star** (em*)

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Mai 2022

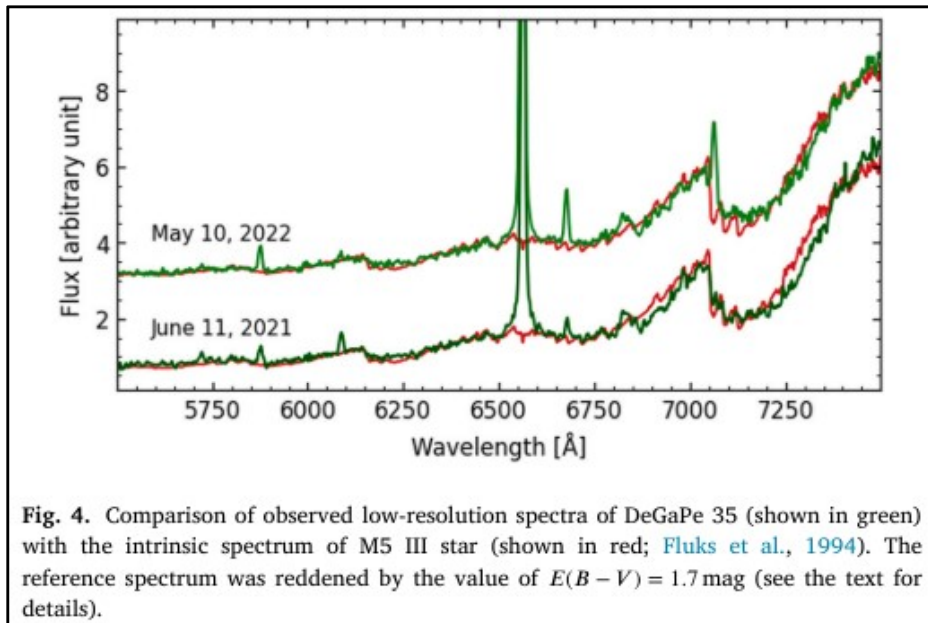
Jaroslav Merc came into the PNnet database...

- new spectrum
- confirmation of the SySt profil
- publication in New Astronomy: [Petit et al. 2023](#)



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Some characteristics of DeGaPe 35



Cool component

- M4-5 III type giant
- $T_{\text{eff}} \sim 3380\text{-}3470$ K
- luminosity $\sim 3 \times 10^3 L_{\odot}$
- adopted distance 3 kpc
- period $\sim 700\text{-}800$ days

Hot component

- probably shell-burning white dwarf
- mass $\sim 0.6 M_{\odot}$
- luminosity $2300\text{-}2400 L_{\odot}$

[Petit et al. 2023](#)

→ DeGaPe 35 is classified as a S-type symbiotic star

Last words...

Pro/Am collaborations
Many thanks to **Jaroslav Merc** and...



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