Caught in the act: a post-starburst galaxy quenched b
AGN feedback

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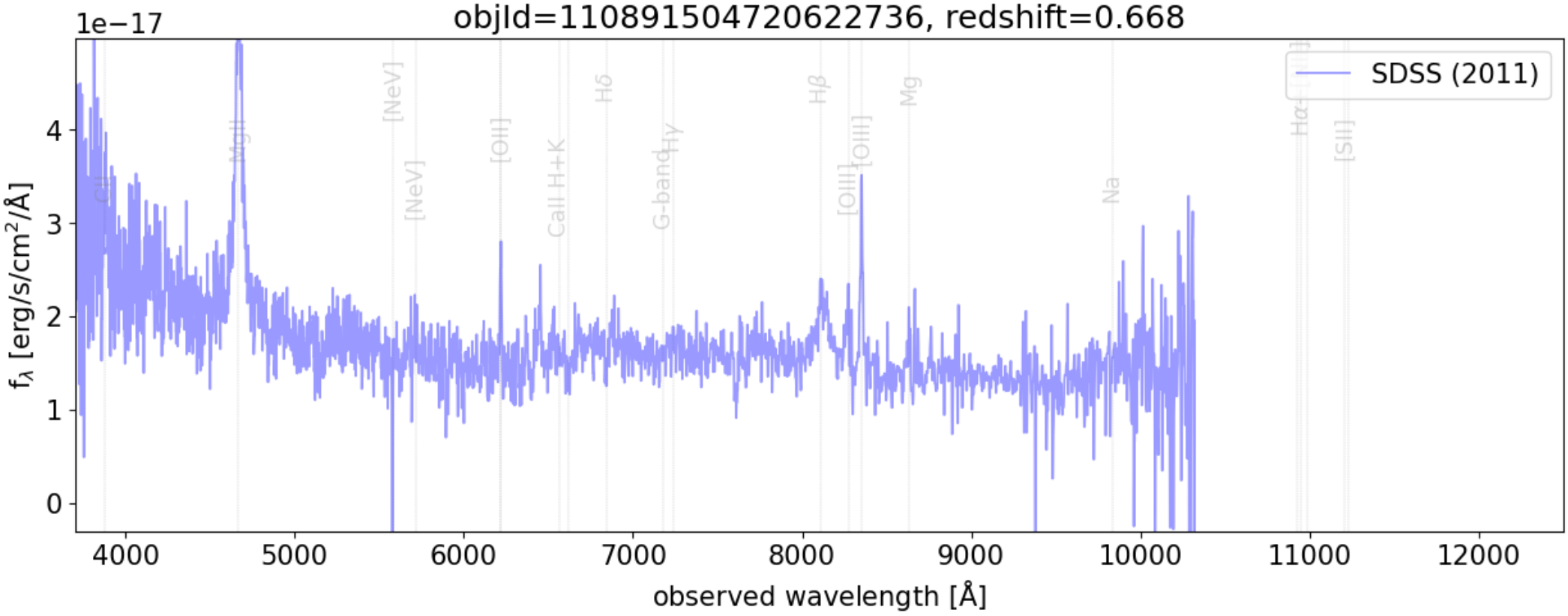
- A quick summary of obs. filler
- The post-starburst galaxy
- Its physical properties
- Summary

Observatory Filler

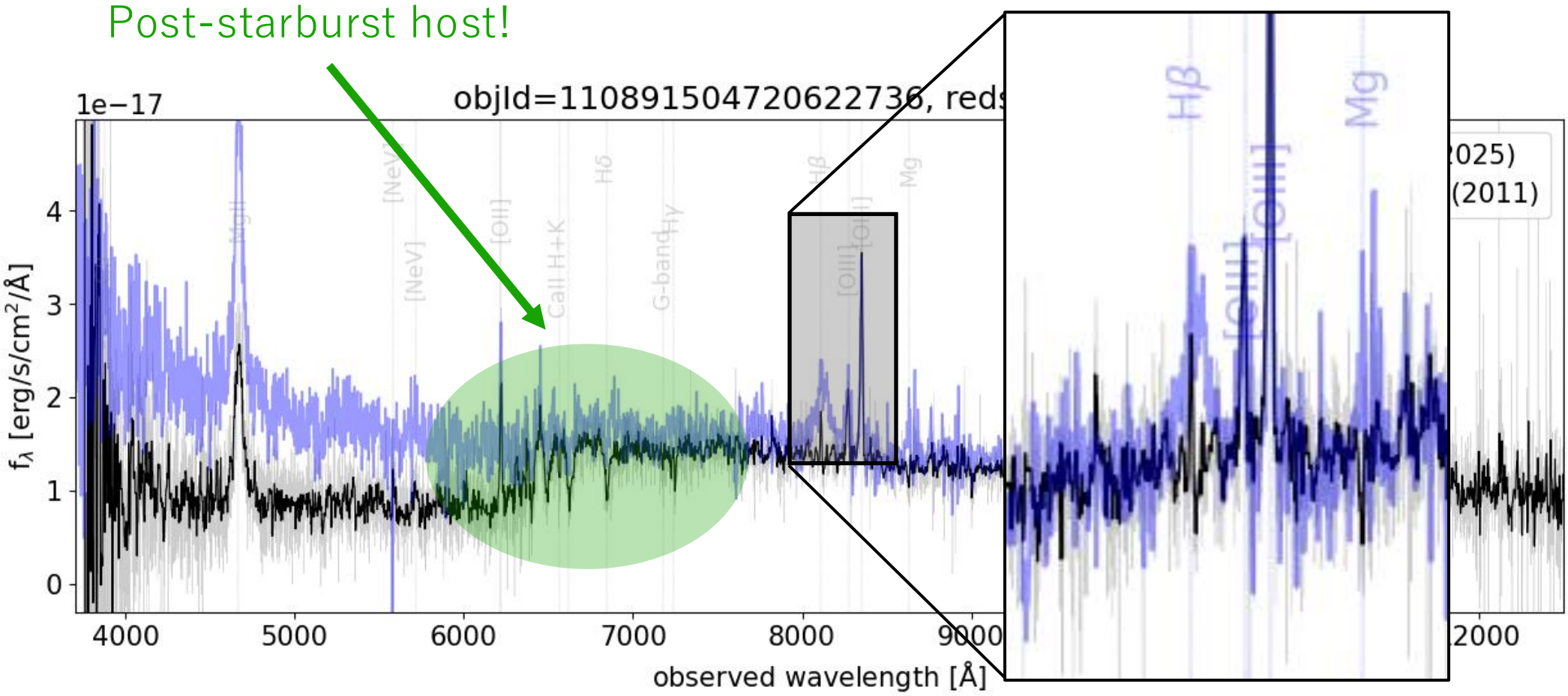
- When PFS fibers are left unassigned to science targets, they are used for filler objects.
- The observatory prepared a flux-limited ($18<i<21$) sample from PS1 DR2 to cover most of the observable sky from Maunakea.
- The total number of the observatory fillers observed so far amounts to about 200,000 objects (run21-25), making it the biggest, public sample of objects observed with PFS.
- We happened to find an interesting post-starburst galaxy from the very first release and we focus on it in this talk.

An AGN at z=0.668



SDSS spectrum from 2011

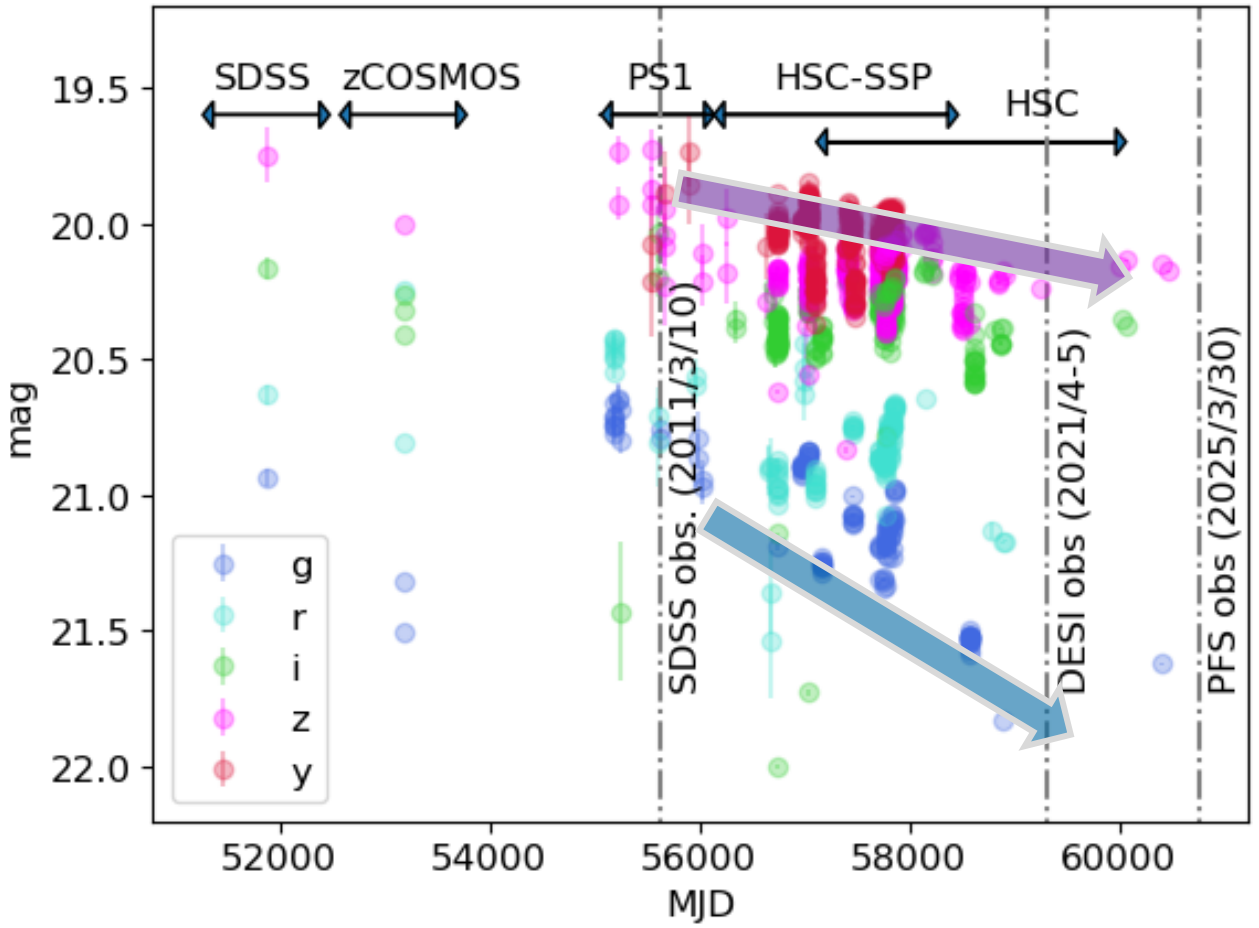
An AGN + host galaxy at z=0.668



SDSS spectrum from 2011

PFS spectrum from 2025

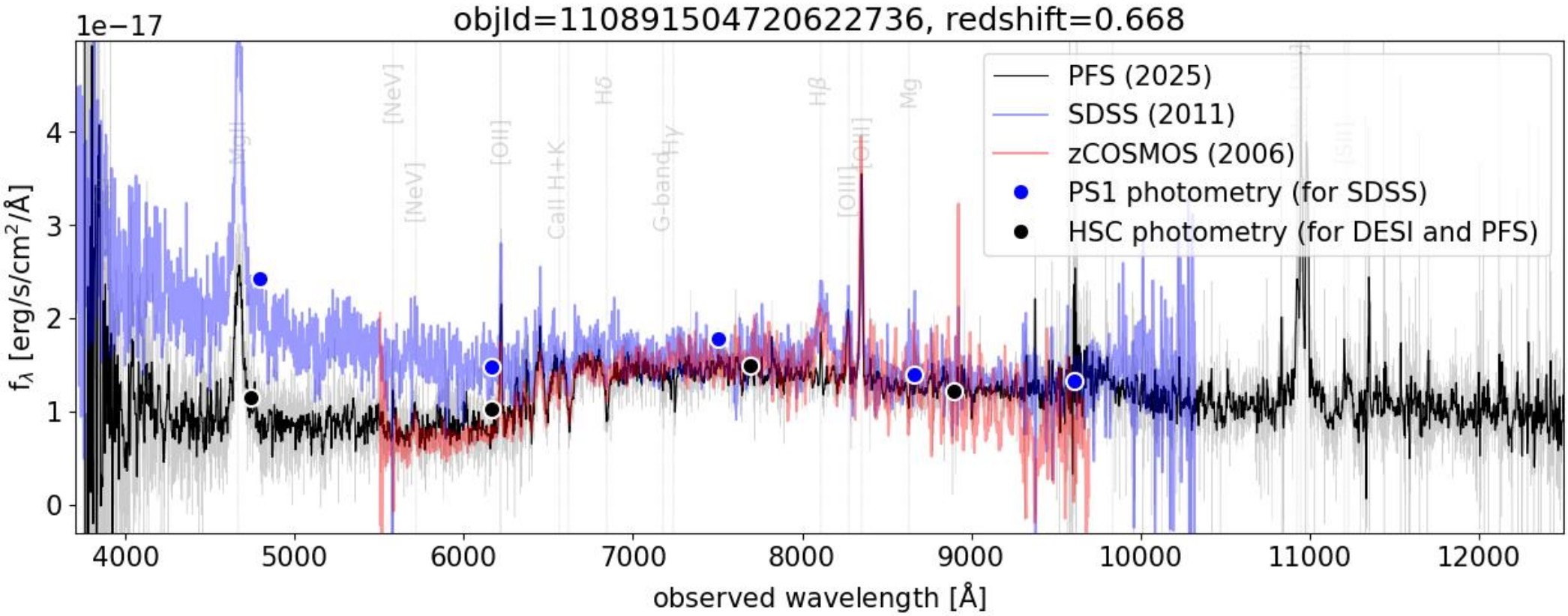
Photometric variability



The object became fainter (slightly more rapidly in the blue)
→ AGN is fading

Courtesy: Kokubo-san, Yasuda-san, Moriya-san

An AGN + host galaxy at z=0.668

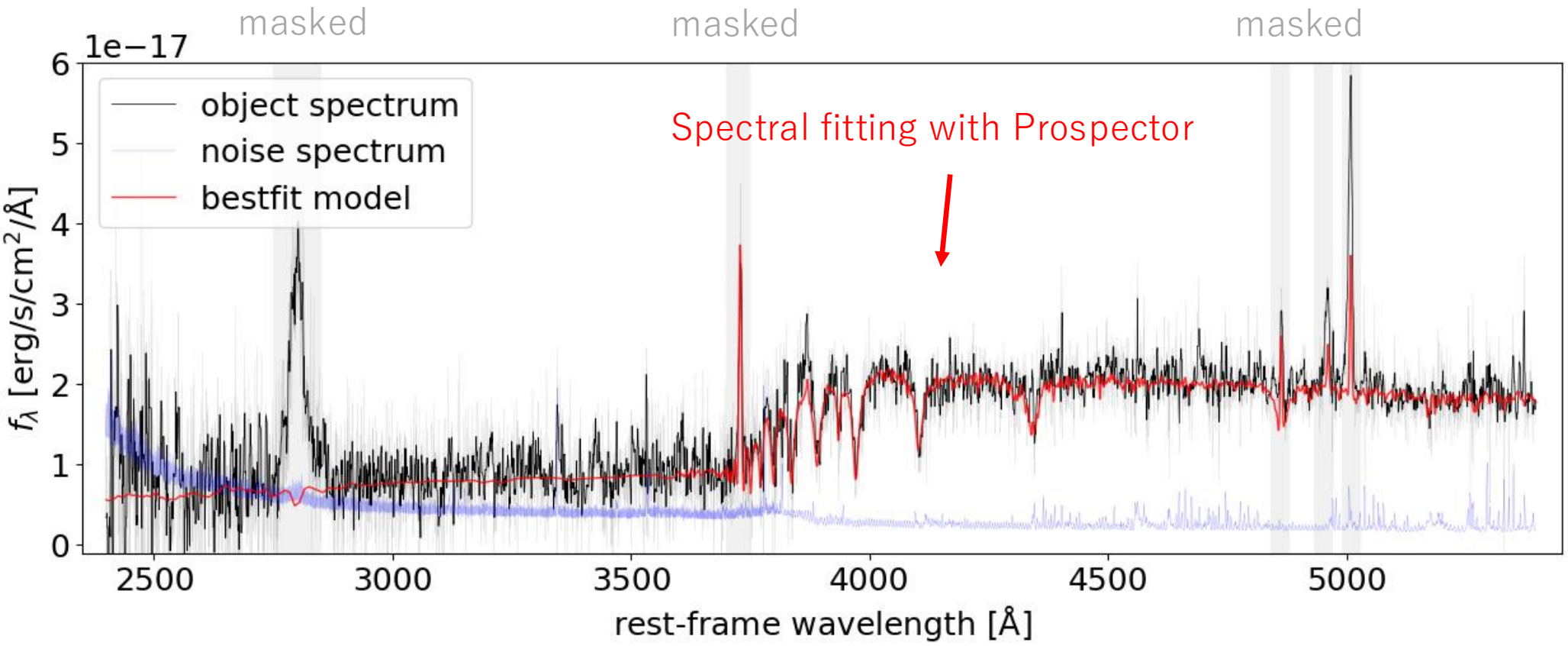


zCOSMOS specrtum from 2006

SDSS spectrum from 2011

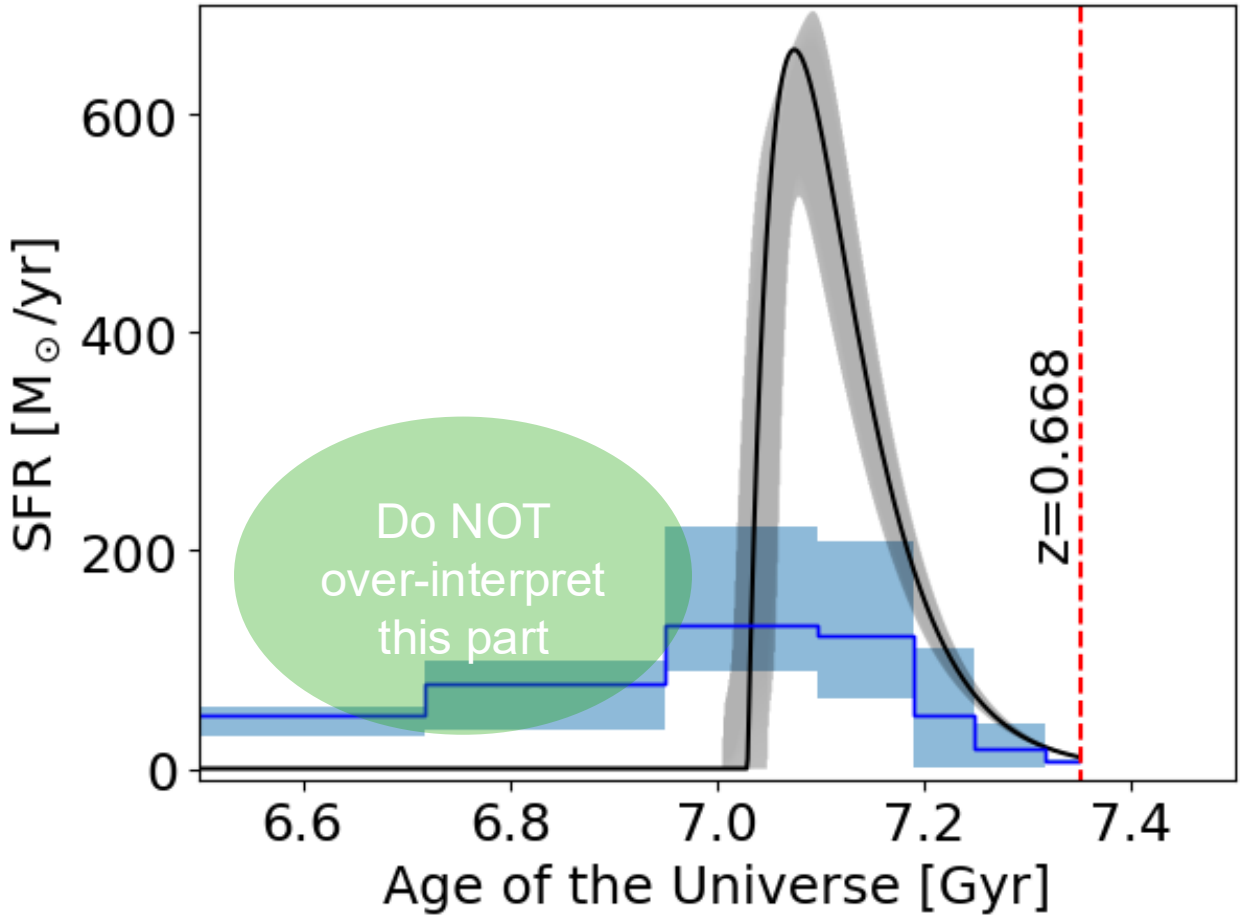
PFS spectrum from 2025

Spectrum fitting of the host galaxy



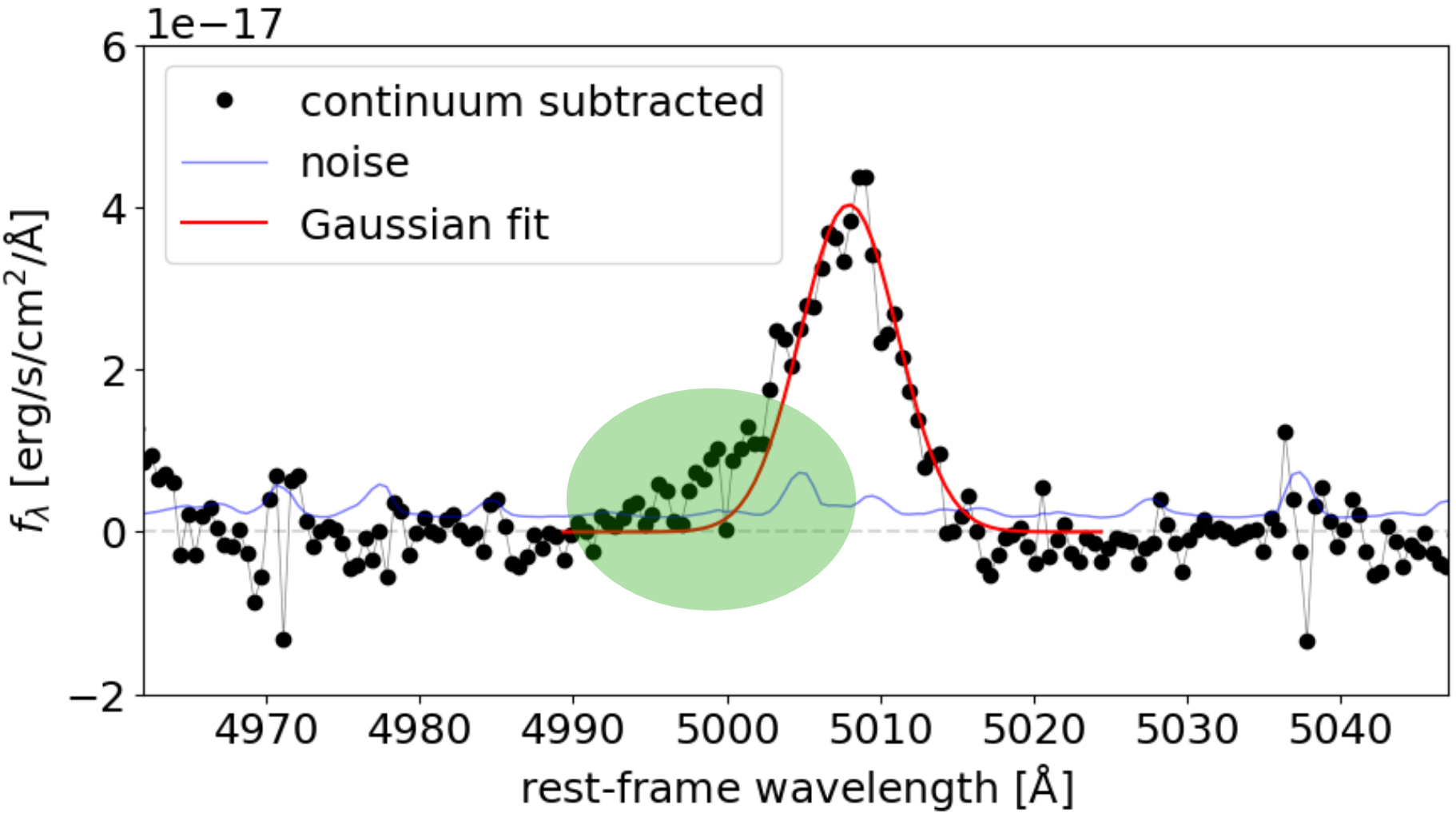
The residual AGN component is subtracted from the PFS spectrum and the host-only spectrum is fit by prospector to infer physical properties of the host.

Star formation history

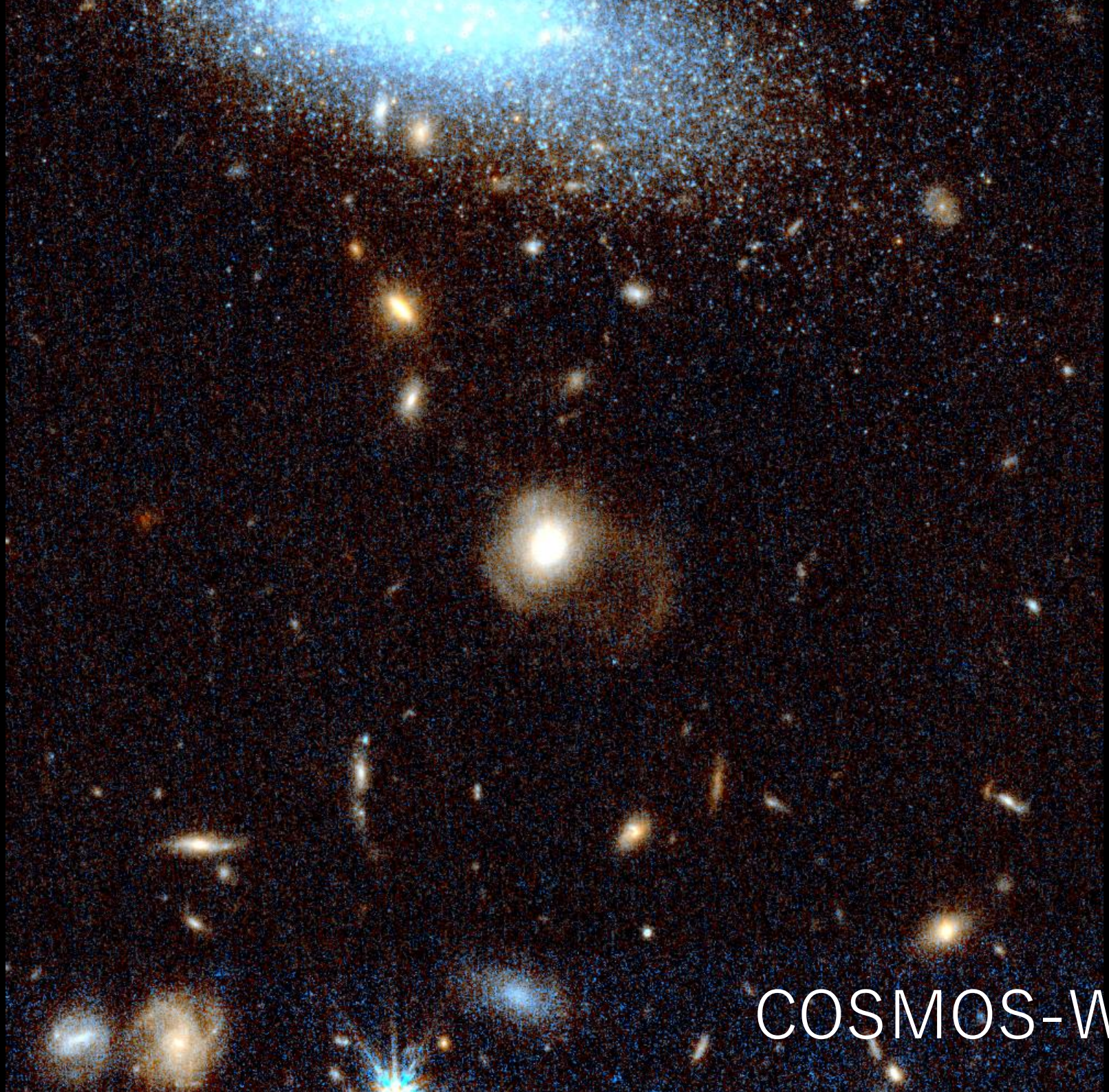


The main take-away is (1) galaxy experienced a starburst ~0.3 Gyr ago, and (2) its SFR decayed with tau~0.1 Gyr.

[OIII] outflow

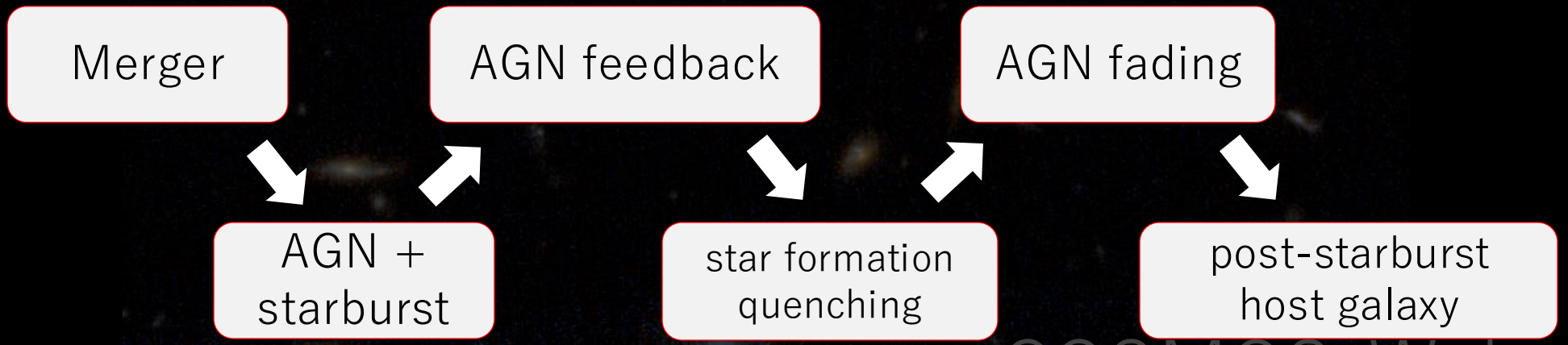


The blueshifted wing of the [OIII] emission.
A sign of ionized gas outflow!


COSMOS-Web

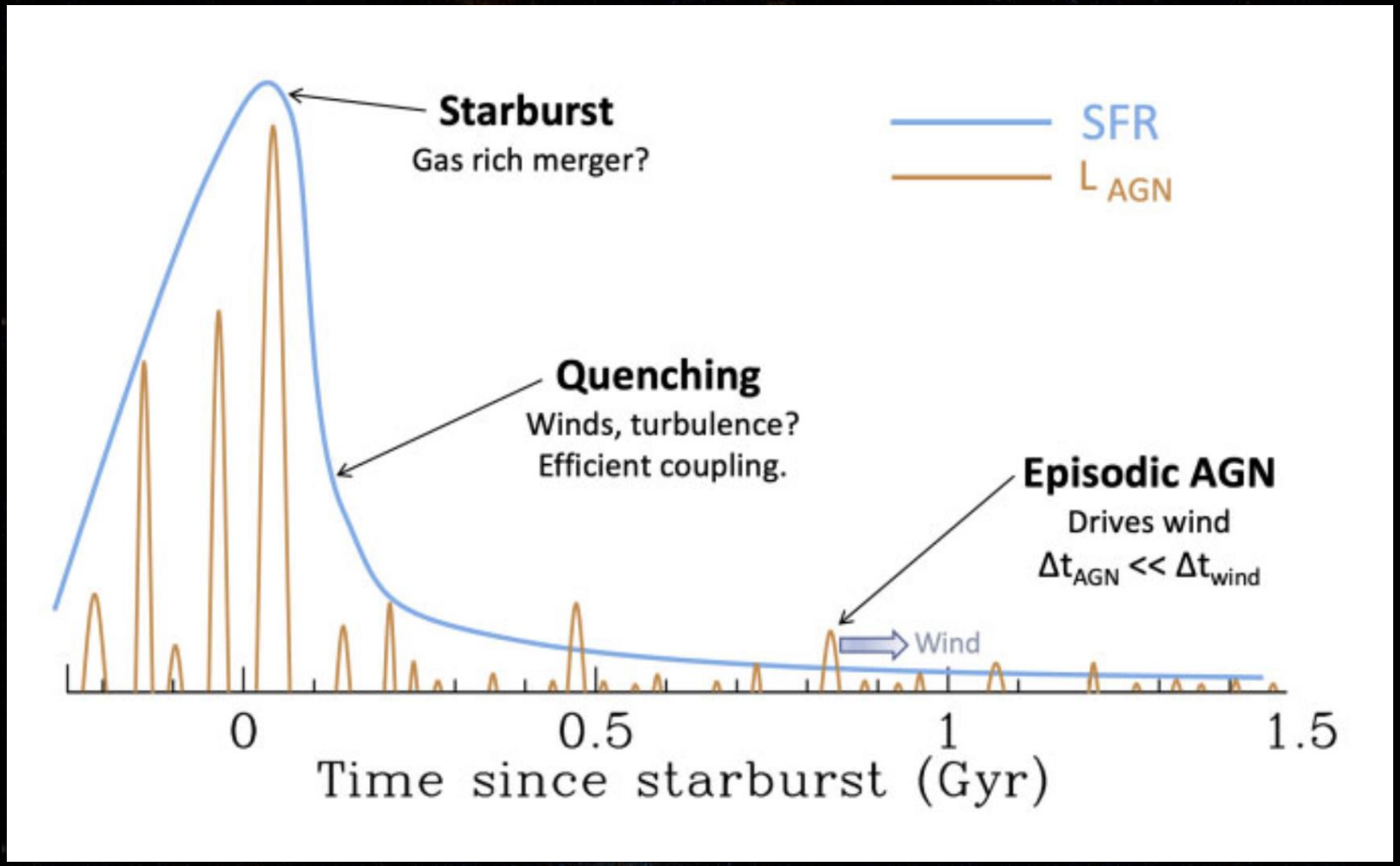
This object

- is a massive (~10^{11} Msun) galaxy with a starburst ~0.3Gyr prior to the observed epoch
- is a merging galaxy (likely a late-phase merger)
- has an fading/flickering AGN
- shows a sign of outflowing ionized gas



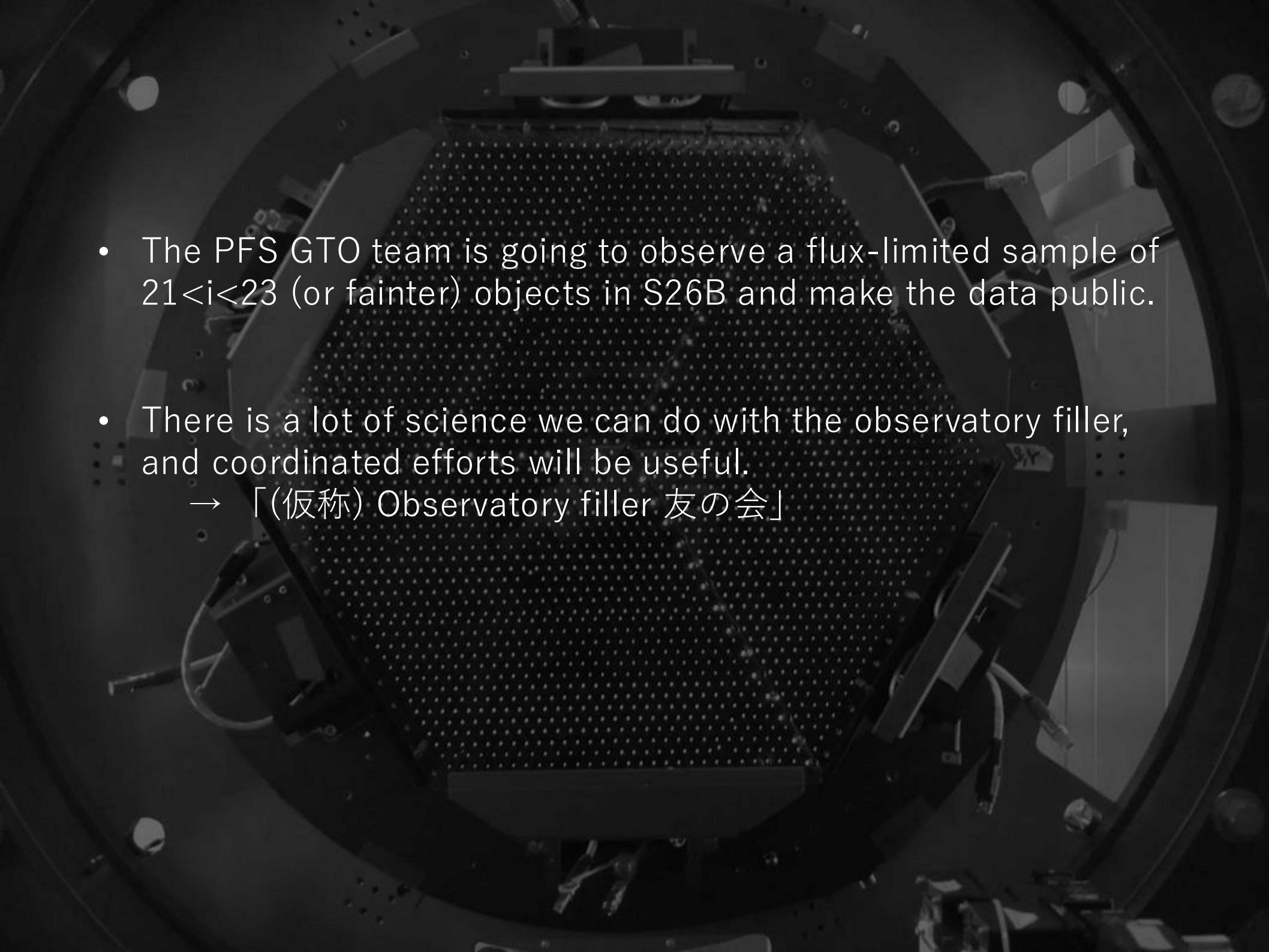
COSMOS-Web

This object is consistent with the quenching picture recently proposed by Almaini+25.



Summary:

- ~200,000 observatory filler objects so far.
- One of them is a nice post-starburst galaxy with fading/flickering AGN
- The galaxy exhibits the outflowing [OIII] gas and the tidal features around it.
- A possible interpretation is that the galaxy is quenched by AGN feedback.
- Time-domain spectroscopic studies are possible with PFS!



- The PFS GTO team is going to observe a flux-limited sample of 21<i<23 (or fainter) objects in S26B and make the data public.

- There is a lot of science we can do with the observatory filler, and coordinated efforts will be useful.
  → 「(仮称) Observatory filler 友の会」