



Observing comets with BlueMUSE

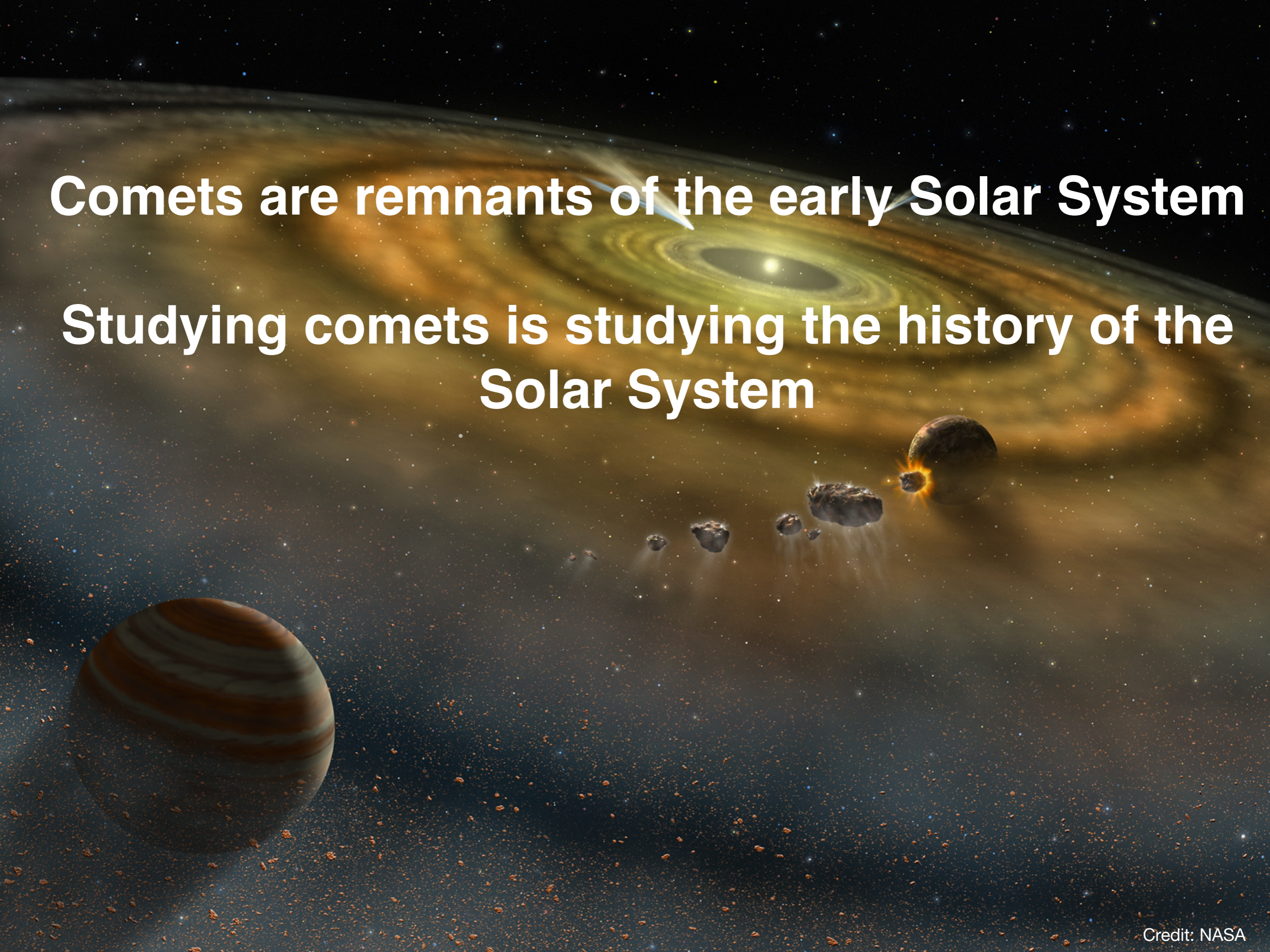
Cyrielle Opitom^{1,2}, Bin Yang²

(¹) The University of Edinburgh, (²) ESO

BlueMUSE Science workshop, 9-10 Nov 2020

Comets are remnants of the early Solar System

**Studying comets is studying the history of the
Solar System**



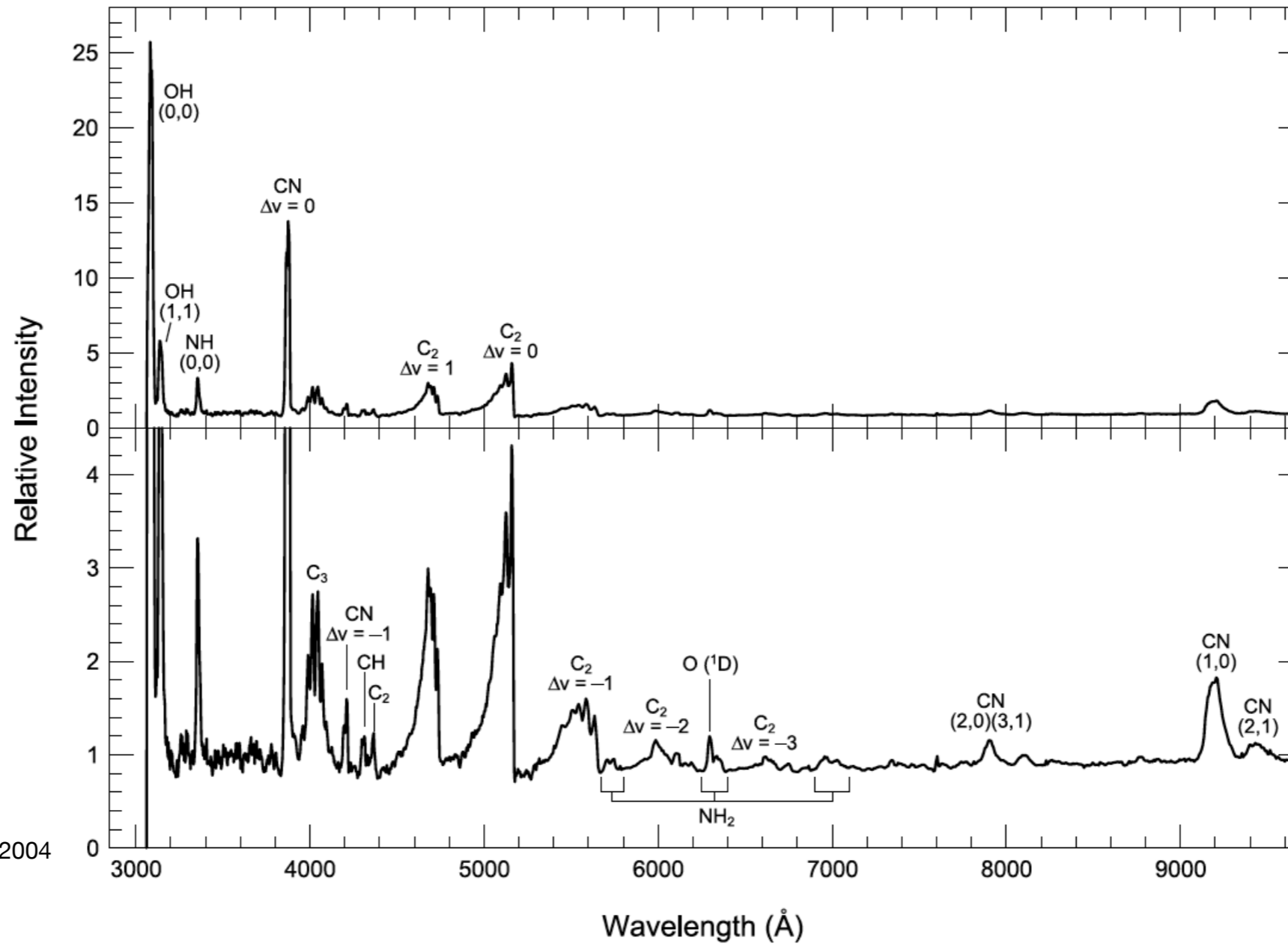
Comets are remnants of the early Solar System

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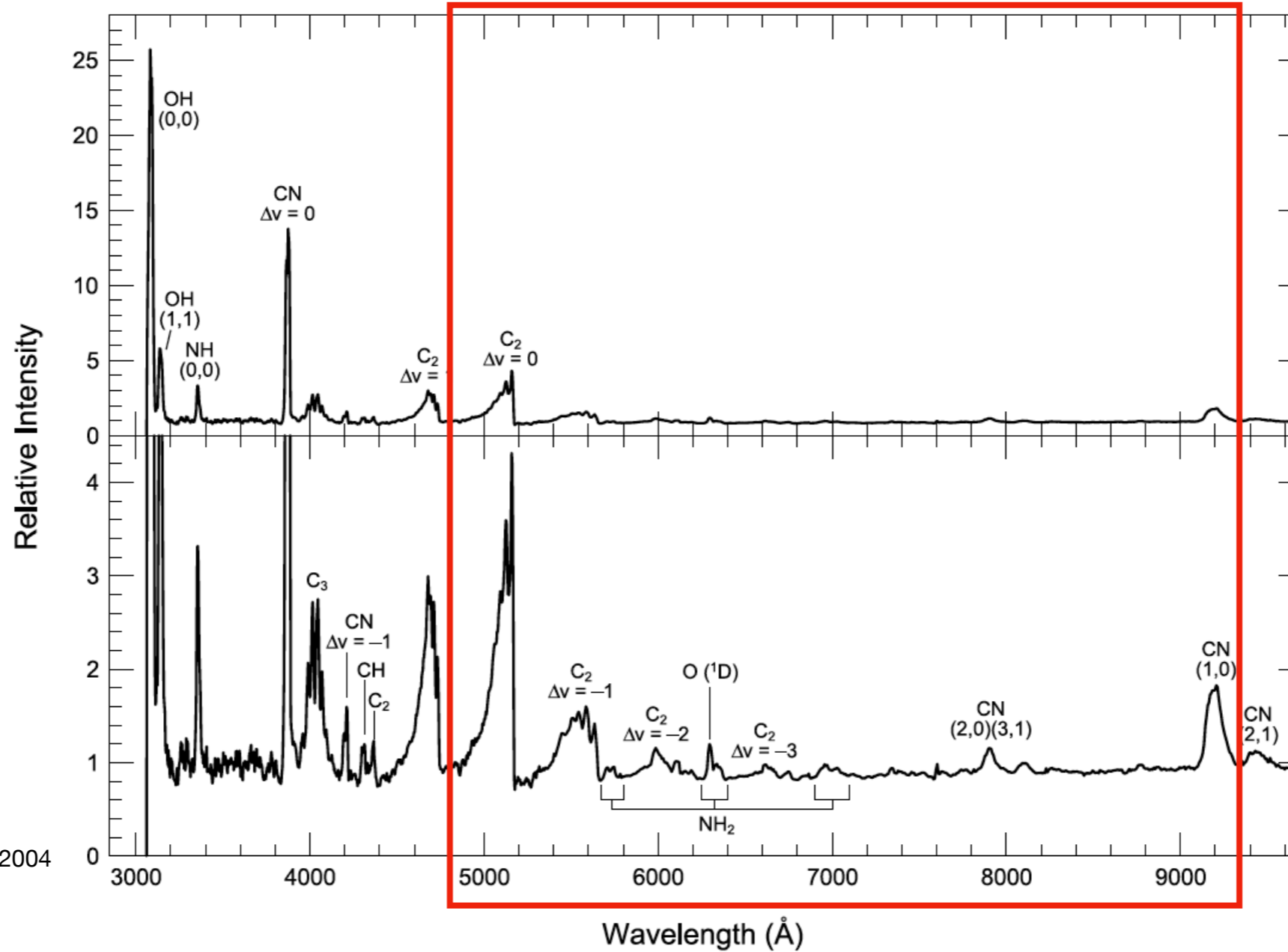
COMETS AT OPTICAL WAVELENGTHS



Feldman et al., 2004

COMETS AT OPTICAL WAVELENGTHS

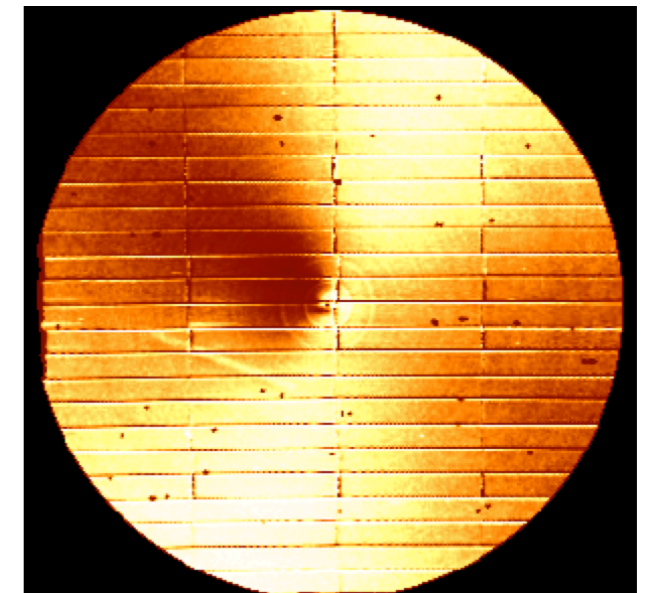
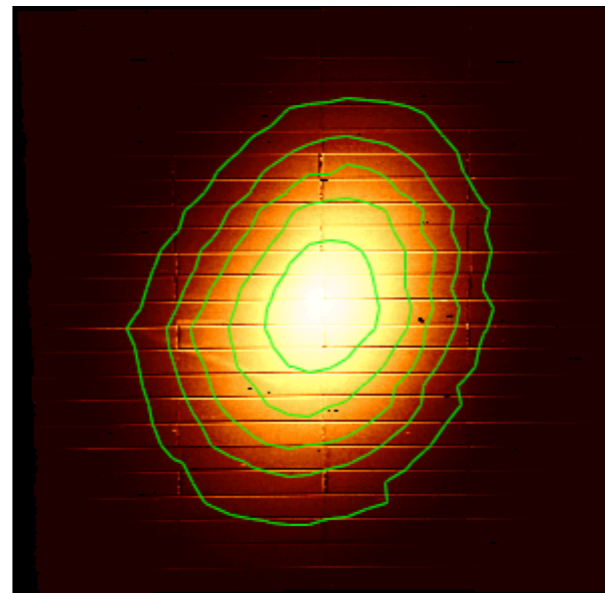
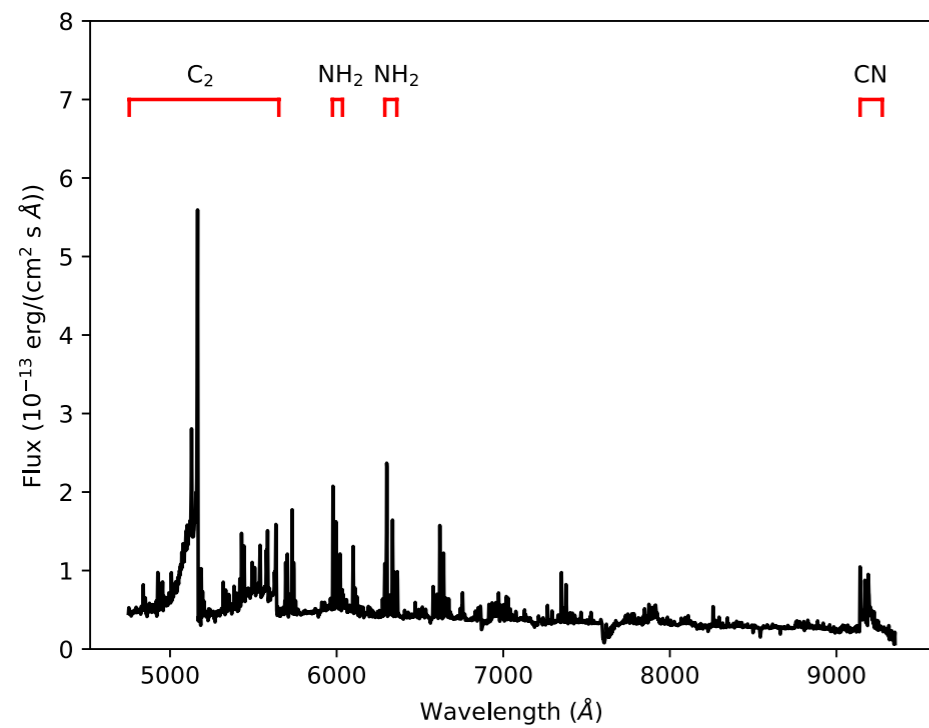
MUSE



Feldman et al., 2004

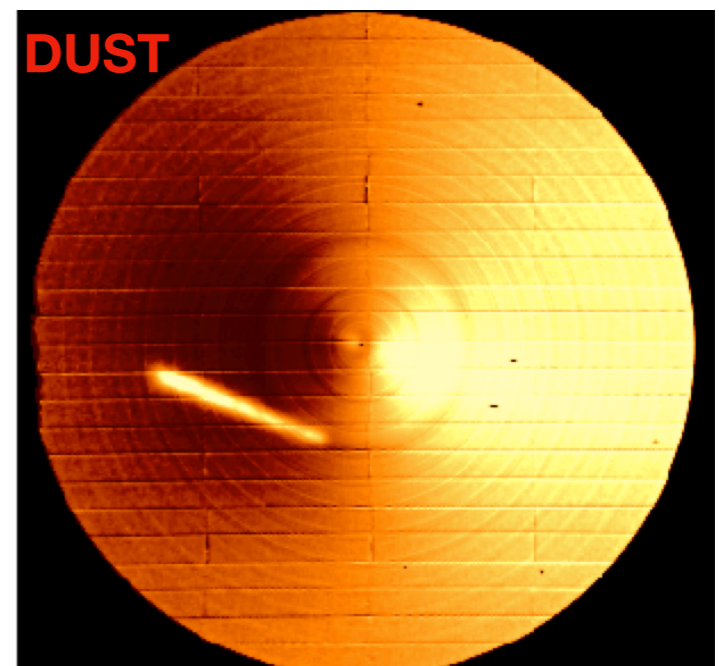
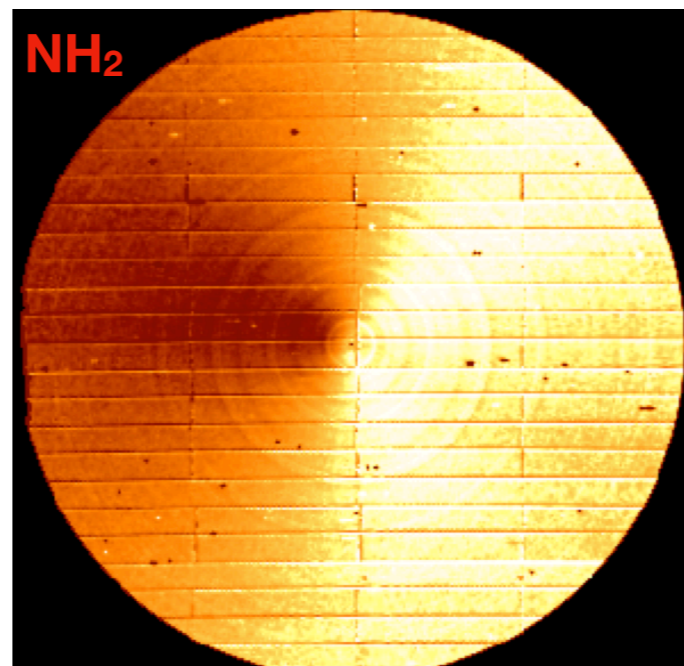
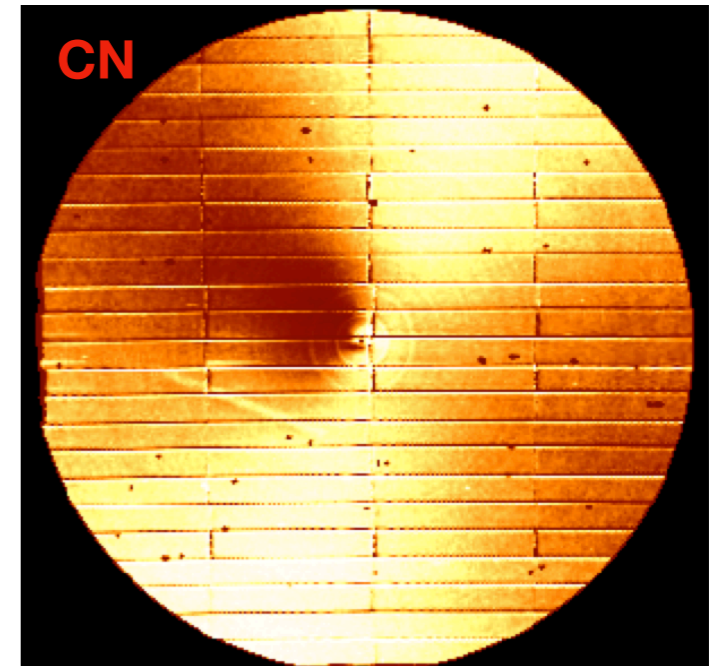
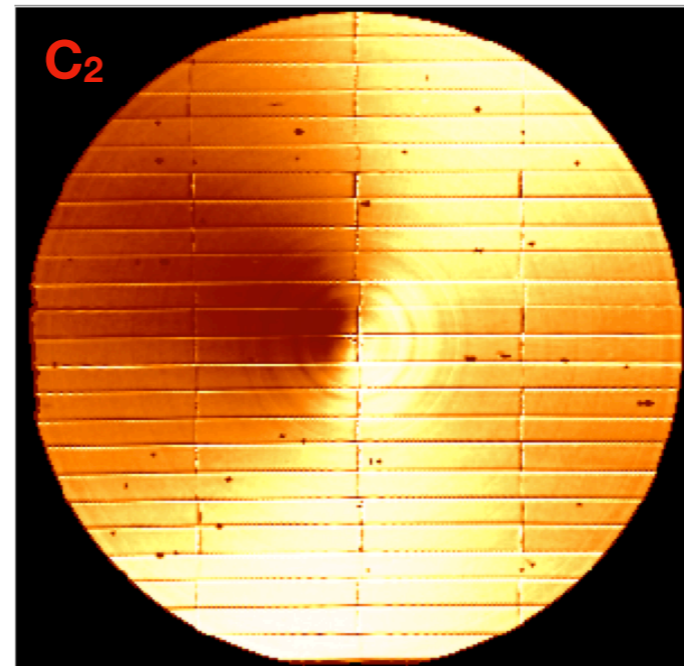
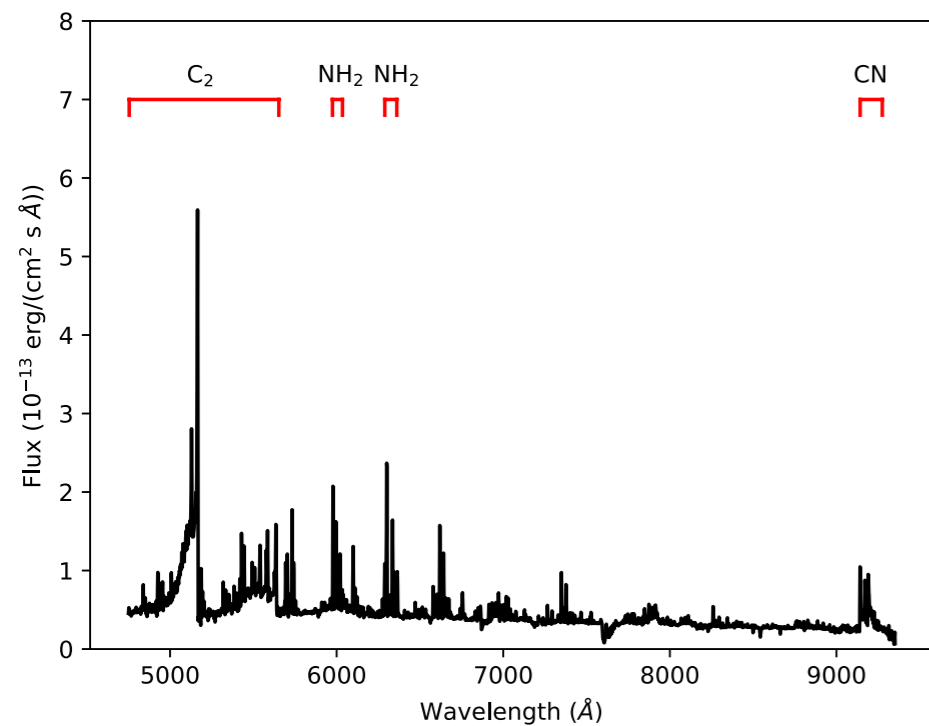
COMETS WITH MUSE

Investigating the origin of species in the coma



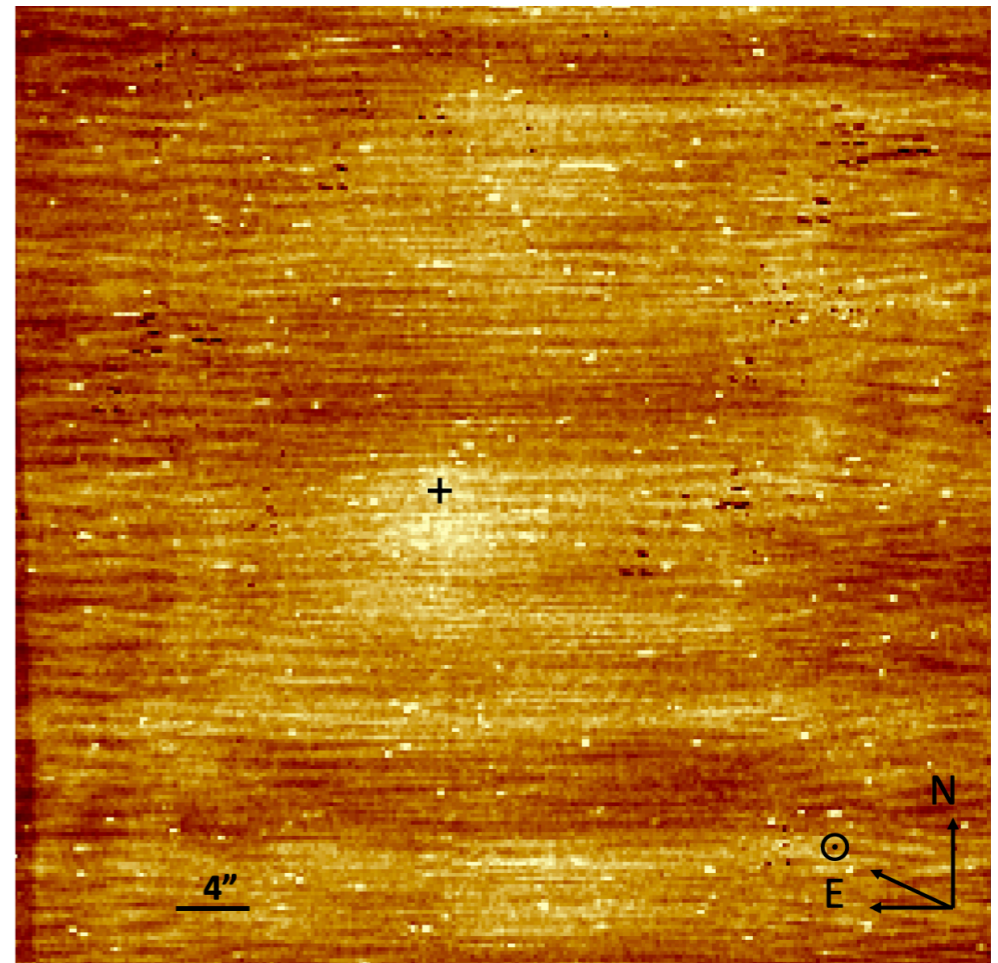
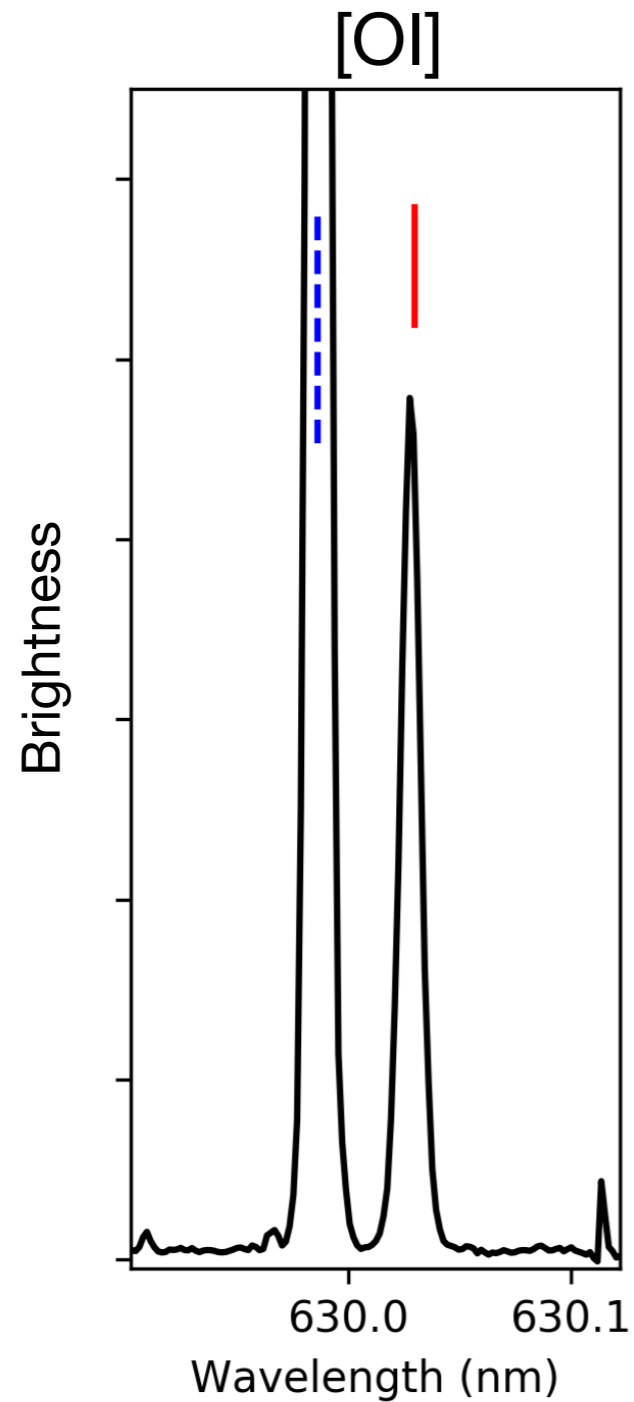
COMETS WITH MUSE

Investigating the origin of species in the coma



COMETS WITH MUSE

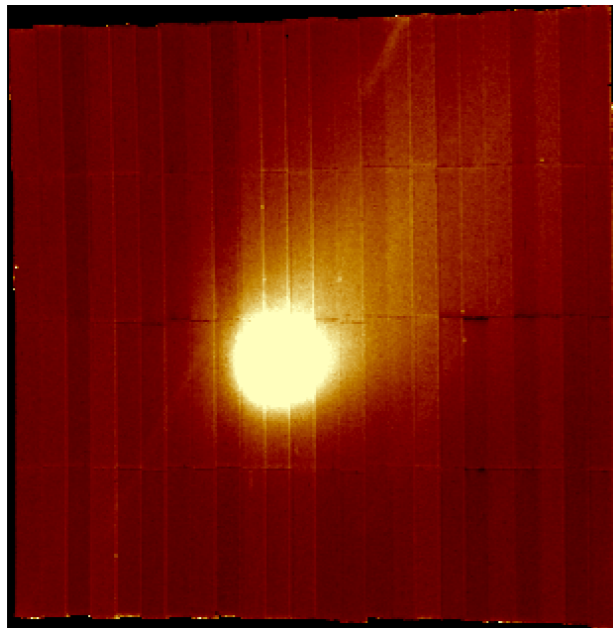
Detect faint level of activity in comets



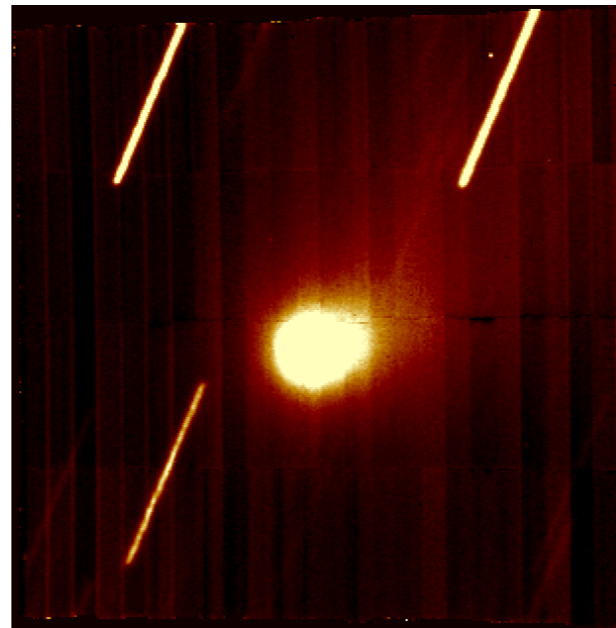
Opitom et al., 2020

COMETS WITH MUSE

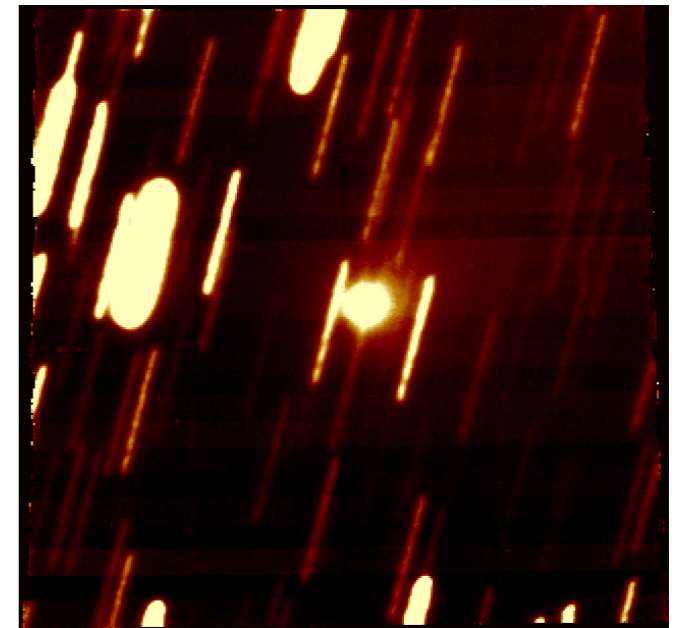
Follow-up the activity and composition of (interstellar) comets



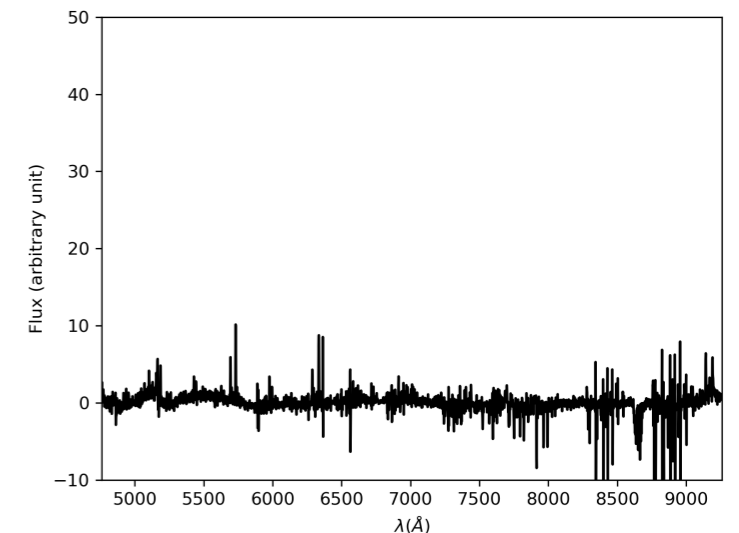
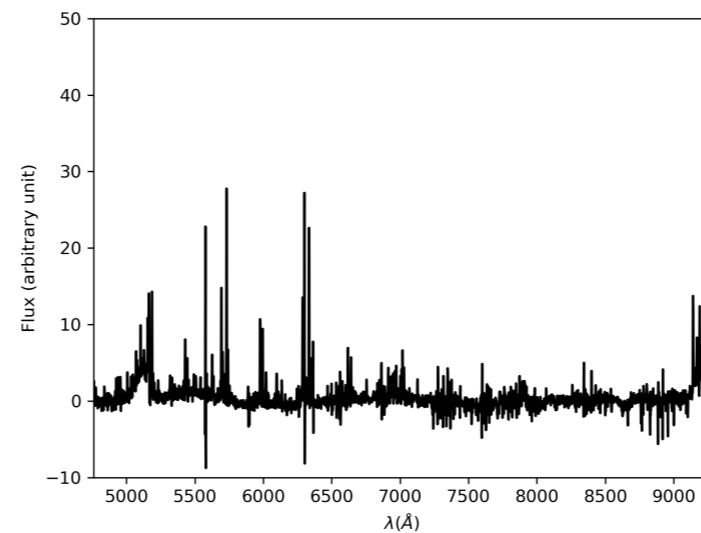
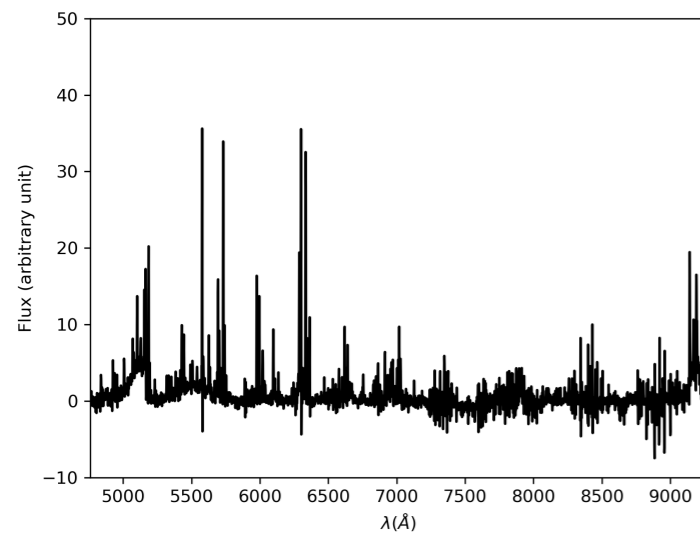
06/12/2019: $r_h=2.0$ au, $\Delta = 2.0$ au



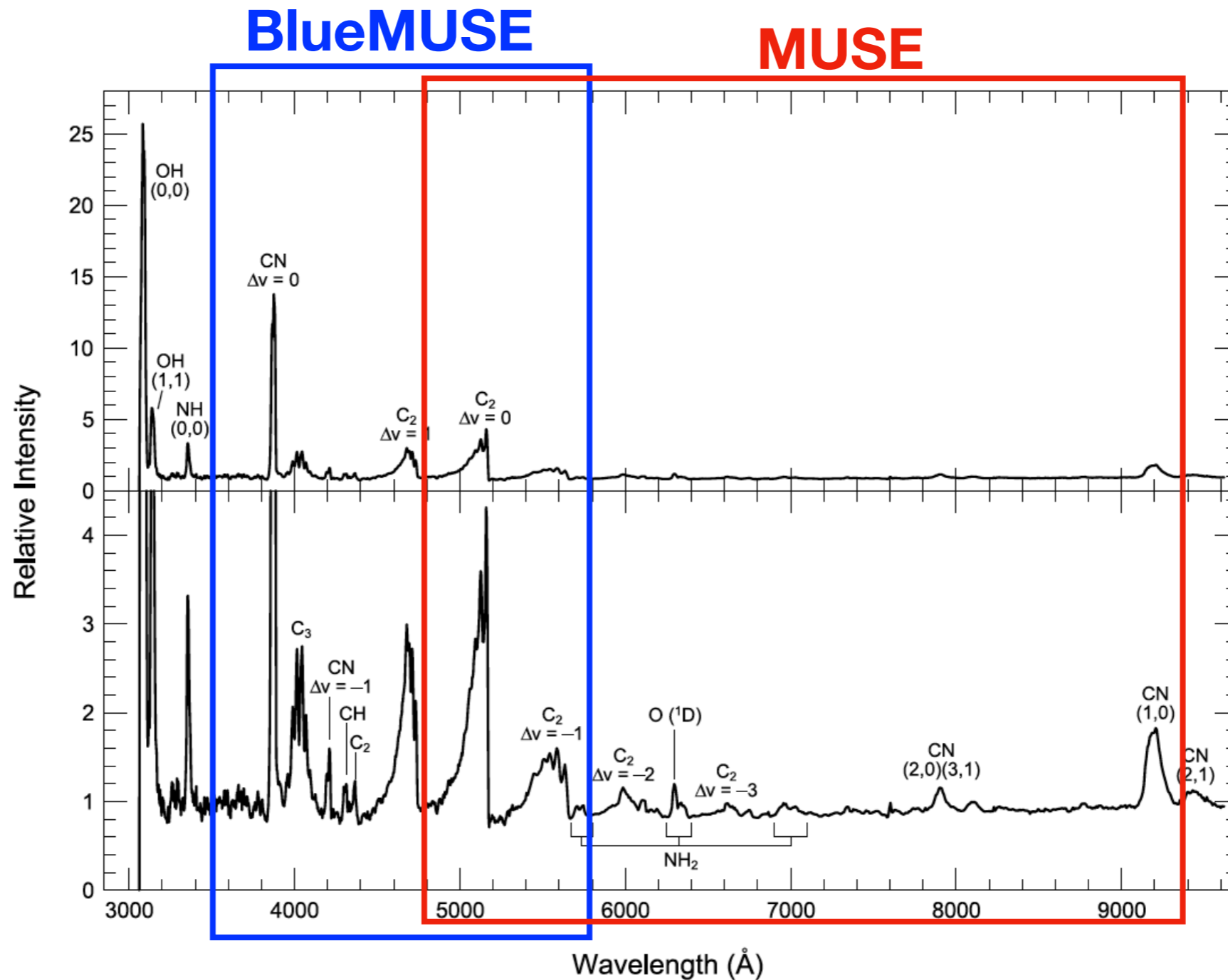
31/12/2019: $r_h=2.1$ au, $\Delta = 1.9$ au



02/02/2020: $r_h=2.4$ au, $\Delta = 2.1$ au



COMETS WITH BlueMUSE

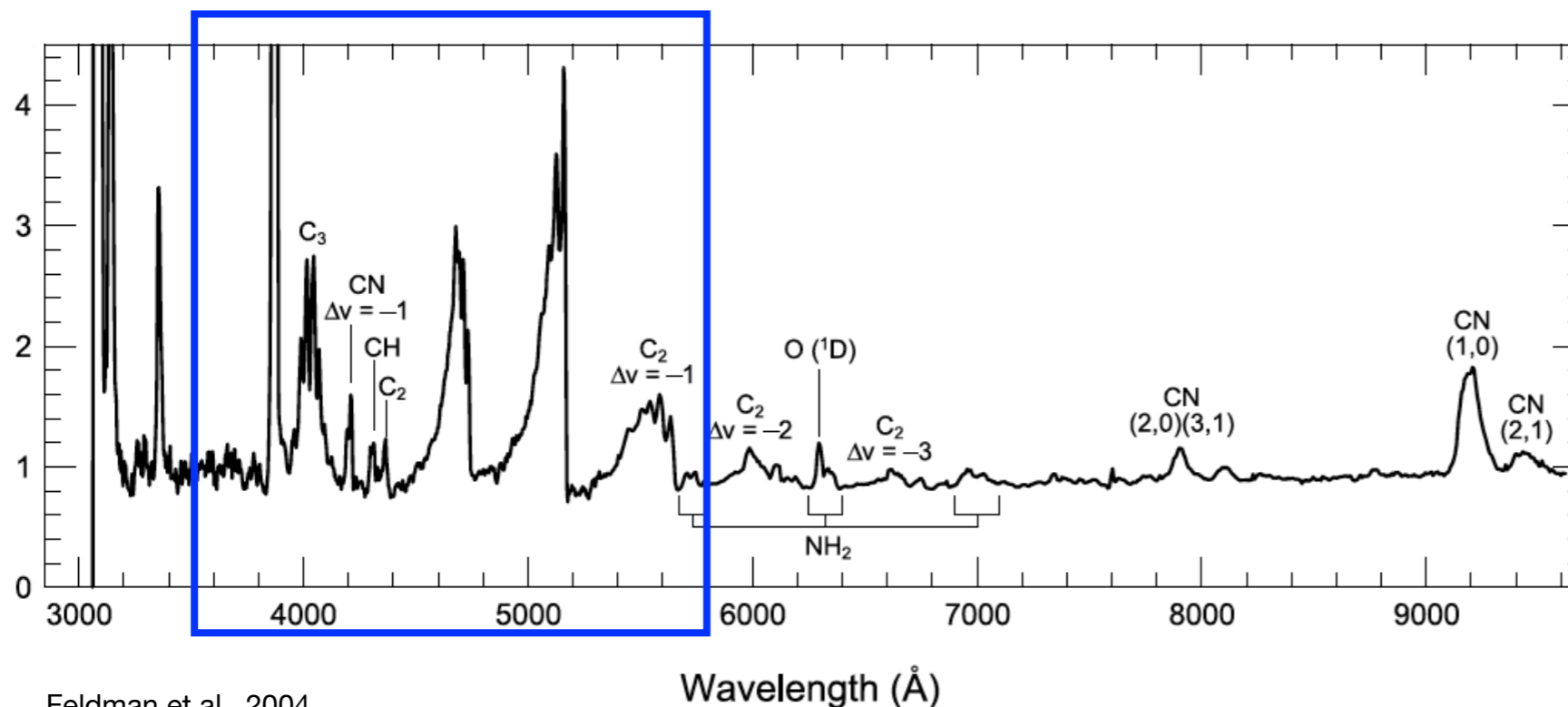


Feldman et al., 2004

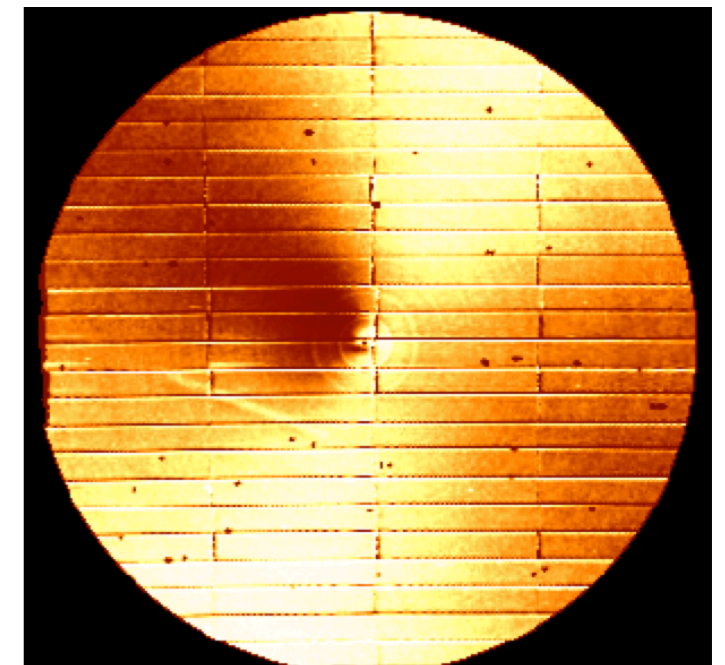
Access to blue CN system, C₃, and CH in addition to C₂ and NH₂

COMETS WITH BlueMUSE

- Study the species parentage for fainter comets and for a larger number of species (CN, C₃, CH, C₂, and NH₂)
- Use the blue CN $\Delta\nu=0$ line to detect activity in fainter comets
- Bright comets are very extended -> study larger scales in the coma

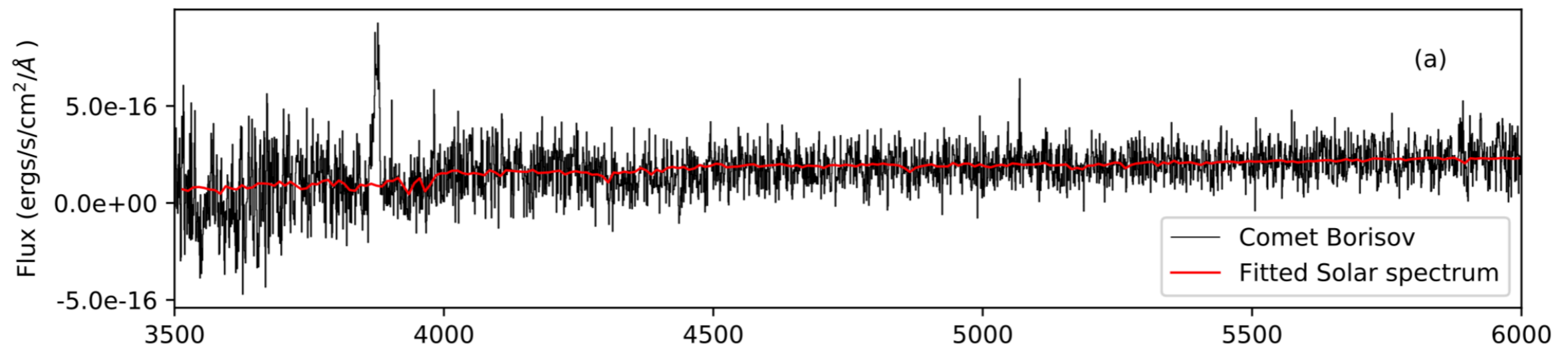


Feldman et al., 2004



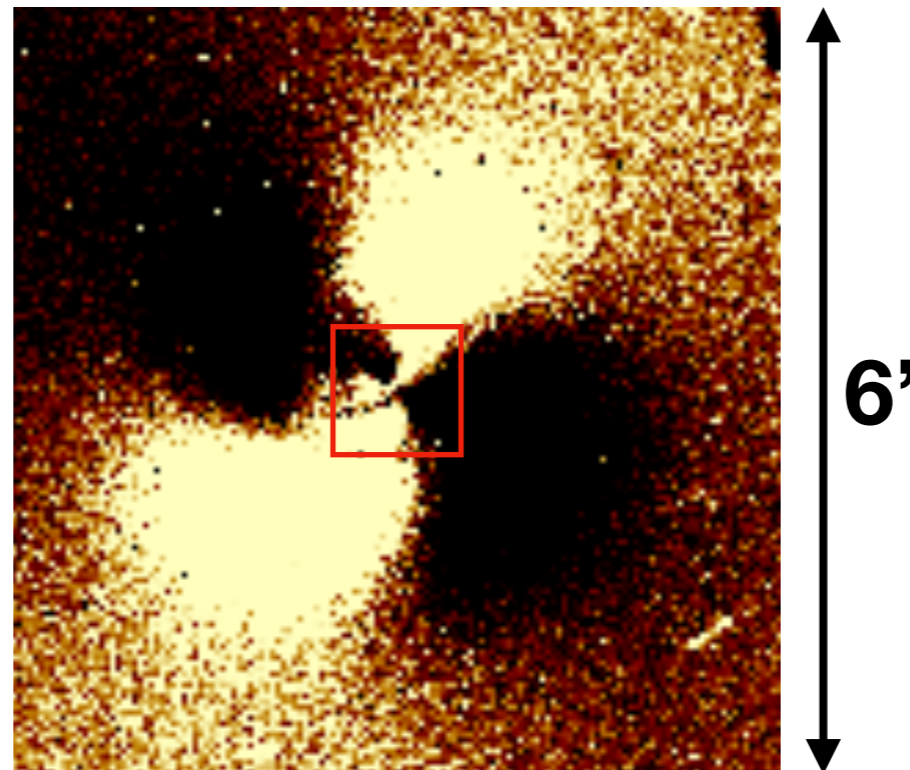
COMETS WITH BlueMUSE

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COMETS WITH BlueMUSE

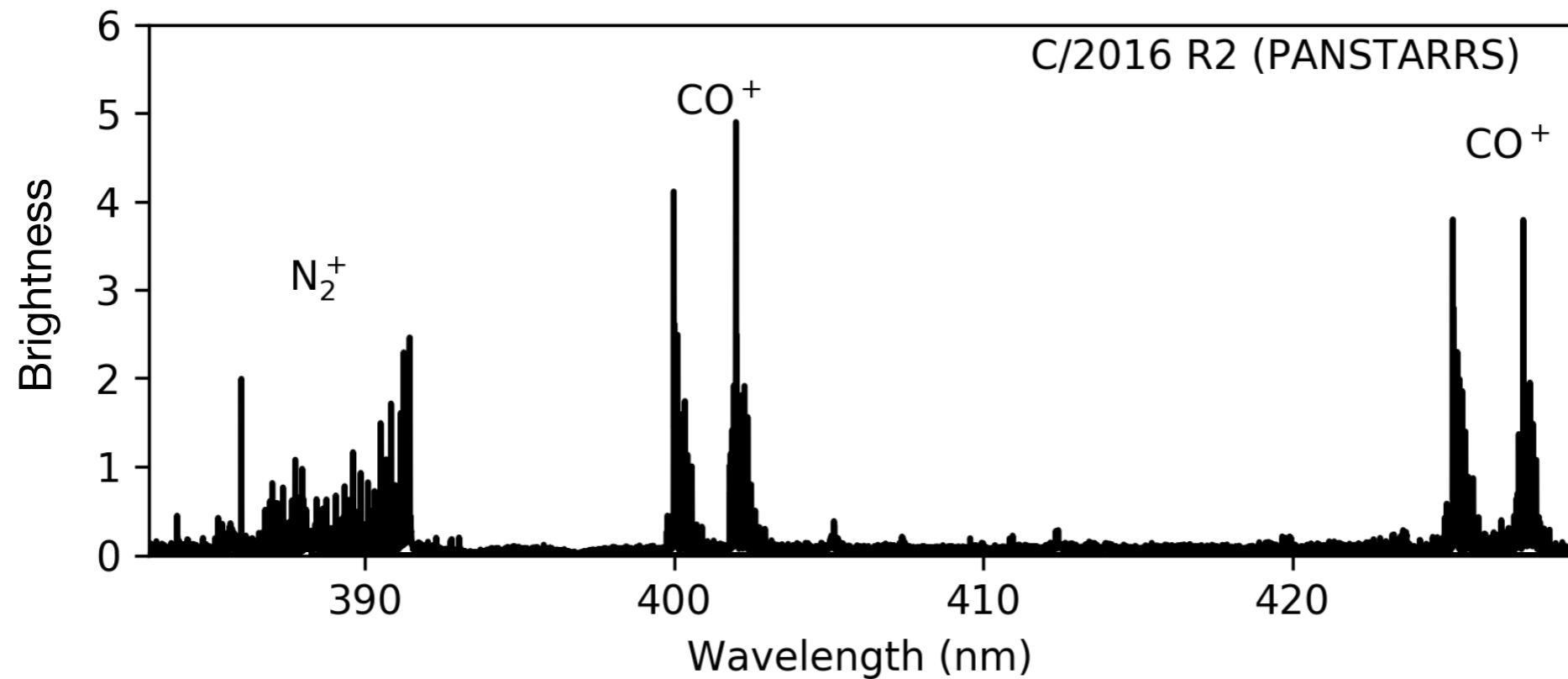
- Study the species parentage for fainter comets and for a larger number of species (CN, C₃, CH, C₂, and NH₂)
- Use the blue CN $\Delta\nu=0$ line to detect activity in fainter comets
- **Bright comets are very extended -> study larger scales in the coma**



Opitom et al., 2016

COMETS WITH BlueMUSE

Measure the N_2/CO ratio in the coma of comets



Conclusion

BlueMUSE will allow us to:

- ✓ Study species parentage in comets
- ✓ Study the composition and activity of distant comets or interstellar comets
- ✓ Measure the N_2/CO in a sample of comets

Synergies with MUSE, CUBES