



UNIVERSITY
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Centre of Excellence
neutronstars.fi

Optical polarization of Sco X-1



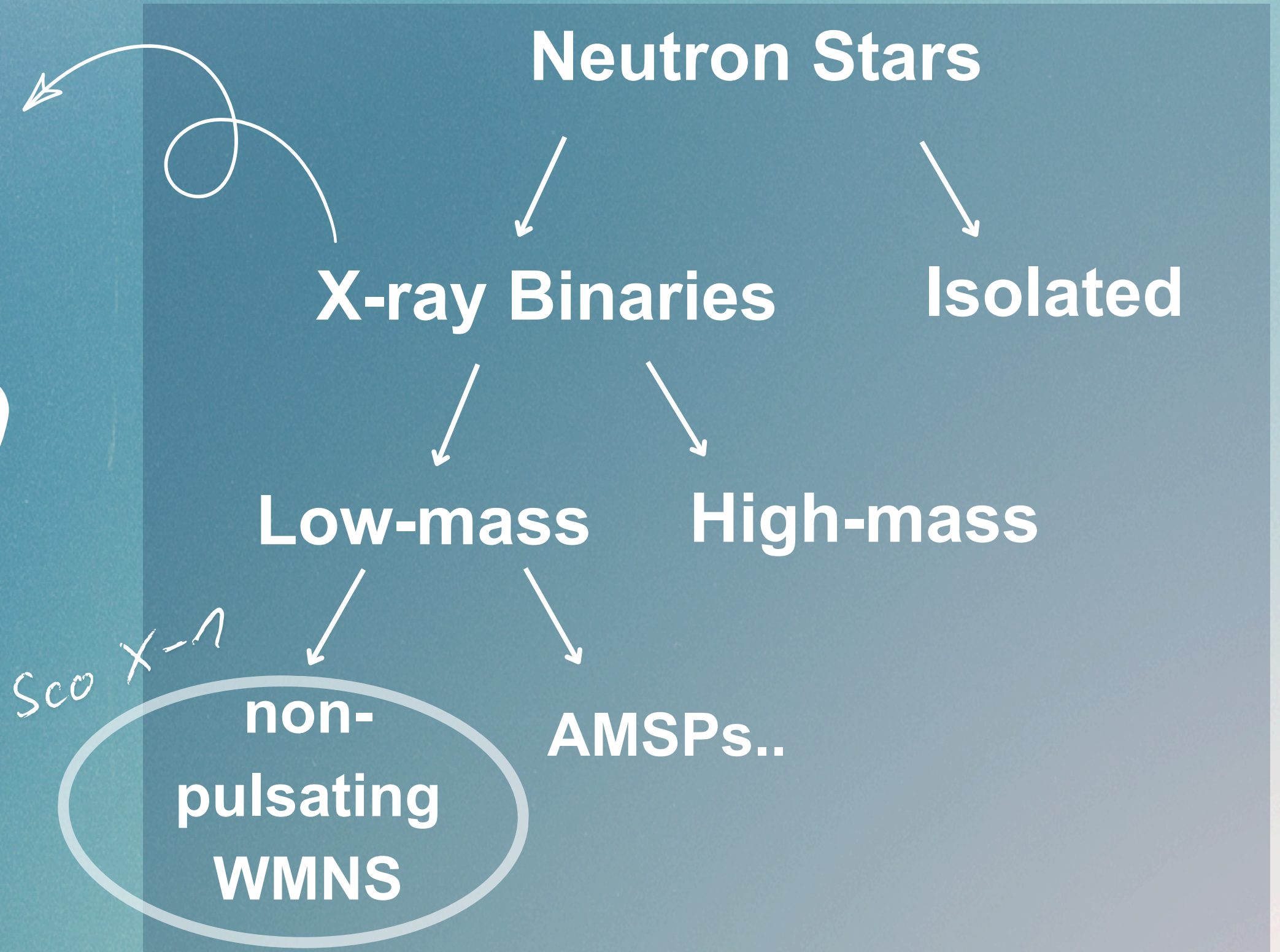
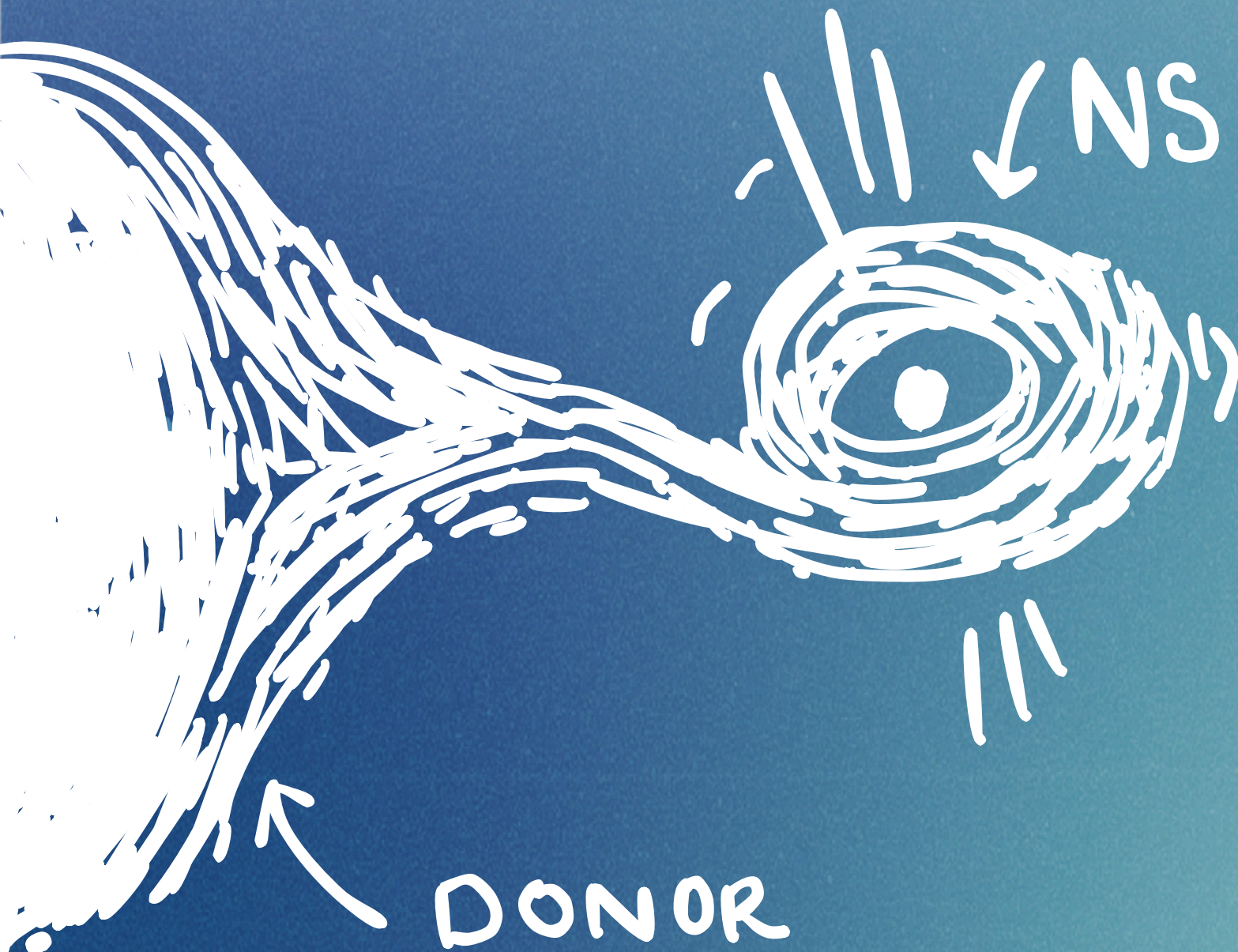
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Andrei Berdyugin, Anagha Nitindala,
Juri Poutanen

NOT

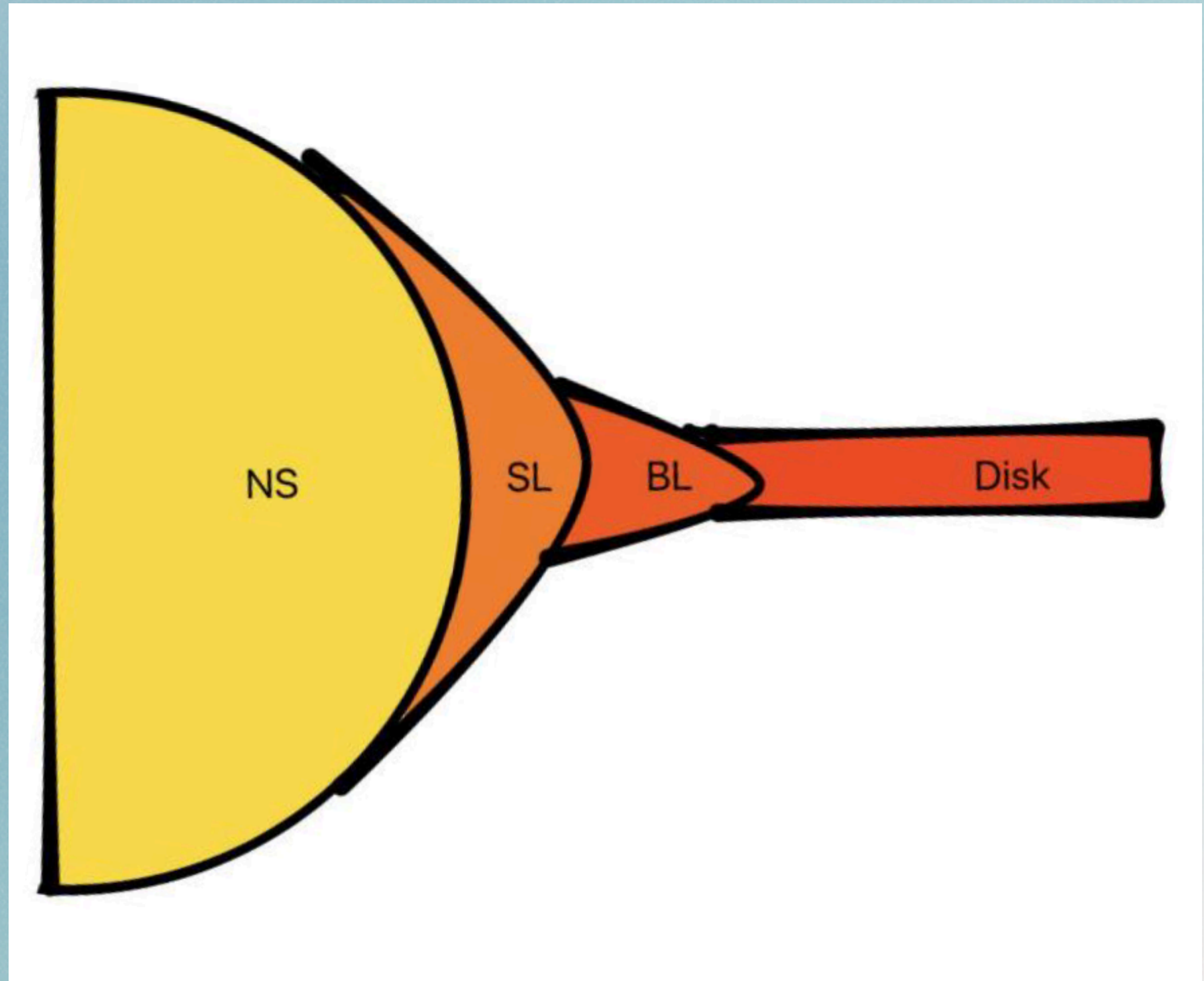
The Nordic Optical Telescope

NEUTRON STARS 101



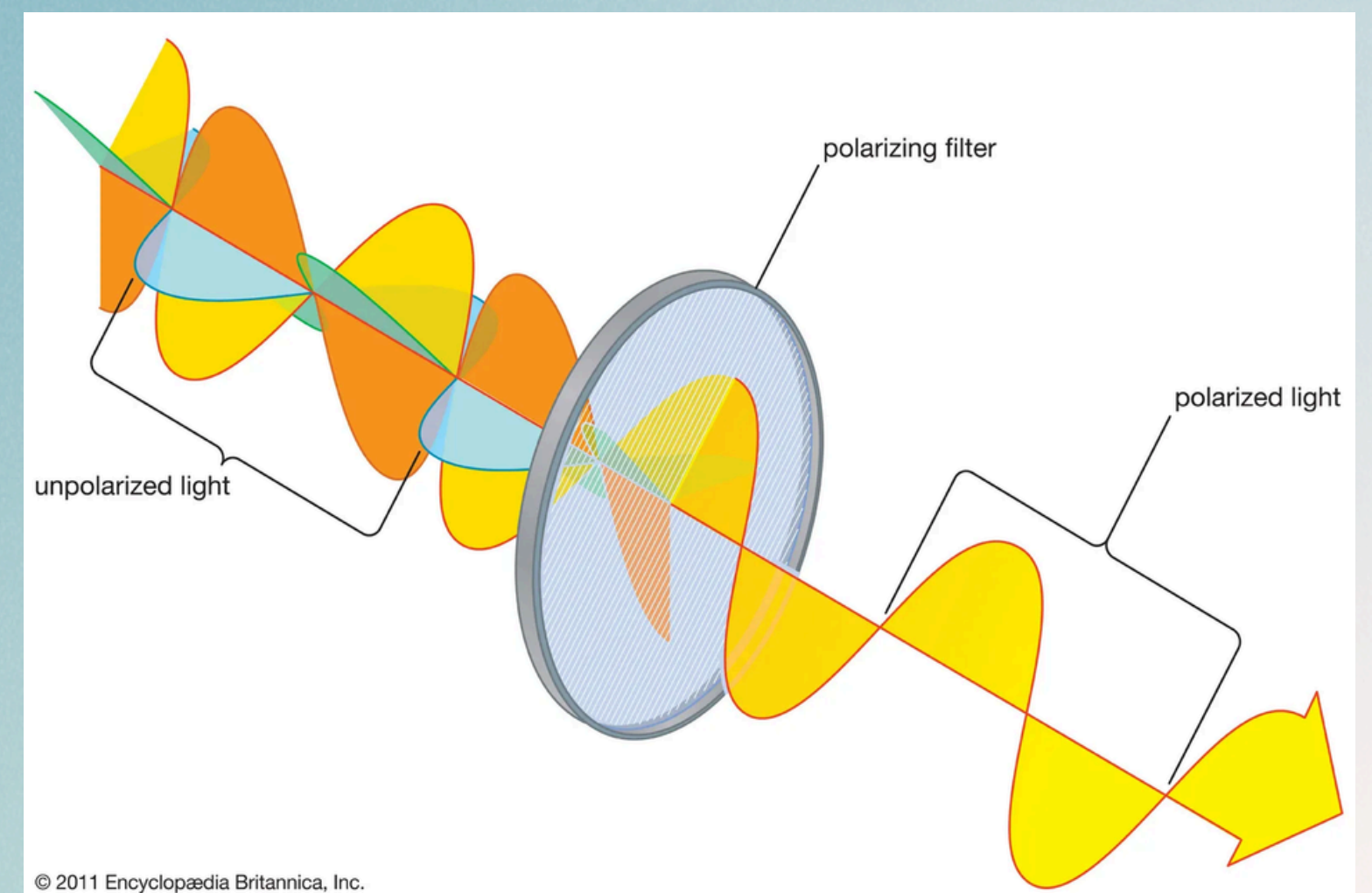
NEUTRON STARS 101

- **WMNS** are complex systems!



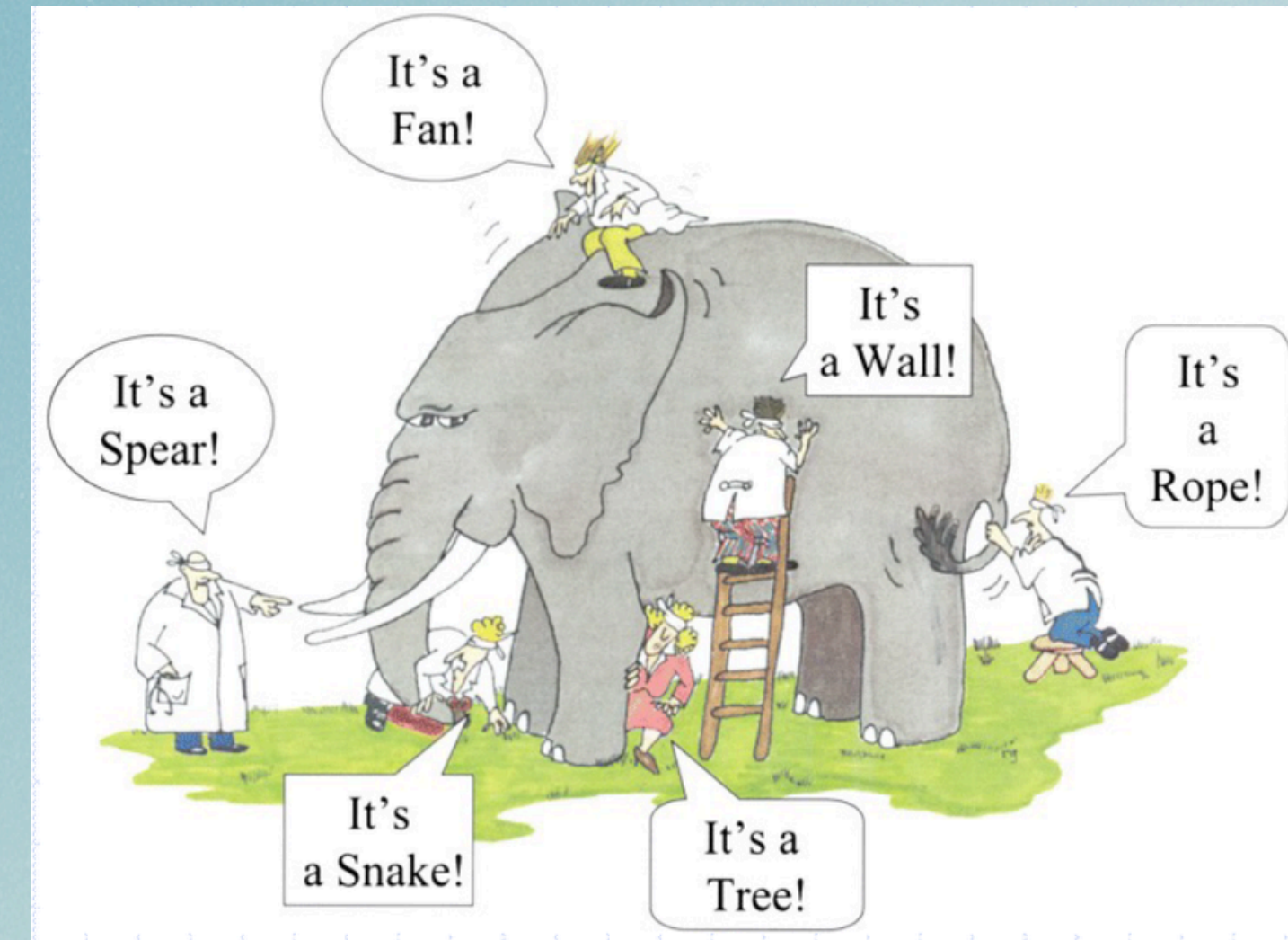
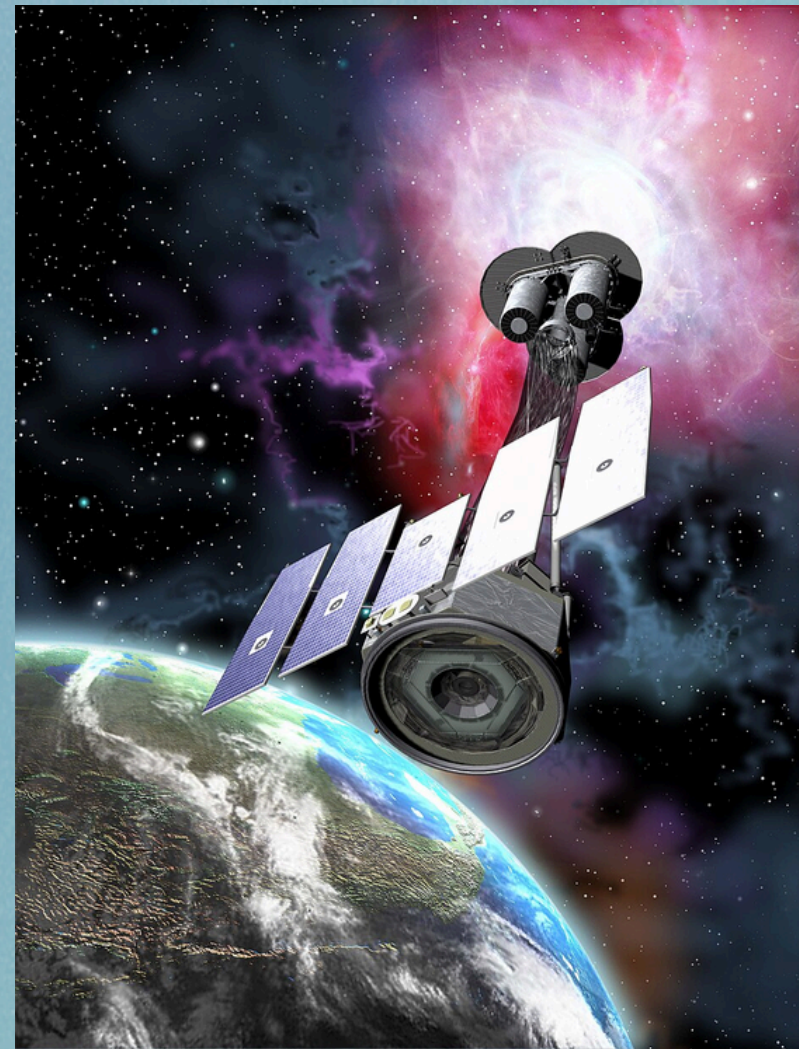
POLARIMETRY 101

- Polarization state: light's preferred direction of oscillation
- Two observables:
 - Polarization degree (PD) and polarization angle (PA)
- Useful to probe geometry



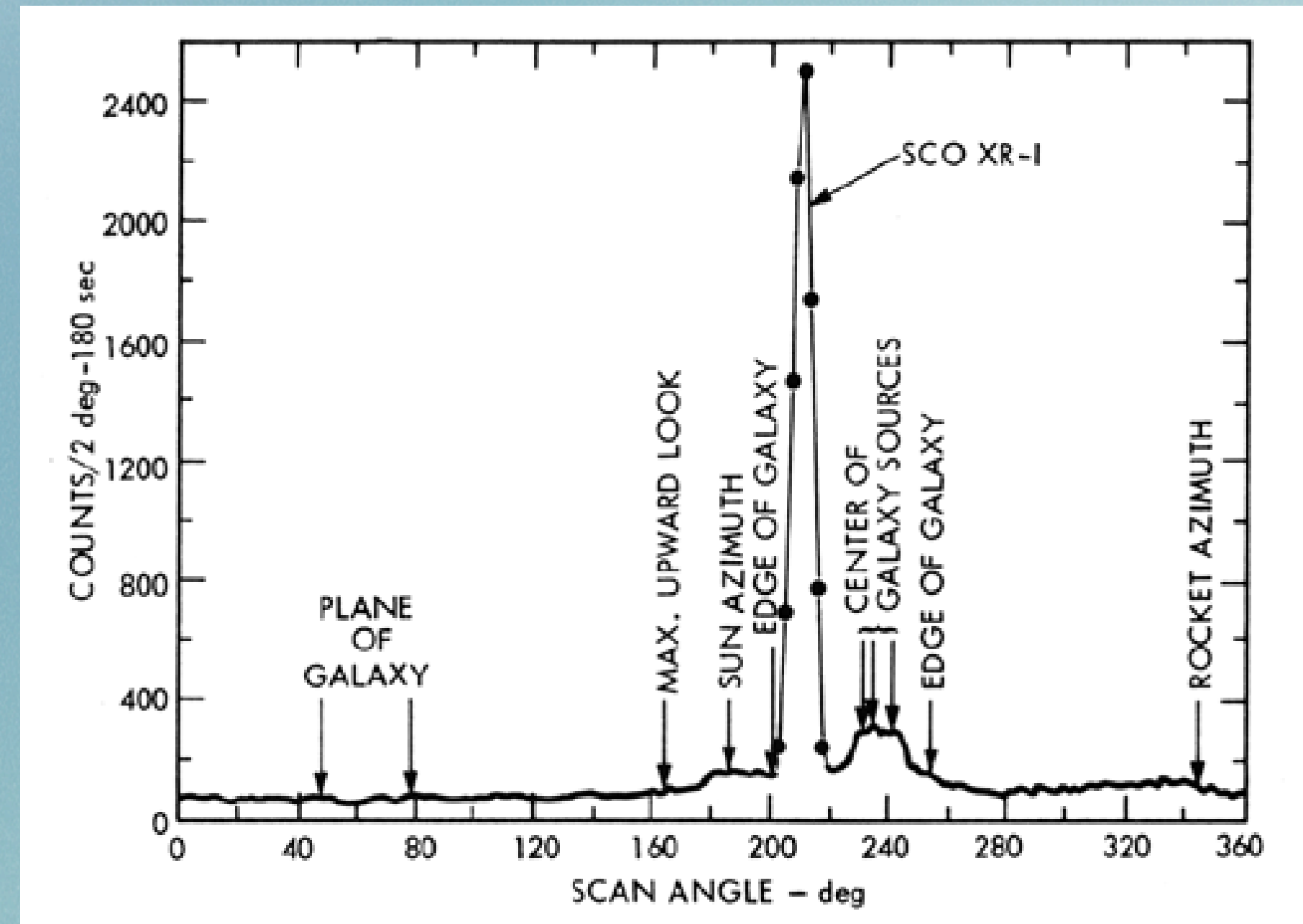
POLARIMETRY 101

- Different wavelengths probe different things!
- Optical: orbital scale, outer accretion disk
- X-rays: Inner regions



SCO X-1

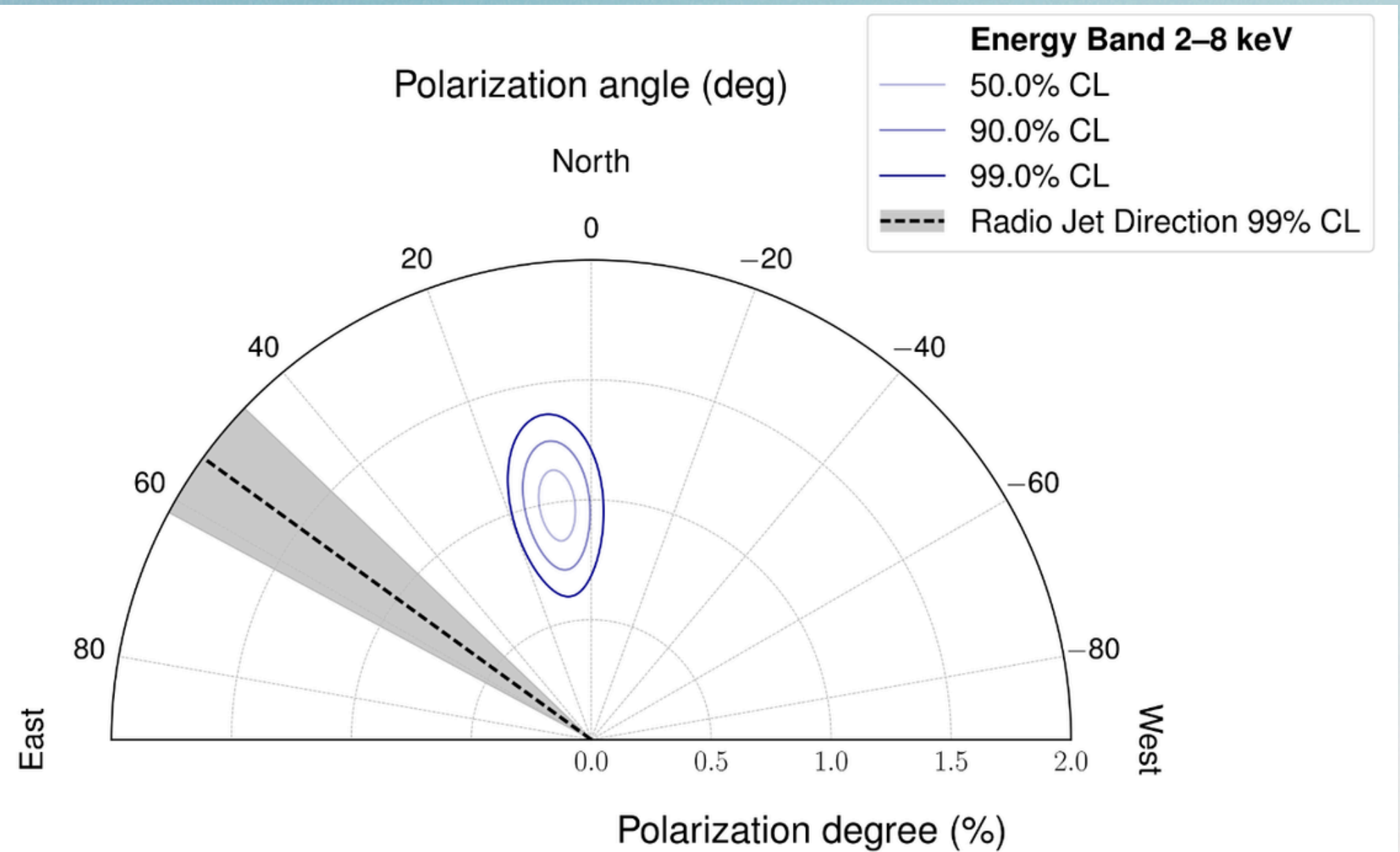
- 1st extra-solar X-ray source!
- 1st radio detection of an XRB
- Odd behaviour across wavelengths



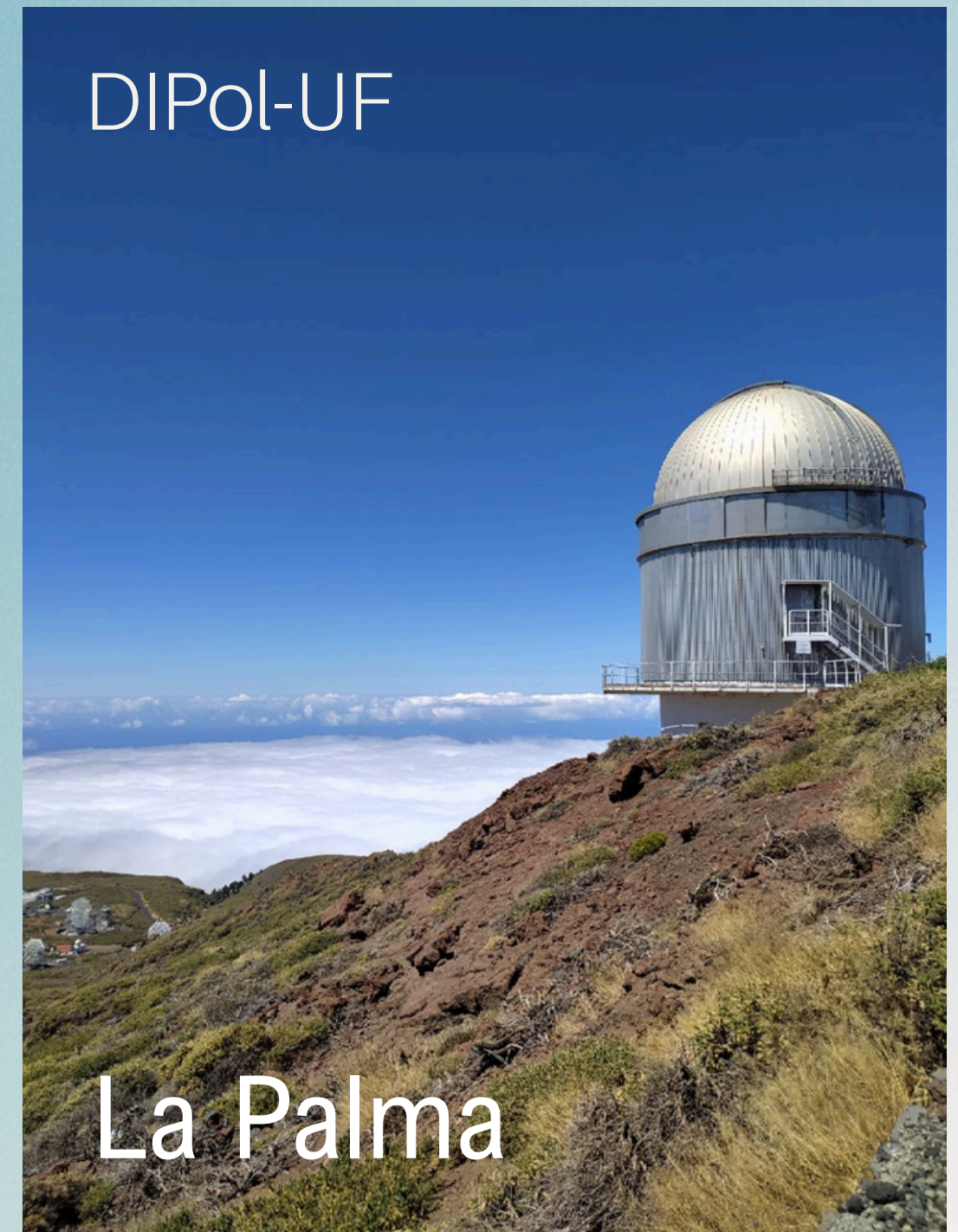
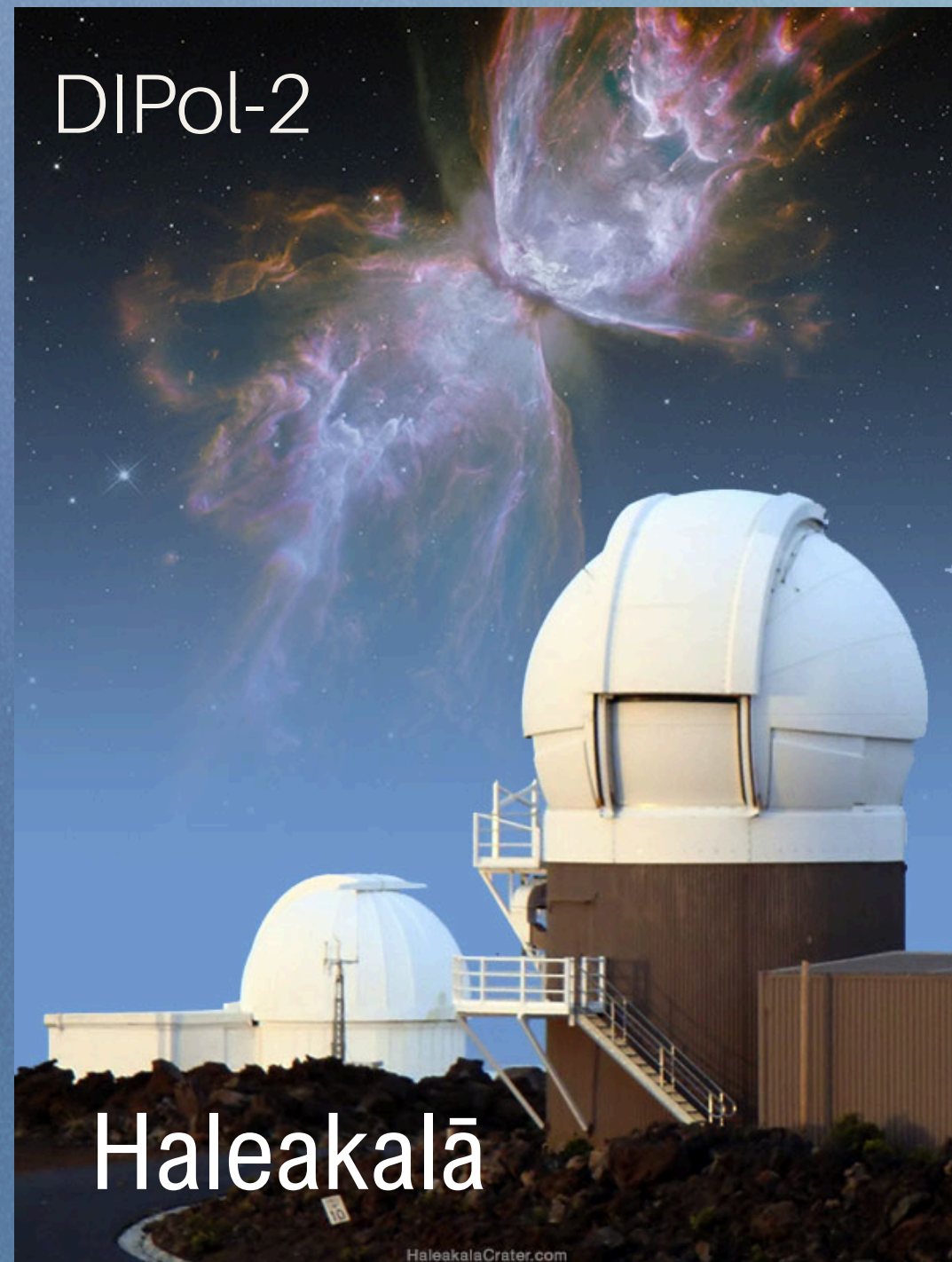
Hill et al. (1968)

SCO X-1

- Angle of radio jet is **offset** $\sim 46^\circ$ with X-ray PA
- Why?
 - Precession?
 - Geometry changes w/ spectral state?

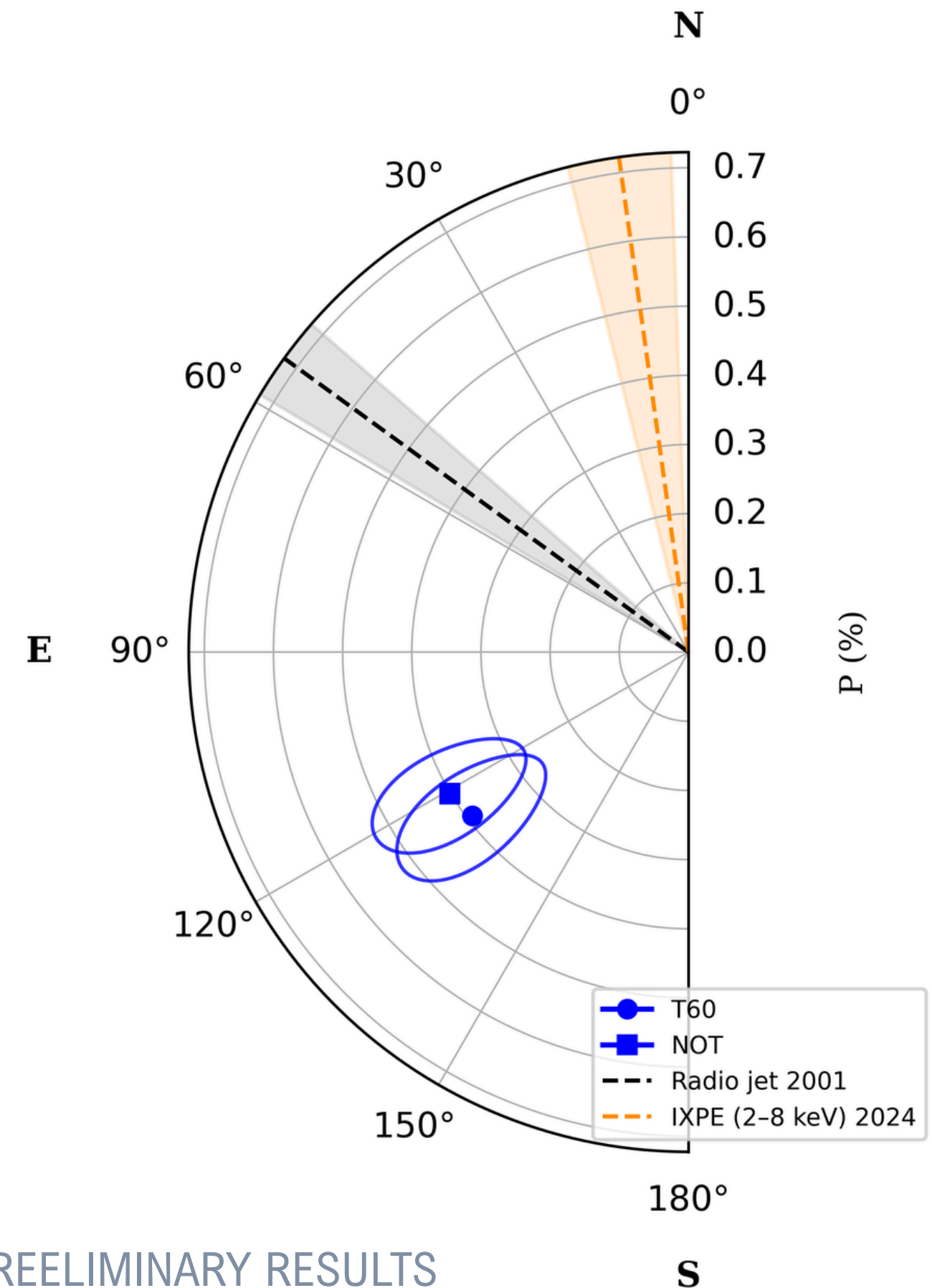


OPTICAL CAMPAIGN



RESULTS

- **Optical PA is offset from both radio jet and X-ray PAs**
- Maybe perpendicular to X-ray PA?
- Next steps:
 - Improve estimation of ISM
 - Compare to 2025 X-ray + radio campaign



PREELIMINARY RESULTS

CONCLUSIONS

- Sco X-1 is a LMXB w/ an X-ray PA offset from its radio jet
- **We studied its optical polarimetry: optical PA is offset from both angles!**
- Next steps: compare with new multiwavelength measurements, improve measurements
- Implications for system's geometry + spectral behaviour!



Thank you for listening!



**I'M CURRENTLY LOOKING
FOR A POSTDOC**

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SCO X-1

