Annual Meeting 2026

Strong Gravitational Effects on the Fe Kα line in AGN

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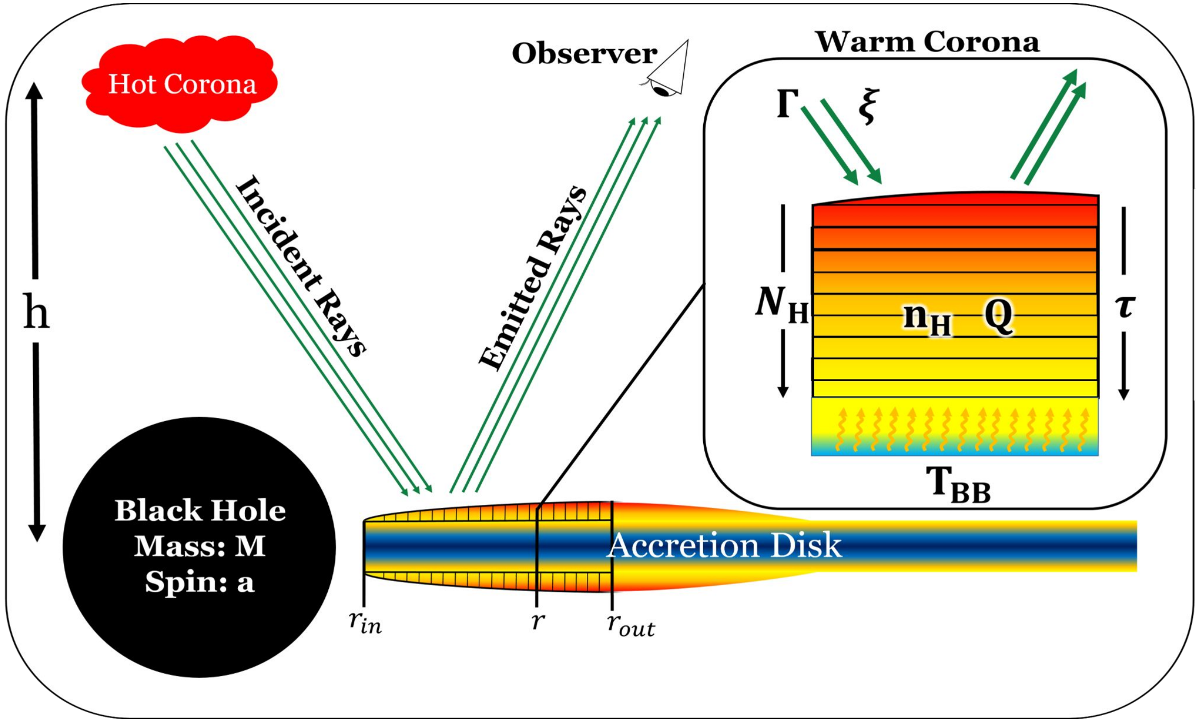
Wednesday, February 4th, 2026

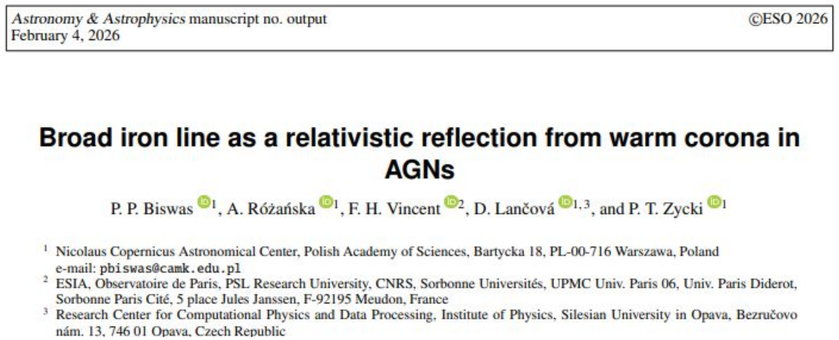
Inner Region of the Accretion Disk in AGN (Project 1)

- AGNs, one of the most luminous sources throughout the electromagnetic spectrum.
- Central Engine of Galaxies with a supermassive black hole at the center and a surrounding accretion disk with a distant torus.
- Inner region majorly responsible for emitting in X-rays.
- A warm comptonized structure called the warm corona is theorised to be on top of the inner region of the accretion disk.



Inner Region of the Accretion Disk in AGN (Project 1)

- We computed the inner region of the disk vertically (using our photoionization code TITAN) and horizontally (using the publicly available ray-tracing code GYOTO).
- This allowed us to add the relativistic effects from the inner region emission of the accretion disk.
- We showed the contributions from the Fe Kα with the variation in the disk parameters like: spin, viewing angle, dissipative factor, illumination from the lamp.
- We also showed the individual contributions of the line emissions.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Broad iron line as a relativistic reflection from warm corona in AGNs

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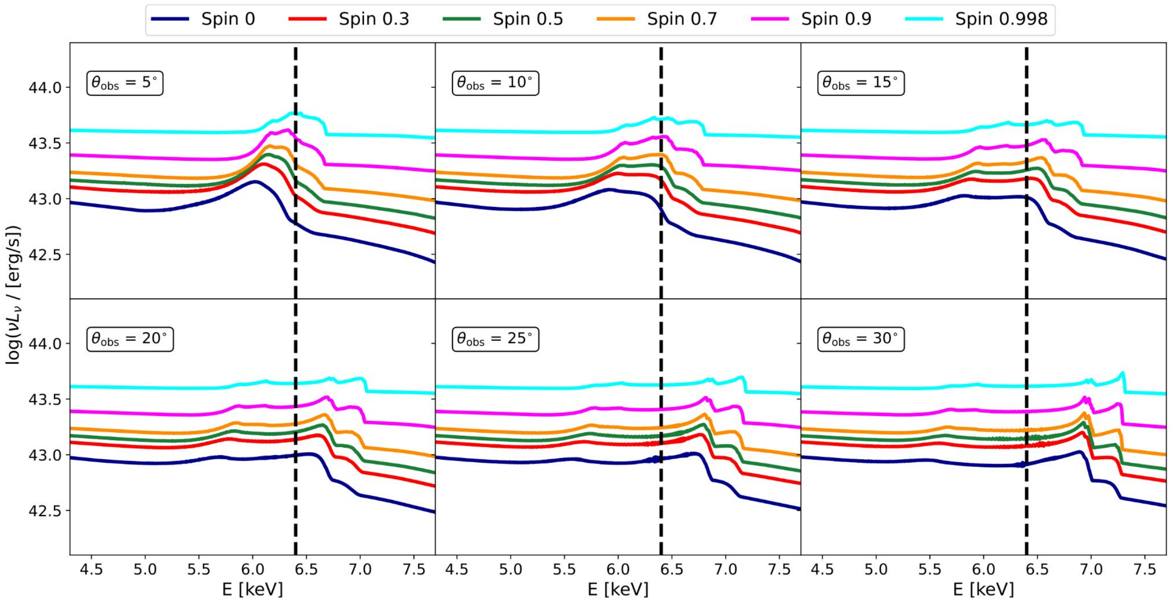

The edge of Warm Corona (Project 2)

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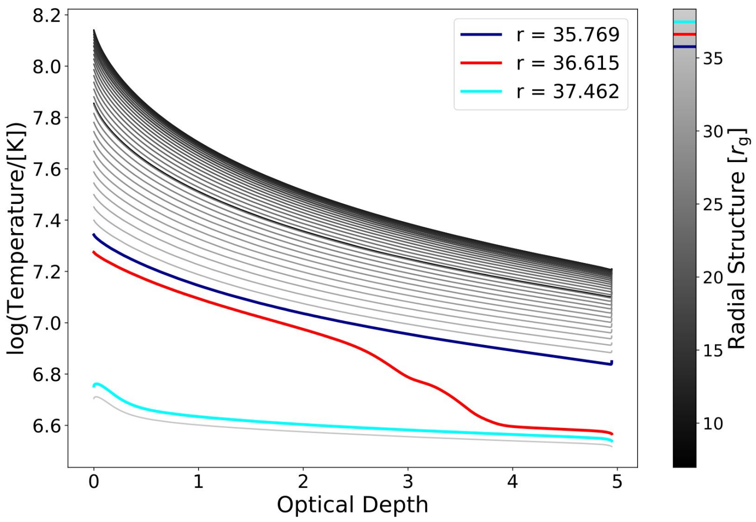
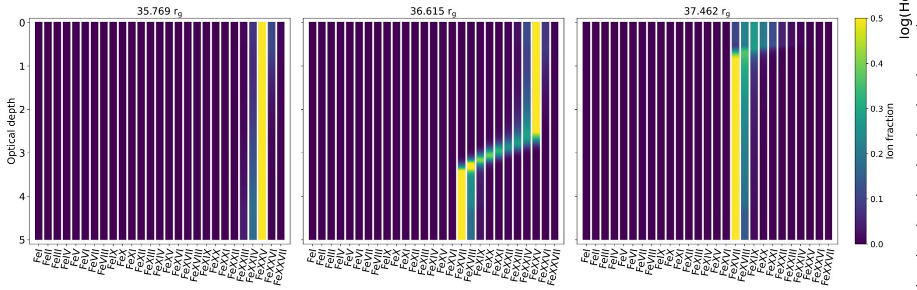
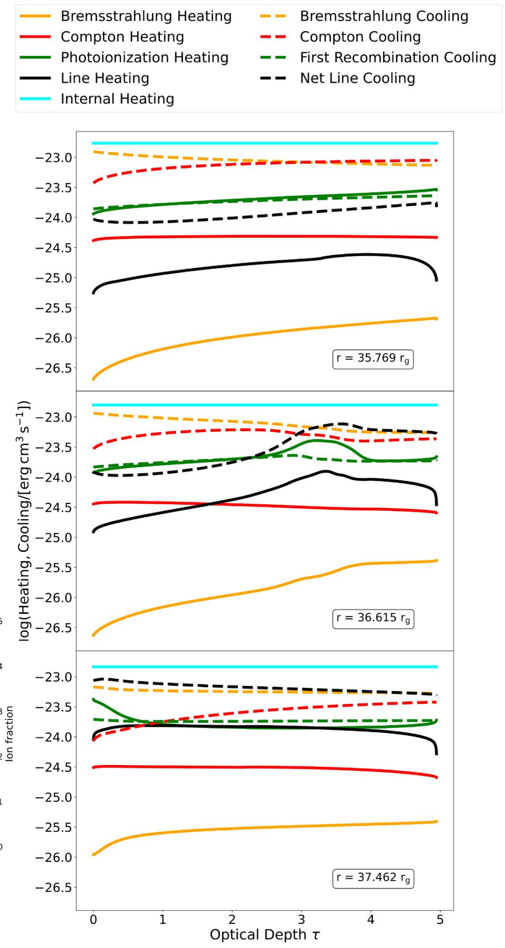
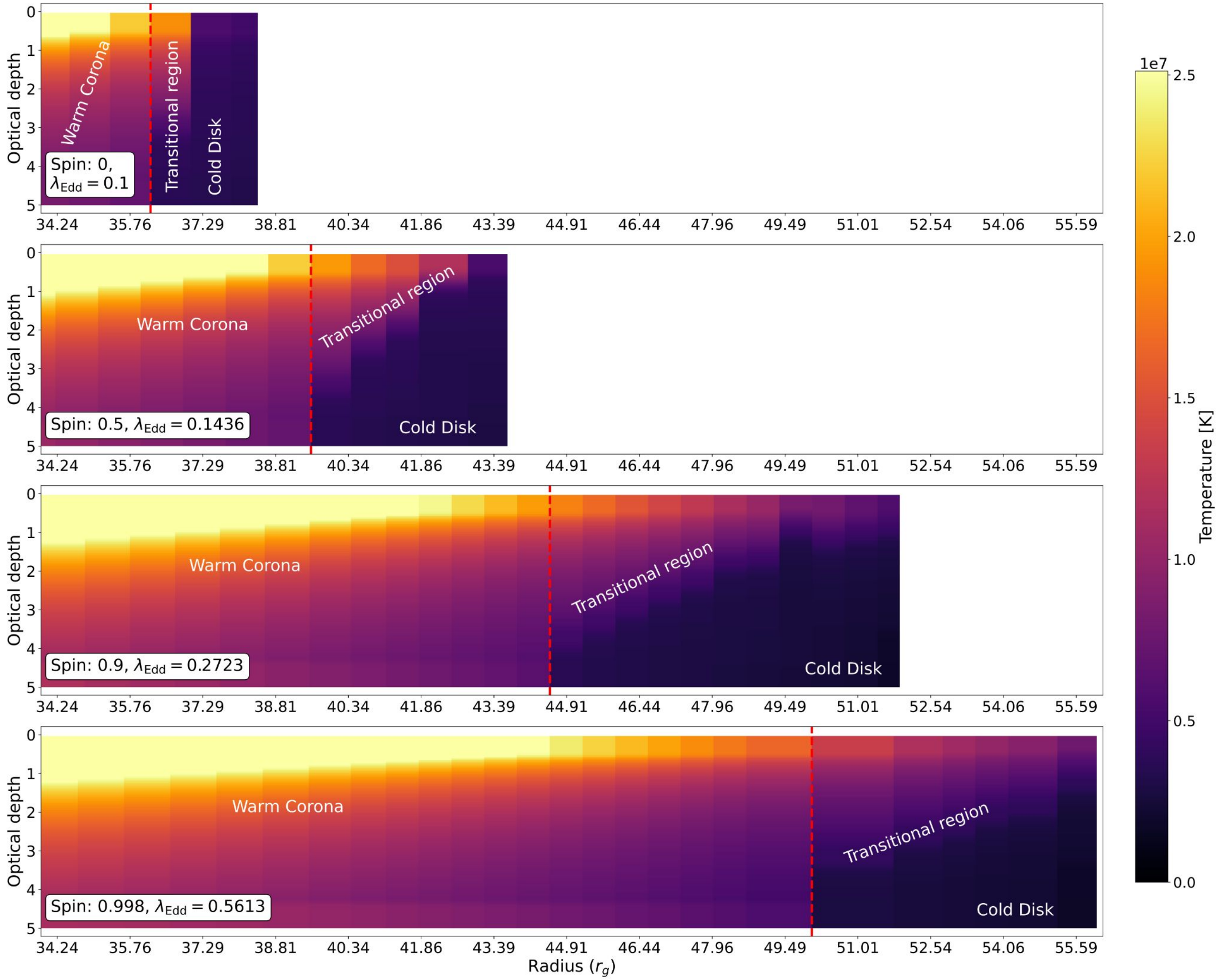
- We also realised during our first project that there is a jump in the temperature structure.
- This jump was due to the dominance of a physical process called the net line cooling.
- This net line cooling occurs due to the recombination mechanism of the iron ions.
- After this recombination the disk gets cool and starts emitting neutral iron emission at around 6.4 keV which is the definition of a cold accretion disk.
- Hence thai region depicts the transition from the warm corona to the cold accretion disk.







The edge of Warm Corona (Project 2)



Papers, Courses, and Conferences

Accepted Paper:
Broad iron line as a relativistic reflection from warm corona in AGNs
Collaborators: Agata Różańska, Frederic Vincent, Debora Lancová, Piotr Zycki
(https://arxiv.org/abs/2511.03575, A&A)

Course:
Interdisciplinary Lecture: All you want to know about climate change and its impact from the ocean perspective

Conferences/Workshops:
- EAS 2025, Cork, Ireland (Poster with Flash talk)
- Summer School in Alps, Gerlosberg, Austria (Oral Presentation)
- PTA 2025, Warsaw, Poland (Poster Presentation)
- RAGTIME 27, Opava, Czech Republic (Oral Presentation)