# Homework 4

## Instructions

Based on the papers you have been reading so far, complete the following:

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Paper Titles
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- **Select two** paper titles you find **effective** and **two** that you think are **weak**.
- For each, write **1–2 sentences** explaining why you like or dislike the title.
- For the two weaker titles, suggest how **you** would have rewritten them to be more effective or engaging.

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Introductions
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- Choose at least **one strong** and **one weak** introduction from the papers you've read.
- In a few sentences each, explain what works well in the strong example, and what you found lacking in the weaker one.
- For the weaker introduction, describe how you would improve it. You're welcome to quote or refer to specific parts of the paper to support your points.

Please compile everything into a **single PDF** and submit it by the deadline.

## Titles

1. https://arxiv.org/abs/2503.00373

"Their currents turn awry, and lose the name of action. I: Fundamental limits to orbit reconstruction due to non-conservation of stellar actions"

This is from Shakespeare's play Hamlet, but no comments because I dont really read Shakespeare's literature.

2. https://arxiv.org/abs/2505.21042

"What exactly did the Transformer learn from our physics data?"

Transformer + physics data, good. I also really want to know what exactly did the Transformer learn from our physics data?

3. https://arxiv.org/abs/2505.20968

"A numerical approach for modelling the polarisation signals of strong resonance lines with partial frequency redistribution. Numerical applications to two-term atoms and plane-parallel atmospheres"

Boring. I will reject this paper if i am the editor. Try using "Numerical modelling of polarised resonance lines with partial frequency redistribution".

4. https://arxiv.org/abs/2505.19844

"Magnetic fields in the massive star-forming region NGC 6334 and their relationship with the properties of dust filaments probed by [CII] and PAH emissions"

Try this: "Magnetic fields in NGC 6334: Relationship with dust filaments probed by [CII] and PAH emission"

5. https://arxiv.org/abs/2505.19832

"Reconciling extragalactic star formation efficiencies with theory: insights from PHANGS"

Extragalactic SFE + PHANGS, very clear and I am happy to read.

## Introductions

1. Week: https://arxiv.org/abs/2505.21042

"What exactly did the Transformer learn from our physics data?"

The title catch my eye, but unfortunately the introduction is quite week.

First is that I dont see any novelty or at least statement of novelty. They have things like “In this paper we show two applications…”. However, they do not say why these applications are novel compared with prior interpretation work in high-energy physics. Also they do not mention any particular reasons why they choose these data to do their experiment.

Also, citations [4–8] are listed as proof that Transformers have “replaced earlier approaches,” yet the introduction provides no sentence on what those studies found, and how this paper relates to previous studies.

2. Strong: https://arxiv.org/abs/2505.16858

"Non-Parametric Attenuation Curves in Local Star-Forming Galaxies: Geometry Effect, Dust Evolution, and ISS"

Very clear from big picture to current gap. They start with why dust matters to galaxy physics. Then they briefly desribe previous approaches to derive attenuation curves and point out the limitations. And finally they propose a new method in this study. This is a classical roadmap of a good introduction.