

Self-Reflection

1. Professional Impact & Ambition:

The lesson highlighted how AI is changing jobs and enabling professionals to achieve more.

- What *specific* change (big or small) do you realistically foresee AI bringing to your *job role* or *professional workflow* in the next 1-2 years?
- What's one 'previously impossible' or significantly challenging *professional task or career goal* that you imagine being able to tackle if you were 'fully supercharged' with AI?

Answer:

AI will increasingly assist in analysing large datasets from current astronomical surveys, such as deep field imaging or large-scale spectroscopic surveys. Traditionally, this involves manual data cleaning, writing SQL queries, applying strict selection cuts, and visually inspecting data subsets using tools like TOPCAT or Aladin. AI-powered clustering, anomaly detection, and dimensionality reduction will allow much faster identification of rare objects. This includes high-redshift galaxies or strong gravitational lenses. This will free a significant amount of time for purely scientific analysis.

Building adaptive, real-time observational feedback systems for ongoing surveys or telescope observations. For example, using AI models to flag transient or highly unusual astrophysical events during observations. For example, microlensing events or unexpected gravitational lensing. This will allow dynamic reallocation of telescope time that currently depends on slower post-observation data processing cycles.

2. Your Core Professional Strengths & AI:

We discussed three core strengths: Domain Experience, Tech Leverage, and Future-Proofing Skills (problem-solving, adaptability, curiosity).

Domain Experience: Identify one key aspect of your unique knowledge or experience in your professional field. How could AI *amplify* this specific strength, rather than replace it? (e.g., "My deep understanding of regulatory requirements could be combined with AI tools to quickly scan proposed policies for potential conflicts.")

Answer:

My knowledge of astrophysical simulations—such as modeling galaxy cluster formation or simulating star formation processes—could be amplified through AI surrogate models. These models would approximate complex, computationally intensive simulations, enabling rapid exploration of parameter spaces that would otherwise take days or weeks of computing time.

Tech Leverage: Where is the biggest opportunity in your *current work* to use AI for automation or scaling, freeing you up for more strategic tasks? Be specific about the task or process.

Answer:

AI can automate parts of spectroscopic data reduction pipelines, including emission/absorption line detection, and initial redshift estimation. This would allow me to shift focus towards interpreting physical properties, such as supernova decay rates instead of repetitive preprocessing.

Future-Proofing: Which of the future-proofing skills (problem-solving, adaptability, curiosity) do you feel is your strongest *in your professional context*? Which one could you most benefit from developing further to enhance your career resilience in the age of AI?

Answer:

My strongest skill is curiosity, a deep drive to understand the unknown, which originally drew me to astrophysics. The vast unanswered questions in areas like

dark matter, galaxy formation, and cosmic inflation fuel my motivation to explore new methods and ideas. I would benefit most from developing adaptability: continually learning how to integrate emerging AI techniques for multi-parameter data integration or active learning frameworks for scarce labelled data. I feel that once I am adeptly adaptable, my problem-solving skills should also improve in tandem, as efficiency will free up more time for critical thinking.

3. Your Work Environment & AI Action:

The approach to AI adoption can differ based on your organisation's size and structure.

(If in a Large Org): What's *one tangible step* you could take this month to engage with AI initiatives within your company? (e.g., Ask about ongoing projects, identify a repetitive task suitable for automation exploration, suggest an AI discussion in a team meeting, research your company's approved AI tools).

(If in a Startup/Small Org/Consultancy): What's *one specific AI tool or experiment* you could realistically explore or introduce to your team soon to test its potential benefits for your business goals? (e.g., Trying an AI writing assistant for proposals, using an AI data analysis tool on a small dataset, experimenting with an AI image generator for marketing materials).

Answer:

If choosing only one tool, it would have to be custom GPTs. Students (at university) already commonly use LLMs such as chatGPT for assistance in their work or revision, no matter what field of study. Utilising custom GPTS improves efficiency based on the individuals needs.

4. Professional Connecting & Growth:

The lesson highlighted the importance of connecting with the broader AI ecosystem for professional development.

What is *one* action you could take to connect with others learning about or using AI in your professional field or industry? (e.g., Search for relevant LinkedIn groups,

find industry-specific AI webinars, join an online community/forum, identify one relevant professional event to follow, reach out to a contact using AI).

Answer:

Locate and join a online community focused on AI in astrophysics, and attend an upcoming AI-for-science workshop or seminar series. Also, I could start an AI tools & skills society at my university, so that I can share ideas and improve my own skills.

5. Leading with AI in Your Role:

The ultimate goal isn't just to adapt but to *lead* within your professional capacity.

In your specific role and organisational context, what does "leading with AI" look like *for you*? It might not mean being a tech expert, but perhaps shaping strategy, guiding your team's adoption, or becoming the go-to person for AI applications relevant to your department's function. Briefly describe this vision.

Answer:

Take AI initiative in my student research group. Who actively tests and integrates new AI models into research workflows: such as using deep learning for classification of galaxies or unsupervised methods for anomaly detection in survey data. My leadership would focus on evaluating model reliability, guiding tool adoption, and helping others apply AI effectively to specific scientific questions.