

IMPRS-HD summer school, 8.-12.9. 2025

AI for Astronomy

Programme (preliminary)

Monday, 8.9.2025

Time	Lecturer(s)	Topic
8:00 - 12:30	LOC	Registration
9:00 - 9:30	SOC & LOC	Welcome & Logistics
9:30 - 10:45	Matthew Ho	<i>Simulation-Based Inference: Theory, Applications, and Limitations</i>
10:45 - 11:15	-	Coffee Break
11:15 - 12:30	Primer on best software practices	TBD / SSC
12:30 - 14:00	-	Lunch Break
14:00 - 15:30	François Lanusse	<i>Differential programming and its applications to ML in Astrophysics</i>
15:30 - 16:00	-	Coffee Break
16:00 - 17:30	Matthew Ho	Exercise

Tuesday, 9.9.2025

Time	Lecturer(s)	Topic
9:00 - 10:15	Ioana Ciuca	<i>Advancing Astronomy in the Era of Artificial Intelligence</i>
10:15 - 10:45	-	Coffee Break

10:45 - 12:00	François Lanusse	Exercise
12:00 - 12:30	Local speaker	Science talk
12:30 - 14:00	-	Lunch Break
14:00 - 16:00	Aleksandra Ciprijanovic	<i>Domain shift problem and model robustness</i>
16:30 - 21:00	-	Tour & BBQ @ MPIA

Wednesday, 10.9.2025

Time	Lecturer(s)	Topic
9:00 - 10:15	Carolina Cuesta-Lazaro	<i>Generative models for Astrophysics</i>
10:15 - 10:45	-	Coffee Break
10:45 - 12:00	Ioana Ciuca	Exercise
12:00 - 12:30	Local speaker	Science talk
12:30 - 14:00	-	Lunch Break
		Free Afternoon or exercises

Thursday, 11.9.2025

Time	Lecturer(s)	Topic
9:00 - 10:15	Matthew Ho	<i>Simulation-Based Inference: Theory, Applications, and Limitations</i>
10:15 - 10:45	-	Coffee Break
10:45 - 12:00	Aleksandra Ciprijanovic	Exercise
12:00 - 12:30	Local speaker	Science talk
12:30 - 14:00	-	Lunch Break
14:00 - 15:30	François Lanusse	<i>Differential programming and its applications to ML in Astrophysics</i>
15:30 - 16:00	-	Coffee Break

16:00 - 17:00	Carolina Cuesta-Lazaro	Exercise
19:00	-	Pub evening

Friday, 12.09.2025

Time	Lecturer(s)	Topic
9:00 - 10:15	Ioana Ciuca	<i>Advancing Astronomy in the Era of Artificial Intelligence</i>
10:15 - 10:45	-	Coffee Break
10:45 - 12:00	Aleksandra Ciprijanovic	<i>Domain shift problem and model robustness</i>
12:00 - 12:30	Local speaker	Science talk
12:30 - 14:00	-	Lunch Break
14:00 - 15:30	Carolina Cuesta-Lazaro	<i>Generative models for Astrophysics</i>
15:30 - 16:15	local speaker	TBD
16:15 - 16:30	SOC	Closing Remarks

Lecturers and lecture titles:

- **Aleksandra Ciprijanovic:** *Domain shift problem and model robustness*
- **Ioana Ciuca:** *Advancing Astronomy in the Era of Artificial Intelligence*
- **Carolina Cuesta-Lazaro:** *Generative models for Astrophysics*
- **Matthew Ho:** *Simulation-Based Inference: Theory, Applications, and Limitations*
- **François Lanusse:** *Differential programming and its applications to ML in Astrophysics*