

19th Heidelberg Astronomy Summer School, Sep. 2 – 6, 2024

New Opportunities to Test Cosmology

Invited Lecturers:

Camille Bonvin (Geneva University)

Shirley Ho (Flatiron Institute, New York)

Benjamin Joachimi (U. College London)

Alessandra Silvestri (Leiden University)

SOC: Hans-Walter Rix (MPIA), Björn-Malte Schäfer (ARI), Luca Amendola (ITP)

Science Talk Speakers:

TBD

School program (preliminary):

Monday, September 2

Time	Lecturer	Topic
08:30 – 09:30		Registration & Welcome
09:30 – 10:00		Introctions LOC
10:00 – 11:00		Code Installations
11:00 – 12:30	Alessandra Silvestri	Cosmological Foundations - I <ul style="list-style-type: none">- “standard” LCDM- Beyond the standard model- Late-epoch signatures of inflation
12:30 – 14:00	–	Lunch break
14:00 – 15:30	Alessandra Silvestri	Cosmological Foundations - II <ul style="list-style-type: none">- cosmological tensions- Late-epoch signatures of inflation
15:30 – 16:00	–	Coffee break
16:00 – 17:30		Hands-on activities

Tuesday, September 3

Time	Lecturer	Topic
09:00-10:30	Benjamin Joachimi	Gravitational Lensing Cosmology - I <ul style="list-style-type: none">- Gravitational lensing theory- Single-object strong and weak lensing & cosmological applications
10:30 – 11:00	–	Coffee break
11:00 – 12:30	Benjamin Joachimi	Gravitational Lensing Cosmology - II <ul style="list-style-type: none">- Cosmic shear theory & methods- Cosmological constraints from lensing
12:30 - 14:00	–	Lunch
14:00 – 15:00		Hands-on activity / focused science talks
15:00 – 21:00	--	Tour of MPIA and BBQ (transport organized)

Wednesday, September 4

Time	Lecturer	Topic
09:00-10:30	Camille Bonnin	Large-Scale Structure - I <ul style="list-style-type: none">- Principles of LSS mapping with galaxy redshifts- What have we learned from existing surveys?
10:30 – 11:00	-	Coffee break
11:00 – 12:30	Camille Bonnin	Large-Scale Structure - II <ul style="list-style-type: none">- Correlating galaxy LSS with other tracers- What can next-generation galaxy surveys teach us?
12:30 - 14:00	-	Lunch
14:00 – 15:00		Hands-on activity
15:00 – 15:30	-	Coffee break
15:30 – 16:30		focused science talks
16:30 – 17:30		Hands-on activity

Thursday, September 5

Time	Lecturer	Topic
09:00 – 10:30	Shirley Ho	Machine Learning and Inference - I <ul style="list-style-type: none">- Forward modelling- Likelihood-free inference
10:30 – 11:00	–	Coffee break
11:00 – 12:30	Shirley Ho	Machine Learning and Inference - II <ul style="list-style-type: none">- “Fitting” simulations to data
12:30 – 14:00	--	Lunch
14:00 – 15:00		focused science talks
15:00 – 15:30	--	Coffee break
15:30 – 16:30		Hands-on activity
16:30 – 17:30		Hands-on activity
19:00		Pub evening

Friday, September 6

Time	Lecturer	Topic
09:00-10:30	Luca Amendola (TBC)	Attractive theories beyond the standard framework
10:30 – 11:00	-	Coffee break
11:00 – 12:30	TBD	Outlook: future projects and missions
12:30 - 14:00	-	Lunch
14:00 – 15:00		Hands-on activity / focused science talks
15:00 – 15:30		Conclusions / farewell

For the daily **lunch menu** at university check:
https://www.studierendenwerk.uni-heidelberg.de/en/speiseplan_neu