Friday · 6 September

9:00	**Outlook on the day**
9:30	*Plenary Lecture* B.-M. Schäfer (Heidelberg) **Lensing of the cosmic microwave background**
10:00	
10:30	
11:00	**Coffee break**
11:30	*Plenary Lecture* M. Hendry (Glasgow) **Einstein's masterpiece: 100 years of testing General Relativity, from Eddington to LIGO and beyond**
12:00	
12:30	
13:00	**Lunch break**
13:30	
14:00	
14:30	*Plenary Lecture* N. Wex (Bonn) **Propagation of pulsar signals in curved spacetime and its applications**
15:00	
15:30	
16:00	**Coffee break**
16:30	*Group Tutorials* **The optical gravitational lens experiment**
17:00	
17:30	
18:00	**Summary of the day**
18:30	
19:00	**Social dinner** at "Fuchsturm"
19:30	
20:00	
20:30	
21:00	

Saturday · 7 September

9:00	**Outlook on the day**
9:30	*Plenary Tutorial* M. Hendry (Glasgow) **Making (and lensing) waves in the classroom: Introducing the physics and astrophysics of gravitational waveforms using high-school concepts**
10:00	
10:30	
11:00	**Coffee break**
11:30	*Plenary Lecture* V. Perlick (Bremen) **Gravitational lensing by black holes: Multiple imaging and shadow**
12:00	
12:30	
13:00	**Lunch break**
13:30	
14:00	
14:30	*Plenary Discussion* **Teaching of gravitational lensing to high-school students**
15:00	
15:30	
16:00	**Coffee break**
16:30	**Summary of the day**
17:00	**Closing ceremony**
17:30	
18:00	
18:30	
19:00	
19:30	
20:00	
20:30	
21:00	

IAU 100 Jahre: Unter Einem Himmel

Universität Heidelberg

Haus der Astronomie Heidelberg

Università degli Studi di Padova

Osservatorio Astronomico di Padova

Universität Jena

Università degli Studi di Firenze

INAF - Arcetri

Osservatorio di Arcetri

The Heraeus Summer School at the Friedrich Schiller University, Jena, is the seventh edition of the bi-national, Itlaian-German teacher training seminar "Astronomy from 4 Perspectives" (Heidelberg, Padova, Jena, Florence). The long-term scope of the seminar series is to create and maintain a network connecting teachers to each other and to their university teachers, and to develop teaching material about topical subjects of current research in astronomy for use in secondary schools. 2019 is the centenary year of the celebrated eclipse expeditions which confirmed Einstein's General Relativity. During the last sixty years the deflection of light by gravitational fields, now called "gravitational lensing", has become a powerful tool of astrophysics and cosmology.

Venue
Friedrich-Schiller University · Jena
Lecture Hall at Max-Wien-Platz 1

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Cover Photo: **Uwe Alberti**
Picture of the main building of the Jena Faculty of Physics and Astronomy taken through a lens that simulates the Plummer gravitational potential.

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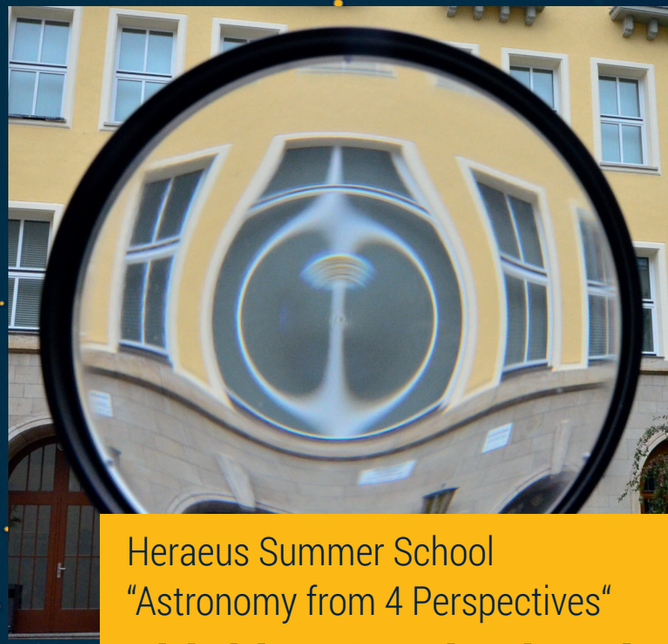
JENA
Faculty of Physics and Astronomy



Heraeus Summer School
"Astronomy from 4 Perspectives"

Thinking Gravitational Lensing for Teaching

Jena · 2 – 7 September 2019

WILHELM UND ELSE HERAEUS-STIFTUNG

Monday · 2 September

8:30

9:00 **Opening ceremony**

9:30 *Plenary Lecture*
M. Bartelmann (Heidelberg)
Introduction to gravitational lensing and its strong variant

10:30

11:00 **Coffee break**

11:30 *Plenary Lecture*
K.-H. Lotze (Jena)
Various approaches to teach light deflection in gravitational fields

12:30

13:00 **Lunch break**

14:00

14:30 *Plenary Tutorial*
A. Tegon (Venice) / L. Vaona (Verona)
How to curve a light ray

15:30

16:00 **Coffee break**

16:30 *Plenary Lecture*
M. Pössel (Heidelberg)
Light, delayed: Newtonian derivation of the Shapiro effect

17:30

18:00 **Summary of the day**

18:30 **Guided tour through Jena**

19:00

19:30

20:00

20:30

21:00

Tuesday · 3 September

9:00 **Outlook on the day**

9:30 *Group Tutorial*
Lens equation, lens models, magnification

10:30

11:00 **Coffee break**

11:30 *Plenary Lecture*
D. J. Kennefick (Fayetteville, Arkansas)
No shadow of a doubt: The eclipse expeditions of 1919 in detail

12:30

13:00 **Lunch break**

14:00

14:30 *Plenary Lecture*
R. Schmidt (Heidelberg)
Quasar lensing

15:30

16:00 **Coffee break**

16:30 *Plenary Lecture*
C. Lämmerzahl (Bremen) / S. Simionato (Jena)
The optical gravitational lens experiment

17:30

18:00 **Summary of the day**

18:30 **Informal get-together**
Restaurant "Zur Noll"

19:00

19:30

20:00

20:30

21:00

Wednesday · 4 September

8:30 **Bus transfer to Dornburg**

9:00

9:30 **Outlook on the day**

10:00 **The Dornburg Castles**

10:30 *Plenary Lecture*
M. Lombardi (Milano)
Measuring the invisible: Theory and applications of weak lensing

11:30

12:00 **Lunch and Coffee break**

12:30

13:00 **Visit to Karl Schwarzschild Observatory Tautenburg**

14:00

14:30

15:00

15:30 **Visit to Naumburg Cathedral**
(World Cultural Heritage)

16:00

16:30

17:00

17:30

18:00 **Free time in Naumburg**

18:30

19:00

19:30

20:00

20:30

21:00 **Bus transfer to Jena**

Thursday · 5 September

9:00 **Outlook on the day**

9:30 *Plenary Tutorial*
Student talks

10:30

11:00 **Coffee break**

11:30 *Plenary Lecture*
R. Schmidt (Heidelberg)
Gravitational microlensing

12:30

13:00 **Lunch break**

14:00

14:30 *Group Tutorial*
Cosmological applications, distances

15:30

16:00 **Coffee break**

16:30 *Plenary Tutorial*
M. Lombardi, C. Toci (Milano)
Playing with real data: Galaxy cluster masses and gravitational lensing

17:30

18:00 **Summary of the day**

18:30 **Meeting of the organisational committee**
Restaurant "Stilbruch"

19:00

19:30

20:00

20:30

21:00