



Fondazione CARIPLO



Brave new worlds II

Lake Como School of Advanced Studies - 12-16 June 2023

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Lake Como School of Advanced Studies

BRAVE NEW WORLDS II

Understanding the planets of other stars

Villa del Grumello
Como - Italy

12-16 June 2023

Every star in our Galaxy hosts at least one planetary companion: our Milky Way is crowded with billions of planets!

But, the Solar System does not appear to be the paradigm in our Galaxy, but only one of the many possible configurations we are seeing out there. These include planets completing a revolution in less than one day, as well as planets orbiting two stars or moving on trajectories so eccentric as to resemble comets. Some of them are freezing cold, some are so hot that their surface is molten. How do we progress from here?

The school is aimed at providing a comprehensive view of the nature of exoplanets, through an integrated approach covering observations, data analysis and interpretation. Finding out why are these new worlds as they are is one of the key challenges of modern astrophysics.

LECTURES

- Ahmed Al-Refaie (UCL)
Numerical models to interpret exoplanetary data
- Beth Biller (University of Edinburgh)
Imaging extrasolar worlds
- Masahiro Ikoma (NAOJ)
How do planets form and evolve
- Miguel Angel Granada (Barcelona)
From the Only World to the Infinite Planetary Systems: Copernicus, Kepler, Bruno
- Pierre Olivier Lagage (CEA)
Exoplanets with the James Webb Space Telescope
- Malena Rice (MIT/Yale)
Orbital architectures of Planetary Systems
- Giusi Micela (INAF - Osservatorio di Palermo)
The stellar environment
- Jonathan Tennyson (UCL)
Molecular spectroscopy for exoplanets
- Giovanna Tinetti (UCL)
Decoding the light of planets in our galaxy
- Angelos Tsiaras (INAF - Osservatorio di Arcetri)
Analysis of exoplanetary data: a hands-on approach
- Ingo Waldmann (UCL)
Artificial Intelligence and exoplanets

ORGANIZING COMMITTEE

- Giovanna Tinetti (Director -UCL)
- Ugo Moschella (Director -Insubria)
- Monica Colpi, Massimo Dotti (Bicocca)
- Sergio Cacciatori, Vittorio Corini, Francesco Haardt, Oliver Piattella (Insubria)



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APPLICATION AND INFO
<http://gatr2023.lakecomoschool.org>

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Organising Committee

- **Giovanna Tinetti** (Director-UCL)
- **Ugo Moschella** (Director-Insubria)
- **Monica Colpi, Massimo Dotti** (Bicocca)
- **Sergio Cacciatori, Vittorio Gorini, Francesco Haardt, Oliver Piattella** (Insubria)

Only nine planets were known before the nineties, namely the ones orbiting our favourite star, the Sun, which then included Pluto. Thirty years later, we have «lost» Pluto but we have gained 5200+ planets in orbit around other stars. Current statistical estimates indicate that, on average, every star in our Galaxy hosts at least one planetary companion, i.e. our Milky Way is crowded with billions of planets!

The most revolutionary aspect of this young field is the discovery that the Solar System does not appear to be the paradigm in our Galaxy, but rather one of the many possible configurations we are seeing out there. These include planets completing a revolution in less than one day, as well as planets orbiting two stars or moving on trajectories so eccentric as to resemble comets. Some of them are freezing cold, some are so hot that their surface is molten. How do we progress from here?

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Lecturers

Ahmed Al-Refaie (UCL) Numerical models to interpret exoplanetary data

Beth Biller (University of Edinburgh) Imaging extrasolar worlds

Masahiro Ikoma (NAOJ) How do planets form and evolve

Miguel Angel Granada (Barcelona) From the Only World to the Infinite Planetary Systems: Copernicus, Kepler, Bruno

Pierre Olivier Lagage (CEA) Exoplanets with the James Webb Space Telescope

Malena Rice (MIT/Yale) Orbital architectures of Planetary Systems

Giusi Micela (INAF – Osservatorio di Palermo) The stellar environment

Jonathan Tennyson (UCL) Molecular spectroscopy for exoplanets

Giovanna Tinetti (UCL) Decoding the light of planets in our galaxy

Angelos Tsiaras (INAF – Osservatorio di Arcetri) Analysis of exoplanetary data: a hands-on approach

Ingo Waldmann (UCL) Artificial Intelligence and exoplanets



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Protetto: Lectures Slides

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Program

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Program

Monday, June 12th			
9.30-10.00	<i>Registration</i>		
10.00-11.30	Giusi Micela	INAF (Osservatorio di Palermo)	The stellar environment
11.30-12.00	COFFEE BREAK		
12.00-13.00	Malena Rice	MIT/Yale	Orbital architectures of planetary systems
13.00-14.00	LUNCH BREAK		
14.00-16.00	Malena Rice	MIT/Yale	Orbital architectures of planetary systems
16.00-16.30	COFFEE BREAK		
16.30-18.00	Giusi Micela	INAF (Osservatorio di Palermo)	The stellar environment
Tuesday, June 13th			
9.00-10.00	Jonathan Tennyson	UCL	Molecular spectroscopy of exoplanets
10.00-11.00	Masahiro Ikoma	NAOJ	How do planets form and evolve?
11.00-11.30	COFFEE BREAK		
11.30-13.30	Masahiro Ikoma	NAOJ	How do planets form and evolve?
13.30-14.30	LUNCH BREAK		
14.30-16.00	Beth Biller	University of Edinburgh	Imaging extrasolar worlds
16.00-16.30	COFFEE BREAK		
16.30-17.30	Beth Biller	University of Edinburgh	Imaging extrasolar worlds
17.30-18.30	Miguel A. Granada	University of Barcelona	The Extension of the Stellar sphere in the Copernican Cosmology
Wednesday, June 14th			
9.00-11.00	Jonathan Tennyson	UCL	Molecular spectroscopy of exoplanets
11.00-11.30	COFFEE BREAK		
11.30-13.00	Giovanna Tinetti	UCL	Decoding the light of planets in our galaxy
13.00-14.00	LUNCH BREAK		
14.00-15.00	Giovanna Tinetti	UCL	Decoding the light of planets in our galaxy
15.00-16.00	Angelos Tsiaras	INAF – Osservatorio di Arcetri	Analysis of exoplanetary data: a hands-on approach
16.00-16.30	COFFEE BREAK		
16.30-18.00	Angelos Tsiaras	INAF – Osservatorio di Arcetri	Analysis of exoplanetary data: a hands-on approach
Thursday, June 15th			
9.00-11.00	Jonathan Tennyson	UCL	Molecular spectroscopy of exoplanets
11.00-11.30	COFFEE BREAK		
11.30-13.00	Ingo Waldmann	UCL	Artificial Intelligence and exoplanets
13.00-14.00	LUNCH BREAK		
14.00-15.00	Ingo Waldmann	UCL	Artificial Intelligence and exoplanets
16.00-16.30	COFFEE BREAK		
16.30-18.00	Ahmed Al-Refaie	UCL	Numerical models to interpret exoplanetary data
Friday, June 16th			
9.00-10.00	Jonathan Tennyson	UCL	Molecular spectroscopy of exoplanets
10.00-11.00	Pierre Olivier Lagage	CEA	Exoplanets with the James Webb Space Telescope
11.00-11.30	COFFEE BREAK		
11.30-13.30	Pierre Olivier Lagage	CEA	Exoplanets with the James Webb Space Telescope
13.30-14.30	Lunch		
14.30-16.30	<i>Presentations from participants</i>		
16.30-17.00	COFFEE BREAK		
17.00-18.00	Miguel A. Granada	University of Barcelona	Bruno and Kepler: Affirmation and Negation of Exoplanets
18.00 -	End of the School		



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