Welcome!

Mainz Institute for Theoretical Physics

Pre-covid

Before the covid pandemic, students from all over the world would come to Mainz for three weeks in the summer to

- learn about theoretical physics
- meet fellow students from all over the world

2019: Non-perturbative Phenomena and the Early Universe
2018: Towards the Next Quantum Field Theory of Nature
2017: Joint Challenges for Cosmology and Colliders
2016: New Physics on Trial at LHC Run II

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Virtual summer school

We would like to keep both aims:

- learn about theoretical physics
- meet fellow students from all over the world

You live in different time zones: Time slots for interactive sessions restricted to 16h-19h CEST (central european summer time)

- Within these time slots:
  - Discussion sessions
  - Mentoring sessions
  - Student talks
  - Zoom dinners
- Outside these time slots:
  - Watch the videos of the lectures
  - Do the homework problems

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Communication

- Zoom: All video conferencing of the summer school will be done via Zoom.
- Indico: The Indico page is visible by everyone. You will find the timetable and the link to the lecture videos there.
- Slack: We use Slack for summer school-internal communication (among students, lecturers and organisers).

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The lectures

- Week 1:
  - Henriette Elvang "Basics of Scattering Amplitudes"
  - Alexander Huss, "Jet physics"
  - Ira Rothstein "Effective Field Theories"
- Week 2:
  - Jacob Bourjaily "Geometry of Amplitudes"
  - Ruth Britto "The Coaction"
  - Claude Duhr "Polylogs, elliptic polylogs etc."
  - Erik Panzer "Mathematical concepts"
- Week 3:
  - Donal O'Connell "Double Copy"
  - Lance Dixon "Bootstrap"
  - Yvonne Geyer "Amplitudes from the nodal Riemann sphere"
  - Oliver Schlotterer "String Amplitudes"

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Homework problems

- For each lecture course there will be one problem sheet.
- We will group you in teams of 5 students: The Zoom dinner today will have several breakout rooms: The students in one breakout room form one team.
- The problem sheets are on the Slack page. The deadline for handing in the solutions is on Thursdays, 23:00h CEST.
- For the solutions prepare a pdf-file, typeset in LaTeX, and send it by email to

  MITPschool2021@uni-mainz.de

- There will be a prize for the best team and the winner will be announced on Friday, 30.07.2021.
- Contact person for the organisation of the homework problems: Camila Machado

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T-shirt design group

- It has become a tradition of the previous summer schools that the students design a T-shirt.
- There will be a channel on Slack for the design of the T-shirt.
- We will send a (free) T-shirt to anyone interested (we need the size of the T-shirt and your postal address).
- Contact person for the T-shirt design group: Maximilian Stahlhofen

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Outlook

Your participation and your contribution will make the summer school a success!

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