



# High precision fundamental constants at the TeV scale

Organisers: Sven-Olaf Moch and Stefan Weinzierl

Scientific program at the  
Mainz Institute for Theoretical Physics

March 10-21, 2014

## Scientific programs and topical workshops 2013:

- Cosmic-Rays and Photons from Dark Matter Annihilation: Theoretical Issues
- Low-energy precision physics

## Scientific programs and topical workshops 2014:

- High precision fundamental constants at the TeV scale
- Hadronic contributions to the muon anomalous magnetic moment: strategies for improvements of the accuracy of the theoretical prediction
- Theory facing experiment on Electroweak Symmetry Breaking, Flavor and Dark matter: where do we stand
- Proton Radius Puzzle
- Probing the TeV scale and beyond
- Jets, particle production and transport properties in collider and cosmological environments
- String theory and its applications

- All guest offices are located in the middle building (Staudinger Weg 9), second floor, north wing.
- The seminar room is located in the physics building (Staudinger Weg 7), fifth floor, west wing.
- The secretary office is located on the fourth floor of the physics building in the east wing (room 04-126).
- The local particle theory group is located mainly in the fourth and third floor of the physics building in the east wing.
- Officially, the balconies on the first and on the fifth floor can be used to get from one building to the other.

# Practical issues: Food (Lunch)

- The default option: the mensa
  - for the lower floor a mensa card is needed,
  - on the upper floor (mensaria) one can pay cash.
- other options:
  - Baron (restaurant on campus, at the other end of the campus)
  - Plaka (greek restaurant in walking distance outside the campus)

*“Zuerst müßt ihr uns was zu fressen geben, dann könnt ihr reden: damit fängt es an.”*

*(Must first makes sure that we have food to eat. Then you can resume your talking, that's where it begins.)*

Bertolt Brecht

- If there is interest, we can book a table at a restaurant in town.

Tour and dinner at the beer brewery “Eisgrub” (optional)

- English guided tour through the first beer brewery in Mainz,
- followed by a rustic dinner (which you can choose yourself)
- Tour is free, for the dinner you have to pay yourself.
- More information: <http://www.eisgrub.de>

## High precision fundamental constants at the TeV scale

- Motivation: Current knowledge on the fundamental constants often the limiting factor in the uncertainty of theoretical predictions.
- Impact: Precision tests of the Standard Model and on the interpretation of potential deviations in experimental measurements in terms of new physics phenomena.
- Aim: Resolution of current discrepancies between different methods or different sets of data used to determine the same parameter as well as at the identification of areas where theory improvement is necessary.

## Scientific program at MITP:

- Bring together physicists with common scientific interests for discussions and collaborations.
- Short informal talks to inspire for discussions.

## Schedule:

- Week 1: Focus on  $\alpha_s$
- Week 2: Focus on  $m_{\text{top}}$



- Short entry presentations, should trigger discussions.
- Schedule can be found at

`http://indico.mitp.uni-mainz.de/conferenceDisplay.py?confId=8`

- Email pdf-file of the transparencies to the organisers.

# Charge to the participants

- Are there currently discrepancies between different methods or different sets of data used to determine the same parameter?
- Are there areas where theory improvement is necessary?
- What are reliable uncertainties?
- What are the implications for new physics?

- We plan to have a write-up.
- Individual contributions should be about 2-3 pages, deadline 11.04.2014
- A LaTeX template will be provided.
- The write-up will appear on the arXiv.

Your participation and your contribution will make the scientific program a success!