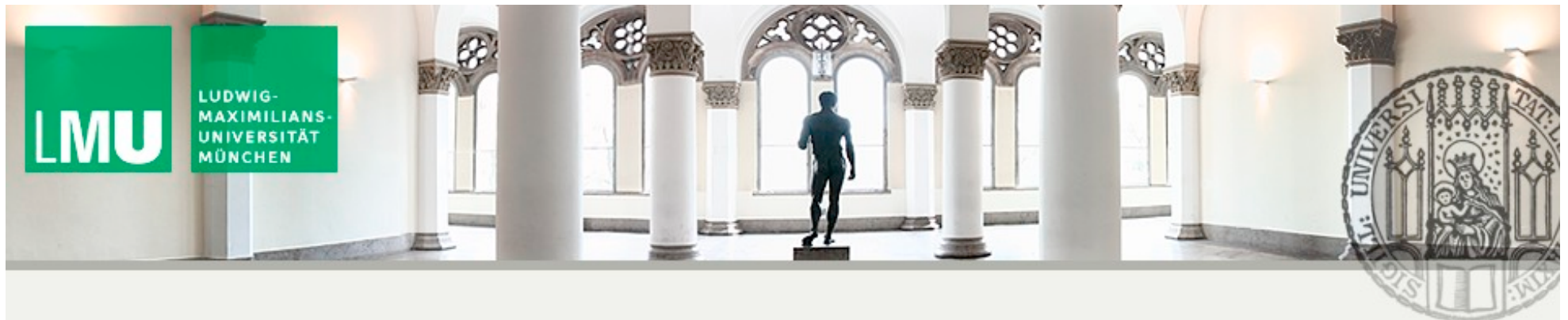


20 Years of String Theory In Munich

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Course Summer Term 2025 at LMU

Outline (preliminary)

08. May: Intersecting Brane Worlds Models
(Chios, 2004)

15. May: Moduli Stabilisation and Entropy
Maximization in Type II Calabi-Yau
compactifications
(Eurostrings Cambridge, 2006)

21. May: String Amplitudes for the LHC in
D-brane Compactifications (Dublin, 2009)

28. May: Emergent String Geometry from
Particles Species (Corfu, 2011)

12. June: Strings and non-commutative/non-associative geometry (Corfu, 2012)

18. June: Classical and Quantum Black Hole Hair (Cuba, 2016)

3. July: Higher Spin Theories, AdS Distance and the Swampland (StringPheno CERN, 2019)

10. July: Minimal Black Holes and Species Thermodynamics (Harvard, 2023)

17. July: Swampland and Dark Relations (Sifnos, 2024)

Intersecting Brane Models

Primary Goals:

- Derive the (supersymmetric) Standard Model from String Compactifications.
- Derive the couplings and the low energy effective action of the SM fields.

State of the art in 2003/2004:

- Heterotic string constructions: Calabi-Yau compactifications, orbifolds, fermionic and bosonic constructions.
- Effective SUGRA models, SUSY breaking by non-perturbative gaugino condensation.

Intersecting Brane Models

Further progress in the field:

- Moduli stabilization and SUSY breaking by fluxes (KKLT)
- F-theory compactifications
- Swampland constraints (exclusion from bottom-up)

Yet no fully complete derivation of the SM from string theory.