

## AdS/CFT correspondence

### Plan of lectures

1. Supergravity and simple supersymmetric solutions
  - (a) Minimal supergravity and anti de Sitter (AdS) space-time
  - (b) Minimal gauged supergravity in  $D = 4$
  - (c)  $D = 11$  supergravity a.k.a. M-theory
  - (d) Type IIA and type IIB supergravities
  - (e) D-brane solutions and near-horizon limit
2. AdS/CFT illustrated with the example of the  $\text{AdS}_5 \times S^5/\mathcal{N} = 4$  SYM duality
  - (a) Statement of the correspondence and regimes of its validity
  - (b) Matching of symmetries
  - (c) Matching of spectra
  - (d) Basics of holographic correlation functions
3. A selection of topics among the following
  - (a) Basics of holographic renormalization and holographic Weyl anomaly
  - (b) Finite temperature AdS/CFT and black holes
  - (c) Holographic renormalization group (RG) flows
  - (d) Sasaki-Einstein/ $\mathcal{N} = 1$  SCFT duality

### Main references

- O. Aharony, S. S. Gubser, J. M. Maldacena, H. Ooguri and Y. Oz, “Large  $N$  field theories, string theory and gravity,” Phys. Rept. **323** (2000) 183 [hep-th/9905111].
- D. Z. Freedman and A. Van Proeyen, “Supergravity,” Cambridge University Press, 2012.
- H. Năstase, “Introduction to the AdS/CFT Correspondence,” Cambridge University Press, 2015.