

This is a collection of references for the online lecture series “*Modular Forms in String Compactifications*” that i held 22.2.-26.2.2021 for the Bethe Center for Theoretical Physics. The list is intended to be an entry point for further studies and does not aim to include all of the relevant original papers. References to the latter can be found in the reviews below.

## 1 Day 1: Introduction

### 1.1 Morning session

- Introductions to modular forms: [1–3]

### 1.2 Afternoon session

- Introductions to string compactifications: [4, 5]

## 2 Day 2: Type II Strings on Tori

- Homological mirror symmetry on tori: [6, 7]
- Modular forms as sections of line bundles: [8]

## 3 Day 3: Strings on torus fibered Calabi-Yau threefolds

- Reviews on topological strings: [9]

## 4 Day 4: F-theory and elliptic genera

- Reviews on F-theory: [10, 11]
- Derivation of representations from wrapped branes: [12]

## 5 Day 5: Jacobi forms and the Swampland

- Reviews on the Swampland program: [13, 14]
- The sublattice weak gravity conjecture: [15–17]

## References

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- [4] A. Font and S. Theisen, “Introduction to string compactification,” *Lect. Notes Phys.* **668** (2005) 101–181.
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- [8] J. S. Milne, “Modular functions and modular forms (v1.31),” 2017. Available at [www.jmilne.org/math/](http://www.jmilne.org/math/).
- [9] M. Alim, “Lectures on Mirror Symmetry and Topological String Theory,” [arXiv:1207.0496 \[hep-th\]](#).
- [10] T. Weigand, “F-theory,” *PoS TASI2017* (2018) 016, [arXiv:1806.01854 \[hep-th\]](#).
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- [14] S. Lanza, F. Marchesano, L. Martucci, and I. Valenzuela, “Swampland Conjectures for Strings and Membranes,” *JHEP* **02** (2021) 006, [arXiv:2006.15154 \[hep-th\]](#).
- [15] B. Heidenreich, M. Reece, and T. Rudelius, “Evidence for a sublattice weak gravity conjecture,” *JHEP* **08** (2017) 025, [arXiv:1606.08437 \[hep-th\]](#).
- [16] S.-J. Lee, W. Lerche, and T. Weigand, “Tensionless Strings and the Weak Gravity Conjecture,” *JHEP* **10** (2018) 164, [arXiv:1808.05958 \[hep-th\]](#).
- [17] S.-J. Lee, W. Lerche, and T. Weigand, “A Stringy Test of the Scalar Weak Gravity Conjecture,” *Nucl. Phys. B* **938** (2019) 321–350, [arXiv:1810.05169 \[hep-th\]](#).