

## 4 Exercise session 4, July 21–22 (weekend)

### 4.1 Exercises about Guido Festuccia's course

**Exercise 4.1.** In the class we saw that for Abelian flavour symmetries only  $a_{\bar{7}}$  affect the partition function. Sketch the argument for non-Abelian flavour symmetries.

### 4.2 Exercises about Francesco Benini's course

**Exercise 4.2.** Compute the  $U(1)$ -equivariant volume of  $\mathbb{C}$ , where  $U(1)$  acts by rotations of  $\mathbb{C}$ . Compute the  $U(1)$ -equivariant volume of  $S^2 \simeq \mathbb{CP}^1$  where  $U(1)$  acts by rotations.

### 4.3 Exercises about Wolfger Peelaers' course

**Exercise 4.3.** Consider the torus with one puncture. What is the theory associated by the AGT correspondence to this Riemann surface? Same question for a torus with several punctures.

### 4.4 Exercises about Seiji Terashima's course

**Exercise 4.4.** Construct a (non-zero) anti-self-dual connection on  $S^1 \times \mathbb{R}^3$ .