

# Chapter 1

## Seigel-Bargmann Space

In this chapter, we will collect ideas and other perspective we have understanding the concentration of measure phenomenon. Especially with symmetric product of  $\mathbb{C}P^1$  and see how it relates to Riemman surfaces and Seigel-Bargmann spaces.

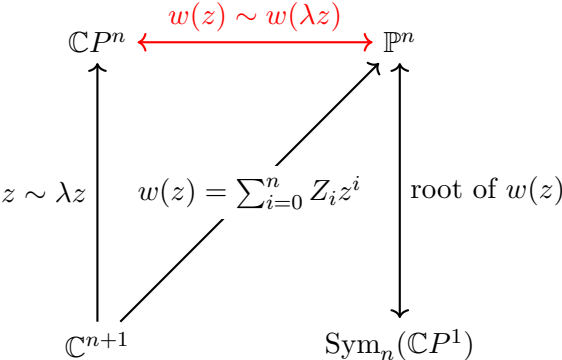


Figure 1.1: Majorana stellar representation

Basically, there is a bijection between the complex projective space  $\mathbb{C}P^n$  and the set of roots of a polynomial of degree  $n$ .

We can use a symmetric group of permutations of  $n$  complex numbers (or  $S^2$ ) to represent the  $\mathbb{C}P^n$ , that is,  $\mathbb{C}P^n = S^2 \times S^2 \times \dots \times S^2 / S_n$ .

One might be interested in the random sampling over the  $\text{Sym}_n(\mathbb{C}P^1)$  and the concentration of measure phenomenon on that.

### 1.1 Majorana stellar representation of the quantum state

### 1.2 Space of complex valued functions and pure states