First and foremost, I want to thank the professor Rossetti, president of the jury, as well as, Professor Schwartz and Professor Schredl, members of the jury, for the interest you have shown in my work and for allowing me to defend this doctoral thesis today. I also want to thank doctor Perrine Ruby, my thesis advisor, for her great help over the past 4 years, and without whom none of the present work would have been possible. Finally, I also wish to thank everyone in this room for being here.

I will start my presentation by introducing some of the main issues related to dreaming. In the second and most substantial section of my talk, I will detail several studies that we have conducted in the aim of improving our knowledge of the mechanism of dream recall frequency. In the third section, I will detail a study which aimed at characterizing the link between waking-life and dream content in order to better understand the possible function of dreaming. In the fourth section, I will briefly describe an open-source software that I co-developed which aims at providing a comprehensive and free graphical interface for the visualization and analysis of sleep data. Finally, I will end with some general conclusions and future perspectives.

To begin with, I would like to start by stating some open questions related to dreaming that I will use as a support for introducing this vast phenomenon. These questions are: what is dreaming? When does it occur during sleep? Does it have a function? And why is there such variability in dream recall? Or, to be more precise, why is there such variability, both among and between individuals, in the frequency of dream recall?

Regarding the first question, I will use during this presentation the working model and framework proposed by Fabian Guénolé which states that “dreaming is a mental experience during sleep which can be recalled and reported at wake”. In this model, the dreaming phenomenon is separated in three successive forms, namely the dream experience, the dream recall and finally the dream report. The dream experience takes place during sleep and refers to the dream as it is originally experienced. Upon awakening, the dream experience can be recalled, or forgot, depending on whether one is able to encode the dream experience into long term memory or not. Finally, the dream can be reported using either words or pictures. Importantly, there is a loss of information between each of these three steps, in part because of forgetting, reconstruction mechanisms, censorship and description difficulties.