## Acknowledgements

I would like to express my sincere gratitude to my advisor Prof. Matthias Jamin for his continuous support, for his motivation and for his enormous knowledge. I specially thank him for not giving up on me even in complicated times.

Besides my advisor I would like to thank Prof. Santiago Peris Rodríguez as forming part of my thesis committee and his insightful comments.

I also want to thank the Institute IFAE and my university UAB for carrying all bureaucratic tasks and offering plentiful events to widen my research from various perspectives. I specially like to thank my university for allowing me to teach various courses, getting to know bright students to which I am still in contact with.

As having spent four month at the CNRs in Marseille I also want to thank the Université d'Aix-Marseille for having me. Special thanks goes to Dr. Marc Knecht who perfectly organised my two stays and Dr. Laurent Lellouch and Dr. Aoife Bharucha, which were more than welcoming.

I also need to thank Ramon Miravtillas Mas and Xabier Llobregat for always being helpful friends and guiding me through this thesis. Especially I need to thank Ramon for finding the time to help me with my questions in all the times I was stuck.

Last but not the least, I would like to thank the persons closest to me. My parents for being as supportive as ever, my sister for her motivational speaches and Beata for just being there for me when needed.