Anyonic, cosmic, and chaotic: three faces of Majorana fermions

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The cover shows artistic representation of the portraits of three scientists that made significant contribution to the fields studied in this thesis. Ettore Majorana (upper right) proposed a solution to the Dirac equation that corresponds to a fermion that can be its own anti-particle. Such fermion was later called Majorana. Alexei Kitaev (left) contributed a lot to the study of the SYK model. Wolfgang Pauli (lower right) invented neutrinos to explain β-decay spectrum of radioactive atoms. The green stripe symbolizes unification of the corresponding topics in this thesis. The plant on the back is Marjoram which in Ukrainian is spelled in the same way as Majorana. The cover is a digital painting made by the author of the thesis.

To my first scientific mentor, V.Yu Reshetnyak
Моему першому науковому наставнику, В. Ю. Решетняку

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