

Appendix 2

THE EUROPEAN EXPERIMENTAL LANDSCAPE OF DIRECT DETECTION OF AXION DARK MATTER

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Understanding the nature of **Dark Matter** is one of the most pressing issues facing today research. A well motivated dark-matter candidate is the **Axion**, a particle first introduced by R.Peccei, H.Quinn, S.Weinberg, and F. Wilczek to solve the “strong CP problem” of the QCD. In the last decade, the European experimental landscape of direct detection of Axion Dark Matter drastically changed with the proposal of new experiments and the start of an intense R&D activity on new detection concepts and technologies. Proposed experiments include conventional Sikivie haloscopes as well as multimode, ferromagnetic, NMR, dielectric, dish antenna up to the most recent plasma haloscopes. After giving an overview of this landscape, recent results of **QUAX** will be presented and progress and perspectives in quantum sensing for Axion detection, including the **SUPERGALAX** project, will be discussed.