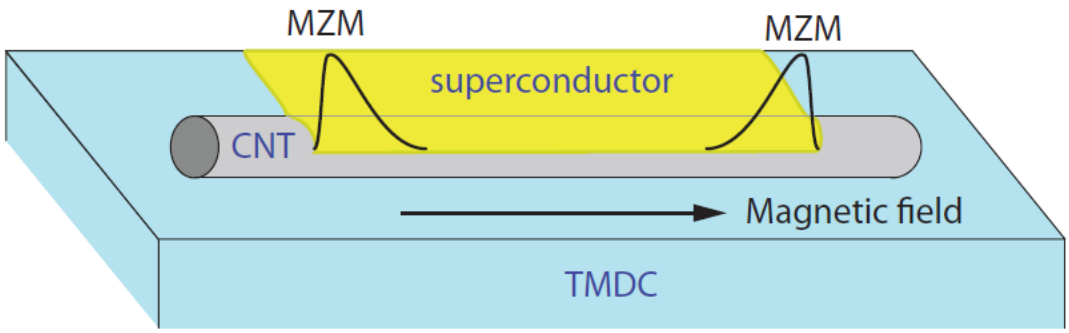
徵才資訊 (recruiting information)

計畫方向：利用一維及二維半導體-超導體混成材料實現拓樸超導元件

Research direction: Realizing the topological superconducting devices based on 1D and 2D semiconductor-superconductor hybrid materials



計畫內容：計畫的目標是開發新的一維或二維混成材料系統來實現馬約拉納零態(Majorana Zero modes)以及探索尚未被實現的拓撲特性，例如奈米碳管(CNT)與二維過度金屬硫化物(TMDC)的混成。為此，計畫將針對幾種有利於提供較穩定的馬約拉納零態的混成材料並且提更好的拓樸能態(topological gap)來實現具拓樸保護的量子元(qubit)。透過研究馬約拉納零態的電子傳輸，藉由量測局部(local spectrumscopy)和非局部(non-local spectrumscopy)的電導特性可對馬約拉納零態有更好的解析。除此之外，當我們將幾個馬約拉納零態耦合在一起時，在研究馬約拉納零態相互作用下的特性並同時建立起基本拓樸量子元的原型。

The project goal is to develop and demonstrate the topological properties of MZMs based on novel hybrid one or two-dimensional systems, such as carbon nanotube with transition metal dichalcogenide. We aim to explore several promising hybrid material systems, therefore, a more stable MZM can be developed with a sizable topological gap for better qubit protection. By studying the electron transport through MZMs, the signature in the local and nonlocal conductance could provide a better understanding of the underlying physics. While coupling several MZMs together, we aim to study the effect of the electron interactions and have a prototype of basic qubit elements. With these results, it will not only provide smoking-gun evidence of MZMs but also lead to a platform for a future topologically protected quantum computer.

徵才需求：1 位研究助理，1 位博士生及 1 位博士後研究員

We are looking for 1 research assistant, 1 Ph.D. candidate, and 1 Postdoctoral researcher

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