

# 國立中山大學應用數學系

## 學術演講

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講題：An Example of Phase Transition in Disordered System:  
Self-Avoiding Walk in Random Environment

時間：2023/03/14 (Thursday) 14:10~15:00

地點：理 SC 4009-1 教室

茶會：13:30

### Abstract

It is known that self-avoidance affects to random walk much in lower dimensions in a homogeneous setting. The lace expansion has been used to understand the asymptotic behaviour, which especially in higher dimensions (above 4). Self-avoiding walk (SAW) asymptotically behaves like simple random walk in the sense that both model have the same critical exponent, which yields the upper critical dimension.

It is also known that random environment affects to the asymptotic behaviour of models, like random walk in random environment. In the previous works, it is proved that SAW in random environment shows that the strong disorder in 1 and 2 dimensions. However, it is still open whether we have only strong disorder regime or there is a crossover between weak and strong disorder regimes in more than 2 dimensions. We expect the existence of the crossover from the result of directed polymer model. We are interested in which dimension we have the crossover. This gives us the lower critical dimension.

Through considering the behaviour of the critical point, we will see the crossover between the strong and weak disorder in 3 dimension or higher dimensions.

Keywords: Self-avoiding walk, random environment, weak and strong disorder regimes

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