



北京大學  
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高能物理研究中心

## Recent searches for Higgs boson pair production at ATLAS



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**Organizer:** Xiaohu SUN, Peking University

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**Location:** CHEP B105, [Zoom](#)

**Webpage:** <https://indico.ihep.ac.cn/event/15663/>



**Abstract:** Since the discovery of the Higgs boson by the ATLAS and CMS Collaborations in 2012, a major focus in particle physics has been understanding its interactions. Tremendous progress has been made in determining the strength of the Higgs bosons couplings to fermions and vector bosons, but its self-interaction has yet to be established. Understanding the Higgs self-coupling and the form of the potential function of the Higgs field will allow us to explore why the Higgs boson acquires a vacuum expectation value, and, critically, whether we live in a stable universe. The most natural way to probe the Higgs self-interaction is via searches for Higgs boson pair production, HH. The latest ATLAS HH searches reported in this seminar bring substantial improvements over previous results. In the case of non-resonant HH searches, results are interpreted both in terms of sensitivity to the Standard Model and as limits on the Higgs boson self-coupling. Search results on new resonances decaying into pairs of Higgs bosons are also reported.

**Brief bio:** I did my PhD at the University of Liverpool. I graduated in 2010 and the topic of my thesis was searches for Higgs bosons decaying to tau leptons at the ATLAS experiment. I held post-doc positions at the University of the Witwatersrand (South Africa) and University College London (UK). Since 2018 I've been Research Assistant Professor at Southern Methodist University (US). I've been working on di-Higgs analyses in ATLAS since 2014. I was appointed as one of the ATLAS DiHiggs convenors when the subgroup was formed in early 2019, and I'm now convenor of the "Higgs and DiBoson Searches" physics group that encompasses ATLAS's search programme for new physics in the scalar sector, including HH.