

**FAKULTÄT für PHYSIK  
LUDWIG-MAXIMILIANS-UNIVERSITÄT  
MÜNCHEN/GARCHING**

**PHYSIK-DEPARTMENT  
TECHNISCHE UNIVERSITÄT MÜNCHEN  
MÜNCHEN/GARCHING**

## **MLL-KOLLOQUIUM**

**Donnerstag, 18.07.2019, 16<sup>15</sup> Uhr**

Hörsaal der LMU in Garching, Am Coulombwall 1  
Treffen zum gemeinsamen Kaffee 16 Uhr

**Dr. Kyohei Mukaida  
(DESY, Hamburg)**

### **Refining Calculations of WIMP Abundance**

Astrophysical and cosmological observations from galactic to cosmological scales indicate the existence of dark matter. Nevertheless, most of its property still remain to be unknown and hence candidates range from  $10^{-31}$  to  $10^{50}$  GeV in its mass scale. Among them, the traditional dark matter candidate, so called WIMP (weakly interacting massive particle) is still attractive because its production mechanism, i.e., thermal freeze-out, naturally explains its abundance and pins down its mass scale to be  $1 \sim 10^5$  GeV. Moreover, the same interaction required for the thermal freeze-out allows us to detect them directly/indirectly. The key observable for this program is the abundance of dark matter, which is one exceptional parameter we measured very precisely, i.e., within 1% accuracy. Hence, it is desirable to give theoretical prediction of WIMP abundance for a given model within this accuracy. Based on these, I will talk about my recent attempts to refine the calculation of WIMP abundance.

gez. Peter Thirolf  
Tel. 289-14064

gez. Norbert Kaiser  
Tel. 289-12367