

# Axion Cosmology – GPPU progress report –

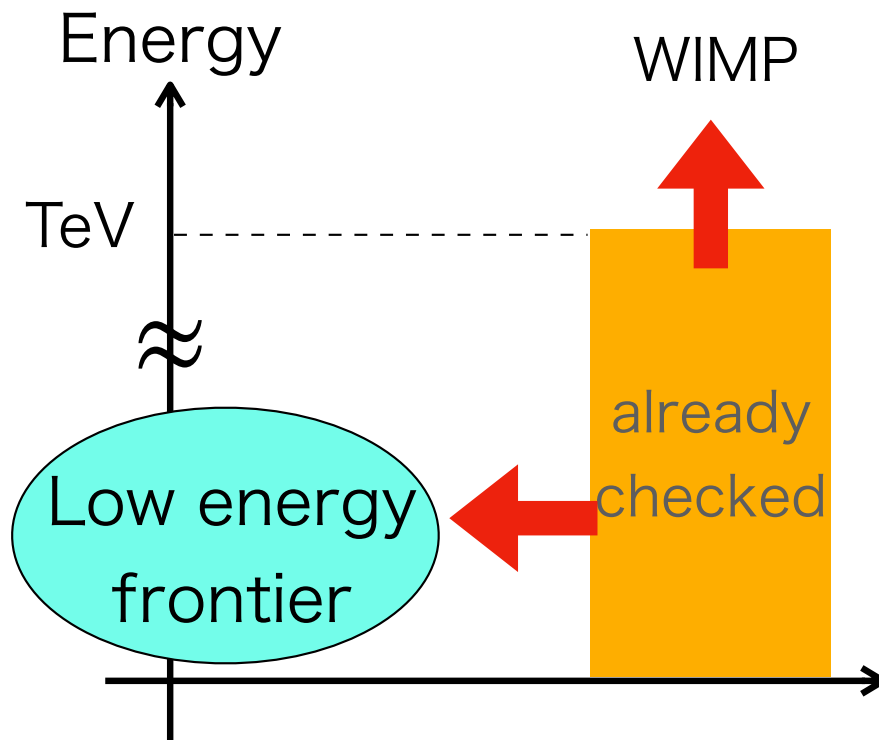
Shota Nakagawa (Particle and cosmology group, D1)

## Interest

= The nature of Dark matter



@Higgs-tan



Low scale is also interesting!

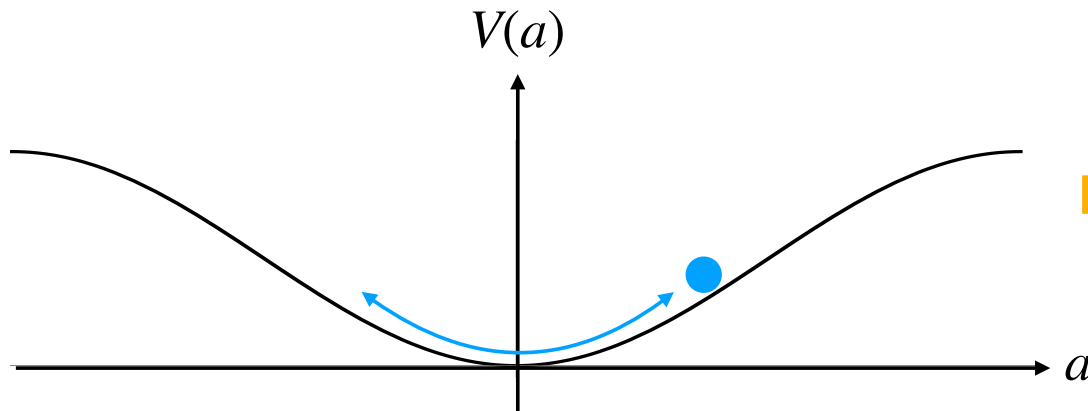
e.g. QCD axion

Axion-like particle

Hidden photon

# Current research

I'm studying the QCD axion DM now.



The axion abundance

$$\Omega_a h^2 \lesssim \Omega_{\text{DM}} h^2$$

**But, the dynamics is controversial.**

In my work, I focus on the effects of hidden monopoles on the axion.

The paper will be submitted soon!

# Future work

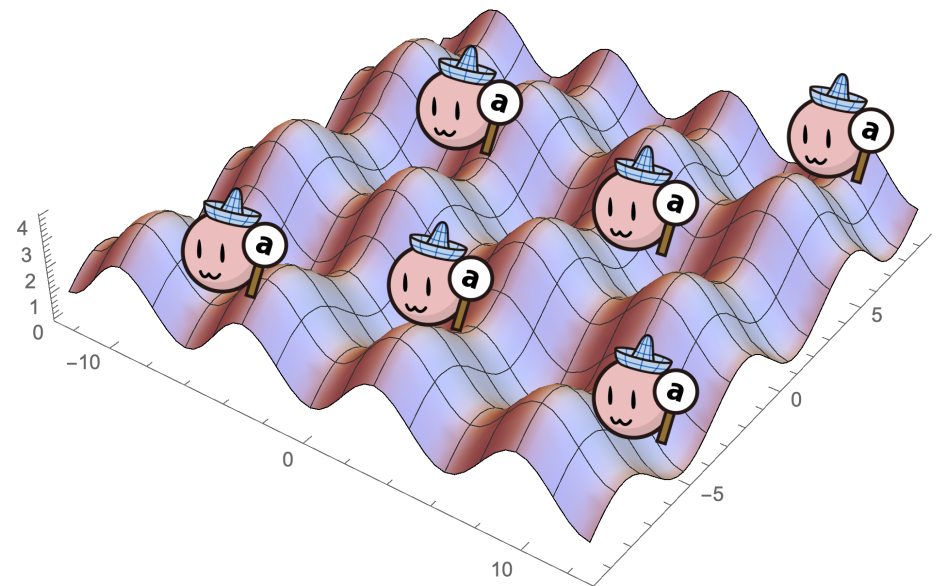
I will continue the study of the axion DM.

## Example

Many axions populate  
Axion Landscape.

T. Higaki, F. Takahashi (2014, 2015)

Some may behave as DM,  
and some as inflaton.



## Research Plan

- Constructing the cosmological scenario explaining both DM and inflation
- Finding the solution to  $H_0$ -tension

# Overseas study

## Past activity

2020 2/28-3/15 Axion Cosmology (Germany)

## Future activity

Collaborator candidates:

- K. S. Jeong (Pusan National University, Korea)
- K. Choi (Institute for Basic science, Korea)
- M. Hertzberg (Tufts University, The U.S.)



I talked with him in Germany.