# Project topics for
## General Relativity @ Wuhan University

There are many topics you can find for this course. You are encouraged to find topics that you find interesting by yourself. If you have not found a good one, the following are the ones that you can consider:

1. The detection of gravitational wave.
Is gravitational wave detected? What are the main experimental projects to detect those waves? Why might they detect the wave? What is the current status of these detectors? If not detected, what is the reason and how to improve the current detectors?

2. The cosmic microwave background.
What is the cosmic microwave background? What can this background tell us about cosmology, gravity and general relativity, and why? What is the current experimental status of the CMB observation and why do we do so many experiments about the CMB?

3. The well-known black holes.
What are the famous black holes? What is their metric, curvature etc.? What special features do these black holes have? What are the common features of these black holes?

4. The black hole thermodynamics.
What are the thermodynamic laws of black hole? Are they really thermodynamics in the usual sense? What is Hawking radiation?

5. The test of general relativity at different scales.
What test has general relativity passed? What tests are being carried out for general relativity? Why do we need to do these tests?

6. The inflation of the universe.

What is inflation? Is inflation confirmed and if yes, how accurate is the confirmation? What are the basic inflation models? What problem are they supposed to solve and what problem do they have?

## 7. Models of gravity

Are there other theories about gravity besides the general relativity? What are the basic ones? What is the difference of these theories compared to general relativity? What are the advantages and disadvantages for these theories? Are there experimental supports or disfavors for these theories?

## 8. Models of the cosmology

What basic other models are there for cosmology? What are their main features? Are their experimental observations that favor or disfavor these models?

## 9. Gravitational Lensing

What is gravitational lensing? Is it observed? What basic scenarios are there for gravitational lensing? What is the application of gravitational lensing?

## 10. Binary system

Is the gravitational solution of binary system completely known? What are the basic models for binary system (or what assumptions are used to model binary system)? Are they well justified? What are the usual methods for research in this field?
How the binary system can be useful?

In addition, there are good topics in the MIT open course website given at [here](#).