

# Galaxies and Cosmology in Light of Strong Lensing

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Gravitational lensing continues to grow in importance as a tool to explore the Universe which is dominated by dark components. In particular, strong gravitational lensing plays an important role in studying small-scale structure of dark matter distributions, distant objects with help of lensing magnifications, and cosmological parameters by taking advantage of its simple physics. This is why we held the workshop, “Galaxies and Cosmology in Light of Strong Lensing,” from November 17 to 21. This workshop has successfully attracted a great deal of attention, probably because workshops focusing on strong lensing have been rare. As a result, the workshop was truly international, with 70 participants, about 50 of which were from outside Japan.

In this workshop, we assigned different topics for different days. On Monday we discussed (mostly time delay) cosmology, Tuesday was devoted to dark halo substructures and fine structure of sources, Wednesday to galaxy and cluster structures, Thursday to distant galaxies, and Friday featured strong lens searches. One unique feature of this workshop was that we had an hour of open discussion time at the end of each day, in addition to many

invited and contributed talks.

One of the main discussion points was the role of simulations and mock data. It was suggested that blind analysis of mock data is very useful in checking the presence of any bias in the results, and in understanding the true uncertainties of the analysis of strong lensing data that are usually limited. It was also argued, on the other hand, that very detailed analysis of strong lens systems may not be practical as it is sometimes very time-consuming. Another important point in the discussions was how to make lens searches and lens mass modeling more efficient, possibly in automated

way, given the fact that ongoing and future surveys will easily find hundreds of new strong lens systems. The discussions were held in a critical but friendly atmosphere, which were so fulfilling that the discussion time passed very quickly.

This workshop would not have been possible without the help of the other organizing committee members, Eiichiro Komatsu, Anupreeta More, Surhud More, Sherry Suyu (ASIAA), and Masahiro Takada. I also thank the Kavli IPMU administrative office members, especially Shoko Ichikawa, for their dedicated support.

