



# San Mateo County Astronomical Society



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*SMCAS General Meeting and Presentation on Friday November 1, 2019*

**Dr. Simon Birrer**

Stanford University - KIPAC

## Probing Fundamental Physics with Strong Gravitational Lensing

Friday, November 1, 2019 , [College of San Mateo, Building 36](#)

SMCAS General meeting at 7:00 p.m. ISC Room, room 110

Presentation at 8:00 p.m. [Planetarium](#)

Free and open to the public, free parking.

In general relativity, the presence of matter can curve spacetime, and the path of a light ray will be deflected as a result. This process is called gravitational lensing, analogous to the deflection of light by (e.g. glass) lenses in optics. In rare and extreme cases, light can take different paths to the observer and more than one image of the source will appear. Strong gravitational lensing is lensing that is strong enough to produce these multiple images, arcs, or even Einstein rings. Many useful results for cosmology have come out of using this phenomena. Dr Birrer will shed more light on how astronomers are utilizing strong gravitational lensing to probe the nature of dark matter and dark energy, the dominant but yet unknown components of our Universe.

Dr Simon Birrer is a KIPAC Postdoctoral Fellow at Stanford University since Fall 2019. Before joining Stanford he was a Postdoctoral Researcher at the University of California, Los Angeles (UCLA). He completed his BSc and MSc in Physics and PhD in cosmology at [ETH Zurich](#). His research focus has been on dark matter and dark energy and how to probe fundamental physics with astrophysical observations. His scientific expertise is the interface between the exquisite data sets available on one side and the fundamental theory predictions on the other side. He is actively developing advanced computational and statistical tools and applies them to measure the expansion rate of the Universe and to constrain the properties of dark matter. He is actively involved in public outreach for science, from giving public lectures to being the national coordinator of the [Swiss Physics Olympiad](#) (2010-14) and then executive chairman of the [International Physics Olympiad](#) in 2016.

