

UK participation in LSST Galaxy science



Sugata Kaviraj

LSST:UK Galaxies Point of Contact

s.kaviraj@herts.ac.uk

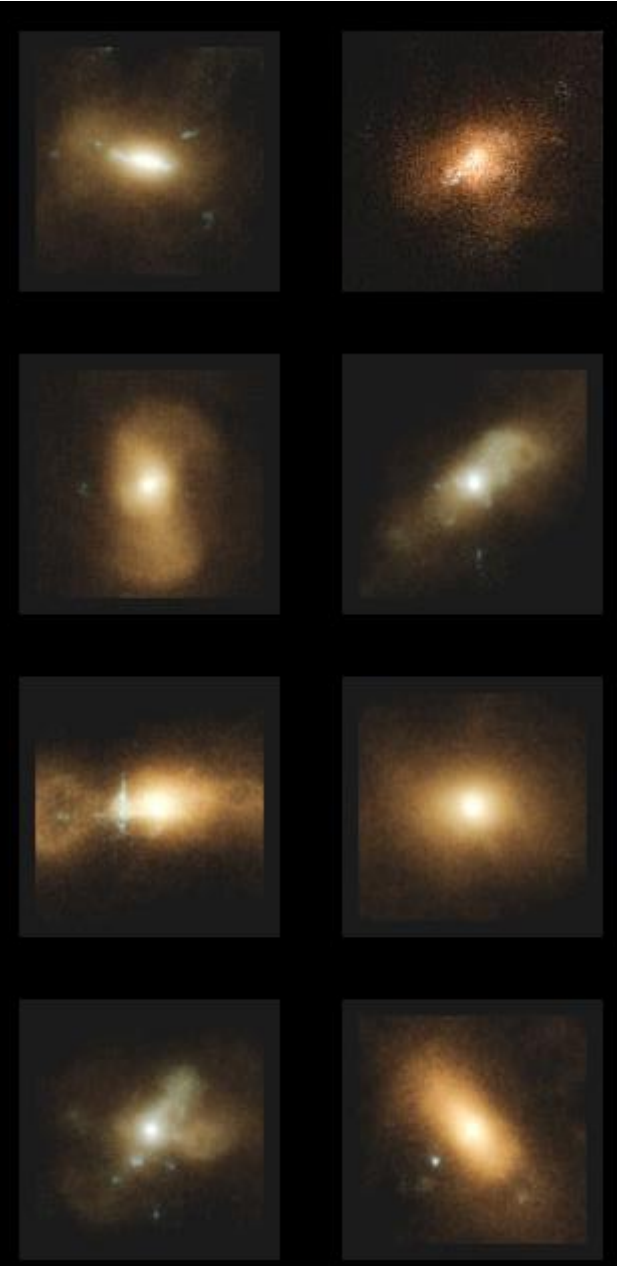
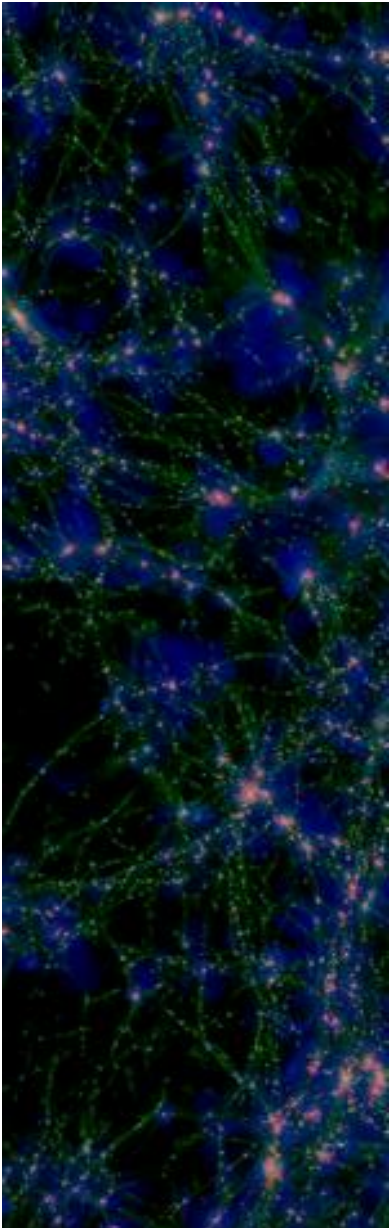
The Large Synoptic Survey Telescope

www.lsst.org



- LSST can survey entire visible sky in just a few nights
- Stacked sky survey of unprecedented depth and area
- Reaches SDSS Stripe 82 depth as soon as it is switched on
- 18,000 square degree footprint
- 5 mag deeper than standard SDSS imaging ($r \sim 27.5$)
- Database of ~ 20 billion galaxies and a similar number of stars.

Simulations



Horizon-AGN simulation

Sugata Kaviraj (s.kaviraj@herts.ac.uk)

- Simulations will be used to test LSST pipelines
- LSST data will offer tests of models to at least $z \sim 1$
- Active theoretical community in the UK: Horizon-AGN, EAAGLE, Illustris, Massive Black

Morphology and low surface-brightness science

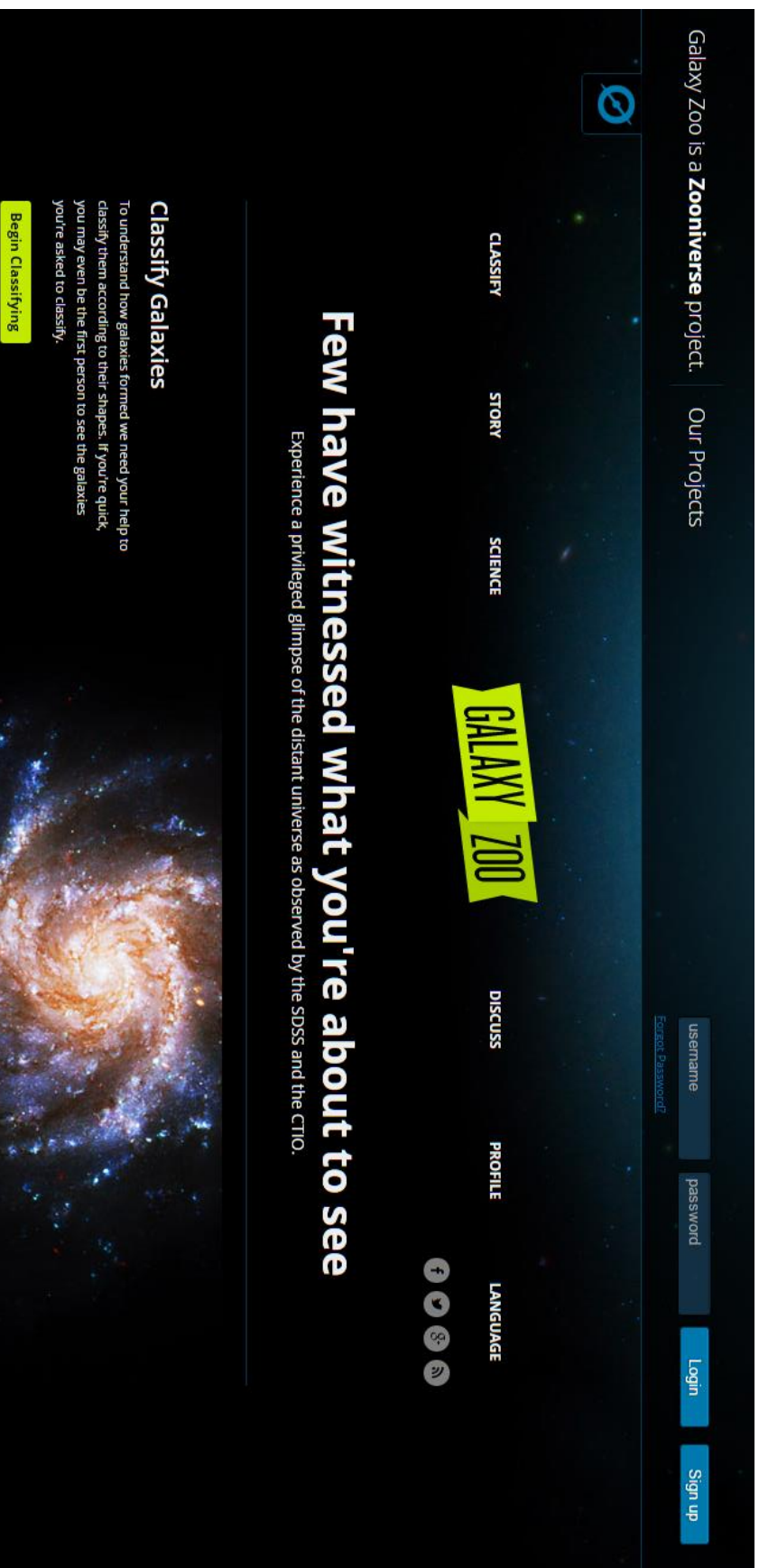


- Deep LSST images will offer exquisite morphological detail
- Low SB science will become routine with LSST

Hyper Suprime Cam Survey

Sugata Kaviraj (s.kaviraj@herts.ac.uk)

Morphology and low surface-brightness science

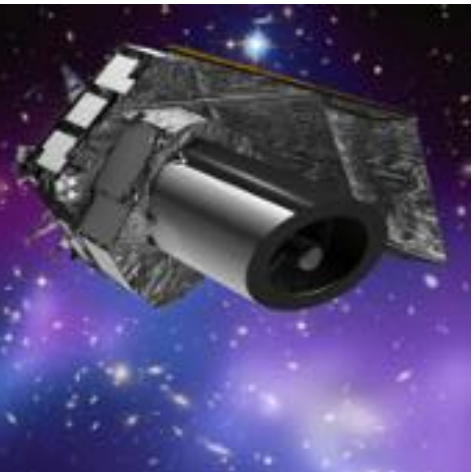
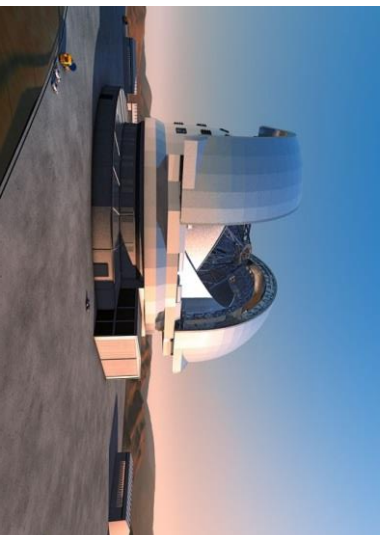


The screenshot shows the Galaxy Zoo website interface. At the top, it says "Galaxy Zoo is a Zooniverse project." and "Our Projects". Below this is a navigation menu with links for "CLASSIFY", "STORY", "SCIENCE", "DISCUSS", "PROFILE", and "LANGUAGE". A central banner features the "GALAXY ZOO" logo and the headline "Few have witnessed what you're about to see" with the subtext "Experience a privileged glimpse of the distant universe as observed by the SDSS and the CTIO." Below the banner is a "Begin Classifying" button. On the left, there is a section titled "Classify Galaxies" with a description: "To understand how galaxies formed we need your help to classify them according to their shapes. If you're quick, you may even be the first person to see the galaxies you're asked to classify." At the bottom right, there are input fields for "username" and "password", and buttons for "Login" and "Sign up".

Crowd sourcing + machine learning algorithms will be important in morphological analysis from LSST

Sugata Kaviraj (s.kaviraj@herts.ac.uk)

Complementary datasets



- UK well positioned to offer complementary datasets e.g.
 - SKA and SKA precursors
 - Euclid
 - E-ELT
 - MOONS
 - 4MOST
 - DESI

LSST Galaxies meeting, 22-23 July, Oxford

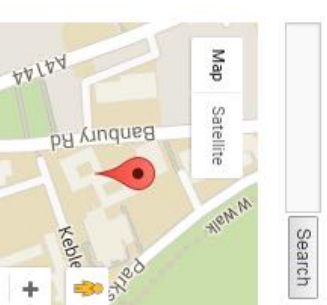
LSST Galaxies Workshop

Oxford 22-23 July 2016



[Home](#) [Rationale](#) [Registration](#) [Meeting information](#) [Travel funding](#) [Accommodation](#) [Programme](#) [Contact](#)

The [Large Synoptic Survey Telescope](#) (LSST) is one of the most ambitious science projects of the next decade. It will survey the entire visible sky every few days, producing a stacked sky survey of unprecedented depth and area. It will make transformative advances across a plethora of topics, from potentially hazardous asteroids, to the structure of the Milky Way, the nature of dark matter and dark energy and the evolution of galaxies and AGN over cosmic time. The co-added data within the 18,000 square degree survey footprint will be 5 mag deeper than the SDSS ($r \sim 27.5$), with the main survey producing a database of ~ 20 billion galaxies and a similar number of stars.



<https://lsstgalaxies2016.wordpress.com/>

Sugata Kaviraj (s.kaviraj@herts.ac.uk)

LSST Galaxies meeting, 22-23 July, Oxford

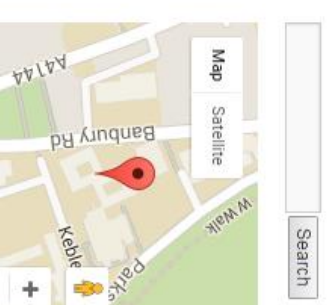
LSST Galaxies Workshop

Oxford 22-23 July 2016



[Home](#) [Rationale](#) [Registration](#) [Meeting information](#) [Travel funding](#) [Accommodation](#) [Programme](#) [Contact](#)

The [Large Synoptic Survey Telescope](#) (LSST) is one of the most ambitious science projects of the next decade. It will survey the entire visible sky every few days, producing a stacked sky survey of unprecedented depth and area. It will make transformative advances across a plethora of topics, from potentially hazardous asteroids, to the structure of the Milky Way, the nature of dark matter and dark energy and the evolution of galaxies and AGN over cosmic time. The co-added data within the 18,000 square degree survey footprint will be 5 mag deeper than the SDSS ($r \sim 27.5$), with the main survey producing a database of ~ 20 billion galaxies and a similar number of stars.



<https://lsstgalaxies2016.wordpress.com/>

Sugata Kaviraj (s.kaviraj@herts.ac.uk)