Please see below for the content we will be discussing. The lectures will be ~1-2 hour per day but emphasis will be on discussing the concepts together via reading material where appropriate.

Day 1: Overview of galaxy formation: knowns and know unknowns

Very brief history of the Universe: Big Bang, large scale structure formation, first stars and galaxies, and present-day universe.

Tutorial: problem set on some concepts. No computer needed.

Day 2: Observational techniques in astronomy: Intro to AstroOptics

Basic geometrical optics, image formation, cameras, and spectroscopy.

Tutorial: Problem set. Will require literature study of selected new generation instruments. Computer with internet access necessary.

Day 3: Modelling the Universe.

Basic introduction to different modelling methods. Further investigation into stellar population modelling.

Tutorial: Use FSPS (<https://github.com/cconroy20/fsps>) with its python wrapper (<https://github.com/dfm/python-fsps>) to investigate the evolution of spectral properties/colors of galaxies with physical parameters.

Day 4: Combining Observations with data.

Introduction of using observed data to infer redshift/physical/chemical properties of galaxies, overview of SED fitting techniques and advantages/disadvantages of different techniques.

Tutorial: Hands on experience on using several codes (EAZY: https://github.com/gbrammer/eazy-photoz/ and FAST: <https://github.com/cschreib/fastpp#install-instructions> , prospector: <https://github.com/bd-j/prospector/tree/master/demo> ) to obtain galaxy properties via photometry.

Day 5: Galaxy surveys

Overview of large scale sky surveys, *Hubble* deep fields, and discussion on contributions to our knowledge of the Universe.

Tutorial: Continuation of Day 4 tutorial and buffer.