ASTR 257 Project 6:
Radio Astronomy Interferometric Imaging with ALMA (Optional)

In this class we've focused almost exclusively on optical/infrared astronomy, which is the area of focus at Lick Observatory (and in UCSC Astronomy & Astrophysics). I wanted to have a radio component of this class, particularly given the incredible power of the Atacama Large Millimeter/Sub-millimeter Array (ALMA) for all sub-fields of astronomy. The ALMA website has some guides:

https://casaguides.nrao.edu/index.php/ALMAguides

I ran through the guide "A First Look at Imaging":

https://casaguides.nrao.edu/index.php/First_Look_at_Imaging

This guide gives you pre-processed data and helps you look through it with CASA, which is the standard software used by ALMA and other radio interferometers. My opinion after going through the guide is that it is well written and can teach you some of the basics of using ALMA data products with CASA. However, unlike the rest of the class where we write our own code from scratch, the ALMA data reduction is a "black box" and it will be difficult to obtain the depth of knowledge that you are developing for optical/infrared data reduction.

Radio astronomy data reduction can be extremely complex. ALMA has made an effort to supply reduced data so that non-radio experts can use the facility. The point of ASTR 257 is to obtain and reduce *raw* data. That's not really possible with ALMA. As a result, I leave these pages here as a resource. You are welcome to run through the "First Look at Imaging" tutorial after the field trip. We will have done a Radio Astronomy lecture, so you won't be starting from scratch. If you would like to learn more about interferometry in general, I include a review article by John Monnier that gives a good introduction from first principles.

If you do run through the ALMA tutorial, please let me know what you think.