**EE129B Presentation Script**

Slide 2:

UC Santa Cruz currently utilizes a repeater which AC6P and K3RRY designed and built for radio communications. The repeater essentially listens for low power signals at 144.710 MHz and immediately rebroadcasts, or ‘repeats,’ them at much higher power on a slightly different frequency in order to increase the range of wireless communication. Ideally, for reliable communication a repeater antenna would be at the top of a tall building in the line of sight of those it is trying to communicate with. The location of UCSC and the surrounding geography present a problem with wireless communication and due to the mountainous terrain, some coverage areas are shadowed by hills or are subject to multipath interference. We currently have a 7/8 wave vertically polarized antenna on the roof of Baskin Engineering, vertical polarization meaning the electric field vectors of the propagating wave are perpendicular to the earth.

Say AC6P were driving home through the SCZ mountains and needed to send an emergency message to our repeater from his vertical antenna on the roof of his truck ( he doesn’t own a cell phone btw). By the time the traveling wave reaches our repeater it may be tilted as it travels over the earth or bounced off objects or hills. By super position this may result in a horizontally polarized wavefront which would cause a loss of 20 dB or more in received power. Our goal is to create an antenna which radiates with circular polarization, with a wavefront which corkscrews through space. This mitigates the polarization mismatch and results in only 3 dB of loss regardless of how the linear antennas are oriented.

Slide 3:

Our project will solve these issues by designing and implementing a system which can switch wirelessly, from a handheld radio, between our current antenna and our newly designed circularly polarized antenna. We will also be extending this improvement to our repeater by implementing two RoIP ( Radio over IP) nodes which will allow worldwide access to and from our repeater (given you have internet access).