

Fulton FYRE 2022: "OU Lights"  
Dr. Caleb Fulton, OU ECE/ARRC

As the OU Advanced Radar Research Center brings online the Horus All-Digital Phased Array Radar in 2021 and 2022 ([https://www.ou.edu/web/news\\_events/articles/news\\_2018/ou-radar-team-developing-fastest-most-advanced-radar-in-the-nation](https://www.ou.edu/web/news_events/articles/news_2018/ou-radar-team-developing-fastest-most-advanced-radar-in-the-nation)), we will have the opportunity to demonstrate its radiation using RF-to-light antennas with LEDs to show where it is radiating. A precursor to this type of demonstration was done more than a decade ago by Dr. Fulton at Purdue, when he worked with a team that did the "Capstone"-like project featured here: <https://youtu.be/QBbqIEw0CLE>, but we now have the opportunity to do this with a modern, electronically-scanned digital phased array that will show its colors on OU logos placed near the radar! A prototype of the antenna has been designed and simulated (see the left side of the figure), as has a version of this that works at 3x the frequency (which is more difficult but is shown on the right side of the figure; notice the little red light?). **Students working towards this FYRE effort will help to iteratively design, fabricate, test, and replicate the OU lights, which will be crimson or creme depending on the polarization of the radar's transmissions (with the simulated patterns showing polarization discrimination in the direction pointing towards the radar).**

