These are informal exercises you will be asked to think about during our discussion, and then we will discuss them.

1. Below is a reconstruction from limited CT data of a brain. What is the data set, $\phi \in \mathbb{R}$, $\rho \in \mathbb{R}$?

Brain phantom (left) [radiopedia.org], FBP reconstruction [Friel, Q 2013]

(a) Which features of the brain are visible in the reconstruction? Which are invisible?
(b) Are there added streak artifacts?
2. What boundaries will be easy to see in an exterior reconstruction of the phantom on the left?
   You can draw on the phantom or on the right.
3. Defects in rocket shells are generally along the circumference direction of the shell.

(a) Would exterior CT be a good modality for such defects?
(b) According to the theory, what types of defects would be easy to see from exterior CT?
(c) According to the theory, what types of defects would be easy to see from exterior CT?
(d) Were there added artifacts in the reconstruction(s) I showed?
(e) Do you think there could be added artifacts in reconstructions from exterior data? Why or why not?
4. Let’s say you have a ROI data set of the Shepp-Logan phantom pictured here for lines that are inside the red circle.

(a) According to the theory, what object boundaries would be easy to reconstruct from the ROI data inside the ROI?

(b) According to the theory, what object boundaries would be easy to reconstruct from the ROI data outside the ROI?

(c) According to the theory, what types of object boundaries would be difficult to see from the ROI data?

(d) Did you observe this in the reconstructions you did in exercises using iRadon? If not, any ideas why not?