**List of issues / questions to be worked on for LUXE**

**Laser / infrastructure (Ingmar, Ralph)**

1. What lasers would be available in the 1019 – 1021 W/cm2 range and what are their physical requirements on space? And, what do they cost?
2. Where would be a room to put a new laser, and how can it be guided to the IP?
3. Can an existing laser be guided to the IP? E.g. from HIBEF.
4. How well can we know the intensity of the laser? E144 had up to 50% uncertainty on this.
5. How far does the electron beam need to be from the XFEL photon beam at laser IP?

**Experiment / infrastructure (Matthew, Beate, Jenny, Ties)**

1. Where can the experiment go in the tunnel?
   1. What are the experiment’s maximum dimensions?
   2. Need diameter of tunnel and how much is needed for safety; this leads to how much can we use.
   3. Should the “schikane” be vertical or horizontal?
2. Need to start simulation of detector systems
   1. Can start with simple analytical calculations to get rough positions of magnets and detectors and the fields needed.
   2. Can also make more detailed GEANT simulation.
3. When will the call for proposals open for use of the tunnels?

**Physics case (Andreas, Tony)**

1. What makes XFEL ideal (or not) for this experiment in terms of beam parameters (e.g. bunch length in z, energy, …)? (Particularly compared to other proposals (e.g. FACET-II))
2. What is the physics rate of the different types of events (inverse Compton and pair production) per electron−laser crossing for typical set of parameters?
   * Need energy spectra and rates of photons and electrons for input to detector simulations.
3. How many photons from the laser field are we absorbing at typical laser parameters?
4. What is the mass shift and what drives it? How does this affect a detector design? E144 could not measure it.
5. What new physics are we sensitive to and how does this manifest itself?

**Accelerator (Evgeni, Ralph, Winnie)**

1. What are the beam properties at location of experiment (after undulators)? Are there focussing elements needed after the undulators before the IP?
2. How much space do we have in transverse
3. How bad can beam properties be after experiment before dump? What is the minimum bending radius allowed?
4. Can we reuse old magnets available at DESY for schikane?
5. To which extent is the crane needed in the future? Can we guide pipe through crane path?