# Wrap-up

- Carsten
  - There is a wide range of possible applications (in and out of HEP) for this technology
- Hao
  - Qualification of the test bench performance improving greatly
  - Cross-section compares (surprisingly) well with theory for N2
  - Good proposal for why the signals for N2 and Ne are so similar – good news!
  - Cockcroft gas background will always be (?) dominated by the e-gun
- Stefano
  - We now know that SR and particle background will be a major issue
  - We have an estimate that ‘black’ means 0.2% reflectivity, at least in the acceptance of the optical system
  - Working on a value for maximum safe pressures in the LHC

- Johanna/Marton on SR background
  - There are nice tools that allow for a detailed SR background picture
  - SR masks should be possible, but will they cause more problems by scattering?
    - Should we just slightly increase the RF screen ID to make a shadow?
- Serban
  - Argon is still an interesting option
  - Results with protons show good comparison with theory for both N2 and Ne
  - Image processing is extremely important!!
  - Should we consider an emCCD camera?
  - Should we be looking for combinations of spectral lines with broader filters?
- Carsten
  - Cockcroft finances OK for the v3 demonstrator
  - There is the option for someone to come and work at CERN (on the e-lens?)
  - There is additional technician support planned at Cockcroft
  - Many options for publications, conference and peer-review.

- Adriana
  - E-beam is larger, as we want to use from injection at 450 GeV
  - No show-stoppers from the e-beam simulations so far
  - We need to integrate the BGV v3 into the e-lens test stand.
- Tom/Johanna – design
  - Input from different parts of the layout – is this doable?
  - Baffle leak-tightness is very important
- Marton
  - Good simulations, but still limited by input from S1 and by scaling with the densities from the v2 prototype
  - We can reduce the diameters
- Guiseppe
  - No obvious solution for the nozzle zone
  - Resources for phase 2 need to be agreed

- Barbara
  - I still don’t understand expansion into a vacuum
  - Any other (optimized) nozzle geometry should be better than a flat plate to maximise density
- Johanna – blackening
  - We have good options available at different levels of performance and cost
- Tom
  - Keep working with BGV and PANDA as there seem to be many mutual benefits.

# Actions

- Experimental programme
  - Alignment - remove and check?
  - Understanding of the results from the nozzle-skimmer separation
  - Can we get more detail from the moveable gauge on the edges of the curtain
  - Maximise the gas density at the intereaction…!
  - Final measurements for Run2 with ions
  - Measurements with Argon
  - Re-analyse the LHC data to try to find beam (Stefano, Serban)
  - Send the primary pump to Cockcroft for test
  - What pressure do we really need in the nozzle chamber.
  - Agree a list of different skimmers to manufacture
  - Test the CERN CD nozzle

- Design
  - Integrate the drawings into the e-lens test stand
  - Check transport zone size.
  - Ideally, would like to instrument horizontal, pump not on top and viewport not on bottom. Will see if that works.
  - Gerhard - check the different zones and their use.
- Simulation
  - What pressure do we really need in the nozzle chamber.
  - Produce a model for the gas density for Argon. Also for cluster formation
  - Limits and consequences for increasing the gas jet width
  - SR background in the BGC environment
  - Cockcroft will share reports for nozzle design and Fresnel lens
  - Design the optimal nozzle…
- Project management
  - Specification - what are we asking for?
  - Carsten Google drive with list of forthcoming publications as a ‘roadmap’

- Thanks to all our visitors for coming
- Thanks to Gerhard and team for the excellent organisation