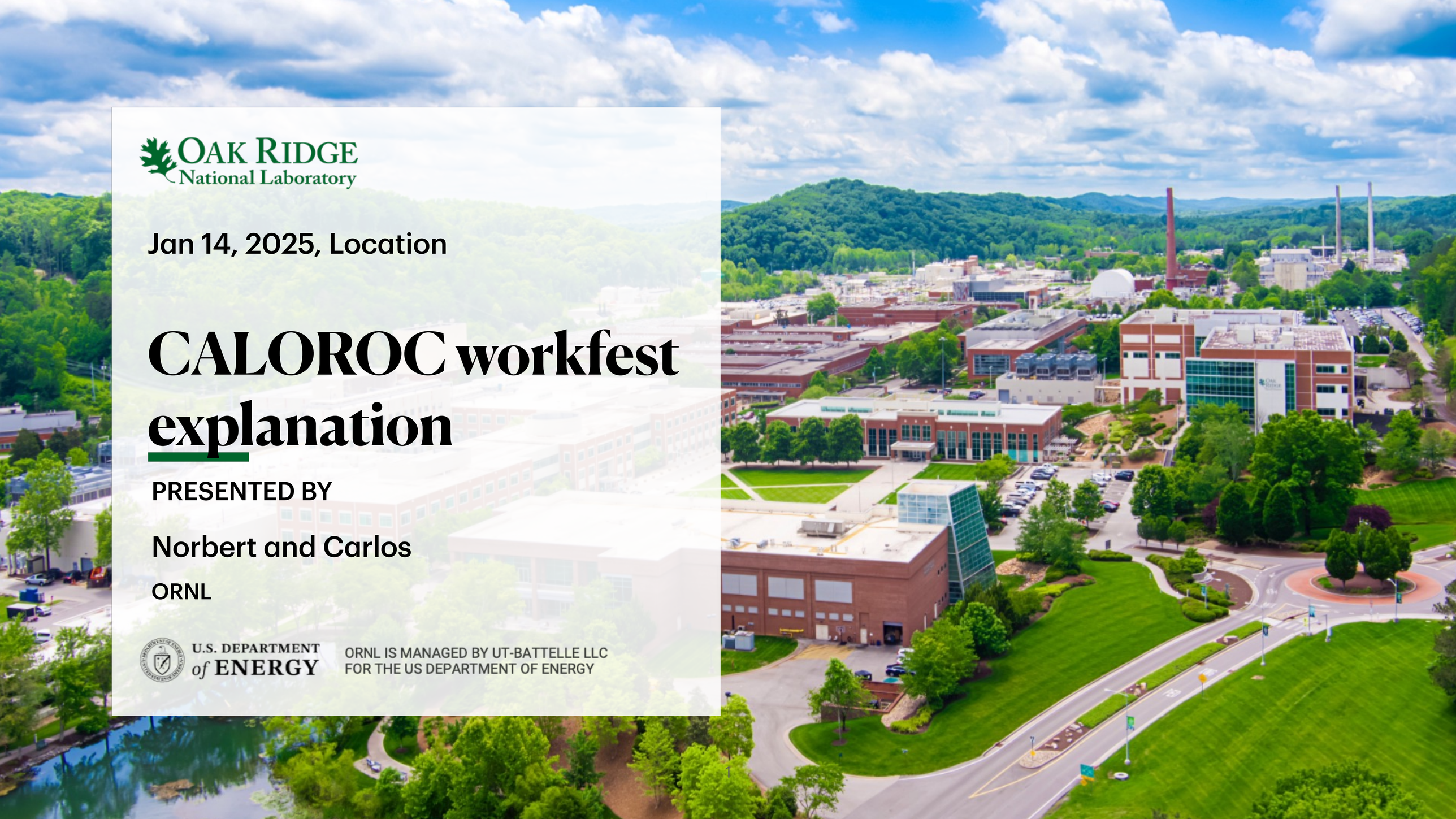

OAK RIDGE National Laboratory

Jan 14, 2025, Location

CALOROC workfest explanation

PRESENTED BY

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ORNL

U.S. DEPARTMENT of ENERGY

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Introduction

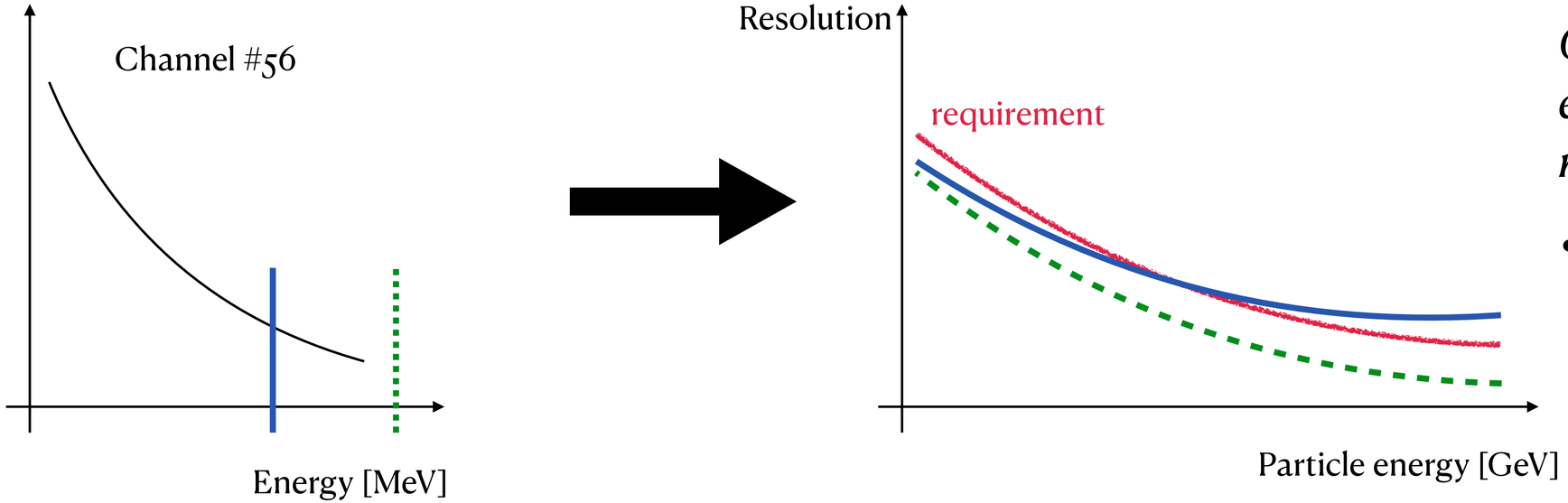
- CALOROC1 A and B are expected to be received in March 2026:
  - These are exactly the same preamp as the H2GCROC:
    - ADC, TOT, TOA for the CALOROC1 A
    - ADC, ADC(switch gain), TOA for the CALOROC1 B
  - We need to give a feedback this calendar year to Omega in order to design the CALOROC2:
    - Only one, has to be chosen for A or B
- Purpose of this workfest is to start constraining the design:
  - By end of the year we should have created a document with figures justifying the design requirements and choices - simulation, measurements

Questions

1. What is the capacitance of the detector per channel? (pF)
2. What is the lowest signal measurement required? (fC)
3. What is the highest signal measurement required? (fC)
4. Do you have a measurement with certain settings of MIP peak, other fixed signal? (With the H2GCROC and settings)
5. What is the charge resolution requirements? (Percentage as a function of charge, not in bits)
6. What is your timing requirements/measurements?
7. What is the expected occupancy per channel from simulation? (Including full background)
8. What is the maximum hit rate per channels needed if all channels are activated at the same time?
9. What is the expected dark noise rate?
10. What is the maximum hit rate required for a single channel? (If only one receives signal)
11. What is the double pulse separation needed? Overlap signals from two independent bunch crossings? (This affects small or large signals differently in your detector?)
12. How many number of samples you require as minimum (max is 7 now in CALOROC)?
13. What is the preference for A or B for CALOROC?

Answers

- Short slides with a figure (or two) explaining the choice of the answer:
  - Please if you have no idea then skip the question (like Q13 about A or B)
- Most of the answers should be supported by simulation/measurements, there was a great effort in the last two years to make the simulation more realistic (all the backgrounds, geometries, etc)
- Example



Cartoon to justify the maximum energy measurement (dynamic range) for the channel:

- *Saturation of the readout ASIC will effect the large energy resolution*