



# Deliverable 1.2: low-MTE photocathodes integration in existing photoinjectors



**Identification of beamlines** for a potential experimental demonstration of the simultaneous generation of low-emittance and high-charge ( $\sim 100$  pC) bunch, using CBB low-MTE photocathodes and diagnostics, that when coupled with a bunch-compression beamline would produce beams with 5D normalized brightness  $I/\varepsilon^2 > 10^{15}$  A/m<sup>2</sup>.

- **Progress/Current Activities:**
  - Exploring possible facilities where an integrated test could be performed.
  - Investigating transverse brightness preservation during compression of low-emittance bunches.
- Pending successful outcome: this deliverable will morph into a prioritized deliverable to carry relevant experiment(s) at available facilities [**would probably need to have a good plan w/ commitment from a facility by mid CY23**].



# Open questions/status



- Some simulations/optimization (preliminary stage)
  - FAST/IOTA 40 MeV injector (Jared)
  - PEGASUS injector (Jared?)
  - AWA (Emily Frame, started)
  - Other candidates facility
- How do we identify best candidates?
  - Change of success (cathode compatibility – INFN-type for FAST/PEGASUS, ANL-type for AWA)
  - Available diagnostics (will need some work at FAST+AWA)
  - Interest in pushing beam brightness (+ taking on a new photocathode)
  - Beam time allocation + compatibility with nominal operation + available laser.

Should we pursue parallel efforts?

