



Cornell Laboratory for  
Accelerator-based Sciences and Education (CLASSE)

# Welcome / Introduction



Jan. 5, 2011

ERL Phase 1B Gun External Review

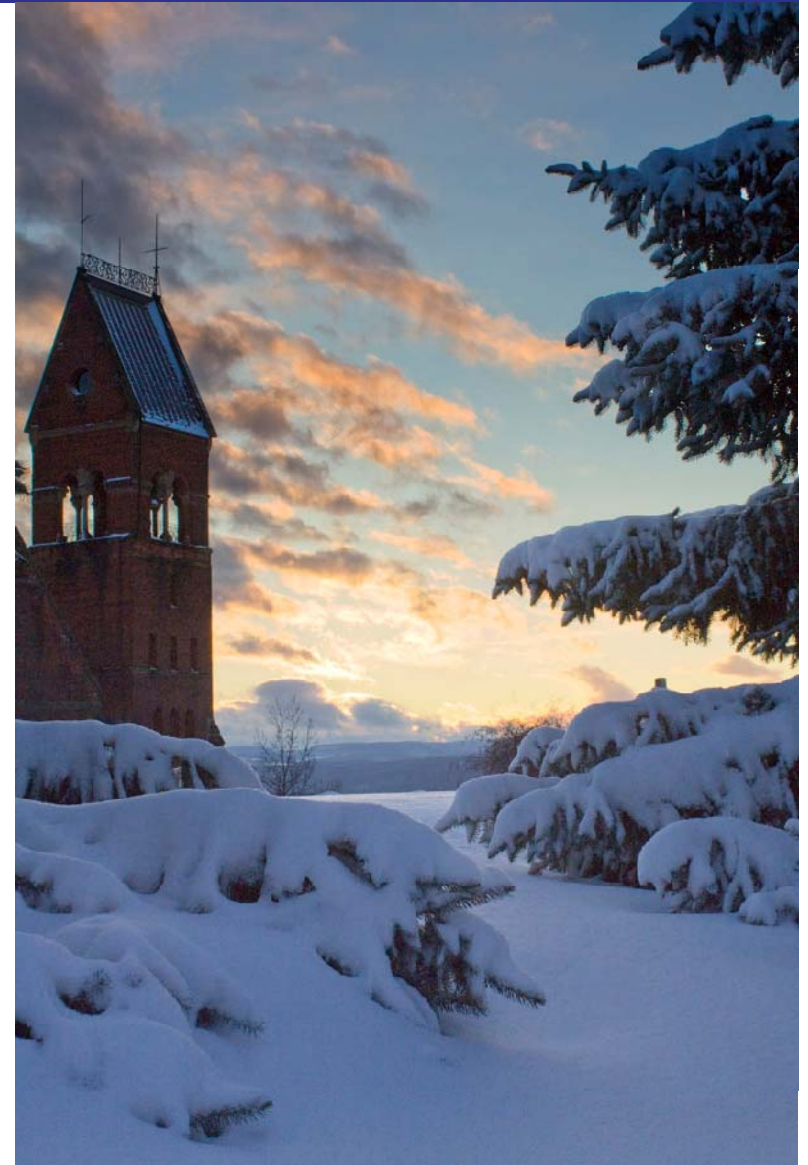
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## Thank you for joining us

Goal: to progress rapidly towards a second generation DC photocathode gun, at the state of the art, and operational this summer.

Further: this gun should allow for both reliable routine operation and for ***experimental development over a broad parameter space.***





## *experimental development over a broad parameter space*

- We do not expect the level of complexity proposed would be incorporated into a gun destined for routine operation.
- We expect that after a period of development parameters would be fixed and the gun would be rebuilt for incorporation into the prototype injector linac.
- Examples:
  - adjustable gap would be replaced after range of gaps are explored – bellows and drive system removed simplifying vacuum system
  - Intermediate electrode tested to determine if worth the additional challenges
- Some foresight needed now to determine what experiments are most important to explore for future guns.



Ivan Bazarov – ERL Project Co-PI

Joe Conway – Cathode Preparation System

Luca Cultrera – Cathode Growth (Multi Alkali system)

Bruce Dunham – ERL Project Director

Siddharth Karkare – Cathodes / e- energy analyzer

Yulin Li – Cathodes and Vacuum

Xianghong Liu – Cathodes (GaAs system)

Jared Maxson – Beam Dynamics / Optimization

Bill Schaff – III-V semiconductor materials and devices

Karl Smolenski – Gun Systems Engineering

Zhi Zhao – Laser Systems



David Dowell - SLAC

Carlos Hernandez-Garcia - JLab

Matt Poelker – JLab (Chair)

Charlie Sinclair – Cornell (ret.)

Will Waldron - LBNL



Schedule and all presentations online at:

<http://edms.classe.cornell.edu/agenda/>

- Flexible and driven by committee
- Concrete to speculative
- Overview to details
- Please interrupt, ask questions, discuss



- Review performance and status of current gun (Mk. I)
- Overview of Mk. II gun
- Brief Tour (30 min.) / Lunch Discussion
- Electrode design
- Solenoidal focusing within the gun
- Gun parameter optimization / beam dynamics
- High voltage systems (HVPS, SF<sub>6</sub> PV, Insulator Design)
- Ion back-bombardment simulation
- Vacuum system overview



- GaAs cathode development
- e- energy analyzer
- MultiAlkali cathode development (CsKSb)
- Dual gap guns (intermediate voltage electrodes)
- Cathode cooling / cryogenic cathodes
- Committee Input for future R&D
- Opportunities for collaborations
- Lunch
- New directions for future DC guns (Mk. III)
- Executive session (hopefully ending before 3pm)
- More extensive tours for anyone staying over





- Men's room – down one flight and to right.
- Coffee, snacks, water in the hall.
- Lunch will be in this room both days
- Dinner this evening together

Any questions?