

# **Photocathode Physics for Photoinjectors 2012**

## **Report of Contributions**

Contribution ID: 0

Type: **not specified**

## Workshop Welcome

*Monday, October 8, 2012 8:30 AM (10 minutes)*

**Presenter:** BAZAROV, Ivan (Cornell)

**Session Classification:** Session 1 - Workshop Welcome, Reviews

Contribution ID: 1

Type: **not specified**

## **Review of recent European Cathode Workshop**

*Monday, October 8, 2012 8:40 AM (25 minutes)*

**Presenter:** DOWELL, David (SLAC)

**Session Classification:** Session 1 - Workshop Welcome, Reviews

Contribution ID: 2

Type: **not specified**

## **Review of recent U Chicago photocathode/detector workshop**

*Monday, October 8, 2012 9:05 AM (25 minutes)*

**Presenter:** SMEDLEY, John (BNL)

**Session Classification:** Session 1 - Workshop Welcome, Reviews

Contribution ID: 3

Type: **not specified**

## **Memories of the previous P3 workshop**

*Monday, October 8, 2012 9:30 AM (15 minutes)*

**Presenter:** RAO, Triveni (BNL)

**Session Classification:** Session 1 - Workshop Welcome, Reviews

Contribution ID: 4

Type: **not specified**

## **Measurements of transverse momentum of photoelectrons from metals and alkali antimonide semiconductors**

*Monday, October 8, 2012 10:15 AM (25 minutes)*

**Presenter:** VECCHIONE, Theo (LBNL)

**Session Classification:** Session 2 - New significant developments and relevant measurements

Contribution ID: 5

Type: **not specified**

## **Measuring the growth of alkali antimonides using in-situ XRD and x-ray reflectivity**

*Monday, October 8, 2012 11:05 AM (25 minutes)*

**Presenter:** SCHUBERT, Susanne (HBZ)

**Session Classification:** Session 2 - New significant developments and relevant measurements

Contribution ID: 6

Type: **not specified**

## Open Discussion or Contributed Talks

*Monday, October 8, 2012 11:30 AM (30 minutes)*

**Session Classification:** Session 2 - New significant developments and relevant measurements



Contribution ID: 7

Type: **not specified**

## **Measurement of the chemistry and growth of alkali antimonides using in-situ AFM and XPS**

*Monday, October 8, 2012 10:40 AM (25 minutes)*

**Presenter:** OSES, Miguel Ruiz (BNL)

**Session Classification:** Session 2 - New significant developments and relevant measurements

Contribution ID: 8

Type: **not specified**

## **Fabrication, characterization and use of alkali antimonides in a dc gun**

*Monday, October 8, 2012 1:00 PM (25 minutes)*

**Presenter:** CULTRERA, Luca (Cornell)

**Session Classification:** Session 2 - New significant developments and relevant measurements

Contribution ID: 9

Type: **not specified**

## **MBE growth of GaAs photocathodes for the Cornell ERL photoinjector and effect of roughness on emittance**

*Monday, October 8, 2012 1:25 PM (25 minutes)*

**Presenter:** SCHAFF, Bill (Cornell)

**Session Classification:** Session 2 - New significant developments and relevant measurements

Contribution ID: **10**

Type: **not specified**

## Open Discussion or Contributed Talks

*Monday, October 8, 2012 2:30 PM (30 minutes)*

**Session Classification:** Session 2 - New significant developments and relevant measurements

Contribution ID: 11

Type: **not specified**

## **Surface characterization of GaAs photocathodes and high current operation experience**

*Monday, October 8, 2012 1:50 PM (25 minutes)*

**Presenter:** HERNANDEZ-GARCIA, Carlos (JLAB)

**Session Classification:** Session 2 - New significant developments and relevant measurements

Contribution ID: 12

Type: **not specified**

## **Reduction of emittance from metals to less than thermal**

*Monday, October 8, 2012 3:40 PM (15 minutes)*

**Presenter:** FENG, Jun (LBNL)

**Session Classification:** Session 2 - New significant developments and relevant measurements

Contribution ID: 13

Type: **not specified**

## **Growth and operation of Pb/Nb photocathodes in SRF gun**

*Monday, October 8, 2012 3:55 PM (15 minutes)*

**Presenter:** SCHUBERT, Susanne (HZB)

**Session Classification:** Session 2 - New significant developments and relevant measurements

Contribution ID: 14

Type: **not specified**

## **Cathode characterization and analysis at DESY**

*Monday, October 8, 2012 4:10 PM (15 minutes)*

**Presenter:** LEDERER, Sven (DESY)

**Session Classification:** Session 2 - New significant developments and relevant measurements



Contribution ID: 15

Type: **not specified**

## **Workfunction and Quantum Efficiency studies on Cesium Telluride**

*Monday, October 8, 2012 4:25 PM (15 minutes)*

**Presenter:** HARKAY, Katherine (ANL)

**Session Classification:** Session 2 - New significant developments and relevant measurements

Contribution ID: 16

Type: **not specified**

## Open Discussion or Contributed Talks

*Monday, October 8, 2012 5:25 PM (35 minutes)*

**Session Classification:** Session 2 - New significant developments and relevant measurements

Contribution ID: 17

Type: **not specified**

## Monte Carlo Scattering Corrections to Moments-Based Emission Models

*Tuesday, October 9, 2012 9:20 AM (25 minutes)*

**Presenter:** MONTGOMERY, Eric (UMD)

**Session Classification:** Session 3 - Photocathode physics I: new insights in theory and modeling

Contribution ID: **18**

Type: **not specified**

**KEK**

**Presenter:** TBD (KEK)

Contribution ID: 19

Type: **not specified**

## **Models of effect of roughness on emittance**

*Tuesday, October 9, 2012 10:15 AM (25 minutes)*

**Presenter:** DOWELL, Dave (SLAC)

**Session Classification:** Session 3 - Photocathode physics I: new insights in theory and modeling

Contribution ID: 20

Type: **not specified**

## Cs surface effects

**Presenter:** TBD (UMD/NRL)

Contribution ID: 21

Type: **not specified**

## **One-step model of photoemission and extensions to the three-step model**

*Tuesday, October 9, 2012 10:40 AM (25 minutes)*

**Presenter:** WAN, Weishi (LBNL)

**Session Classification:** Session 3 - Photocathode physics I: new insights in theory and modeling

Contribution ID: 22

Type: **not specified**

## **Monte-Carlo simulations of Charge transport and photoemission from GaAs photocathodes**

*Tuesday, October 9, 2012 8:30 AM (25 minutes)*

**Presenter:** KARKARE, Siddharth (Cornell)

**Session Classification:** Session 3 - Photocathode physics I: new insights in theory and modeling



Contribution ID: 23

Type: **not specified**

## **Modeling Electron Emission from Diamond-Amplified cathodes**

*Tuesday, October 9, 2012 8:55 AM (25 minutes)*

**Presenter:** DIMITROV, D. A. (TechX)

**Session Classification:** Session 3 - Photocathode physics I: new insights in theory and modeling

Photocathode P... / Report of Contributions

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Contribution ID: 24

Type: **not specified**

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**Presenter:** TBD (UCLA)

Contribution ID: 25

Type: **not specified**

## Open Discussion

*Tuesday, October 9, 2012 9:45 AM (15 minutes)*

**Session Classification:** Session 3 - Photocathode physics I: new insights in theory and modeling

Contribution ID: 26

Type: **not specified**

## **Redesigning Cs<sub>2</sub>Te: Workfunction Lowering and Quantum-Efficiency Preservation via Acetylation**

*Tuesday, October 9, 2012 1:00 PM (15 minutes)*

**Presenter:** HARKAY, Katherine (ANL)

**Session Classification:** Session 4 - Photocathode physics II: towards photocathode material engineering

Contribution ID: 27

Type: **not specified**

## Plasmonic photocathodes

**Presenter:** SCHREODER, Andreas (UI Physics)

Contribution ID: 28

Type: **not specified**

## Surface science techniques

*Tuesday, October 9, 2012 1:15 PM (15 minutes)*

**Presenter:** HESS, Wayne (PNNL)

**Session Classification:** Session 4 - Photocathode physics II: towards photocathode material engineering

Contribution ID: 29

Type: **not specified**

## Nano-cavity plasmonic photocathodes

*Tuesday, October 9, 2012 3:15 PM (15 minutes)*

**Presenter:** POLYAKOV, Alex (LBNL)

**Session Classification:** Session 4 - Photocathode physics II: towards photocathode material engineering

Contribution ID: 30

Type: **not specified**

## Grating based plasmonic photocathodes

*Tuesday, October 9, 2012 3:30 PM (15 minutes)*

**Presenter:** MUSUMECI, Pietro (UCLA)

**Session Classification:** Session 4 - Photocathode physics II: towards photocathode material engineering



Contribution ID: 31

Type: **not specified**

## **Genetic optimization technique for bandgap tuning**

**Presenter:** MONTANO, Ines (SNL)

Contribution ID: 32

Type: **not specified**

## Open Discussion or Contributed Talks

*Tuesday, October 9, 2012 2:40 PM (20 minutes)*

**Session Classification:** Session 4 - Photocathode physics II: towards photocathode material engineering

Contribution ID: 33

Type: **not specified**

## Update on the photocathode wiki-project

*Wednesday, October 10, 2012 9:10 AM (10 minutes)*

**Presenter:** KARKARE, Siddharth (Cornell)

**Session Classification:** Session 5 - Future outlook and collaborations

Contribution ID: 34

Type: **not specified**

## **Cathode production and supply, useful things to track, photocathode website**

*Wednesday, October 10, 2012 8:30 AM (25 minutes)*

**Presenter:** SERTORE, Daniele (INFN)

**Session Classification:** Session 5 - Future outlook and collaborations

Contribution ID: 35

Type: **not specified**

## **LBNL gun as a test venue for various cathodes**

*Wednesday, October 10, 2012 8:55 AM (15 minutes)*

**Presenter:** SANNIBALE, Fernando (LBNL)

**Session Classification:** Session 5 - Future outlook and collaborations

Contribution ID: 36

Type: **not specified**

## Open Discussion for Future Collaboration

*Wednesday, October 10, 2012 11:00 AM (1 hour)*

**Session Classification:** Session 5 - Future outlook and collaborations

Contribution ID: 37

Type: **not specified**

## **Outlook and 2-year plans from each group (1 slide in advance)**

*Wednesday, October 10, 2012 10:30 AM (30 minutes)*

**Session Classification:** Session 5 - Future outlook and collaborations

Contribution ID: **38**

Type: **not specified**

## Summary of the workshop

*Wednesday, October 10, 2012 9:50 AM (25 minutes)*

**Presenter:** SINCLAIR, Charlie

**Session Classification:** Session 5 - Future outlook and collaborations



Contribution ID: 39

Type: **not specified**

## Open Discussion for Future Collaborations

Contribution ID: 40

Type: **not specified**

## **Development of high performance photocathodes for microscopy and accelerators**

*Monday, October 8, 2012 3:15 PM (25 minutes)*

**Presenter:** JIN, Xiuguang (Nagoya University)

**Session Classification:** Session 2 - New significant developments and relevant measurements

Contribution ID: 41

Type: **not specified**

## **DMD-Based Quantum Efficiency Mapping and Self-Healing of Hybrid Diffuser Dispensers**

*Monday, October 8, 2012 4:40 PM (15 minutes)*

**Presenter:** MONTGOMERY, Eric (UMD)

**Session Classification:** Session 2 - New significant developments and relevant measurements

Contribution ID: 42

Type: **not specified**

## Open Discussion or Contributed Talks

*Tuesday, October 9, 2012 11:45 AM (15 minutes)*

**Session Classification:** Session 3 - Photocathode physics I: new insights in theory and modeling

Contribution ID: 43

Type: **not specified**

## Open Discussion

*Tuesday, October 9, 2012 3:45 PM (15 minutes)*

**Session Classification:** Session 4 - Photocathode physics II: towards photocathode material engineering

Contribution ID: 44

Type: **not specified**

## Open Discussion or Contributed Talks

*Wednesday, October 10, 2012 9:30 AM (20 minutes)*

**Session Classification:** Session 5 - Future outlook and collaborations

Contribution ID: 45

Type: **not specified**

## **Modeling the Resupply, Diffusion, and Evaporation of Cesium Based Dispenser Photocathodes**

*Tuesday, October 9, 2012 11:05 AM (25 minutes)*

**Presenter:** PAN, Zhigang (NRL)

**Session Classification:** Session 3 - Photocathode physics I: new insights in theory and modeling

Contribution ID: 46

Type: **not specified**

## **Electron effective mass: Emittance and efficiency**

*Tuesday, October 9, 2012 1:30 PM (25 minutes)*

**Presenter:** SCHROEDER, Andreas (UIC)

**Session Classification:** Session 4 - Photocathode physics II: towards photocathode material engineering



Contribution ID: 47

Type: **not specified**

## Operation of the High-Charge PHIN RF Photoinjector with Cs<sub>3</sub>Sb Cathodes

*Monday, October 8, 2012 4:55 PM (15 minutes)*

**Primary author:** HESSLER, Christoph (CERN, Geneva, Switzerland)

**Co-authors:** CHEVALLAY, Eric (CERN, Geneva, Switzerland); DOEBERT, Steffen (CERN, Geneva, Switzerland); FEDOSSEEV, Valentin (CERN, Geneva, Switzerland)

**Presenter:** HESSLER, Christoph (CERN, Geneva, Switzerland)

**Session Classification:** Session 2 - New significant developments and relevant measurements

Contribution ID: 48

Type: **not specified**

## Status OF CsBr Photocathodes

*Tuesday, October 9, 2012 1:55 PM (15 minutes)*

**Primary author:** Dr MALDONADO, Juan (SLAC National Accelerator Laboratory)

**Co-authors:** Ms TRAUTWEIN, Ann (SLAC National Accelerator Laboratory); Dr DOWELL, David (SLAC National Accelerator Laboratory); Dr CORBETT, Jeffrey (SLAC National Accelerator Laboratory); Dr PIANETTA, Piero (SLAC National Accelerator Laboratory); Mr PARK, Sam (SLAC National Accelerator Laboratory); Dr CLAY, William (Stanford University)

**Presenter:** Dr MALDONADO, Juan (SLAC National Accelerator Laboratory)

**Session Classification:** Session 4 - Photocathode physics II: towards photocathode material engineering

Contribution ID: 49

Type: **not specified**

## Photocathodes for Rossendorf SRF gun

*Monday, October 8, 2012 5:10 PM (15 minutes)*

**Primary author:** Dr XIANG, Rong (Helmholtz-Zentrum Dresden-Rossendorf)

**Co-authors:** Dr ARNOLD, Andre (Helmholtz-Zentrum Dresden-Rossendorf); Dr TEICHERT, Jochen (Helmholtz-Zentrum Dresden-Rossendorf); Dr MICHEL, Peter (Helmholtz-Zentrum Dresden-Rossendorf); MURCEK, Petr (Helmholtz-Zentrum Dresden-Rossendorf)

**Presenter:** Dr XIANG, Rong (Helmholtz-Zentrum Dresden-Rossendorf)

**Session Classification:** Session 2 - New significant developments and relevant measurements

Contribution ID: 54

Type: **not specified**

## German-Russian collaboration on high-brightness photocathodes

*Wednesday, October 10, 2012 9:20 AM (10 minutes)*

**Primary authors:** SCHMEISSER, Martin (Helmholtz Centre Berlin); Dr KAMPS, Thorsten (Helmholtz Centre Berlin)

**Presenter:** SCHMEISSER, Martin (Helmholtz Centre Berlin)

**Session Classification:** Session 5 - Future outlook and collaborations

Contribution ID: 55

Type: **not specified**

## **Measurements and modeling of space charge assisted photoemission at PITZ**

*Tuesday, October 9, 2012 11:30 AM (15 minutes)*

**Primary author:** KRASILNIKOV, Mikhail (DESY)

**Presenter:** KRASILNIKOV, Mikhail (DESY)

**Session Classification:** Session 3 - Photocathode physics I: new insights in theory and modeling

Contribution ID: 56

Type: **not specified**

## Nanostructured Photoelectron Sources for Electron Beamlet Array Generation

*Tuesday, October 9, 2012 2:10 PM (15 minutes)*

**Primary authors:** Dr SWANWICK, Michael (Massachusetts Institute of Technology); Dr HOBBS, Richard (Massachusetts Institute of Technology)

**Co-authors:** Prof. KAERTNER, Franz (Massachusetts Institute of Technology); Prof. BERGGREN, Karl (Massachusetts Institute of Technology); Prof. VELASQUEZ-GARCIA, Luis (Massachusetts Institute of Technology); Mr KEATHLEY, Phillip (Massachusetts Institute of Technology); Dr GRAVES, William (Massachusetts Institute of Technology); Mr YANG, Yujia (Massachusetts Institute of Technology)

**Presenters:** Dr SWANWICK, Michael (Massachusetts Institute of Technology); Dr HOBBS, Richard (Massachusetts Institute of Technology)

**Session Classification:** Session 4 - Photocathode physics II: towards photocathode material engineering

Contribution ID: 57

Type: **not specified**

## High Aspect Ratio Si Photoelectron Emitter Arrays

*Tuesday, October 9, 2012 2:25 PM (15 minutes)*

**Presenter:** KEATHLEY, Donnie (MIT)

**Session Classification:** Session 4 - Photocathode physics II: towards photocathode material engineering

Contribution ID: 58

Type: **not specified**

## **K2CsSb cathode tests at JLAB**

*Monday, October 8, 2012 2:15 PM (15 minutes)*

**Presenter:** RAO, Triveni (BNL)

**Session Classification:** Session 2 - New significant developments and relevant measurements