

# Pico-Second Workshop VII

## The Development of Large-Area Psec Photo-Devices

### February 26-27, 2009: Argonne National Lab

Version 1.0 Feb. 14, 2009

*Session 1 Chair: Karen Byrum (ANL-HEP)*

#### Thurs February 26, 2008 8:30 am Welcome and Introduction

8:30 - 8:40 Harry Weerts, Director, High Energy Physics Division Welcome

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#### Session 1: State of the Art with Glass MCP's

*Topics: State-of-the-art for Timing with MCP's; Early design choices, Pitfalls to be avoided.*

8:40 - 9:00	Goals of the Workshop	Henry Frisch (UChicago)
9:00 - 9:25	History and Design Choices for MCP's	Oswald Siegmund (SSL)
9:25 - 9:50	Can We Meet the Requirements with MCP-based Photomultipliers?	Jon Howorth (Photek)
9:50 - 10:15	TOF Measurements with MCP's	Jerry Va'vra (SLAC)
10:15 - 10:30	Coffee	

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*Session 2 Chair: Gary Varner (UHawaii)*

#### Session 2: Time Evolution and Pulse Formation

*Topics: Factors determining TTS, cathode jitter, first-strike jitter, jitter from pores, anode collection, space-charge saturation, anodes, signal processing*

10:30 - 10:55	MCP effects with potential TTS consequences	Oswald Siegmund (SSL)
10:55 - 11:20	Saturation (Space-charge, Current&Rate Limits)	Anton Tremsin (SSL)
11:20 - 11:45	Overview of Anodes and Front-End Electronics	Jean-Francois Genat (UChicago)
11:45 - 12:10	Open	Open
12:10 - 1:15	Lunch (ANL Cafeteria)	

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*Session 3 Chair: Jerry Va'vra (SLAC)*

#### Session 3: Large-Area MCP's: AAO/ALD

*Topics: AAO; Pore parameters, Materials, Ions, Aging*

1:30 - 1:55	Advances in Anodic Alumina	Patrick Nedelec (Lyon)
1:55 - 2:20	Experience Using AAO for MCP's	Hau Wang (ANL-MSD)
1:20 - 2:45	Prospects and Limitations of AAO/ALD Submicro- and Microchannel Structures for Large Area MCPs	Dmitri Routkevitch (Synkera)
2:45 - 3:10	Characteristics of Substrates for MCP's	Neal Sullivan (Arradance)
3:10 - 3:25	Coffee	

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*Session 4 Chair: Patrick Nedelec (Lyon)*

#### Session 4: Surface Chemistry and Physics

*Topics: Surface Issues- Materials, Secondary Emission, Facilities*

3:30 - 3:55	Operational Experience with ALD-based MCP's	Neal Sullivan (Arradance)
3:55 - 4:20	Capabilities&Limitations of Atomic Layer Deposition	Jeffrey Elam (ANL-ES)
4:20 - 4:45	Measuring Secondary Emission Properties	Igor Veryorkin (ANL-MSD)
4:45 - 5:10	Simulation of Secondary Emission Properties	Zeke Insepov (ANL-MCS)
5:10 - 5:30	Surfaces: Diagnostic Facilities/Tools/What Not To Do	Michael Pellin (ANL-MSD)

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6:00 - 6:30 Happy Hour (Freund Lodge)

6:30 - 8:30 Dinner (Freund Lodge)

Session 5 Chair: Patrick LeDu (Lyon)

**Friday February 27, 2008 8:30 am**

8:30 - 8:40 Bob Rosner, Director, Argonne National Laboratory Welcome

**Session 5: Photo-Cathodes**

*Topics: Materials, Properties, Fabrication*

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8:40 - 9:00	Photo-cathode Theory, Materials and Parameters: QE, Time Jitter, Spectral Response	Oswald Siegmund (SSL)
9:00 - 9:20	Large Area Photo-Cathodes	Daniel Ferenc (UC-Davis)
9:20 - 9:40	Advanced Photo-Cathode Materials	Daniel Leopold (WashU.)
9:40 - 10:00	Nanoparticle Photo-Cathodes	Klaus Attenkofer (ANL-APS)
10:00 - 10:15	Argonne Photo-cathode R&D	Zikri Yusof (ANL-HEP)
10:15 - 10:30	Coffee	

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Session 6 and 7 Chair: Hogan Nguyen (FNAL)

**Session 6: Other Issues: Windows, Frame, Vacuum**

*Topics: Spectral characteristics of windows, conducting layers, vacuum, surface purity, aging*

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10:30 - 10:55	MCP Windows: Absorption, Transmission, Reflection, Conduction, Fibers	Anton Tremsin (SSL)
10:55 - 11:20	Vacuum and Getters	Paul Hink (Photonis)
11:20 - 11:45	Aging	Oswald Siegmund (SSL)

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**Session 7: Alternative Methods, Geometries**

*Topics: Alternatives to AAO*

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11:20 - 11:45	VLSI Semiconductor and N/MEMS Fabrication	David Winn (Fairfield)
11:45 - 12:10	Aerogel	Michael Pellin (ANL-MSD)
12:10 - 12:30	Can Diamond out perform MCPs?	Jon Howorth (Photek)
12:30 - 1:30	Lunch (ANL Cafeteria)	

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Session 8 Chair: Hau Wang (ANL-MSD)

**Session 8: Testing**

*Topics: What do we test as we develop? What facilities exist? Are they available and at what price?*

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1:30 - 1:50	Photek Test Capabilities	Panos Kapetanopoulos (Photek)
1:50 - 2:10	ANL Test Capabilities	Bernhard Adams (ANL-APS)
2:10 - 2:30	LAAP/Minsk Test Capabilities	Patrick Nedelec (Lyon)
2:30 - 2:50	SSL Test Capabilities	Anton Tremsin (SSL)
2:50 - 3:10	Technology of Photo-Cathode Production	Emile Schyns (Photonis)
3:10 - 3:25	Coffee	

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Session 9 and 10 Chair: Henry Frisch (UChicago)

**Session 9: Simulation**

*Topics: What do we want to know; what tools do we have; what has been simulated and compared to data; how do we interface particle-, device-, and electronics-simulation packages?*

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3:25 - 3:50	Questions to be Answered by Simulation	Patrick LeDu (Lyon)
3:50 - 4:15	MCP Simulations: State of Art	Valentin Ivanov (Muons.Inc)
4:15 - 4:35	MCP Simulations: What Do We Need as Input?	Anton Tremsin (SSL)

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**Session 10: Longterm Planning for Development of Large-Area Photo-detectors**

*Topics: AAO, ALD functionalization, vacuum assembly, New Designs for large area, Specs and Considerations*

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4:35 - 5:00	The DOE Perspective on a Large Area Detector	Howard Nicholson (DOE)
5:00 - 6:00	Plan/Steps/Facilities/People/Funding	Discussants
6:00	End of Workshop	