

# FINAL CALL FOR PAPERS

*The 2010 U.S. WORKSHOP on the PHYSICS  
and CHEMISTRY of II-VI MATERIALS*

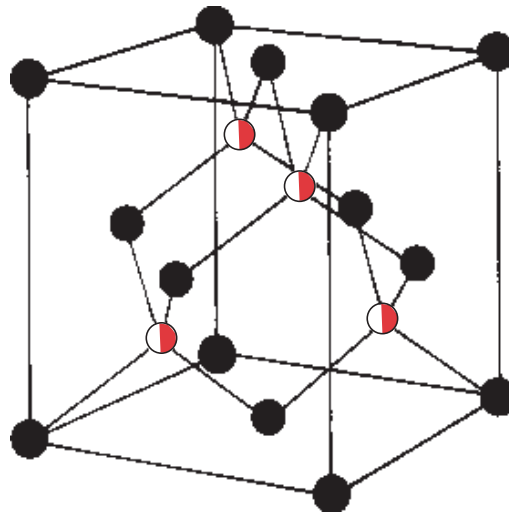
Sheraton New Orleans  
October 26–28, 2010  
New Orleans, Louisiana

## II-VI Detector Materials

- IR
- UV
- Gamma-Ray
- X-Ray
- Photovoltaic
- CdZnTe
- HgCdTe
- ZnO

## Special Sessions

- Superlattices: Strained and Unstrained
- II-VI Based Solar Cells
- Alternatives to CdZnTe Substrates
- HgCdTe Avalanche Photodiodes
- X-Ray and Gamma-Ray Detectors
- Surfaces and Interfaces
- ZnO Materials and Devices
- Defects and Doping



## **Participating Agencies**

*U.S. Army RDECOM CERDEC Night Vision & Electronic Sensors  
Directorate*

*U.S. Army Research Laboratory  
U.S. Army SMDC*

*U.S. Navy Electro-Optics Center  
Penn State University*

*Office of Naval Research*

*Air Force Research Laboratory*

*Army Research Office*

*The Minerals, Metals & Materials Society*

## **Endorsed by**

*The American Physical Society*

<http://www.ii-viworkshop.org>

## 2009 II-VI WORKSHOP

### Purpose

The purpose of this Workshop is to bring together the industrial, governmental, and academic communities that work with II-VI materials. These II-VI materials are critical in a wide range of detector technologies operating in the infrared, ultraviolet, x-ray, and gamma-ray regions of the spectrum. They include HgCdTe, ZnSe, ZnO, and CdTe, as well as other II-VI semiconductors and alloys. Spectrometers, imagers, and other sophisticated systems exploiting various properties of these materials are finding applications in many fields, including national security, homeland security, medicine, industrial process monitoring, basic science, and more. The Workshop aims at advancing the understanding of the basic physics and chemistry of these materials, and thereby contributes to the continual improvement of these system capabilities.

The 2010 Workshop is the 29th in a series that began in 1981.

### Areas of Interest

Areas covered include a broad range of disciplines and materials properties. Included are materials growth and characterization, materials engineering, intrinsic and extrinsic defects and dopants, surface chemistry, fabrication processes, electrical properties and modeling, charge transport, noise sources, optical properties, photorefraction, electro-optical and magneto-optical properties, as well as the interaction among all these.

### Workshop Format

The Workshop program will consist of about 60 oral presentations. Invited and contributed papers with a common theme will be grouped for presentation.

To provide ample time for discussion, there are scheduled morning and afternoon breaks. Lunch will be provided, affording additional discussion time. To further promote informal discussion and interaction, the first day will conclude with a wine and cheese reception accompanied by tabletop displays from commercial vendors displaying products and services of interest to the Workshop community.

Authors of accepted papers are encouraged to submit full-length manuscripts, which will be peer reviewed and published as part of the Workshop proceedings in a Special Issue of the *Journal of Electronic Materials*.

Student participation is strongly encouraged. An award recognizing the best student paper will be presented at the conclusion of the Workshop. Funding exists to support travel to the Workshop. Some student financial assistance is available for conference attendees.

### **Keynote Address**

**Dr. Philip Perconti,**

*U.S. Army RDECOM CERDEC NVESD*

**“U.S. Army Challenges and Opportunities for the II-VI Community”**

### **Invited Speakers**

**Dr. Philippe Ballet,**

*CEA/LETI, France*

**“Progress in MBE Growth at CEA/LETI”**

**Dr. Madhu Reddy,**

*Raytheon Vision Systems*

**“MBE Growth of HgCdTe on Large-Area Si and CdZnTe Substrates”**

**Dr. Donald Lee,**

*Teledyne Imaging Systems*

**“MCT on Alternative Substrates”**

**Prof. Gary Wicks,**

*University of Rochester*

**“Applications of nBn and Other Heterostructures for Dark Current Suppression in IR Detectors”**

**Dr. David Rhiger,**

*Raytheon Vision Systems*

**“Performance Comparison of LWIR Type-II Superlattice Devices with HgCdTe”**

**Dr. Michael Carmody,**

*EPIR Technologies*

**“II-VI Semiconductors for Photovoltaic Solar Energy Harvesting”**

**Dr. Arnab Basu,**

*Kromek*

**“Novel Method of Growth of High Quality CdTe Crystals and Applications in the Radiation Detection and Imaging Markets”**

### **Selected Focus Topics**

***Substrates for HgCdTe: CdZnTe and Alternative Product Availability – What Works and What Doesn’t***

***Junction Formation Techniques: Limitations and Advantageous***

- *Heterostructures vs. Homojunctions*
- *Planar vs. Mesa*
- *Interface/lattice mismatch limitations*

## GENERAL TOPICS

The scope of the Workshop includes the basic physics and chemistry of all II-VI materials and their applications. Materials of interest include HgCdTe, ZnSe, ZnO, CdTe, and CdZnTe. Issues in the following critical areas are of interest:

- **Emerging Detector Technologies**
  - Multiband Detectors
  - Near-Room-Temperature IR Devices
  - HgCdTe Avalanche Photodiodes
- **X-Ray & Gamma-Ray Radiation Detectors**
- **Radiation Effects in HgCdTe**
- **II-VI-Based Solar Cells**
- **Materials Growth and Characterization**
  - Control of composition, carrier concentration, and lifetime
  - Novel material and device structures
  - Modeling of growth and processing
  - Equilibrium and non-equilibrium growth
- **Substrates for HgCdTe: CdZnTe and Alternatives**
- **Defects and Doping**
  - Physics of Failure
  - Characterization, particularly non-destructive
  - Effect on electrical and optical properties
  - Thermodynamics
  - P-doping issues in HgCdTe
  - Impurities
  - Diffusion
  - Activation and segregation
  - Dislocations: generation mechanisms, properties, kinetics, characterization, mitigation
- **Surfaces and Interfaces**
  - Etching, passivation, and metallization
- **Modeling and Simulation**
  - Material properties
  - Growth and processing
  - Device physics
- **Characterization of Materials**
  - Electrical, optical, and microstructural characterization
  - Defects and impurities
  - Contactless and other non-destructive methods
  - Device-material correlations
- **ZnO Materials and Devices**
- **Strained Layer Superlattices: III-IV and II-V**

## **CALL FOR PAPERS**

Papers describing significant advances in the state of the art of scientific results and understanding in the Workshop issues are solicited. Experimental results or theoretical results addressing experiments are encouraged. Emphasis should be on new fundamental physics and chemistry of materials for detector applications. Abstracts must contain results to be considered.

Papers will be selected on the basis of (1) originality, (2) significance of results, (3) quality and completeness of the research, and (4) breadth of interest.

Extended abstracts of all accepted papers will be published in the *Book of Extended Abstracts*, which will be distributed at the Workshop. Submitted full-length manuscripts, after peer review, will be published in the *Journal of Electronic Materials (JEM)*.

## **WORKSHOP WEB SITE**

**(<http://www.ii-viworkshop.org>)**

The Workshop Internet Web page has the latest information on the Workshop and is updated as information becomes available.

## ABSTRACTS

1. Abstracts, suitable for publication, should clearly indicate the following:
  - a. original aspects of research
  - b. objective and approach of work
  - c. previous publications or presentations
  - d. experimental data
  - e. scientific implications of results
2. One-page abstracts should be double spaced on a single 8½ × 11-in. sheet of paper. One (1) additional page of supporting figures will be accepted and is encouraged. The title, author(s), and affiliation(s) must be included.
3. A complete mailing address (phone, fax, and e-mail) of the presenter must be included.
4. Abstracts to be considered as student papers must be identified as such, and the name of the advisor must also be included.

5. Abstracts are to be submitted before June 4, 2010 to: <http://www.sheridanprinting.com/pcm/iivi/iivi.cfm>

Please enter the information requested and be sure to attach a copy of your abstract.

For assistance, please contact Ralph Nadell at:  
Palisades Convention Management  
The 2010 II-VI Workshop  
411 Lafayette Street, Suite 201  
New York, NY 10003  
212/460-8090, ext. 203, fax -5460  
e-mail: [madell@pcm411.com](mailto:madell@pcm411.com)

6. Foreign authors requiring a visa are encouraged to submit their abstracts as early as possible. Special consideration will be made to ensure that an early application for a visa can be made.
7. Authors of accepted papers will be notified by July 1, 2010. Authors of accepted papers are requested to submit a revised abstract, not to exceed four pages, for inclusion in the *Book of Extended Abstracts* by September 1, 2010.
8. Full-length papers for publication in the Workshops Proceedings in a Special issue of the *Journal of Electronics Materials* must be submitted electronically by using the link on the Workshop's Web page (<http://www.ii-iworkshop.org>). The authors can submit manuscripts from October 1 to November 5, 2010.

## WORKSHOP CALENDAR

Deadline for Submission of Abstracts	June 4, 2010
Notification of Accepts/Rejects	July 1, 2010
Deadline for Late-News Abstracts	August 3, 2010
Deadline for Extended Abstracts	September 1, 2010
Hotel Reservation Deadline	October 4, 2010
Registration Deadline	October 8, 2010
Electronic Paper Submission for Publication	October 1 – November 5, 2010
2010 II-VI Workshop	October 26–28, 2010

## **WORKSHOP ORGANIZATION**

### **CO-CHAIRS**

S. M. Johnson, *Raytheon Vision Systems*  
T. H. Myers, *Texas State University – San Marcos*

### **PROGRAM COMMITTEE**

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\*Proceedings Co-Editor

\*Web Site Manager

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e-mail: Rnadell@pcm411.com

## **WORKSHOP PARTICULARS**

### **Location and Date**

The 2010 II-VI Workshop will be held October 26–28, 2010 at the Sheraton New Orleans, New Orleans, Louisiana.

### **Registration**

The Workshop Registration Card, available on-line in June 2010, should be completed and mailed/faxed to:

Palisades Convention Management  
The 2010 II-VI Workshop  
Attn: Ralph Nadell  
411 Lafayette St., Suite 201  
New York, NY 10003  
Fax: 212/460-5460

The deadline for Workshop registration is October 8, 2010. The registration fee for all attendees, except full-time university students, will be \$695. The special student fee will be \$150. The fees include lunches, refreshments, a copy of the *Book of Extended Abstracts*, and a soft-bound copy of the Workshop proceedings in a Special Issue of the *Journal of Electronic Materials*. A hard-bound copy of the Workshop proceedings can be purchased for an additional \$40. Please make all checks, drawn from a U.S. bank in U.S. dollars, payable to The II-VI Workshop.

### **Location and Date**

A block of rooms has been reserved at the Sheraton New Orleans at special Workshop rates. A limited number of rooms will be available to Government employees and university staff/students with proper identification. If calling for reservations, the hotel must be advised that you are a II-VI Workshop attendee to obtain these special rates. On-line hotel reservations will be available through the Workshop Web site in early June. Reservations received after the cut-off date of October 4, 2010 will be subject to availability.

### **Student Financial Assistance**

To help defray the cost of attending the Workshop, the registration fee for students will be \$150. In addition, full-time students presenting papers will receive up to \$650 in support. This support must be requested in advance of the Workshop.

**THE II-VI WORKSHOP  
411 LAFAYETTE ST., SUITE 201  
NEW YORK, NY 10003**

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