

# Yongdong Zhou (US Citizen)

**Address:**

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A senior engineer/scientist and successful high school teacher, university professor of 8-year teaching experiences, with professional leading research experiences of Ge/Si X-ray, and Gamma-ray, and particle detectors, HgCdTe IR FPAs, InGaAsP/InP DFB laser diodes, CdZnTe Gamma-ray image detector arrays, etc.

## I. WORKING EXPERIENCES

### A. ACADEMIC TECHING AND SCIENTIFIC RESEARCH EXPERIENCES

1. Post Doctor Research Associate, Research Assistant Professor, Phys. Dep., University of Illinois at Chicago. May 2001 to Feb. 2004
  - Worked as the only device specialist in the lab on advanced HgCdTe infrared detector development. Developed RT operating, Very long wavelength, Avalanche, etc. HgCdTe detectors for DOD, NASA, and NIH, etc. projects.
  - Did detector design, photolithograph mask design, fabricate, dicing saw, wire bonding, loading, testing, reports, all the way to presentations for the lab etc.
2. Assistant, Associate Professor at Thin Film Lab, Phys. Dep., Soochow University, P.R.China. June 1997 to May 2001
  - Courses taught: General College Physics, Semiconductor Ceramic Materials, Principal Sensor Applications, Electronic Material Property Research Methods
  - Did 9 Scientific Research Grants as “Principal Investigator” on semiconductor material research and semiconductor device developments.
  - University 3<sup>rd</sup> Generational Excellent Young Backbone Faculty Award, Dec. 1999
  - University Outstanding Faculty Award of 1999
  - University 1998 Summer Excellent Supervisor Award
3. High school Physics Teacher: September 1, 1987 to July 18, 2001, Qutang Advanced High School, Haiian, Jiangsu province, P.R.China
  - Courses taught: High School Physics, Architecture Mechanics, Olympic Physics Special Training programs

### B. MANUFACTURING and R&D WORKING EXPERIENCES

1. VP and Chief Scientist, MicroPho Corp, Oak Ridge, Tennessee. July 2010 to Present.
  - New products, technology development.
  - Patent and project development and application.
2. PROCESS ENGINEER on Silicon & Germanium X-Ray and Gamma Ray Detector at AMETEK ORTEC, Oak Ridge, Tennessee. July, 2006 to June, 2010
  - Worked as the only active device engineer on High Purity Germanium (HPGe) X-ray and Gamma Ray detector manufacturing line. AMETEK ORTEC has been leading the word with her HPGe and Si X-ray and Gamma Ray detector fabricate technology for about half century.
  - Doubled, tripled the HPGe detector production lines.
3. SENIOR SCIENTIST on CdZnTe X-Ray and Gamma Ray Detector fabrication at MicroPho Corp, Oak Ridge, Tennessee. Sep. 2004 to June 2006

- Developed CdZnTe Ohm contact technique for detector application.
  - Developed CdZnTe single element, 16×16, and 32×32 X-ray and Gamma ray detector arrays.
4. SENIOR SCIENTIST on CdZnTe Crystal Growth Manufacturing at Yinel Tech Inc., South Bend, Indiana. March 2004 to Aug. 2004
    - Worked on CdZnTe Vertical Bridgman crystal growth and annealing improvement.
    - Set up clean room for company.
  5. DEVICE PROCESS ENGINEER at Photonami Inc., Chicago, IL. Nov. 2002 to Feb. 2004
    - Worked on developing III-V (InGaAsP/InP) 1310nm, 1550nm InGaAsP/InP surface emitting DFB Laser Diodes.

## II. EDUCATION

- **Post Doctor** on “Semiconductor Device” at University of Illinois at Chicago, 05/2001- 10/2002 HgCdTe Infrared Detector
- **Ph.D.** on “Semiconductor Physics and Semiconductor Device Physics” at Chinese Academy of Sciences, 09/1994 – 06/ 1997 HgCdTe Infrared Detector
- **Master degree** on “Solid State Physics” at Chinese Academy of Sciences, 09/1991 – 06/1994 Luminescent Porous Silicon Research
- **University** on “Physics” at Nanjing Normal University, P.R. China, 09/1983-06/1987

## III. Master Degree Students Supervised and Financially Supported

1. **Bangli Liang**, master degree thesis “InGaAsSb Infrared Detector Experiment Fabrication Study”  
 Scientific paper published as my student, “The Material Construction Design and Numerical Simulation of GaInAsSb Multi-junction PIN Photovoltaic Infrared Detector”, LIANG Bangli<sup>1,2</sup>, XIA Guanqun<sup>1</sup>, ZHOU Yongdong<sup>2</sup>, FAN Shuping<sup>2</sup>, *Chinese Journal of Research and Progress of Solid State Electronics*, 2002, Vol(1)
2. **Caiyun Wu**, master degree thesis “Organic Light-Emitting Film and device Experimental Fabrication Study”  
 Scientific paper published as my student, “Sputtering Growth of BaTiO<sub>3</sub> Thin Films and The Films’ Property Studies”, WU Cai-Yun JI Xiao-Bing FAN Shu-Ping ZHOU Yong-Dong CHU Jun-Hao WANG Kang-Jie, *Chinese Journal of Research and Progress of Solid State Electronics*, 2001. Vol (3), pp.361-365)

## IV. Others:

- Publication Summary:** Published over 50 publications in various kinds of reputable journals. Publication list is available upon request.
- Presentation Summary:** did 6 Invited Presentations and 10s of others. Presentation list is available upon request
- Awards as Principal Investigator:** Received and successfully fulfilled 9 scientific research grants on optoelectronics materials and devices
- Grants as Investigator:** did over 10 grants from such as: *NASA, NIH, and USA Army Research Laboratory*, etc. as chief investigator.
- Computer related:** JMP, Auto CAD, Microsoft Word, PowerPoint, Excel, GammaVision, Maestro, PDF, Fortran, Basic, Origin, etc.

## V. Some Hand-on Clean Room Experiment Skills

1. **Wet process, Photolithograph related hand on**
  - **Mask Design, CAD Drawing and Data Conversion for Pattern Generate:** GCA MANN Model 3600F Pattern Generator experience

- **Mask Fabrication:** both chromium & iron oxide mask fabricate experiences
- **Photolithograph:** Karl Suss MJB3, MA6, etc. Mask aligner experiences. Lots of experiences on both positive & negative Photoresists, such as AZ 1811 (positive), AZ 1818 (positive), AZ 4400 (positive), AZ 5214 (positive & negative), etc.
- **Special Photolithograph technique:** for 10 micron thick metal film lift off
- **Nomarski Microscope and Surface Profile etc. for process monitoring:** Optical profilometer and Mechanical profilometer experience, such as Veeco Wyko NT 3300 Surface Optical Profilometer, Tencor P-1 Long Scan Surface Profiler, etc. experiences.
- **AFM for E-beam pattern transfer characterization:** Contact mode and Tapping mode. Nanoscope III AFM/STM system experiences

## 2. Thin Film Clean Room Hand-on Skills

- Electron beam: CdT, ZnS, Ti, Cr, Ni, In, Pt, and Au etc. experiences
- Sputtering:  $\alpha$ -Si,  $\alpha$ -Ge, SiN, BaTiO<sub>4</sub>, Al, Ti, Pt, Au, and Ni etc. experiences
- Large area ion beam sputtering: CdT, ZnS, Cr, Pt, and Au etc. experiences
- Thermal evaporation deposition: CdT, ZnS, In, Pd, Au, Ni, and Li etc. experiences
- PECVD: SiO<sub>2</sub> experience
- MBE growth: Riber Opus 45 system experience for CdTe on Silicon wafer

## 3. Some Other Hand-on Clean Room Skills

- **Surface Precise Polishing Technique:** Lapping, Mechanical, Chemo-mechanical polishing
- **Crystal wafer precise cutting:** Wire Saw & Dicing Saw
- **Plasma Device Crystal Surface Cleaning** for residue of the resist
- **Vacuum technique:** Mechanical pump, Diffusion pump, Turbo pump, Sublimation pump, Ion pump and Cryopump experiences
- **Hand on Spectra Test Techniques:** FTIR absorption spectrum, Raman spectrum, X-ray Photoelectron Spectroscopy, etc. experiences
- **Etching:** both dry (Wide ion beam, RIE and Plasma Surface Clean and Etching) and wet Etching
- **Wire Bonding:** Ball, Wedge bonding, manual cool and thermal micro soldering
- **Annealing:** HgCdTe p-type activation, CdZnTe crystallography improving, thin film property improvement, Rear earth luminescent center activation, N-type Germanium Li diffusion etc.
- **Device Test:** I-V, C-V, D\* (Detectivity), R (Responsivity), N (Noise), R<sub>0A</sub>,  $\gamma$ -Ray resolution spectrum related etc.
- **And More:** SEM, TEM, Chemical Wet process Techniques, Photo-Luminescence Spectrum Techniques, X-ray diffraction, Detector loading, Ohm Contact, Packaging

## VI. References: (please notify me before contact any of them)

1. Dr. Zhiqiang Mao, Professor, Department of Physics, Penn State University, Email: [zim1@psu.edu](mailto:zim1@psu.edu), Phone: 8148657258, Cell: 5044609197, Fax: 5048628702. Relationship: University classmate
2. Dr. Zhisheng Shi, Professor, School of Electrical, Computer Engineering, College of Engineering, University of Oklahoma. Email: [shi@ou.edu](mailto:shi@ou.edu), Phone: 4053254292, Secretary: 4053254721, Fax: 4053257066.
3. Dr. Yonghang Zhang, Professor, Electrical Engineering at Arizona State University. Director of ASU Nanofab and the Center for Photonics Innovation, Email: [yhzhang@asu.edu](mailto:yhzhang@asu.edu), Phone: 4809652562, Fax: 4809650775, Web Page:<http://asumbe.eas.asu.edu>