

CHANGJUN HUANG

187 MRI Bldg., 230 Innovation Blvd., University Park, PA 16802

Tel: (814) 863-4339 • Email: cuh11@psu.edu

EXPERIENCE

2006 – present: **Research Associate** – *Pennsylvania State University, Material Research Institute, University Park, Pennsylvania, USA*

Promote interdisciplinary research activities for the NSF-funded nanofabrication facility. Activities include facilitating cross-disciplinary external collaborations, and initiating optoelectronic materials and devices-related research projects.

2005 – 2006: **Research scientist** - *University of Delaware, Department of Electrical and Computer Engineering, Newark, Delaware, USA*

Explore photonic devices for millimeter-wave imaging and detection system:

1. Design and fabricate broad-band LiNbO₃ optical modulator with bandwidth up to 95 GHz; Develop and optimize whole processing with critical processes including waveguide diffusion, LiNbO₃ etching, and high aspect-ratio electrode formation.
2. Utilize finite element method to analyze and optimize modulator design; Generated Matlab code handles anisotropic material; Design RF interface between antenna and optical modulator with commercial HFSS software.
3. Program with Labview to demonstrate an RF scanning image system.
4. Built W-band RF detector with the fabricated modulators; the pixels have high sensitivities with NETDs less than 7 K.

2003 – 2004: **Postdoctoral Fellow** - *University of Toronto, Department of Material Science and Engineering, Toronto, Ontario, Canada*

Investigated high-efficiency organic light emitting devices for flat panel display applications:

1. Discovered that C₆₀ can be used to boost electron injection and form an ohmic cathode, hence drastically reduce driving voltage and power consumption of the OLEDs. Found the passivation effect of a thin LiF interlayer between Al and C₆₀ preserves the ohmic contact.
2. Demonstrated a new method to control hole injection to improve efficiency of OLED by tuning surface Fermi level of semiconductor (especially Si).
3. Built software models for OLED spectrum analysis and prediction.
4. Maintained a five-chamber vacuum deposition system for the OLED fabrication.

1998 – 2003: **Research Assistant** - *Institute of Semiconductors, Chinese Academy of Sciences, State Key Laboratory of Optoelectronics, Beijing, China*

Research on Ge/Si quantum dots (QDs) and Si-based photonic devices:

1. Studied growth mechanism and optical properties of Ge QDs. Found the self-wrapping Ge/SiGe structure and the strain-induced alloy phenomenon through AFM analysis; Revealed how the oblique alignment in QD stacks can help increasing size uniformity of self-assembled QDs with TEM ; Observed different transfer paths between hole and electron in a QDs' with PL experiment.
 2. Designed and fabricated photonic devices such as SiGe Mach-Zehnder optical modulator, tunable Si optical filter, and resonant-cavity-enhanced SiGe photodetector.
 3. Applied holographic lithography to pattern substrate for QDs growth to improve uniformity.
 4. Maintained an UHV-CVD system for SiGe epitaxy.
-

EDUCATION

2002 Ph. D. in Microelectronics and Solid-state Electronics, graduated with honor
Institute of Semiconductors, Chinese Academy of Sciences, Beijing, China
Thesis topic: Physics and device application of self assembled Ge quantum dots

1998 Bachelor of Science in Applied Physics
and Bachelor of Engineering in Computer Software
University of Science and Technology of China, Hefei, China

AWARDS

2002 Dean Prize of Chinese Academy of Sciences (Special honor[†])
[†] Awarded annually to the top-10 among ~20,000 graduates in Chinese Academy of Sciences

2001 Dean Scholarship of Chinese Academy of Sciences

1997 University Outstanding Student Scholarship

1996 University Outstanding Student Scholarship

PROFESSIONAL SOCIETIES

Member, IEEE
Member, SPIE

SELECTED PUBLICATIONS

1. “Development of photonic devices for MMW imaging and sensing”, **C. J. Huang**, C. Schuetz, R. Shireen, T. Hwang, S. Shi, and D. W. Prather, Defense and Security Symposium, Proc. SPIE 6232, 62320Q (2006).
 2. “Quasimetallic behavior of carrier-polarized C-60 molecular layers: Experiment and theory”, Z. H. Lu, C. C. Lo, **C. J. Huang**, Y. Y. Yuan, M. W. C. Dharma-wardana, and M. Z. Zgierski, PHYSICAL REVIEW B 72, Art. No. 155440 (2005).
 3. “Passivation effect of Al/LiF electrode on C60 diodes”, **C. J. Huang**, D. Grozea, A. Turak, and Z. H. Lu, APPL. PHYS. LETT. 86, Art. No. 033107 (2005).
 4. “Cavity-enhanced photoluminescence of SiGe/Si multi-quantum wells grown on silicon-on-insulator substrate” C. B. Li, **C. J. Huang**, B. W. Cheng, Y. H. Zuo, R. W. Mao, L. P. Luo, J. Z. Yu, and Q. M. Wang, J. APPL. PHYS. 95, 5914 (2004).
 5. “Nanofabrication of patterned substrate by holographic lithography” **C. J. Huang**, X. P. Zhu, C. Li, Y. H. Zuo, B. W. Cheng, D. Z. Li L. P. Luo, J. Z. Yu, and Q. M. Wang, J. CRYST. GROWTH 236, 141 (2002).
 6. “Shape evolution of Ge/Si(001) islands induced by strain-driven alloying” **C. J. Huang**, Y. H. Zuo, D. Z. Li, B. W. Cheng, L. P. Luo, J. Z. Yu, and Q. M. Wang, APPL. PHYS. LETT. 78, 3881 (2001).
 7. “Different transfer paths for thermally activated electrons and holes in self-organized Ge/Si(001) islands in multilayer structure” **C. J. Huang**, Y. Tang, D. Z. Li, B. W. Cheng, L. P. Luo, J. Z. Yu, and Q. M. Wang, APPL. PHYS. LETT. 78, 2006 (2001).
-
-