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课题组主页: <https://mipros.tamu.edu/>

## 教育经历

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德州农工大学 博士 电子工程	Sept 2014 - May 2019
研究课题: 基于中红外电应用的光电调制器和传感器	
上海交通大学 硕士 电子与通信工程	Sept 2010 - May 2013
研究课题: 基于碳纳米管的场效应晶体管与光伏器件.	
南京邮电大学 学士 电磁场与微波技术	Sept 2006 - July 2010

## 科研经历

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研究助理/ 博士后研究员, 德州农工大学	Sept 2014 - Present
- 研究并设计了基于中红外应用的各种光集成原件包括光电调制器、光栅耦合器、环形谐振器、光学分束器等, 并对器件的结构和光学性能进行仿真分析	
- 研究了基于 barium titanate (BTO) 与 lithium niobate (LN)的光电调制器并实现在中红外波段的幅度调制 barium titanate (BTO)与 lithium niobate (LN)的光电调制器并实现在中红外波段的幅度调制.	
- 研究了多种中红外光波导传感器包括 Si-on-BTO/AlN sensor, flexible AlN sensor 与 micro-cavity sensor 并实现了血糖、 羟基化合物、石油气体、挥发性有机污染物等的检测.	

## 技能

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- 具有电子工程、光学物理以及材料科学等相关背景.
  - 具有光集成、电子集成元件的研究设计等相关经验,
  - 具有多年净化间半导体制造研究经验, 包括薄膜生长、沉积 (Evaporator, PLD, PECVD, LPCVD, MOCVD, ALD), 刻蚀 (ICP-RIE, CCP-RIE, DRIE, FIB), 光刻 (E-beam/photo lithography, Laser writer), 表征 (SEM, TEM, AFM, XPS, EDX, XRD, FTIR, Raman, Ellipsometry, Profilometry).

## 学术成果简述

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主要从事集成光电子器件, 非线性光学材料, 中红外传感器, 光电调制器等方面的研究。已研究开发了多种基于传统半导体材料 (无定形硅, 氮化铝, 氮化硅等) 的中红外波导传感器, 并成功实现了对血糖、 羟基化合物、石油气体、挥发性有机污染物等的检测; 研究了非线性光学材料 barium titanate (BTO)的生长以及基于 BTO 薄膜的中红外传感器与光电调制器, 并首次成功实现了对中红外波段光信号的极化调制。

近几年, 研究成果发表于 ACS Applied Materials & Interfaces, Analytical chemistry, Advanced Optical Materials, IEEE Journal of Selected Topics in Quantum Electronics 等国际高水平期刊, 发表期刊及会议论文 30 余篇。

## 部分期刊论文

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1. T. Jin, L. Li, B. Zhang, H.-Y. G. Lin, H. Wang, P. T. Lin, "Monolithic Mid-Infrared Integrated Photonics Using Silicon-on-Epitaxial Barium Titanate Thin Films," *ACS Appl. Mater. Interfaces*. 9, 21848-21855, 2017.
  2. T. Jin, Pao Tai Lin, "Efficient Mid-Infrared Electro-Optical Waveguide Modulators Using Ferroelectric Barium Titanate," *IEEE J. Sel. Top. Quantum Electron.* 26, 1-7, 2020.
  3. T. Jin, H.-Y. G. Lin, P. T. Lin, "Monolithically Integrated Si-on-AlN Mid-infrared Photonic Chips for Real-Time and Label-Free Chemical Sensing," *ACS Appl. Mater. Interfaces*. 9, 42905-42911, 2017.
  4. T. Jin, J. Zhou, Z. Wang, R. Gutierrez-Osuna, C. Ahn, W. Hwang, K. Park, P. T. Lin, "Real-time Gas Mixture Analysis Using Mid-Infrared Membrane Microcavities," *Anal. Chem.* 90, 4348-4353, 2018.
  5. T. Jin, J. Zhou, H.-Y. Lin, P. T. Lin, "Mid-Infrared Chalcogenide Waveguides for Real-Time and Non-Destructive Volatile Organic Compounds Detection," *Anal. Chem.* 91, 817-822, 2019.

6. J. Huang, T. Jin, S. Misra, H. Wang, Z. Qi, Y. Dai, X. Sun, L. Li, J. Okkema, H. Chen, P. Lin, X. Zhang, H. Wang, "Tailorable Optical Response of Au–LiNbO<sub>3</sub> Hybrid Metamaterial Thin Films for Optical Waveguide Applications," *Adv. Opt. Mater.* 6, 1800510, 2018.
7. T. Jin, L. Li, B. Zhang, H.-Y. G. Lin, H. Wang, P. T. Lin, "Real-Time and Label-Free Chemical Sensor-on-a-chip using Monolithic Si-on-BaTiO<sub>3</sub> Mid-Infrared waveguides," *Sci. Rep.* 7, 5836, 2017.
8. T. Jin, H.-Y. G. Lin, T. Tiwald, P. T. Lin, "Real-Time and Label-Free Chemical Sensor-on-a-chip using Monolithic Si-on-BaTiO<sub>3</sub> Mid-Infrared waveguides," *Sci. Rep.* 9, 4153, 2019.
9. T. Jin, J. Zhou, P. T. Lin, "Real-time and non-destructive hydrocarbon gas sensing using mid-infrared integrated photonic circuits" *RSC Advances*. 10, 7452-7459, 2020.
10. Pao Tai Lin, Hao-Yu Greg Lin, Zhaohong Han, Tiening Jin, Rachel Millender, Lionel C Kimerling, Anu Agarwal. "Label-Free Glucose Sensing Using Chip-Scale Mid-Infrared Integrated Photonics". *Adv. Opt. Mater.* 4, 1755-1759, 2016.