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高进伟, 教授, 博士生导师
Jinwei Gao, Dr. Prof.

研究领域:

- 1、新型柔性透明导电电极及其光电子器件应用
- 2、纳米结构光电催化制氢
- 3、柔性太阳能电池材料(有机小分子及其钙钛矿光伏电池)
- 4、太阳能海水淡化
- 5、分子尺度光热电能转换与运输机制研究

Research Interests:

1. Emerging nano-materials transparent conductive electrodes and the applications in flexible electronics;
2. Water splitting (bio-inspired structure);
3. Flexible solar cells (Perovskite solar cells, small molecule organic solar cells)
4. Solar-powered seawater desalination
5. Fundamental researches in solar, thermal, and electric energy conversion and transport mechanism.



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简介:

2010年4月毕业于华南理工大学, 获工学博士学位; 2007-2010年, 在美国麻省理工学院机械系陈刚院士课题组开展研究工作; 2010年4月-至今, 在华南师范大学华南先进光电研究院工作; 2015年晋升为教授, 博导。

近年来围绕能源与显示光电材料与器件研究方向开展了系列研究工作, 特别是在新型柔性透明导电薄膜的低成本设计和光电应用、钙钛矿太阳能电池以及光电材料的第一性原理计算方面开展了一些创新性工作。提出了多种金属网络透明电极的制备方法, 例如龟裂模板、仿生结构等。在Nature Communications、Advanced Materials、Advances in Physics、Nano Letters、Nano Today、Laser & Photonic Review, Small等期刊发表论文70多篇, 论文引用次数达2400多次; 申请国际国内发明专利25项(已经授权14项)。多篇论文在Advanced Materials, Advanced Materials Technologies, Small等以封面形式刊出, 同时被国内外多家主流科技媒体, 例如Science daily、Phys.org、中国科技日报等报道和转载。有关亚微米金属网络透明电极技术已经开始R2R中试生产, 具有较好的应用前景。

Personal CV:

Jinwei Gao is currently Professor of South China Academy of Advanced Optoelectronics at South China Normal University. He received his master degrees from Chemistry Department, Xiangtan University, China, in 2006. After that, he moved to South China University of Technology as a Ph.D. candidate. In spring of 2007, he was interviewed by Professor Gang Chen as a Joint Ph.D. candidate to receive a scholarship from China Scholarship Council (CSC). He joined Professor Chen's group in September 2007, until the end of 2009, he returned to China and obtained his PhD degree. He was an associate professor at South China Normal University from 2010, and was promoted to full professor in 2015.

Prof. Gao's research interests center on optoelectronic materials and devices, especially in flexible transparent conductors and the applications in modern electronics, such as solar cells, display and sensor. He has made important contributions to the emerging nanomaterial in ITO replacement, such as cracking metallic networks, fractal metallic networks, and nature inspired electronics. He and his collaborators exploited the unique fractal structure and the transport physics to advance the field of transparent conductors and their applications in solar cells and displays. His group also developed strategies to engineer nanostructures to achieve high efficiency perovskite solar cells, 3D fractal and hierarchical structures in water splitting and special concept for steam generation. By exploring those micro/nanoscale transport phenomena, Prof. Gao's group is advancing a wide range of technologies such as cracking metallic transparent conductor, fractal and stretchable transparent conductor, and high effective perovskite solar cells. Prof. Gao published more than 70 technical articles, including Nature Communications, Advanced Materials, Advances in Physics etc. He has over 25 granted and pending patents.

教育工作简历/Education and Professional Experience:

2015年-现在: 华南师范大学大学教授, 博士生导师

2015-present: Professor, Academy of Advanced Optoelectronics, SCNU

2010-2015: 华南师范大学大学副教授

2010-2015: Associate Professor, Academy of Advanced Optoelectronics, SCNU

2006-2010年博士毕业: 麻省理工学院(2.5年)/华南理工大学(1年) 工学博士
 2006-2010 Ph.D. Mechanical Engineering Department, MIT/ Chemical Engineering Department of South China University of Technology
 2003-2006年硕士毕业: 湘潭大学 物理化学理学硕士
 2003-2006 M.S Chemical Department of Xiangtan University

学术成果/Scientific achievements:

近5年来, 在Nature Communications、Advanced Materials、Advances in Physics、Nano Letters、Nano Today、Laser & Photonic Review, Small等重要期刊发表论文70多篇, 论文引用次数达2000多次; 申请国际国内发明专利25项, 授权14项。
 More than 70 technical articles, including Nature Communications, Advanced Materials, Advances in Physics etc. Over 25 granted and pending patents.

主持项目/Funds:

主持科技项目6项(包括国家自然科学基金项目1项, 广东省重大科技专项1项, 基金委面上项目1项, 广东省教育厅创新团队项目1项, 广东省引进高层次人才项目1, 中央财政支持地方高校发展项目1项等); 近5年来, 项目总经费约700万
 More than 7 million in recent 5 years, including NSFC, Guangdong Science and Technology funding, Renovation team etc.

科研活动/Professional activities:

学术会员 (AMSE, MRS, and OSA)
 Membership for AMSE, MRS, and OSA
 审稿期刊 (Advanced Materials, ACS Nano, Advanced Functional Materials, Advanced Energy Materials等40多种期刊)
 Referee of Advanced Materials, ACS Nano, Advanced Functional Materials, Advanced Energy Materials etc. More than 40 journals.
 2017 ACP 亚洲通讯与光子会议 第七专题co-主席
 Track co-chair – 2017 ACP Asia Communications and Photonics Conference
 2017年哈尔滨能源与量子调控会议 分会主席
 Session chair -2017 Harbin Energy and Quantum conference
 2015年全国新能源材料技术与应用研讨会分会主席
 Session chair-2015 Workshop in new energy materials and technologies

会议 (邀请) 报告/Conferences and Workshops (2014年以前)

- [1] Asia Communications and Photonics Conference (ACP), Guangzhou, on November 10-13, 2017. Co-chair for Track 7: Photonic for Energy.
- [2] Jinwei Gao, Sputtering/evaporation-free Processing of a Flexible Metallic Nanonetwork, ICFPE 2017, Jeju Island, Korea, Sept. 5-7, 2017
- [3] Jinwei Gao, 全湿法金属网络: from lab to pilot scale, 哈尔滨, August 9-12, 2017, invited talk, Session chair
- [4] 高进伟, Vacuum-free Processing of a Flexible Metallic Nanonetwork, C-MRS, 银川, 2017年7月9-12号, 口头报告
- [5] Jinwei Gao, Cost-effective solution-processed transparent conductive metallic networks for flexible optoelectronic applications, 2017年微纳调控青年学术国际研讨会Yinchuan, July 12 2017, invited
- [6] 高进伟, 金属网络类透明导电电极的设计, 运输机理及其应用, 2016年广东省物理年会, 2016年12月9日-11日, 韶关学院, 邀请报告
- [7] Jinwei Gao, Boosting the figure of merit of ribbon based metallic networks by electroplating, International conference on flexible and printable electronics, 6-9 September 2016, Yamagata University, Japan. Oral talk.
- [8] Jinwei Gao, Flexible transparent conductors, Forum of understanding on Nanomaterials and their interdisciplinary applications, 3-5 June 2016 WARSAW, Invited talk.
- [9] J. Gao*, Q. Peng, S. Li, B. Han, Q. Rong, X. Lu, G. Zhou, J.-M. Liu, Q. Wang, Z. Ren, others, Colossal figure of merit of transparent conducting nano-ribbon networks, March Meeting 2016 of the American Physical Society (APS) March 14-18, 2016 in Baltimore, Maryland, USA. Oral
- [10] 高进伟, 柔性透明电极及其薄膜光伏应用, 2015年全国新能源材料技术与应用研讨会, 27/11-30/11, 深圳, 邀请报告(Session chair).
- [11] Jinwei Gao*, Submicro-metallic networks as a high performance transparent conductors, 2015 Flexible and printable electronics (全国第五届柔性印刷电子研讨会 (FPEChina2015, Suzhou, China, Oral.
- [12] Jinwei Gao*, Low-cost Subwavelength metallic network as a high performance transparent conductor, 2015 International conference for top and emerging materials scientists (IC-TEMS 2015), 19-22 July, Lijiang, China, Invited talk.
- [13] Jinwei Gao*, Solution-Processed Metallic network as high performance transparent conductive electrode, International workshop on thin-films for electronics, electro-optics, energy and sensors (TFE3S), 4-6 July, 2015. University of Dayton China Institute, Suzhou, China. Session Chair and invited talk.
- [14] Jinwei Gao*, Solution-Processed Metallic Network as a High Performance Transparent Conductive Electrode, MRS, 1-5, December 2014, Boston (US), Poster.
- [15] Jinwei Gao*, Metallic Networks for Optoelectronic Applications, Progress in Electromagnetics Research Symposium (PIERS), 25-28, August 2014, Guangzhou (Canton), China, Session Organizer and invited talk.

10 Key Publications/10篇代表作

- [1] B. Han, Y. Huang, R. Li, Q. Peng, J. Luo, K. Pei, A. Herczynski, K. Kempa, Z. Ren, **J. Gao***, Bio-inspired networks for optoelectronic applications., **Nat. Commun.** 5 (2014) 5674. doi:10.1038/ncomms6674. (IF=11.5)
- [2] B. Han, Q. Peng, R. Li, Q. Rong, Y. Ding, E. Metin, K. Kempa*, **J. Gao***. Optimization of hierarchical structure and nanoscale-enabled plasmonic refraction for window electrodes in photovoltaics, **Nat. Commun.** 7(2016) 12825 DOI: 10.1038/ncomms12825. (IF=11.5)
- [3] R. Zheng, **J. Gao**, J. Wang, G. Chen*, Reversible temperature regulation of electrical and thermal conductivity using liquid-solid phase transitions., **Nat. Commun.** 2 (2011) 289. doi:10.1038/ncomms1288. (IF=11.5)
- [4] B. Han, K. Pei, Y. Huang, X. Zhang, Q. Rong, Q. Lin, Y. Guo, T. Sun, C. Guo, D. Carnahan, M. Giersig, Y. Wang, **J. Gao***, Z. Ren*, K. Kempa*, Uniform self-forming metallic network as a high-performance transparent conductive electrode, **Adv. Mater.** 26 (2014) 873–877. doi:10.1002/adma.201302950. (IF=19.5,封面文章) 高引论文
- [5] **Jinwei Gao***, and Krzysztof Kempa*, Michael Giersig, Eser Metin Akinoglu, Bing Han, and Ruopeng Li, Physics of Transparent Conductors. **Adv. Phys.** 65 (2016) 553–617 (**Invited Review**). (IF=20.1)
- [6] R. Li, Q. Peng, B. Han, Y. Ke, X. Wang, X. Lu, X. Wu, J. Kong, Z. Ren, E.M. Akinoglu, M. Giersig, G. Zhou, J.-M. Liu, K. Kempa*, **J. Gao***. Plasmonic refraction-induced ultrahigh transparency of highly conducting metallic networks, **Laser Photon. Rev.** (2016). doi:10.1002/lpor.201500271. (IF=8)
- [7] **J.W. Gao**, R.T. Zheng, H. Ohtani, D.S. Zhu, G. Chen*, Experimental investigation of heat conduction mechanisms in nanofluids. Clue on clustering, **Nano Lett.** 9 (2009) 4128–4132. doi:10.1021/nl902358m. (IF=12.5)
- [8] Zhike Xian, Bing Han, Songru Li, Chaobin Yang, Sujuan Wu, Xubing Lu, Xingsen Gao, Min Zeng, Qianming Wang, Pengfei Bai*, Michael J. Naughton, Guofu Zhou, Jun-Ming Liu, Krzysztof Kempa*, and **Jinwei Gao***. A Practical ITO Replacement Strategy: Sputtering-free Processing of a Metallic Nanonetwork, *Advanced Materials Technologies*, 2017, DOI: 10.1002/admt.201700061 (封面文章)
- [9] **J. Gao***, K. Pei, T. Sun, Y. Wang, L. Zhang, W. Peng, Q. Lin, M. Giersig, K. Kempa, Z. Ren, Y. Wang, Transparent nanowire network electrode for textured semiconductors, **Small.** 9 (2013) 733–737. doi:10.1002/smll.201201904. (封面文章)
- [10] Q. Peng, Songru Li, K. Pei, B. Han, R. Li, G. Zhou, J.-M. Liu, K. Kempa*, **J. Gao***, Colossal figure of merit in transparent-conducting metallic ribbon networks, **Advanced Materials Technologies**, 1(2016) 1600095. doi: 10.1002/admt.201600095. (封面文章)

奖励/Award and Honors:

- 2017年“华南师范大学科研工作先进个人”
- 2016年“中国十大新锐科技人物”（中国科协，知社）
- 2016年华南师范大学“爱岗敬业、教书育人”模范共产党员
- 2016年华南师范大学“十佳学生论文”指导老师（李若朋）
- 2015年广东省“南粤优秀教师”称号
- 2015年中国光学学会“王大珩”光学奖高校学生奖指导老师
- 2015年全国大学生挑战杯“特等奖”指导老师（韩兵、李若朋、彭强）
- 2015年华南师范大学“十佳学生论文”指导老师（韩兵）
- 2014年华南师范大学“十佳学生论文”指导老师（裴颖）
- 2015年广东省“优秀学生”指导老师（黄苑林）
- 2014年第七届全国大学生“创新创业年会”优秀奖指导老师（韩兵）
- 2014年第八届“全国高等学校物理教学实验研讨会”一等奖指导老师（韩兵）
- 2014年华南师范大学“研究院高的科技奖学金”一等奖指导老师（韩兵）
- 2013-2015年教育部研究生国家奖学金指导老师（裴颖、张玲海、韩兵）
- 2013年华南师范大学“十佳学生论文”指导老师（张玲海）
- 2013年华南师范大学“华藏奖学金”（裴颖）
- 2013年华南师范大学“曾永裕奖学金”（张玲海）

联系信息:

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