Amir Fathi

Curriculum Vitæ

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Highlight of Qualifications

- PhD degree from top three university of Taiwan
- Willingness to learn and meet the demands of new experiences
- Extensive lab experiences in both hardware & software
- Skilled researcher & analytical problem-solver

Research Interests

Super-resolution pump-probe laser scanning imaging

Ultrafast Laser spectroscopy & microscopy

Scientific instrument design and setup (hardware and software wise)

Education

2013–2020 **Ph.D**, *National Chiao Tung University*, Hsinchu.
Super-resolution Pump-Probe Imaging;
Transient Absorption Microscopy – SEM Mapping

2008–2010 **Master Degree**,
Univesity of Semnan, Semnan, Iran,
Solid State Physics (Crystal Growth),
GPA: 15.04/20.

2003–2008 **Bachelors Degree**,
Shahid Beheshti University, Evin, Tehran, Iran,
Solid State physics,
GPA: 13.83/20 (Stuents' GPA of the Department: 12.29/20).

Projects & Research

2017–2020 Mapping transient absorption images on SEM images

2014–2017 Constructing a pump-probe microscope for super-resolution imaging of nanoparticles

2017–2018 Construction of SS-PL system with TE-Cooled PD and demodulated with lockin amplifier for NIR region as sensitive as photon counting PMT in visible region

2016–2017 Design, simulation, print, assembly and test of tuned amplifier circuit as a cost effective replacement of lock-in amplifier

2013–2014 Femtosecond relaxation studies on perovskite solar cells

2010–2012 Rietveld refinement XRD analysis to Determine Composition Value in ZnS_xSe_{1-x} Single Crystals grown by CVT

2008–2010 Simulation, growth and characterization of single II-IV crystals by chemical vapor trasnport (CVT) though Chernov bulk diffusion model

Experiences

2018–2020 Handling and operating scanning electron microscope

2013–2020 Setting up ultrafast pump-probe laser scanning microscope

2013–2020 Ultrafast laser spectroscopy and microscopy studies in solar photovoltaic lab (NCTU)

2008–2011 CVT Crystal Growth optimization at University of Semnan

Rewards and Honors

2020 Top publication award for "A Direct Mapping Approach to Understand Carrier Relaxation Dynamics in Varied Regions of a Polycrystalline Perovskite Film"

2020 Top publication award for "Label-Free Optical Microscope Based on a Phase-Modulated Femtosecond Pump–Probe Approach with Subdiffraction Resolution"

2018 Top publication award for "Slow surface passivation and crystal relaxation with additives to improve device performance and durability for tin-based perovskite solar cells"

2013–2020 Rewarded NCTU Scholarship and tuition waver for during PhD program

2008–2010 Rewarded Governmental Academic Scholarship for Master's Degree

2003–2007 Rewarded Governmental Academic Scholarship for Bachelor's Degree

Conference Attended

December, 2018 **Annual Meeting of Taiwan Photonics Society**, NCTU (Tainan campus), Taiwan

March, 2012 **4th International Conference on Nanostructures (ICNS4)**, Kish Island, Iran

September, 2010 **Annual Physics Conference of Iran** held by the Physics Society of Iran, Bu-Ali Sina University, Hamedan, Iran

January, 2009 **Symposium on Quantum Computing and Quantum Information Processing and Experimental Aspects of Quantum Computing**, Shahid Beheshti University (IRI) and Kinki University (JPA)- Tehran, Iran

Technical Skills

Computer

- Programming in MATLAB, LabVIEW, Also familiar with R, python and java script
- Image Processing in ImageJ, Photoshop, Inkscape
- Typesetting with TEX & LATEXEngine
- XRD data analysis with FullProf Suit, MAUD

Scientific Instruments

- Calibration and maintanance of multi-zone box and tube furnaces
- Construction of femtosecond and nanosecond transient absorption spectroscopy systems and related measurements
- Design, simulation and printing of electronic filters
- Steady state photoluminiscence and UV-Vis measurements
- Construction of femtosecond pump-probe microscopy and related image processing
- Programming scientific acquisition systems with photodiod, PMT, APD, EMCCD and iCCD as a detector

Languages

Persian Native

English Fluent; iBT score: 95

Spanish Intermediate . . . . . *Español*

German Intermediate . . . . . *Deutsch*

Morse Code Intermediate. . . . . -- --- .-. ... . -.-. --- -.. .

Chinese Beginner . . . . . 華語

Publications

[1] Fathi, Amir, Chao-Yu Chung, Yuan-Pern Lee, and Eric Wei-Guang Diau. Label-Free Optical Microscope Based on a Phase-Modulated Femtosecond Pump–Probe Approach with Subdiffraction Resolution. *ACS Photonics*, 7(3):607–613, mar 2020.

[2] Fathi, Amir, Efat Jokar, Yuan-Pern Lee, and Eric Wei-Guang Diau. A Direct Mapping Approach to Understand Carrier Relaxation Dynamics in Varied Regions of a Polycrystalline Perovskite Film. *Angewandte Chemie International Edition*, page anie.202008305, jul 2020.

[3] Sudhakar Narra, Efat Jokar, Orion Pearce, Chia-Yi Lin, Fathi, Amir, and Eric Wei-Guang Diau. Femtosecond Transient Absorption Spectra and Dynamics of Carrier Relaxation of Tin Perovskites in the Absence and Presence of Additives. *The Journal of Physical Chemistry Letters*, 11(14):5699–5704, jul 2020.

[4] Saeed Shahbazi, Meng-Yu Li, Fathi, Amir, and Eric Wei-Guang Diau. Realizing a Cosolvent System for Stable Tin-Based Perovskite Solar Cells Using a Two-Step Deposition Approach. *ACS Energy Letters*, pages 2508–2511, jul 2020.

[5] Sumit S. Bhosale, Aparna K. Kharade, Efat Jokar, Fathi, Amir, Sue-min Chang, and Eric Wei-Guang Diau. Mechanism of Photocatalytic CO 2 Reduction by Bismuth-Based Perovskite Nanocrystals at the Gas–Solid Interface. *Journal of the American Chemical Society*, 141(51):20434–20442, dec 2019.

[6] Daniele Benetti, Efat Jokar, Che-Hsun Yu, Fathi, Amir, Haiguang Zhao, Alberto Vomiero, Eric Wei-Guang Diau, and Federico Rosei. Hole-extraction and photostability enhancement in highly efficient inverted perovskite solar cells through carbon dot-based hybrid material. *Nano Energy*, 62:781–790, aug 2019.

[7] Efat Jokar, Cheng-hsun Chien, Cheng-min Tsai, Fathi, Amir, and Eric Wei-guang Diau. Robust Tin-Based Perovskite Solar Cells with Hybrid Organic Cations to Attain Efficiency Approaching 10%. *Advanced Materials*, 31(2):1804835, jan 2019.

[8] Efat Jokar, Cheng-Hsun Chien, Fathi, Amir, Mohammad Rameez, Yu-Hao Chang, and Eric Wei-Guang Diau. Slow surface passivation and crystal relaxation with additives to improve device performance and durability for tin-based perovskite solar cells. *Energy & Environmental Science*, 11(9):2353–2362, 2018.

[9] Sumit S. Bhosale, Efat Jokar, Fathi, Amir, Cheng-Min Tsai, Chi-Yung Wang, and Eric Wei-Guang Diau. Functionalization of Graphene Oxide Films with Au and MoO x Nanoparticles as Efficient p -Contact Electrodes for Inverted Planar Perovskite Solar Cells. *Advanced Functional Materials*, 28(37):1803200, sep 2018.

[10] Kamlesh Awasthi, Chi-Yung Wang, Fathi, Amir, Sudhakar Narra, Eric Wei-Guang Diau, and Nobuhiro Ohta. Anisotropic Electric Field Effect on the Photoluminescence of CH 3 NH 3 PbI 3 Perovskite Sandwiched between Conducting and Insulating Films. *The Journal of Physical Chemistry C*, 121(41):22700–22706, oct 2017.

[11] Hung-Yu Hsu, Chi-Yung Wang, Fathi, Amir, Jia-Wei Shiu, Chih-Chun Chung, Po-Shen Shen, Tzung-Fang Guo, Peter Chen, Yuan-Pern Lee, and Eric Wei-Guang Diau. Femtosecond Excitonic Relaxation Dynamics of Perovskite on Mesoporous Films of Al 2 O 3 and NiO Nanoparticles. *Angewandte Chemie International Edition*, 53(35):9339–9342, aug 2014.

References are available upon request
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