Amir Fathi

Curriculum Vitæ

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Occupation

2020–Present **Postdoctoral Researcher**, *Institute of Molecular Biology, Academia Sinica*, Taipei, Taiwan

Education

2013–2020 **Ph.D**, *Department of Applied Chemistry, National Chiao Tung University*, Hsinchu

2008–2010 **Master Degree**, *Department of Physics, University of Semnan, Semnan, Iran*

2003–2008 **Bachelors Degree**, *Department of Physics, Shahid Beheshti University, Tehran, Iran*

Projects & Research

2020–Present Study the neural encoding of space in adult zebrafish by a home-built two-photon imaging technique in a virtual reality system.

2017–2020 Transient absorption images and SEM images collocalization to study charge transfer heterogeneity in photovoltaic

2014–2017 Constructing a pump-probe microscope for nanoparticle tracking applications at Sub-diffraction resolution

2017–2018 Construction of SS-PL system with TE-Cooled PD and demodulated with lock-in 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 transport (CVT) though Chernov bulk diffusion model

Experiences

2020–Present Building a two–photon laser scanning microscope integrated with a virtual reality environment that detects virtual swim events by a torque/force sensor

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 photovoltaic devices

2008–2011 CVT Crystal Growth optimization at University of Semnan

Rewards and Honors

2021 “2021 Academia Sinica Postdoctoral Research Scholars” for a 2 year funding.

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 Sub-diffraction 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, familiar with R, python, C# and C++
- Image Processing in ImageJ, MATLAB
- Typesetting with TEX & LATEXEngine
- XRD data analysis with FullProf Suit

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 fabrication of electronic filters
- Steady state photoluminiscence and UV-Vis measurements
- Construction of femtosecond pump-probe microscopy and related image processing
- Programming scientific data 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. Bandonil, J. S., Liao, Y.-H., Fathi, Amir & Huang, K.-H. Two-Photon Calcium Imaging of Forebrain Activity in Behaving Adult Zebrafish. *JOVE.* https://www.jove.com/t/65526/two-photon-calcium-imaging-forebrain-activity-behaving-adult (2023).
2. Fathi, Amir, Chung, C.-Y., Lee, Y.-P. & Diau, E. W.-G. Label-Free Optical Microscope Based on a Phase-Modulated Femtosecond Pump–Probe Approach with Subdiffraction Resolution. *ACS Photonics* **7,** 607–613. ISSN: 2330-4022. https://pubs.acs.org/doi/10.1021/acsphotonics.9b01821 (Mar. 2020).
3. Fathi, Amir, Jokar, E., Lee, Y.-P. & Diau, E. W.-G. A Direct Mapping Approach to Understand Carrier Relaxation Dynamics in Varied Regions of a Polycrystalline Perovskite Film. *Angewandte Chemie International Edition,* anie.202008305. ISSN: 1433-7851. https://onlinelibrary.wiley.com/doi/abs/10.1002/anie.202008305 (July 2020).
4. Narra, S., Jokar, E., Pearce, O., Lin, C.-Y., Fathi, Amir & Diau, E. W.-G. 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,** 5699–5704. ISSN: 1948-7185. https://pubs.acs.org/doi/10.1021/acs.jpclett.0c01589 (July 2020).
5. Shahbazi, S., Li, M.-Y., Fathi, Amir & Diau, E. W.-G. Realizing a Cosolvent System for Stable Tin-Based Perovskite Solar Cells Using a Two-Step Deposition Approach. *ACS Energy Letters,* 2508–2511. ISSN: 2380-8195. https://pubs.acs.org/doi/10.1021/acsenergylett.0c01190 (July 2020).
6. Bhosale, S. S., Kharade, A. K., Jokar, E., Fathi, Amir, Chang, S.-m. & Diau, E. W.-G. Mechanism of Photocatalytic CO_2 Reduction by Bismuth-Based Perovskite Nanocrystals at the Gas–Solid Interface. *Journal of the American Chemical Society* **141,** 20434–20442. ISSN: 0002-7863. https://pubs.acs.org/doi/abs/10.1021/jacs.9b11089 (Dec. 2019).
7. Benetti, D., Jokar, E., Yu, C.-H., Fathi, Amir, Zhao, H., Vomiero, A., Wei-Guang Diau, E. & Rosei, F. Hole-extraction and Photostability Enhancement in Highly Efficient Inverted Perovskite Solar Cells through Carbon Dot-based Hybrid Material. en. *Nano Energy* **62,** 781–790. ISSN: 22112855. https://linkinghub.elsevier.com/retrieve/pii/S2211285519304902 (Aug. 2019).
8. Jokar, E., Chien, C.-h., Tsai, C.-m., Fathi, Amir & Diau, E. W.-g. Robust Tin-Based Perovskite Solar Cells with Hybrid Organic Cations to Attain Efficiency Approaching 10%. *Advanced Materials* **31,** 1804835. ISSN: 09359648. http://doi.wiley.com/10.1002/adma.201804835 (Jan. 2019).
9. Jokar, E., Chien, C.-H., Fathi, Amir, Rameez, M., Chang, Y.-H. & Diau, E. W.-G. Slow surface passivation and crystal relaxation with additives to improve device performance and durability for tin-based perovskite solar cells. *Energy & Environmental Science* **11,** 2353–2362. ISSN: 1754-5692. http://xlink.rsc.org/?DOI=C8EE00956B (2018).
10. Bhosale, S. S., Jokar, E., Fathi, Amir, Tsai, C.-M., Wang, C.-Y. & Diau, E. W.-G. 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,** 1803200. ISSN: 1616301X. http://doi.wiley.com/10.1002/adfm.201803200 (Sept. 2018).

11. Awasthi, K., Wang, C.-Y., Fathi, Amir, Narra, S., Diau, E. W.-G. & Ohta, N. 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,** 22700–22706. ISSN: 1932-7447. https://pubs.acs.org/doi/10.1021/acs.jpcc.7b07883 (Oct. 2017).

12. Hsu, H.-Y., Wang, C.-Y., Fathi, Amir, Shiu, J.-W., Chung, C.-C., Shen, P.-S., Guo, T.-F., Chen, P., Lee, Y.-P. & Diau, E. W.-G. Femtosecond Excitonic Relaxation Dynamics of Perovskite on Mesoporous Films of Al 2 O 3 and NiO Nanoparticles. *Angewandte Chemie International Edition* **53,** 9339–9342. ISSN: 14337851. http://doi.wiley.com/10.1002/anie.201404213 (Aug. 2014).

References are available upon request
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