

# 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**, *National Chiao Tung University, Hsinchu*  
Super-resolution Pump-Probe Imaging; Transient Absorption Microscopy – SEM Mapping

2008–2010 **Master Degree**, *Univesity of Semnan, Semnan, Iran*

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

### Projects & Research

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

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  $\text{ZnS}_x\text{Se}_{1-x}$  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 vertual 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 solar photovoltaic lab (NCTU)

2008–2011 CVT Crystal Growth optimization at University of Semnan

### Rewards and Honors

2021 “2021 2nd Session 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 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,      ○ Typesetting with T<sub>E</sub>X & L<sup>A</sup>T<sub>E</sub>X Engine  
familiar with R, python, C# and C++
- Image Processing in ImageJ, Photoshop,      ○ XRD data analysis with FullProf Suit,  
Inkscape      MAUD

### Scientific Instruments

- Calibration and maintainance of multi-      ○ Steady state photoluminescence and UV-  
zone box and tube furnaces      Vis measurements
- Construction of femtosecond and      ○ Construction of femtosecond pump-  
nanosecond transient absorption      probe microscopy and related image pro-  
spectroscopy systems and related      cessing  
measurements
- Design, simulation and printing of elec-      ○ Programming scientific acquisition sys-  
tronic filters      tems with photodiode, PMT, APD, EM-  
CCD and iCCD as a detector

## Languages

Persian	Native	
English	Fluent; iBT score: 95	
Spanish	Intermediate . . . . .	<i>Español</i>
German	Intermediate . . . . .	<i>Deutsch</i>
Morse Code	Intermediate. . . . .	-- --- .-. ... . -.-. --- -. .
Chinese	Beginner . . . . .	華語

## References

1. Fathi, Amir, Chung, C.-Y., Lee, Y.-P. & Diao, 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/acsp Photonics.9b01821> (Mar. 2020).
2. Fathi, Amir, Jokar, E., Lee, Y.-P. & Diao, 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).
3. Narra, S. *et al.* 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.jpcclett.0c01589> (July 2020).
4. Shahbazi, S., Li, M.-Y., Fathi, Amir & Diao, 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/acsenrgylett.0c01190> (July 2020).
5. Bhosale, S. S. *et al.* Mechanism of Photocatalytic CO<sub>2</sub> 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).
6. Benetti, D. *et al.* Hole-extraction and photostability enhancement in highly efficient inverted perovskite solar cells through carbon dot-based hybrid material. *Nano Energy* **62**, 781–790. ISSN: 22112855. <https://linkinghub.elsevier.com/retrieve/pii/S2211285519304902> (Aug. 2019).
7. Jokar, E., Chien, C.-h., Tsai, C.-m., Fathi, Amir & Diao, 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).
8. Jokar, E. *et al.* 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).
9. Bhosale, S. S. *et al.* Functionalization of Graphene Oxide Films with Au and MoO<sub>x</sub> 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).
10. Awasthi, K. *et al.* Anisotropic Electric Field Effect on the Photoluminescence of CH<sub>3</sub>NH<sub>3</sub>PbI<sub>3</sub> 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).
11. Hsu, H.-Y. *et al.* Femtosecond Excitonic Relaxation Dynamics of Perovskite on Mesoporous Films of Al<sub>2</sub>O<sub>3</sub> 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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