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#### Position:

President of central lab in Hakim Sabzavari University, Tohid complex, Sabazvear, Iran (2021 up now)

Assistance professor, Department of physics, Hakim Sabzevari University  
Tohid complex, Sabazvear, Iran (2016 up now)

Visiting researcher (9 month): Advanced Display Research Center, Kyung Hee University, Seoul, South Korea, Prof. Jin Jang

#### Education:

**Doctor of Philosophy, Physics**, Sharif University of Technology, Tehran, Tehran 2010-2015

- Thesis title: Utilizing oxide films as electron/hole injection layers in hybrid light emitting diodes, supervisor: Dr. Nima Taghavina

**Visiting Student** (6 months): Advanced Display Research Center, Kyung Hee University, Seoul, South Korea, Prof. Jin Jang

- thesis title: Utilizing oxide films as electron/hole injection layers in hybrid light emitting diodes, supervisor: Dr. Nima Taghavina, **GPA:19.04/20**

**Master of Science, Physics**, Sharif University of Technology, Tehran, Tehran, 2008-2010

- thesis title: Synthesis of ZnCdS luminescent nanocrystals in due to utilize in hybrid light emitting diodes, supervisor: Dr. Nima Taghavina, **GPA:18.40/20**

**Bachelor of Science, Physics**, Ferdowsi University of Mashhad, Mashhad, Khorasan Razavi, 2004-2008, GPA: **16.09/20**

#### Awards, Distinctions and Fellowships:

- Final acceptance in the field of physics in "department of physics" and nanotechnology in "Institute for NanoScience & NanoTechnology" in Sharif university of technology-2010
- Ranked 32th in MSc entrance exam in physics (from 9000 ones)- 2008
- Ranked 12th in MSc entrance exam in photonic (from 5000 ones)- 2008

#### Research Interests / Research Profile:

- nanomaterials: nanocrystals, nanorods thin film, Nanophotonic: luminescence in nanomaterials, hybrid and organic light emitting diode, solar cell

## Research Interests / Research Profile

**Publications:** [1] [2, 3] [4] [5] [6] [7] [8] [9] [10] [11] [12] [13] [14] [15] [16] [17]

### ISI:

- [1] M. Kazemi, M. Zirak, N. Arab, H. Alehdaghi, J. Baedi, Optimizing ultrasonic mist vapor deposition parameters toward facile synthesis of tungsten oxide nanofibers, *Materials Science in Semiconductor Processing*, 141 (2022) 106431.
- [2] F. Farahmandzadeh, M. Molaei, H. Alehdaghi, M. Karimipour, A. Shamsi, Effect of concentration and shell thickness on the optical behavior of aqueous CdTe/ZnSe core/shell quantum dots (QDs) exposed to ionizing radiation, *Luminescence*, (2022).
- [3] F. Farahmandzadeh, M. Molaei, H. Alehdaghi, M. Karimipour, The significant increasing photoluminescence quantum yield of the CdTe/CdS/ZnS core/multi-shell quantum dots (QDs) by 60Co gamma irradiation, *Applied Physics A*, 128 (2022) 1-10.
- [4] M. Zirak, H. Alehdaghi, A.M. Shakoori, Preparation of ZnO-carbon quantum dot composite thin films with superhydrophilic surface, *Materials Technology*, 36 (2021) 72-80.
- [5] A. Ghasedi, E. Koushki, M. Zirak, H. Alehdaghi, Improvement in structural, electrical, and optical properties of Al-doped ZnO nanolayers by sodium carbonate prepared via solgel method, *Applied Physics A*, 126 (2020) 1-9.
- [6] H. Alehdaghi, A. Kanwat, M. Zirak, E. Moyan, W.-C. Choi, J. Jang, Quasi-2D organic cation-doped formamidinium lead bromide (FAPbBr<sub>3</sub>) perovskite light-emitting diodes by long alkyl chain, *Organic Electronics*, 79 (2020) 105626.
- [7] H. Alehdaghi, M. Kazemi, M. Zirak, Facile preparation of ZnO nanostructured thin films via oblique angle ultrasonic mist vapor deposition (OA-UMVD): a systematic investigation, *Applied Physics A*, 126 (2020) 1-10.
- [8] M.M. F. Farsinia, M. Dehestania and H. Alehdaghi, White emissive alloyed core-shell CdSe<sub>1-x</sub>S<sub>x</sub>/ZnSe QDs: synthesis via a novel approach, investigating optical properties and application for photo-degradation of Methyl Orange (MO), *Materials Technology: Advanced Performance Materials*, In press (2020).
- [9] H. Alehdaghi, E. Assar, B. Azadegan, J. Baedi, A. Mowlavi, Investigation of optical and structural properties of aqueous CdS quantum dots under gamma irradiation, *Radiation Physics and Chemistry*, 166 (2020) 108476.
- [10] M. Zirak, E. Moyan, H. Alehdaghi, A. Kanwat, W.-C. Choi, J. Jang, Anion-and Cation-Codoped All-Inorganic Blue-Emitting Perovskite Quantum Dots for Light-Emitting Diodes, *ACS Applied Nano Materials*, 2 (2019) 5655-5662.
- [11] H. Alehdaghi, M. Zirak, Facile preparation of various ZnO nanostructures via ultrasonic mist vapor deposition: a systematic investigation about the effects of growth parameters, *Journal of Materials Science: Materials in Electronics*, 30 (2019) 2706-2715.
- [12] H. Alehdaghi, M. Marandi, A. Irajizad, N. Taghavinia, J. Jang, H. Zare, Investigating the different conditions on solution processed MoO<sub>x</sub> thin film in long lifetime fluorescent polymer light emitting diodes, *Materials Chemistry and Physics*, 204 (2018) 262-268.
- [13] H. Alehdaghi, M. Marandi, A. Irajizad, N. Taghavinia, Influence of cathode roughness on the performance of F8BT based organic-inorganic light emitting diodes, *Organic Electronics*, 16 (2015) 87-94.

- [14] H. Alehdaghi, M. Marandi, M. Molaie, A. Irajizad, N. Taghavinia, Facile synthesis of gradient alloyed  $ZnxCd_{1-x}S$  nanocrystals using a microwave-assisted method, *Journal of Alloys and Compounds*, 586 (2014) 380-384.
- [15] H. Alehdaghi, M. Zirak, The Optimization of Hole Injection using Composite layer Containing of Graphene Oxide/Molybdenum Oxide in order to Enhance in Lifetime of Organic Light Emitting Diode, *Journal of Advanced Materials and Technologies*, 8 (2019) 71-77.
- [16] M. Zirak, H. Alehdaghi, A. Moshfegh, Fabrication of single-layer  $MS_2$  (M= Mo, W) nanosheets using Li battery setup, *Iranian Journal of Physics Research*, 19 (2019) 365-377.
- [17] H. Alehdaghi, M. Shahraki, H. Heydari, Fabrication and Characterization of Semi-Transparent Hybrid Light Emitting Diode with Inverted Structure, *Nanoscale*, 3 (2016).
- [18] H. ALEHDAGHI, A. IRAJIZAD, N. TAGHAVINIA, M. MARANDI, A FACILE METHOD TO DECREASE SURFACE ROUGHNESS OF FLUORINE DOPED TIN OXIDE USING NANOPARTICLES IN TOOTHPASTE AND ITS APPLICATION IN HYBRID LIGHT EMITTING DIODE, *IRANIAN JOURNAL OF SURFACE SCIENCE AND ENGINEERING* 11 (2015) 13-22.

[7] H. Alehdaghi, M. Shahraki, H. Heydari, Fabrication and Characterization of Semi-Transparent Hybrid Light Emitting Diode with Inverted Structure, *Nanoscale*, 3 (2016).

Internatioanal reviwer of the following journal:

- Nanotechnology
- Alloys and compounds
- Journal of Materials Science: Materials in Electronics
- International Journal of Modern Physics B
- Nanomeghyas (ISC)

#### همایش ها و کنفرانس ها:

۱. محمد زیرک، حسن اله داغی، " سنتز نقاط کوانتومی پروسکایتی  $CsPbBr_3$  آلاییده با روبیدیوم در دمای اتاق "، دومین کنفرانس ملی فرآیندهای گاز و پتروشیمی، ۱۱ اردیبهشت ۱۳۹۸، دانشگاه بجنورد، ایران
۲. حسن اله داغی، محمد زیرک، " تاثیرات شرایط محیطی بر مشخصات نوری پروسکایت هالید آلی-معدنی "، دومین کنفرانس ملی فرآیندهای گاز و پتروشیمی، ۱۱ اردیبهشت ۱۳۹۸، دانشگاه بجنورد، ایران
۳. امیر محمد شکوری، حسن اله داغی، محمد زیرک، " بررسی اثر فاصله نازل تا زیر لایه بر مورفولوژی لایه های متخلخل روی اکسید-پلیمر تهیه شده به روش التراسونیک مرطوب "، دومین کنفرانس ملی فرآیندهای گاز و پتروشیمی، ۱۱ اردیبهشت ۱۳۹۸، دانشگاه بجنورد، ایران

۴. سیده فهیمه حیدری ارچنگانی، حسن اله داغی، جواد باعدی، محمد زیرک، " بررسی ریخت شناسی لایه های نازک اکسید روی به روش سل-ژل با پایدارکننده‌های مختلف " دومین کنفرانس ملی فرآیندهای گاز و پتروشیمی، ۱۱ اردیبهشت ۱۳۹۸، دانشگاه بجنورد، ایران
۵. عفت عصار نوقایی، حسن اله داغی، بهنام آزادگان، علی اصغر مولوی، جواد باعدی، " بررسی خواص نوری نقاط کوانتومی CdS با غلظت‌های مختلف تحت تابش چشمه گاما به منظور کاربرد در دوزیمتری "، پنجمین کنفرانس سنجش و ایمنی پرتو، ۲۶ مهر ۱۳۹۷، کاشان، ایران
۶. محمد زیرک، حسن اله داغی، " تهیه نانولایه روی اکسید به روش سل ژل: بررسی مدون عوامل ساخت برای بدست آوردن ساختار دانه‌ای " همایش ملی توسعه فناوری نانو، ۱۶ اسفند ۹۶، علی آباد کتول، ایران.
۷. حسن اله داغی، محمد زیرک، " افزایش طول عمر دیودهای نورتاب پلیمری بواسطه بهبود در تزریق حفره با بکارگیری لایه ترکیبی گرافن اکساید و مولیبدن اکساید " همایش ملی توسعه فناوری نانو، ۱۶ اسفند ۹۶، علی آباد کتول، ایران.
۸. حسن اله داغی، " بهینه سازی مصرف انرژی در دیودهای نورتاب پلیمری "، اولین کنفرانس ملی فرآیندهای گاز و پتروشیمی، ۱۳ اردیبهشت ۱۳۹۶، دانشگاه بجنورد، ایران

9. **Mohammad Zirak, H. Alehdaghi** "Effect of lithium doping in electron injection layer on the LED performance in reverse structure", 20th Iranian Physical chemistry physics, 20-22 August 2017, Arak, Iran.

10. **H. Alehdaghi, Mohammad Zirak** "Synthesis of n-type and p-type CuInS<sub>2</sub> thin films via simple SILAR method" 20<sup>th</sup> Iranian Physical chemistry physics, 20-22 August 2017, Arak, Iran.

#### Research Experience

- Photoluminescence spectroscopy
- Transmittance spectroscopy
- Analysis of SEM, AFM, XRD, TEM, TRPL
- Fabrication thin films by various physical and chemical method such as vapor depositions, spray, sol-gel and spin coating.*
- Synthesis and characterization of nanocrystals of luminescence made by thermochemical and microwave irradiation.*
- Fabrication of Hybrid light emitting diodes with metal oxides and nanocrystals
- Measurement of optical efficiency in LED*
- Fabrication of more than 20 experimental set up such as; solar simulator, contact angel, four point probe, ZnO, FTO coater machine, XRD improvement and ...

#### Teaching Experience:

- Fundamental physics I
- Fundamental physics II
- Fundamental physics III
- Quantum mechanic
- Mechanic classic I
- Mechanic classic II
- Electronic I
- Statistical mechanic
- Electromagnetism
- Modern physics

- Crystallography
- 
- Advanced quantum mechanics
- Advanced Statistical mechanic
- 

#### **REFERENCES AND COLLABORATORS:**

Prof. Nima Taghavinia (PhD supervisor), Physics Department and Institute for Nanoscience and Nanotechnology, *Sharif University of Technology, Tehran, Iran*, Email: [taghavinia@sharif.edu](mailto:taghavinia@sharif.edu)

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