

نام آزمایشگاه: مدل‌سازی و شبیه‌سازی ادوات (Device Modeling and Simulation Lab)

مسئول آزمایشگاه: محمد کاظم مروج-فرشی

شماره تماس: آزمایشگاه ۸۲۸۸۴۳۳۸

زمینه‌های پژوهشی آزمایشگاه:

افزارها و سامانه‌های نوری و پلاسمونی؛ افزارها و سامانه‌های الکترواپتیک، افزارها و سامانه‌های مبتنی بر امواج صوتی سطحی (Surface Acoustic Waves)، حسگرهای مبتنی بر فیبر نوری (Fiber Optic Sensors)، سلول‌های خورشیدی مبتنی بر پروسکایت (Perovskite Solar Cells)، افزارها و سامانه‌های تراهرتز، افزارها و سامانه‌های فراسطح و فراماده، سامانه‌های مبتنی بر ریزسیال‌ها اعم از اپتوفلوئیدیک (Optofluidic) و آکوستو فلوئیدیک (Acoustofluidic)

عناوین پایان نامه‌ها و رساله‌های منتخب انجام شده:

طراحی و شبیه‌سازی افزارهای نوری مبتنی بر ساختار متقارن PT (دکتری-فخرالدین نظری)
دست‌ورزی میکرو و نانو ذره‌ها با استفاده از نیروهای نوری میدان-نزدیم (دکتری-مصطفی قربان‌زاده)
طراحی و تحلیل منابع تراهرتز نوررسانای نانوساختار (دکتری-محمدجواد محمد زمانی)
طراحی و شبیه‌سازی افزارهای مبتنی بر بلور فونونی (دکتری-بابک رستمی دوگل‌سرا)
دست‌ورزی میکرو و نانو ذره‌ها با استفاده از نیروهای پلاسمونی (دکتری-محسن صمدی)
انتشارحالت‌های کوانتمی نور از ساختارهای پاشنده غیرهرمیتی چندلایه (دکتری-الناز پيله ور)
طراحی فراسطح تراهرتز هندسی تنظیم‌پذیر بر پایه‌ی تشدیدگرهای حلقوی فلز-نیم‌رسانا (دکتری-سعیده احدی)
شبیه‌سازی موجبر پلاسمونی مبتنی بر ساختار گرافن-فلز (ارشد-مرتضی یاراحمدی)

طراحی و شبیه‌سازی بلور فونونی کوک‌پذیر (ارشد- عطا شاکری)

مهندسی گاف پروسکایت با شکاف باند پهن برای استفاده در سلول خورشیدی چندپیوندی (ارشد- عاطفه فتح‌زاده)
ساخت حسگر رطوبت و آمونیاک بر پایه فیبر چند مد باریک‌شونده پوشش‌داده‌شده با ژل سیلیکا (ارشد- محمد انصاری)

طراحی مدولاتور نوری بازتابی با استفاده از توری دوبعدی (ارشد- ساره وطنی)

طراحی و ساخت افزاره‌های موج صوتی سطحی جهت دست‌ورزی سلول اسپرم (ارشد- سارا عباسی کمزانی)

طراحی و ساخت حسگر زیستی موج صوتی برای شناسایی نشانگر زیستی تروپونین قلبی در سرم خون (ارشد- فرزانه سلیمانپور)

عناوین طرح‌های پژوهشی منتخب انجام شده:

طراحی و ساخت انبرک‌های پلازمونی

ساخت و مهندسی سلول خورشیدی مبتنی بر پروسکایت

طراحی و ساخت افزاره‌های مبتنی بر موج صوتی

طراحی و ساخت افزاره‌های صوت‌سیال

لیست مقالات منتخب چاپ شده در مجلات:

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13. Tunable optical isolator using Graphene-photonic crystal based hybrid system, M Zarei, F Nazari, **MK Moravvej-Farshi**, *Physica Scripta* **96** (9), 095502:1-8, 2021.
14. Thermophoresis suppression by graphene layer in tunable plasmonic tweezers based on hexagonal arrays of gold triangles: numerical study, M Samadi, S Darbari, **MK Moravvej-Farshi**, *Optics Express* **29** (18), 29056-29067, 2021.
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16. GNR-FET with Superlattice Source, Channel, and Drain: SLSCD-GNR-FET, B Behtoei, R Faez, A Shahhoseini, **MK Moravvej-Farshi**, *Physica E: Low-dimensional Systems and Nanostructures* **131**, 114728, 2021.
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27. Next-generation on-chip plasmonic tweezer with a built-in light source, AA Khorami, **MK Moravvej-Farshi**, S Darbari, *OSA Continuum* **3** (8), 2044-2052, 2020.
28. Integrated graphene/ferroelectric based plasmonic random access memory (P-RAM), M Ghezelsefloo, **MK Moravvej-Farshi**, S Darbari, *J Physics: Photonics* **2** (3), 035004:1-9, 2020.
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11. E. Pilehvar, **M. K. Moravvej-Farshi** and H. Ramezani, "Tunable Filter by Using Parity Time (PT) Symmetric Periodic Array Electronic," *Electrical Engineering (ICEE), Iranian Conference on*, Mashhad, Iran, 2018, pp. 228-231.
12. A. R. Zali, Y. Yu, **M. K. Moravvej-Farshi** and J. Mork, "Large signal simulation of photonic crystal Fano laser," *2017 International Conference on Numerical Simulation of Optoelectronic Devices (NUSOD)*, Copenhagen, Denmark, 2017, pp. 75-76
13. M. J. Mohammad-Zamani, **M. K. Moravvej-Farshi** and M. Neshat, "Radiation enhancement in unbiased array of CW terahertz photomixer emitters with nano-slit waveguide resonant modes," *2016 Fourth International Conference on Millimeter-Wave and Terahertz Technologies (MMWaTT)*, Tehran, Iran, 2016, pp. 57-61.
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16. F. Koochi-Kamali, **M. K. Moravvej-Farshi** and M. Ebnali-Heidari, "Dispersion compensation of 40 Gb/s data by phase conjugation in slow light engineered chalcogenide and silicon photonic crystal waveguides," *2015 23rd Iranian Conference on Electrical Engineering*, Tehran, Iran, 2015, pp. 1209-1214.
17. M. Faraji, **M. K. Moravvej-Farshi** and L. Yousefi, "A switchable THz perfect absorber using graphene-based metamaterials," *2014 Third Conference on Millimeter-Wave and Terahertz Technologies (MMWATT)*, Tehran, Iran, 2014, pp. 1-4.
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خدمات قابل ارایه شده توسط آزمایشگاه:

سیستم‌های رایانه شخصی (PC)

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سایر توضیحات (در صورت نیاز):

تصویری از آزمایشگاه:

