

1. Name, Position, and Department

Koray Aydin

Associate Professor of Electrical and Computer Engineering
Northwestern University

2. Address and Contact Information

2145 Sheridan Rd, Evanston IL, 60208

Phone: +1(847) 491-3055

E-mail: aydin@northwestern.edu

Website: <http://www.eecs.northwestern.edu/~aydin>

3. Education

Ph.D. in Physics, Bilkent University, 2008

M.S. in Physics, Bilkent University, 2004

B.S. in Physics, Bilkent University, 2002

4. Professional Appointments

2018 – present **Northwestern University**

Associate Professor of Electrical and Computer Engineering

2011 – 2018 **Northwestern University**

Assistant Professor of Electrical Engineering and Computer Science

2010 – 2011 **California Institute of Technology**

Assistant Director, DOE Light-Matter Interactions EFRC

2008 – 2010 **California Institute of Technology**

Postdoctoral Researcher, Applied Physics (Advisor: Harry A. Atwater)

5. Honors & Awards

- **TOYP (Ten Outstanding Young Persons) Turkey Award**, 2019.
- **ONR Young Investigator Program (YIP) Award**, 2017.
- **Searle Teaching Fellow**, Northwestern University, 2013.
- **Associate Member**, Turkish Academy of Sciences, 2012.
- **SPIE Scholarship** in Optical Science and Engineering, 2007.

6. Publications

— Summary: **Times Cited = 12560 | h-index = 49**

(Google Scholar: <http://scholar.google.com/citations?user=ntJy56wAAAAJ>, last accessed 03/24/2023)

a. Refereed Journal Publications

1. “Low-symmetry α -MoO₃ heterostructures for wave plate applications in visible frequencies”
S. Abedini Dereshgi, Y.-S. Lee, M. C. Larciprete, M. Centini, V. P. Dravid, and K. Aydin
Adv. Opt. Mat. ASAP (2023).
2. “Open-channel metal particle superlattices”
Y. Li, W. Zhou, I. Tanriover, W. Hadibrata, B. E. Partridge, H. Lin, X. Hu, B. Lee, J. Liu, V. P. Dravid,

K. Aydin, C. A. Mirkin
Nature 611, 695 (2022).

3. “Shape memory in self-adapting colloidal crystals”
S. Lee, H. A. Calcaterra, S. Lee, W. Hadibrata, B. Lee, E. Oh, K. Aydin, S. C. Glotzer, C. A. Mirkin
Nature 610, 674 (2022).
4. “Deep generative modeling and inverse design of manufacturable free-form dielectric metasurfaces”
I. Tanriover, D. Lee, W. Chen, and K. Aydin
ACS Photonics, ASAP (2022)
5. “Monolayer Plasmonic Nanoframes as Large-Area, Broadband Metasurface Absorbers”
Y. Li, I. Tanriover, W. Zhou, W. Hadibrata, S. Abedini Dereshgi, D. Samanta, K. Aydin, C. A. Mirkin,
Small 18, 2201171 (2022).
6. “Probing the optical response and local dielectric function of an unconventional Si@MoS₂ Core–Shell Architecture”
Y.-S. Lee, S. Abedini Dereshgi, S. Hao, M. Cheng, M. A. Shehzad, C. Wolverton, K. Aydin, R. dos Reis, and V. P. Dravid
Nano Lett. 22, 4848 (2022).
7. “Tuning and hybridization of surface phonon polaritons in α -MoO₃ based metamaterials”
M. C. Larciprete, S. Abedini Dereshgi, M. Centini, and K. Aydin
Opt. Exp. 30, 12788 (2022)
8. “Extrinsic Chirality and Circular Dichroism at Visible Frequencies Enabled by Birefringent α -MoO₃ Nanoscale-Thick Films: Implications for Chiro-Optical Control”
E. Petronijevic, S. Abedini Dereshgi, M. C. Larciprete, M. Centini, C. Sibilia, and K. Aydin
ACS Appl. Nano Mat. 5, 5609 (2022)
9. “Resonance Couplings in Si@MoS₂ Core–Shell Architectures”
T. Hinamoto, Y.-S. Lee, S. Abedini Dereshgi, J. G. DiStefano, R. Dos Reis, H. Sugimoto, K. Aydin, M. Fujii, and V. P. Dravid
Small, 18 2200413 (2022)
10. “Ultra-Thin Infrared Optical Gain Medium and Optically-Pumped Stimulated Emission in PbS Colloidal Quantum Dot LEDs”
N. Taghipour, I. Tanriover, M. Dalmases, G. L. Whitworth, C. Graham, A. Saha, O. Ozdemir, B. Kundu, V. Pruneri, K. Aydin, and G. Konstantatos
Adv. Funct. Mat. 2200832 (2022)
11. “Tuning of optical phonons in α -MoO₃-VO₂ multilayers”
S. Abedini Dereshgi, M. C. Larciprete, M. Centini, A. A. Murthy, K. Tang, J. Wu, V. P. Dravid, and K. Aydin
ACS Appl. Mat. Int. 13, 48981 (2021)
12. “Large-Area, Highly Crystalline DNA-Assembled Metasurfaces Exhibiting Widely Tunable Epsilon-Near-Zero Behavior”
C. Zheng, W. Hadibrata, S. Kim, G. C. Schatz, K. Aydin, and C. A. Mirkin
ACS Nano 15, 18289 (2021)
13. “Neural networks enabled forward and inverse design of reconfigurable metasurfaces”
I. Tanriover, W. Hadibrata, J. Scheuer, and K. Aydin
Opt. Exp. 29, 27219 (2021).
14. “Compact, high-resolution inverse-designed on-chip spectrometer based on tailored disorder modes”
W. Hadibrata, H. Noh, H. Wei, S. Krishnaswamy, and K. Aydin
Laser Photonics Rev. 2000556 (2021).
15. “One-pot bio-assisted synthesis of stable Ag-AgCl system using jellyfish-based scaffold for plasmonic photocatalysis applications”

S. Gavriely, W. Hadibrata, R. Nudelman, K. Aydin, and S. Richter
Adv. Sust. Syst. 5, 21000099 (2021)

- 16.“Enhanced interaction of optical phonons in hBN with plasmonic lattice and cavity modes”
X. Song, S. A. Dereshgi, E. Palacios, Y. Xiang and K. Aydin
ACS Appl. Mat. Int. 13, 25224 (2021).
- 17.“Inverse-design and 3D printing of a metalens on an optical fiber tip for direct laser writing”
W. Hadibrata, H. Wei, S. Krishnaswamy, and K. Aydin
Nano Lett. 21, 2422 (2021).
- 18.“Exceptional adaptable MWIR thermal emission for ordinary objects covered with VO₂ thin film”
H. Kocer, M. C. Cakir, Y. Durna, M. C. Soydan, O. Odabasi, H. Isik, K. Aydin, and E. Ozbay
JQSRT 262, 107500 (2021).
- 19.“Highly efficient light absorption of monolayer graphene by quasi-bound state in the continuum”
T. Sang, S. A. Dereshgi, W. Hadibrata, I. Tanrıover, and K. Aydin
Nanomaterials 11, 484 (2021).
- 20.“Lithography-free IR polarization converters via orthogonal in-plane phonons in α -MoO₃ flakes”
S. A. Dereshgi, T. G. Folland, A. A. Murthy, X. Song, I. Tanrıover, V. P. Dravid, J. D. Caldwell, and K. Aydin
Nat. Comm. 11, 5771 (2020).
- 21.“Effect of heating/cooling dynamics in the hysteresis loop and tunable IR emissivity of VO₂ thin films”
M. C. Larciprete, M. Centini, S. Paoloni, S. A. Dereshgi, K. Tang, J. Wu, and K. Aydin
Opt. Exp. 28, 39203 (2020).
- 22.“Mie-Resonant Three-Dimensional Metacrystals”
S. Kim, C. Zheng, G. Schatz, K. Aydin, K. Kim, and Chad Mirkin
Nano Lett. 20, 8096 (2020).
- 23.“Physics-based approach for a neural networks enabled design of all-dielectric metasurfaces”
I. Tanrıover, W. Hadibrata, and K. Aydin
ACS Photonics 7, 1957 (2020).
- 24.“Device-quality, reconfigurable metamaterials from shape-directed nanocrystal assembly”
W. Zhou, Z. Liu, Z. Huang, H. Lin, D. Samanta, Q.-Y. Lin, K. Aydin, and C. Mirkin
PNAS 117, 21052 (2020).
- 25.“Adaptive tuning of infrared emission using VO₂ thin films”
M. C. Larciprete, M. Centini, S. Paoloni, I. Fratoddi, S. A. Dereshgi, K. Tang, J. Wu, and K. Aydin
Sci. Rep. 10, 11544 (2020).
- 26.“Unveiling the optical parameters of vanadium dioxide in the phase transition region: A hybrid modeling approach”
M. C. Cakir, H. Kocer, Y. Durna, D. U. Yıldırım, A. Ghobadi, H. Hajian, K. Aydin, H. Kurt, N. Saglam, and E. Ozbay
RSC Adv. 10, 29945 (2020).
- 27.“Reconfigurable holograms using VO₂-based tunable metasurface”
T. Haimov, K. Aydin and J. Scheuer
IEEE J. STQE 27, 4700308 (2020).
- 28.“Phonon-polariton assisted broadband resonant absorption in anisotropic a-phase MoO₃ nanostructures”
G. Deng, S. A. Dereshgi, X. Song, C. Wei and K. Aydin
Phys. Rev. B 102, 035408 (2020).
- 29.“Anisotropic localized surface plasmons in borophene”
S. A. Dereshgi, Z. Liu, and K. Aydin
Opt. Exp. 28, 16725 (2020).

- 30.“Polarization Reflector/Color Filter at Visible Frequencies via Anisotropic α -MoO₃”
 C. Wei, S. A. Dereshgi, X. Song, A. Murthy, V. P. Dravid, T. Cao and K. Aydin
Adv. Opt. Mat. 8, 20200088 (2020).
- 31.“Tunable fluorescence from dye-modified DNA-assembled plasmonic nanocube arrays”
 C. Y. Zheng, E. Palacios, W. Zhou, W. Hadibrata, L. Sun, Z. Huang, G. C. Schatz*, K. Aydin*, and C. A. Mirkin*
Adv. Mat. 31, 1904448 (2019).
- 32.“Two-photon direct laser writing of inverse-designed free-form near-infrared polarization beamsplitter”
 H. Wei, F. Callewaert, W. Hadibrata, V. Velev, Z. Liu, P. Kumar, K. Aydin* and S. Krishnaswamy*
Adv. Opt. Mat. 7, 1900513 (2019).
- 33.“Tunable multi-wavelength absorption in mid-IR region based on a hybrid patterned graphene-hBN structure”
 G. Deng, X. Song, S. A. Dereshgi, H. Xu and K. Aydin
Opt. Exp. 27, 23576 (2019).
- 34.“Polarization dependent, plasmon-enhanced infrared transmission through gold nanoslits on monolayer black phosphorus”
 G. Deng, S. A. Dereshgi, X. Song, and K. Aydin
JOSA B 36, F109 (2019).
- 35.“Stimuli-Responsive DNA-linked Nanoparticle Arrays as Programmable Surfaces”
 B. D. Myers, E. Palacios, D. Myers, S. Butun, K. Aydin, and V. P. Dravid
Nano Lett. 19, 4535 (2019).
- 36.“Thermally tuning infrared light scattering using planar layered thin films and space gradient metasurfaces”
 H. Kocer, A. Ozer, S. Butun, K. Wang, J. Wu, H. Kurt, and K. Aydin
IEEE J. STQE 25, 4700607 (2019).
- 37.“Phase engineering and optical properties of 2D MoSe₂: Promise and pitfalls”
 E. D. Hanson, L. M. Lilley, J. D. Cain, S. Hao, E. Palacios, K. Aydin, C. Wolverton, T. Meade, and V.P. Dravid
Mat. Chem. Phys. 225, 219 (2019).
- 38.“Tunable polaritonic metasurface absorbers in mid-IR based on hexagonal boron nitride and vanadium dioxide layers”
 X. Song, Z. Liu, J. Scheuer, Y. Xiang and K. Aydin
J. Phys. D: Appl. Phys. 52, 164002 (2019).
- 39.“Dynamic infrared thin-film absorbers with tunable absorption intensity based on VO₂ phase transition”
 Z. Liu, B. Banar, S. Butun, H. Kocer, K. Wang, J. Wu, and K. Aydin
Opt. Mat. Exp. 8, 2151 (2018).
- 40.“Extrinsic polarization-controlled optical anisotropy in plasmon-black phosphorus coupled system”
 Z. Liu, S. Wells, S. Butun, E. Palacios, M. Hersam, and K. Aydin
Nanotechnology 29, 285202 (2018)
- 41.“DNA-Mediated Size-selective Nanoparticle Assembly for Multiplex Surface Encoding”
 Q.-Y. Lin, E. Palacios, W. Zhou, Z. Li, J. A. Mason, Z. Liu, P-C. Cheng, V. P. Dravid*, K. Aydin*, and C. Mirkin*
Nano Lett. 18, 2645 (2018)
- 42.“Inverse-designed stretchable metalens with tunable focal distance”
 F. Callewaert, V. Velev, S. Jiang, A. V. Sahakian, P. Kumar, and K. Aydin
Appl. Phys. Lett. 112, 091102 (2018)
- 43.“Optically-active 1-D MoS₂ nano-belts”
 A. A. Murthy, Y. Li, E. Palacios, Q. Li, S. Ho, C. Wolverton, K. Aydin, X. Chen, V. P. Dravid
ACS Appl. Mat. & Int. 10, 6799 (2018)

44. "Biaxial hyperbolic metamaterials based on multilayer anisotropic black phosphorus and gold thin films"
 X. Song, Z. Liu, Y. Xiang, K. Aydin
Opt. Express 26, 5469 (2018)
45. "Building Superlattices from Individual Nanoparticles Via Template-Confined DNA-Mediated Assembly"
 Q.-Y. Lin, J. A. Mason, Z. Li, W. Zhou, M. N. O'Brien, K. A. Brown, M. R. Jones, S. Butun, B. Lee, V. P. Dravid*, K. Aydin*, and C. Mirkin*
Science 359, 669 (2018).
46. "Inverse designed broadband all-dielectric electromagnetic metadevices"
 F. Callewaert, V. Velev, P. Kumar, A. V. Sahakian, and K. Aydin
Scientific Reports 8, 1358 (2018).
47. "Enhanced radiative emission from monolayer MoS₂ films with a single plasmonic dimer nanoantenna"
 E. Palacios, S. Park, S. Butun, L. Lauhon, and K. Aydin
Appl. Phys. Lett. 111, 031101 (2017).
48. "Identifying excitation and emission rate contributions to plasmon-enhanced photoluminescence from monolayer MoS₂ using a tapered gold antenna"
 E. Palacios, S. Park, S. Butun, L. Lauhon, and K. Aydin
ACS Photonics 4, 1602 (2017).
49. "Quantifying plasmon-enhanced light absorption in monolayer WS₂ films"
 S. Butun, E. Palacios, J. Cain, Z. Liu, V. P. Dravid, and K. Aydin
ACS Appl. Mat. & Int. 9, 15044 (2017).
50. "Wideband, zero-index metacrystal with high transmission at visible frequencies"
 Z. Li, Z. Liu, and K. Aydin
JOSA B 34, D13 (2017).
51. "Chiral-selective plasmonic metasurface absorbers operating at visible frequencies"
 B. Tang, Z. Li, E. Palacios, Z. Liu, S. Butun, and K. Aydin
IEEE Phot. Tech. Lett. 29, 295 (2017).
52. "Functional metal-insulator top contacts for Si-based color photodetectors"
 S. Butun, and K. Aydin
J. Appl. Phys. 120, 223102 (2016).
53. "Broadband asymmetric light transmission through tapered metallic gratings at visible frequencies"
 B. Tang, Z. Li, Z. Liu, F. Callewaert, and K. Aydin
Scientific Reports 6, 39166 (2016).
54. "Enhanced infrared transmission through gold nanoslit arrays via surface plasmons in continuous graphene"
 Z. Liu, and K. Aydin
Optics Express 24, 27882 (2016).
55. "Time-varying metasurfaces based on graphene micro-ribbon arrays"
 Z. Liu, Z. Li, and K. Aydin
ACS Photonics 3, 2035 (2016).
56. "Inverse design of an ultra-compact broadband optical diode based on asymmetric spatial mode conversion"
 F. Callewaert, S. Butun, Z. Li, and K. Aydin
Scientific Reports 6, 32577 (2016).
57. "Omnidirectional and broadband absorption enhancement from trapezoidal Mie resonators in semiconductor metasurfaces"

R. Pala, S. Butun, K. Aydin, and H. A. Atwater
Scientific Reports 6, 31451 (2016).

58. "Localized surface plasmons in nanostructured monolayer black phosphorus"
Z. Liu, and K. Aydin
Nano Letters 16, 3457 (2016).
59. "Ultrawide angle, directional spectrum splitting visible-frequency versatile metasurfaces"
Z. Li, E. Palacios, S. Butun, and K. Aydin
Adv. Opt. Materials 4, 953 (2016).
60. "Narrow band absorber based on a dielectric nanodisk array on silver film"
F. Callewaert, S. Chen, S. Butun, and K. Aydin
J. of Optics 18, 075006 (2016).
61. "Lithography-free transmission filters at ultraviolet frequencies using ultra-thin aluminum films"
Z. Li, S. Butun, and K. Aydin
J. of Optics 18, 065006 (2016).
62. "Broadband metasurfaces for anomalous transmission and spectrum splitting at visible frequencies"
Z. Li, and K. Aydin
EPJ Appl. Metamat. 2, 2 (2015).
63. "Asymmetric absorption and reflection in plasmonic nanohole arrays"
S. Butun, and K. Aydin
ACS Photonics 2, 1652 (2015).
64. "Unidirectional lasing from template-stripped two-dimensional plasmonic crystals"
A. Yang, Z. Li, M. P. Knudson, A. J. Hryny, W. Wang, K. Aydin, T. W. Odom
ACS Nano 9, 11582 (2015).
65. "Omnidirectional, broadband light absorption using large-area, ultrathin lossy metallic film coatings"
Z. Li, H. Kocer, and K. Aydin
Scientific Reports 5, 15137 (2015).
66. "Dynamically controlled plasmonic nano-antenna phased array utilizing vanadium dioxide",
G. Kaplan, K. Aydin, and J. Scheuer
Optics Materials Express 5, 2513 (2015).
67. "Strong coupling between plasmonic gap modes and photonic lattice modes in DNA-assembled gold nanocube arrays"
Q.-Y. Lin, Z. Li, K. A. Brown, M. N. O'Brien, M. B. Ross, Y. Zhou, S. Butun, P.-C. Chen, G. C. Schatz, V. P. Dravid, K. Aydin, C. A. Mirkin
Nano Letters 15, 4699 (2015).
68. "Intensity tunable infrared broadband absorbers based on VO₂ phase transition using planar layered thin film structures"
H. Kocer, S. Butun, S. Tongay, J. Wu, and K. Aydin
Scientific Reports 5, 13384 (2015).
69. "Thermal tuning of infrared resonant absorbers based on hybrid gold-VO₂ nanostructures"
H. Kocer, S. Butun, B. Banar, K. Wang, S. Tongay, J. Wu and K. Aydin
Applied Physics Letters 106, 161104 (2015)
70. "Enhanced light emission from large-area monolayer MoS₂ using plasmonic nanodisc arrays"
S. Butun, S. Tongay, and K. Aydin
Nano Letters 15, 2700 (2015).
71. "Visible-frequency metasurfaces for broadband anomalous reflection and high-efficiency spectrum splitting"
Z. Li, E. Palacios, S. Butun, and K. Aydin
Nano Letters 15, 1615 (2015).

72. "Large-area, lithography-free super absorbers and color filters based on planar resonant cavities with ultrathin metallic films"
 Z. Li, S. Butun, and K. Aydin
ACS Photonics 2, 183, (2015)
73. "Reduced near-infrared absorption and thermal emission using ultra-thin lossy metals in Fabry-Perot cavities"
 H. Kocer, S. Butun, and K. Aydin
Scientific Reports 5, 8157 (2015)
74. "Ultra-narrow band absorbers based on surface lattice resonances in nanostructured metal surfaces"
 Z. Li, S. Butun, and K. Aydin
ACS Nano 8, 8242 (2014).
75. "Structurally tunable absorption bands using ultrathin broadband plasmonic absorbers"
 S. Butun, and K. Aydin
Optics Express 22, 19547 (2014).
76. "Touching gold nanoparticle chain based plasmonic antenna arrays and metamaterials"
 Z. Li, S. Butun, and K. Aydin
ACS Photonics 1, 228 (2014).
77. "Broadband, polarization-independent resonant light absorption using ultrathin, plasmonic super absorbers"
 K. Aydin, V. E. Ferry, R. M. Briggs, and H. A. Atwater
Nature Communications 2, 517 (2011).
78. "Compliant metamaterials for dynamic infrared spectroscopy and biosensing"
 I. M. Pryce, Y. A. Kelaita, K. Aydin, and H. A. Atwater
ACS Nano 5, 8167 (2011).
79. "Characterization of the tunable response of highly strained compliant optical metamaterials"
 I. M. Pryce*, K. Aydin*, Y. A. Kelaita, R. M. Briggs, and H. A. Atwater (*equal contribution)
Phil. Trans. R. Soc. A 369, 3447 (2011)
80. "Highly strained compliant optical metamaterials with a large frequency tunability"
 I. M. Pryce*, K. Aydin*, Y. A. Kelaita, R. M. Briggs, and H. A. Atwater (*equal contribution)
Nano Lett. 10, 4222 (2010).
81. "Symmetry breaking and strong coupling in planar optical metamaterials"
 K. Aydin, I. M. Pryce, and H. Atwater
Opt. Express 18, 13407 (2010).
82. "Frequency tunable near-infrared metamaterials based on VO₂ phase transition"
 M. J. Dicken*, K. Aydin*, I. M. Pryce*, L. A. Sweatlock, E. M. Boyd, S. Walavalkar, J. Ma, and H. A. Atwater, (*equal contribution)
Opt. Express 17, 18330 (2009).
83. "Retrieval of effective parameters for bianisotropic metamaterials with omega shaped metallic inclusions"
 Z. Li, K. Aydin, and E. Ozbay
Photon. Nanostr.: Fundam. Appl. 10, 329 (2012).
84. "Enhanced transmission of electromagnetic waves through split-ring resonator-shaped apertures"
 L. Sahin, K. Aydin, G. T. Sayhan, and E. Ozbay
J. Nanophot. 5, 051812 (2011)
85. "Transmission spectra and the effective parameters for planar metamaterials with omega shaped metallic inclusions"
 Z. Li, K. Aydin, and E. Ozbay
Opt. Comm. 283, 2547 (2010).

86. "Enhanced transmission through a subwavelength aperture using metamaterials"
A. O. Cakmak, K. Aydin, E. Colak, Z. F. Li, F. Bilotti, L. Vegni, and E. Ozbay
Appl. Phys. Lett. 95, 052103 (2009).
87. "Determination of the effective constitutive parameters of bianisotropic metamaterials from reflection and transmission coefficients"
Z. F. Li, K. Aydin, and E. Ozbay
Phys. Rev. E 79, 026610 (2009).
88. "Split-ring-resonator-coupled enhanced transmission through a single subwavelength aperture"
K. Aydin, A. O. Cakmak, L. Sahin, Z. F. Li, F. Bilotti, L. Vegni, and E. Ozbay
Phys. Rev. Lett. 102, 013904 (2009).
89. "Multi-gap individual and coupled split-ring resonator structures"
R. S. Penciu, K. Aydin, M. Kafesaki, Th. Koschny, E. Ozbay, E. N. Economou, and C. M. Soukoulis
Optics Express 16, 18131 (2008).
90. "Negative phase advance in polarization independent, multi-layer negative index metamaterials"
K. Aydin, Z. F. Li, L. Sahin, and E. Ozbay
Optics Express 16, 8835 (2008).
91. "Wide bandwidth directional beaming via waveguide ports in photonic crystals"
Z. F. Li, K. Aydin, and E. Ozbay
J. Phys. D 41, 155115 (2008).
92. "Super-resolution imaging by one dimensional, microwave left-handed metamaterials with an effective negative index"
E. Ozbay, Z. F. Li, and K. Aydin
J. Phys. Cond. Matt. 20, 304216 (2008).
93. "A hybrid light source with integrated inorganic light-emitting diode and organic polymer distributed feedback grating"
B. Butun*, K. Aydin*, E. Ulker, S. Cheylan, G. Badenes, M. Forster, U. Scherf, and E. Ozbay, (*equal contribution)
Nanotechnology 19, 195202 (2008).
94. "Negative refraction and imaging beyond the diffraction limit by a two-dimensional left-handed metamaterial"
E. Ozbay, and K. Aydin
Photon. Nanostr.: Fundam. Appl. 6, 108 (2008).
95. "Experimental and numerical study of omega type bianisotropic metamaterials combined with a negative permittivity medium"
K. Aydin, Z. F. Li, S. Bilge, and E. Ozbay
Photon. Nanostr.: Fundam. Appl. 6, 116 (2008).
96. "Equivalent circuit models for the design of metamaterials based on artificial magnetic inclusions"
F. Bilotti, A. Toscano, L. Vegni, K. Aydin, K. B. Alici, and E. Ozbay
IEEE Trans. Microw. Theory Tech. 55, 2865 (2007).
97. "Experimental study of subwavelength focusing by left-handed metamaterials with negative refractive index"
E. Ozbay, and K. Aydin
J. Nanophotonics 1, 011695 (2007).
98. "Transmission characteristics of bianisotropic metamaterials based on omega shaped metallic inclusions"
K. Aydin, Z. F. Li, M. Hudlicka, S. A. Tretyakov, and E. Ozbay
New J. Phys. 9, 326 (2007).
99. "Highly directional emission from photonic crystals with a wide bandwidth"
Z. Li, K. Aydin, and E. Ozbay
Appl. Phys. Lett. 91, 121105 (2007).

100. "Metamaterials with negative permeability and negative refractive index: Experiments and simulations"
E. Ozbay, K. Guven, and K. Aydin
J. Opt. A: Pure Appl. Opt. 9, S301 (2007).
101. "Subwavelength resolution with a negative-index metamaterial superlens"
K. Aydin, I. Bulu, and E. Ozbay
Appl. Phys. Lett. 90, 254102 (2007).
102. "Left-handed metamaterial based superlens for subwavelength imaging of electromagnetic waves"
K. Aydin, and E. Ozbay
Appl. Phys. A: Mat. Sci. Proc. 87, 137 (2007).
103. "Negative refraction, subwavelength focusing and beam formation by photonic crystals"
E. Ozbay, K. Aydin, I. Bulu, and K. Guven
J. Phys. D: Appl. Phys. 40, 2652 (2007).
104. "Experimental and numerical analyses of the resonances of split-ring resonators"
K. Aydin, and E. Ozbay
Phys. Stat. Sol. B 244, 1197 (2007).
105. "Study of the field emitted by a source placed inside a two dimensional left-handed metamaterial"
I. Bulu, H. Caglayan, K. Aydin, and E. Ozbay
Opt. Lett. 32, 850 (2007).
106. "Experimental investigation of reflection characteristics of left-handed metamaterials in free space"
K. Aydin, and E. Ozbay
IET Microw. Antennas Propag. 1, 89 (2007).
107. "Capacitor-loaded split ring resonators as tunable metamaterial components"
K. Aydin, and E. Ozbay
J. Appl. Phys. 101, 024911 (2007).
108. "Electromagnetic wave focusing from sources inside a two-dimensional left-handed material superlens"
K. Aydin, I. Bulu, and E. Ozbay
New J. Phys. 8, 221 (2006).
109. "Verification of impedance matching at the surface of left- handed materials"
K. Aydin, I. Bulu, and E. Ozbay
Microw. Opt. Tech. Lett. 48, 2548 (2006).
110. "Identifying the magnetic response of split-ring resonators at microwave frequencies"
K. Aydin, and E. Ozbay
Opto-Electron. Rev. 14, 193 (2006).
111. "Observation of negative refraction and focusing in two-dimensional photonic crystals"
E. Ozbay, I. Bulu, K. Guven, H. Caglayan, and K. Aydin
Japanese J. Appl. Phys. 45, 6064 (2006).
112. "Experimental demonstration of a left-handed metamaterial operating at 100 GHz"
M. Gokkavas, K. Guven, I. Bulu, K. Aydin, R. S. Penciu, M. Kafesaki, C. M. Soukoulis, and E. Ozbay
Phys. Rev. B 73, 193103 (2006).
113. "Negative refraction through an impedance matched left-handed metamaterial slab"
K. Aydin, and E. Ozbay
J. Opt. Soc. Am. B 23, 415 (2006).
114. "Experimental analysis of true left-handed behavior and transmission properties of composite metamaterials"
K. Guven, K. Aydin, and E. Ozbay
Photonics and Nanostruct. - Fund. Appl. 3, 75 (2005).
115. "Focusing of electromagnetic waves by a left-handed metamaterial flat lens"
K. Aydin, I. Bulu, and E. Ozbay
Opt. Express 13, 8753 (2005).

116. "Compact size highly directive antennas based on SRR metamaterial medium"
 I. Bulu, H. Caglayan, K. Aydin, and E. Ozbay
New J. Phys. 7, 223 (2005).
117. "Investigation of magnetic resonances for different split-ring resonator parameters and designs"
 K. Aydin, I. Bulu, K. Guven, M. Kafesaki, C. M. Soukoulis, and E. Ozbay
New J. Phys. 7, 168 (2005).
118. "Observation of negative refraction and negative phase velocity in left-handed metamaterials"
 K. Aydin, K. Guven, C. M. Soukoulis, and E. Ozbay
Appl. Phys. Lett. 86, 124102 (2005).
119. "Highly directive radiation and negative refraction using photonic crystals"
 E. Ozbay, I. Bulu, K. Aydin, H. Caglayan, K. Guven, and B. K. Alici
Laser Phys. 15, 217 (2005).
120. "Effect of disorder on magnetic resonance band gap of split-ring resonator structures"
 K. Aydin, K. Guven, N. Katsarakis, C. M. Soukoulis, and E. Ozbay
Opt. Express 12, 5896 (2004).
121. "Experimental observation of true left-handed transmission peak in metamaterials"
 K. Aydin, K. Guven, L. Zhang, M. Kafesaki, C. M. Soukoulis, and E. Ozbay
Opt. Lett. 29, 2623 (2004).
122. "Spectral negative refraction and point focusing analysis of a two-dimensional left-handed photonic crystal lens"
 K. Guven, K. Aydin, K. B. Alici, C. M. Soukoulis, and E. Ozbay
Phys. Rev. B 70, 205125 (2004).
123. "Physics and applications of photonic nanocrystals"
 E. Ozbay, K. Guven, K. Aydin, and M. Bayindir
Int. J. Nanotechnology 1, 379 (2004).
124. "Negative refraction and subwavelength focusing using photonic crystals"
 E. Ozbay, K. Guven, E. Cubukcu, K. Aydin, and B. K. Alici
Mod. Phys. Lett. B 18, 1275 (2004).
125. "Subwavelength resolution in a two-dimensional photonic crystal based superlens"
 E. Cubukcu, K. Aydin, S. Foteinopolou, C. M. Soukoulis, and E. Ozbay
Phys. Rev. Lett. 91, 207401 (2003).
126. "Transmission and reflection properties of composite double negative metamaterials in free space"
 E. Ozbay, K. Aydin, E. Cubukcu, and M. Bayindir
IEEE Trans. Antennas Propag. 51, 2592 (2003).
127. "Electromagnetic waves: Negative refraction by photonic crystals"
 E. Cubukcu, K. Aydin, E. Ozbay, S. Foteinopoulou, and C. M. Soukoulis
Nature 423, 604 (2003).
128. "Transmission properties of composite metamaterials in free space"
 M. Bayindir, K. Aydin, E. Ozbay, P. Markos, and C. M. Soukoulis
Appl. Phys. Lett. 81, 120 (2002).

b. Non-refereed Journal Articles

1. "Integrated Optics: Nanostructured Silicon Success"
 K. Aydin
Nature Photonics 9, 353 (2015).

c. Conference Abstracts

— Abstracts 1 through 9 are published at Northwestern University

1. “Visible-frequency broadband asymmetric transmission of linear polarized light through a tapered grating”
B. Tang, Z. Li, Z. Liu, F. Callewaert, and K. Aydin
IEEE Photonics Conference Proceedings, pg. 127-128 (2016)
2. “Inverse-designed all-dielectric waveguide bend”
F. Callewaert, and K. Aydin
SPIE Optical Engineering + Applications, 99480Q-8 (2016)
3. “Inverse-designed all-dielectric optical diode”
F. Callewaert, and K. Aydin
SPIE Nanoscience + Engineering, 99182P-10 (2016)
4. “Visible-frequency metasurfaces for broadband anomalous reflection and high-efficiency spectrum splitting”
Z. Li, E. Palacios, S. Butun, and K. Aydin
SPIE Nanoscience + Engineering, 954428-1 (2015)
5. “Large-area lithography-free perfect absorbers, color filters and photodetectors at visible frequencies using ultra-thin silver or amorphous silicon films”
Z. Li, S. Butun, and K. Aydin
SPIE Nanoscience + Engineering, 95461P-1 (2015)
6. “Enhanced infrared transmission from gold wire-grid arrays via surface plasmons in continuous graphene”
Z. Liu, S. Butun, E. Palacios, and K. Aydin
SPIE Nanoscience + Engineering, 95461X-1 (2015)
7. “Tunable short-wavelength infrared reflection and transmission band on nanometric thin film structures”
H. Kocer, S. Butun, and K. Aydin
The European Conference on Lasers and Electro-Optics, CK_11_4 (2015)
8. “Ultraviolet surface-enhanced Raman spectroscopy using aluminum plasmonic gratings”
A.T. Roberts, S. Butun, K. Aydin, H. O. Everitt, M. Bloemer, G. D'Aguanno, N. Mattiucci
APS Meeting Abstracts, R22.004 (2013)
9. “UV-SERS Assisted by Nano-Focusing in Plasmonic Gratings with Tapered Slits”
G. D'Aguanno, N. Mattiucci, S. Butun, J. Callahan, H. O. Everitt, K. Aydin, M. Bloemer
Frontier in Optics, FTu3A.68 (2012)
10. “Active and Tunable Plasmonics and Metamaterials”
H. A. Atwater, I. M. Pryce, and K. Aydin
Frontiers in Optics, FTuU1 (2011)
11. “Increased cell efficiency in InGaAs solar cells with metal and dielectric back reflectors”
K. Aydin, M. S. Leite, and H. A. Atwater
Proc. 34th IEEE Photovoltaics Specialists Conference, p. 001713 (2009).
12. “Active plasmonic devices and optical metamaterials”
K. Aydin, S. Burgos, I. M. Pryce, M. J. Dicken, J. A. Dionne, K. Diest, R. de Waele, A. Polman, and H. A. Atwater,
2009 IEEE LEOS Annual Meeting Conference Proceedings, pp. 92-93 (2009).
13. “Negative refraction and subwavelength imaging using left-handed composite metamaterials”
E. Ozbay, and K. Aydin
Proc. SPIE, 6987, 698703 (2008).
14. “Negative refraction and subwavelength focusing using left-handed composite metamaterials”
E. Ozbay, and K. Aydin,
Proc. SPIE, 6901, 690104 (2008).
15. “Review of experimental studies on microwave left-handed metamaterials”
E. Ozbay, and K. Aydin
AIP Conf. Proc. 959, 72 (2007).

16. "Ferroelectric based tuneable SRR based metamaterials for microwave applications"
E. Ozbay, K. Aydin, K. Kolodziejak, and D. Pawlak
Proc. 37th European Microwave Conference, p. 497 (2007).
17. "Theoretical and experimental analysis of magnetic inclusions for the realization of metamaterials at different frequencies"
F. Bilotti, A. Toscano, L. Vigni, K. Aydin, K. B. Alici, and E. Ozbay
Proc. IEEE MTT-S International Microwave Symposium, p. 1835 (2007).
18. "Experimental demonstration of negative refraction and subwavelength imaging by left-handed composite metamaterials"
E. Ozbay, K. Aydin, G. Ozkan, and I. Bulu
Mater. Res. Soc. Symp. Proc. 919, 0919-J03-06 (2006).
19. "Two dimensional left-handed metamaterial with a negative refractive index"
K. Aydin, K. Guven, and E. Ozbay
Journal of Physics: Conference Series, 36, 6 (2006).
20. "Transmission properties of various split-ring resonator systems"
K. Aydin, I. Bulu, K. Guven, and E. Ozbay
Quantum Electronics and Laser Science Conference, JTuD44 (2006)
21. "Negative refraction and focusing by a left-handed slab in free space"
K. Aydin, and E. Ozbay
CLEO-QELS, pg. 1-2 (2006)
22. "Experimental demonstration of negative refraction and subwavelength imaging by left-handed composite metamaterials"
E. Ozbay, K. Aydin, G. Ozkan, and I. Bulu
MRS Proceedings, 0919-J03-06 (2006)
23. "Observation of negative refraction and negative phase velocity in true left-handed metamaterials"
E. Ozbay, K. Aydin, K. Guven, and I. Bulu
Proc. SPIE 5840, 240 (2005).
24. "Experimental observation of true left-handed metamaterial"
K. Aydin, K. Guven, and E. Ozbay
Conference on Lasers and Electro-Optics, JThC4 (2005)
25. "Negative refraction and subwavelength focusing using photonic crystals"
E. Ozbay, K. Aydin, K. B. Alici, and K. Guven
Proc. SPIE 5733, 39 (2005).
26. "Transmission and reflection properties of composite metamaterials in free space"
K. Aydin, E. Cubukcu, E. Ozbay, and M. Bayindir
Conference on Lasers and Electro-Optics, CMM6 (2003).
27. "Microwave transmission through metamaterials in free space"
K. Aydin, M. Bayindir, and E. Ozbay
Quantum Electronics and Laser Science Conference, QMD1 (2003).

d. Book Chapters

1. "Left-Handed Metamaterials - A Review"
E. Ozbay, G. Ozkan, and K. Aydin
Oxford Handbook of Nanoscience and Technology, Edited by A. V. Narlikar and Y.Y. Fu, Oxford University Press (2010).
2. "Enhanced Transmission through Subwavelength Apertures Using Metamaterials"
F. Bilotti, L. Scorrano, K. B. Alici, K. Aydin, O. A. Cakmak, E. Ozbay, and L. Vigni
Selected Topics on Metamaterials and Photonic Crystals, Edited by A. Andreone, A. Cusano, V. Galdi, and A. Cutolo, World Scientific Pub. (2010)

3. “Composite Metamaterials, Negative Refraction and Focusing”
E. Ozbay, and K. Aydin
Metamaterials Handbook, Edited by Filippo Capalino, CRC Press (2009).

e. Patents

1. “Systems and methods for direct laser writing”
S. Krishnaswamy, H. Wei, W. Hadibrata, K. Aydin
US Patent App 17515841 (2022)
2. “Additive manufacturing of inverse-designed optical metadevices”
F. Callewaert, A. V. Sahakian, K. Aydin
US Patent 11340585 (2022)
3. “Tunable compliant optical metamaterials structures”
I. Pryce, K. Aydin, R. Briggs, H. A Atwater
US Patent 8921789 (2014)

7. Invited Talks

a. International Conferences and Workshops

1. MRS Fall 2023 (Boston, MA), *December 2023*
2. SPP10 (Houston, TX), *May 2023*
3. SPIE Photonics West (San Francisco, CA), *February 2023*
4. IEEE Nanotechnology Council and IEEE Magnetics Society Chicago Chapters 4th Joint Annual Meeting (Evanston, IL), *November 2022*
5. EOSAM 2021, (Rome, Italy), *September 2021*
6. SPIE Optics and Photonics 2021, (San Diego, CA), *August 2021*
7. TMS 2021, (Orlando, FL), *March 2021*
8. PQE Physics of Quantum Electronics, PQE 2020 (Snowbird, UT), *January 2020*
9. MRS Fall 2019 (Boston, MA), *December 2019*
10. MRS Spring 2019 (Phoenix, AZ), *April 2019*
11. PQE Physics of Quantum Electronics, PQE 2019 (Snowbird, UT), *January 2019*
12. Fotonik 2019 (Ankara, Turkey), *September 2018*
13. SPIE Optics and Photonics 2018 (San Diego, CA), *August 2018*
14. SPIE Photonics West (San Francisco, CA), *January 2018*
15. SPIE Optics and Photonics 2017 (San Diego, CA), *August 2017*
16. META Conference 2017 (Seoul, Korea), *July 2017*
17. MRS Spring 2017 (Phoenix, AZ), *April 2017*
18. UCF 2D Workshop (Orlando, FL), *February 2017*
19. First Northwestern Univ. – Tel Aviv Univ. Workshop on Semiconductors, Electronic Materials, Thin Films and Photonic Materials (Tel Aviv, Israel), *February 2015*
20. OSA Incubator on the Fundamentals of Optical Energy Conversion, *November 2014*
21. AVS 61st International Symposium (Baltimore, MD), *November 2014*
22. Physics of Quantum Electronics, PQE 2014 (Snowbird, UT), *January 2014*
23. IEEE Photonics Society Meeting 2013 (Seattle, WA), *September 2013*
24. SPIE Optics and Photonics 2013 (San Diego, CA), *August 2013*
25. SPIE Optics and Photonics 2013 (San Diego, CA), *August 2013*

26. UNAM International Workshop on Cleanroom Training (Ankara, Turkey), *June 2013*
27. Nanotech Conference & Expo 2013 (Washington, DC), *May 2013*
28. SPIE Photonics West 2013 (San Francisco, CA), *February 2013*
29. SPIE Photonics West 2013 (San Francisco, CA), *February 2013*
30. NANOMETA 2013 (Tirol, Austria), *January 2013*
31. GE Global Research Photonics Symposium (Niskayuna, NY), *September 2012*
32. SPIE Optics and Photonics 2012 (San Diego, CA), *August 2012*
33. UNAM International Workshop on Cleanroom Training (Ankara, Turkey), *June 2012*
34. PECS-X Conference (Santa Fe, Mexico), *June 2012*
35. SPIE Photonics West 2012 (San Francisco, CA), *January 2012*
36. SPIE Optics and Photonics 2010 (San Diego, CA), *August 2010*
37. SPIE Photonics Europe 2010 (Brussels, Belgium), *April 2010*
38. IEEE Photonics Society Annual Meeting 2009 (Antalya, Turkey), *October 2009*
39. Progress in Electromagnetic Research Symposium (Hangzhou, China), *March 2008*
40. European Microwave Conference (EUMW) 2006 (Manchester, UK), *September 2006*

b. Seminars and Colloquium

1. Rome University of La Sapienza, *September 2022*
2. Rome University of La Sapienza, *June 2021*
3. Koc University, Electrical Engineering, *August 2019*
4. Bilkent University NANOTAM Center, *July 2019*
5. Rome University of La Sapienza, *June 2019*
6. Photonics Media Webinar, *November 2018*
7. INRS EMT Seminar, *October 2018*
8. California Institute of Technology, Applied Physics Seminar, *November 2017*
9. Northrop Grumman NEXT, *November 2017*
10. Stanford University, Materials Science Seminar, *October 2017*
11. Lawrence Livermore National Laboratory, PLS Division Seminar, *October 2017*
12. Purdue University, ECE Seminar, *September 2017*
13. Washington University in St. Louis, IMSE Seminar, *March 2017*
14. University of Central Florida, CREOL Seminar, *February 2017*
15. Middle East Technical University, Electrical Engineering Seminar, *December 2012*
16. Koc University, Science Seminar, *July 2012*
17. Bilkent University, Electrical and Electronics Engineering, *June 2012*
18. Argonne National Lab, Center for Nanoscale Materials Seminar, *January 2012*
19. Northwestern University, Meet the EECS Faculty Seminar Series, *November 2011*
20. University of Washington, Electrical Engineering, *May 2011*
21. Princeton University, Electrical Engineering, *March 2011*
22. Northwestern University, Electrical Engineering and Computer Science, *March 2011*
23. Washington University in St. Louis, Electrical and Systems Eng., *February 2011*
24. North Carolina State University, Electrical and Computer Engineering, *February 2011*
25. Arizona State University, Department of Physics, *February 2011*
26. University of Minnesota, Chemical Engineering and Materials Science, *February 2011*

27. ETH Zurich, Department of Information Technology and Electrical Eng., *December 2010*
28. Brown University, School of Engineering Seminar, *December 2010*
29. Boston University, ECE Seminar, *November 2010*
30. University of California Los Angeles, ECE Seminar, *November 2010*
31. University of Southern California, EE Photonics Seminar, *November 2010*
32. University of California Irvine, EECS Seminar, *November 2010*
33. AMOLF-FOM, Amsterdam *April 2010*
34. California Institute of Technology, Applied Physics, *January 2008*
35. Harvard University, Applied Physics, *January 2008*
36. University of California Berkeley, Mechanical Engineering, *January 2008*

8. Service

a. to the University

2011 – present	Member, Instructional Labs Committee
2011 – present	Member, Electrical Engineering Undergraduate Curriculum Committee
2011 – present	Invited Distinguished Speakers for EECS Distinguished Seminar Series
2012, 2017	Assisted with Electrical Engineering for ABET Accreditation
2012, 2013, 2015	Member, Applied Physics Graduate Admission Committee
2014 – present	Global McCormick Faculty Ambassador for Turkey
2015	Attended NU – Tel Aviv Workshop in Tel Aviv, Israel to represent EE
2017	Murphy Proposal Awarded (\$16K) for Upgrading EECS 223 Labs

b. to the Profession

Editor:

2014 MRS Spring 2014 Proc., Symposium II: Emerging Nanophotonic Materials and Devices

Conference and Symposium Organizer:

2015	Lead-Organizer , “Nanophotonics Symposium” IEEE Photonics Conference (Herndon, VA), October 2015
2014	Lead-Organizer , “Symposium II: Emerging Nanophotonic Materials and Devices” Spring Meeting of the Materials Research Society (MRS), San Francisco, April 2014

Conference Programming Committee Member:

2018	SPIE Optics and Photonics (Low-Dimensional Materials and Devices)
2014 – ongoing	SPIE Optics and Photonics (Active Photonic Materials)
2010 – 2014	SPIE Optics and Photonics (Metamaterials)
2012	MIOMD XI: Infrared Optoelectronics: Materials and Devices
2014	TechConnect World Innovation Conference & Expo
2014	IEEE - NANO 2014
2014	IEEE Photonics Society Conference (Nanophotonics Session)

Reviewer for Funding Agencies, including:

- National Science Foundation
- Department of Defense, Army Research Office
- Office Department of Energy, Office of Basic Energy
- European Research Council
- TUBITAK
- Swiss National Science Foundation (SNSF)
- ACS Petroleum Research Fund
- Argonne CNM User Proposal Evaluation Board

Reviewer for Peer-Reviewed Journals, including:

ACS Nano, ACS Photonics, ACS Applied Materials and Interfaces, Advanced Materials, Advanced Optical Materials, Applied Physics Letters, Journal of Applied Physics, Journal of Physical Chemistry C, JOSA B, Journal of Optics, Light Science and Applications, Nano Letters, Nature Communications, Nature Materials, Nature Nanotechnology, Nature Photonics, Optics Express, Optics Letters, Physical Review B, Physical Review Letters, Physical Review X, Science Advances, Scientific Reports

Member of Professional Societies:

- Optical Society of America (OSA)
- IEEE Photonics Society
- Materials Research Society (MRS)
- The International Society for Optical Engineering (SPIE)