

## 1. Name, Position, and Department

### Koray Aydin

Associate Professor of Electrical and Computer Engineering  
Northwestern University

## 2. Address and Contact Information

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## 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 = 8661** | **h-index = 42**

(Google Scholar: <http://scholar.google.com/citations?user=ntJy56wAAAAJ>, last accessed 13/12/19)

### a. Refereed Journal Publications

1. “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)

2. “Two-photon direct laser writing of inverse-designed free-form near-infrared polarization beamsplitter”  
H. Wei, F. Callewaert, W. Hadibrata, V. Velez, Z. Liu, P. Kumar, K. Aydin\* and S. Krishnaswamy\*  
*Adv. Opt. Mat.* 7, 1900513 (2019)
3. “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)
4. “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)
5. “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)
6. “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)
7. “Phase engineering and optical properties of 2D MoSe<sub>2</sub>: 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).
8. Tunable polaritonic metasurface absorbers in mid-IR based on hexagonal boron nitride and vanadium dioxide layers  
*J. Phys. D: Appl. Phys.* 52, 164002 (2019).
9. “Dynamic infrared thin-film absorbers with tunable absorption intensity based on VO<sub>2</sub> phase transition”  
Z. Liu, B. Banar, S. Butun, H. Kocer, K. Wang, J. Wu, and K. Aydin  
*Opt. Mat. Exp.* 8, 2151 (2018).
10. “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)
11. “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)
12. “Inverse-designed stretchable metalens with tunable focal distance”  
F. Callewaert, V. Velez, S. Jiang, A. V. Sahakian, P. Kumar, and K. Aydin  
*Appl. Phys. Lett.* 112, 091102 (2018)
13. “Optically-active 1-D MoS<sub>2</sub> 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)
14. “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)
15. “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).

16. "Inverse designed broadband all-dielectric electromagnetic metadevices"  
F. Callewaert, V. Velev, P. Kumar, A. V. Sahakian, and K. Aydin  
*Scientific Reports* 8, 1358 (2018).
17. "Enhanced radiative emission from monolayer MoS<sub>2</sub> films with a single plasmonic dimer nanoantenna"  
E. Palacios, S. Park, S. Butun, L. Lauhon, and K. Aydin  
*Appl. Phys. Lett.* 111, 031101 (2017).
18. "Identifying excitation and emission rate contributions to plasmon-enhanced photoluminescence from monolayer MoS<sub>2</sub> using a tapered gold antenna"  
E. Palacios, S. Park, S. Butun, L. Lauhon, and K. Aydin  
*ACS Photonics* 4, 1602 (2017).
19. "Quantifying plasmon-enhanced light absorption in monolayer WS<sub>2</sub> films"  
S. Butun, E. Palacios, J. Cain, Z. Liu, V. P. Dravid, and K. Aydin  
*ACS Appl. Mat. & Int.* 9, 15044 (2017).
20. "Wideband, zero-index metacrystal with high transmission at visible frequencies"  
Z. Li, Z. Liu, and K. Aydin  
*JOSA B* 34, D13 (2017).
21. "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).
22. "Functional metal-insulator top contacts for Si-based color photodetectors"  
S. Butun, and K. Aydin  
*J. Appl. Phys.* 120, 223102 (2016).
23. "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).
24. "Enhanced infrared transmission through gold nanoslit arrays via surface plasmons in continuous graphene"  
Z. Liu, and K. Aydin  
*Optics Express* 24, 27882 (2016).
25. "Time-varying metasurfaces based on graphene micro-ribbon arrays"  
Z. Liu, Z. Li, and K. Aydin  
*ACS Photonics* 3, 2035 (2016).
26. "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).
27. "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).
28. "Localized surface plasmons in nanostructured monolayer black phosphorus"  
Z. Liu, and K. Aydin  
*Nano Letters* 16, 3457 (2016).
29. "Ultrawide angle, directional spectrum splitting visible-frequency versatile metasurfaces"  
Z. Li, E. Palacios, S. Butun, and K. Aydin  
*Adv. Opt. Materials* 4, 953 (2016).
30. "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).

31. “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).
32. “Broadband metasurfaces for anomalous transmission and spectrum splitting at visible frequencies”  
Z. Li, and K. Aydin  
*EPJ Appl. Metamat.* 2, 2 (2015).
33. “Asymmetric absorption and reflection in plasmonic nanohole arrays”  
S. Butun, and K. Aydin  
*ACS Photonics* 2, 1652 (2015).
34. “Unidirectional lasing from template-stripped two-dimensional plasmonic crystals”  
A. Yang, Z. Li, M. P. Knudson, A. J. Hryn, W. Wang, K. Aydin, T. W. Odom  
*ACS Nano* 9, 11582 (2015).
35. “Omnidirectional, broadband light absorption using large-area, ultrathin lossy metallic film coatings”  
Z. Li, H. Kocer, and K. Aydin  
*Scientific Reports* 5, 15137 (2015).
36. “Dynamically controlled plasmonic nano-antenna phased array utilizing vanadium dioxide”,  
G. Kaplan, K. Aydin, and J. Scheuer  
*Optics Materials Express* 5, 2513 (2015).
37. “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).
38. “Intensity tunable infrared broadband absorbers based on VO<sub>2</sub> phase transition using planar layered thin film structures”  
H. Kocer, S. Butun, S. Tongay, J. Wu, and K. Aydin  
*Scientific Reports* 5, 13384 (2015).
39. “Thermal tuning of infrared resonant absorbers based on hybrid gold-VO<sub>2</sub> nanostructures”  
H. Kocer, S. Butun, B. Banar, K. Wang, S. Tongay, J. Wu and K. Aydin  
*Applied Physics Letters* 106, 161104 (2015)
40. “Enhanced light emission from large-area monolayer MoS<sub>2</sub> using plasmonic nanodisc arrays”  
S. Butun, S. Tongay, and K. Aydin  
*Nano Letters* 15, 2700 (2015).
41. “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).
42. “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)
43. “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)
44. “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).

45. “Structurally tunable absorption bands using ultrathin broadband plasmonic absorbers”  
S. Butun, and K. Aydin  
*Optics Express* 22, 19547 (2014).
46. “Touching gold nanoparticle chain based plasmonic antenna arrays and metamaterials”  
Z. Li, S. Butun, and K. Aydin  
*ACS Photonics* 1, 228 (2014).
47. “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).
48. “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).
49. “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)
50. “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).
51. “Symmetry breaking and strong coupling in planar optical metamaterials”  
K. Aydin, I. M. Pryce, and H. Atwater  
*Opt. Express* 18, 13407 (2010).
52. “Frequency tunable near-infrared metamaterials based on VO<sub>2</sub> 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).
53. “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).
54. “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)
55. “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).
56. “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).
57. “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).
58. “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).

59. “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).
60. “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).
61. “Wide bandwidth directional beaming via waveguide ports in photonic crystals”  
Z. F. Li, K. Aydin, and E. Ozbay  
*J. Phys. D* 41, 155115 (2008).
62. “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).
63. “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).
64. “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).
65. “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).
66. “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).
67. “Experimental study of subwavelength focusing by left-handed metamaterials with negative refractive index”  
E. Ozbay, and K. Aydin  
*J. Nanophotonics* 1, 011695 (2007).
68. “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).
69. “Highly directional emission from photonic crystals with a wide bandwidth”  
Z. Li, K. Aydin, and E. Ozbay  
*Appl. Phys. Lett.* 91, 121105 (2007).
70. “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).
71. “Subwavelength resolution with a negative-index metamaterial superlens”  
K. Aydin, I. Bulu, and E. Ozbay  
*Appl. Phys. Lett.* 90, 254102 (2007).
72. “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).

73. “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).
74. “Experimental and numerical analyses of the resonances of split-ring resonators”  
K. Aydin, and E. Ozbay  
*Phys. Stat. Sol. B* 244, 1197 (2007).
75. “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).
76. “Experimental investigation of reflection characteristics of left-handed metamaterials in free space”  
K. Aydin, and E. Ozbay  
*IET Microw. Antennas Propag.* 1, 89 (2007).
77. “Capacitor-loaded split ring resonators as tunable metamaterial components”  
K. Aydin, and E. Ozbay  
*J. Appl. Phys.* 101, 024911 (2007).
78. “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).
79. “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).
80. “Identifying the magnetic response of split-ring resonators at microwave frequencies”  
K. Aydin, and E. Ozbay  
*Opto-Electron. Rev.* 14, 193 (2006).
81. “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).
82. “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).
83. “Negative refraction through an impedance matched left-handed metamaterial slab”  
K. Aydin, and E. Ozbay  
*J. Opt. Soc. Am. B* 23, 415 (2006).
84. “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).
85. “Focusing of electromagnetic waves by a left-handed metamaterial flat lens”  
K. Aydin, I. Bulu, and E. Ozbay  
*Opt. Express* 13, 8753 (2005).
86. “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).
87. “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).
88. “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).

89. “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).
90. “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).
91. “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).
92. “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).
93. “Physics and applications of photonic nanocrystals”  
E. Ozbay, K. Guven, K. Aydin, and M. Bayindir  
*Int. J. Nanotechnology* 1, 379 (2004).
94. “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).
95. “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).
96. “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).
97. “Electromagnetic waves: Negative refraction by photonic crystals”  
E. Cubukcu, K. Aydin, E. Ozbay, S. Foteinopoulou, and C. M. Soukoulis  
*Nature* 423, 604 (2003).
98. “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. 34<sup>th</sup> 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. 37<sup>th</sup> 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. Vegni, 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. Vegni  
*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. “Additive manufacturing of inverse-designed optical metadevices”  
F. Callewaert, A. V. Sahakian, K. Aydin  
*US Provisional Patent App.* (2017)
2. “Tunable compliant optical metamaterials structures”  
I. Pryce, K. Aydin, R. Briggs, H. A Atwater  
*US Patent App.* 13200273 (2011)

## 7. Invited Talks

### a. International Conferences and Workshops

1. PQE Physics of Quantum Electronics, PQE 2020 (Snowbird, UT), *January 2020*
2. MRS Fall 2019 (Boston, MA), *December 2019*
3. MRS Spring 2019 (Phoenix, AZ), *April 2019*
4. PQE Physics of Quantum Electronics, PQE 2019 (Snowbird, UT), *January 2019*
5. Fotonik 2019 (Ankara, Turkey), *September 2018*
6. SPIE Optics and Photonics 2018 (San Diego, CA), *August 2018*
7. SPIE Photonics West (San Francisco, CA), *January 2018*
8. SPIE Optics and Photonics 2017 (San Diego, CA), *August 2017*
9. META Conference 2017 (Seoul, Korea), *July 2017*
10. MRS Spring 2017 (Phoenix, AZ), *April 2017*
11. UCF 2D Workshop (Orlando, FL), *February 2017*
12. First Northwestern Univ. – Tel Aviv Univ. Workshop on Semiconductors, Electronic Materials, Thin Films and Photonic Materials (Tel Aviv, Israel), *February 2015*
13. OSA Incubator on the Fundamentals of Optical Energy Conversion, *November 2014*
14. AVS 61<sup>st</sup> International Symposium (Baltimore, MD), *November 2014*
15. Physics of Quantum Electronics, PQE 2014 (Snowbird, UT), *January 2014*
16. IEEE Photonics Society Meeting 2013 (Seattle, WA), *September 2013*
17. SPIE Optics and Photonics 2013 (San Diego, CA), *August 2013*
18. SPIE Optics and Photonics 2013 (San Diego, CA), *August 2013*
19. UNAM International Workshop on Cleanroom Training (Ankara, Turkey), *June 2013*
20. Nanotech Conference & Expo 2013 (Washington, DC), *May 2013*
21. SPIE Photonics West 2013 (San Francisco, CA), *February 2013*
22. SPIE Photonics West 2013 (San Francisco, CA), *February 2013*
23. NANOMETA 2013 (Tirol, Austria), *January 2013*
24. GE Global Research Photonics Symposium (Niskayuna, NY), *September 2012*
25. SPIE Optics and Photonics 2012 (San Diego, CA), *August 2012*
26. UNAM International Workshop on Cleanroom Training (Ankara, Turkey), *June 2012*
27. PECS-X Conference (Santa Fe, Mexico), *June 2012*
28. SPIE Photonics West 2012 (San Francisco, CA), *January 2012*
29. SPIE Optics and Photonics 2010 (San Diego, CA), *August 2010*
30. SPIE Photonics Europe 2010 (Brussels, Belgium), *April 2010*
31. IEEE Photonics Society Annual Meeting 2009 (Antalya, Turkey), *October 2009*
32. Progress in Electromagnetic Research Symposium (Hangzhou, China), *March 2008*
33. European Microwave Conference (EUMW) 2006 (Manchester, UK), *September 2006*

## **b. Seminars and Colloquium**

1. Koc University, Electrical Engineering, *August 2019*
2. Bilkent University NANOTAM Center, *July 2019*
3. Rome University of La Sapienza, *June 2019*
4. Photonics Media Webinar, *November 2018*
5. INRS EMT Seminar, *October 2018*
6. California Institute of Technology, Applied Physics Seminar, *November 2017*
7. Northrop Grumman NEXT, *November 2017*
8. Stanford University, Materials Science Seminar, *October 2017*
9. Lawrence Livermore National Laboratory, PLS Division Seminar, *October 2017*
10. Purdue University, ECE Seminar, *September 2017*
11. Washington University in St. Louis, IMSE Seminar, *March 2017*
12. University of Central Florida, CREOL Seminar, *February 2017*
13. Middle East Technical University, Electrical Engineering Seminar, *December 2012*
14. Koc University, Science Seminar, *July 2012*
15. Bilkent University, Electrical and Electronics Engineering, *June 2012*
16. Argonne National Lab, Center for Nanoscale Materials Seminar, *January 2012*
17. Northwestern University, Meet the EECS Faculty Seminar Series, *November 2011*
18. University of Washington, Electrical Engineering, *May 2011*
19. Princeton University, Electrical Engineering, *March 2011*
20. Northwestern University, Electrical Engineering and Computer Science, *March 2011*
21. Washington University in St. Louis, Electrical and Systems Eng., *February 2011*
22. North Carolina State University, Electrical and Computer Engineering, *February 2011*
23. Arizona State University, Department of Physics, *February 2011*
24. University of Minnesota, Chemical Engineering and Materials Science, *February 2011*
25. ETH Zurich, Department of Information Technology and Electrical Eng., *December 2010*
26. Brown University, School of Engineering Seminar, *December 2010*
27. Boston University, ECE Seminar, *November 2010*
28. University of California Los Angeles, ECE Seminar, *November 2010*
29. University of Southern California, EE Photonics Seminar, *November 2010*
30. University of California Irvine, EECS Seminar, *November 2010*
31. AMOLF-FOM, Amsterdam *April 2010*
32. California Institute of Technology, Applied Physics, *January 2008*
33. Harvard University, Applied Physics, *January 2008*
34. 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
- ACS Petroleum Research Fund
- Argonne CNM User Proposal Evaluation Board
- Swiss National Science Foundation (SNSF)

**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:**

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