

# CURRICULUM VITAE

**Title, Name, Last Name:** Asst. Prof. Aykutlu Dâna

## 1. PERSONAL DATA

- 1.1. Birth date and place: 1973 , Isparta -Turkey
- 1.2. Address: Bilkent University, Department of Physics, Bilkent, 06800 Ankara, Turkey
- 1.3. Phone: +90 312 290 3502
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- 1.6. Webpage: www.fen.bilkent.edu.tr/~aykutlu

## 2. ACADEMIC DEGREES

- 2.1. Associate Prof., Turkey Higher Education Council (ÜAK) 01/2011
- 2.2. Res. Assistant Prof., Bilkent University 01/2007
- 2.3. Ph. D., Electrical Engineering, Stanford University 03/2003
- 2.4. Ms., Electrical Engineering, Stanford University 01/1998
- 2.5. Bs., Electrical Engineering, Bilkent University 09/1995

## 3. EMPLOYMENT HISTORY

- 3.1. 01/07-Present Res. Asst. Prof., Bilkent University, UNAM-Institute of Materials Science and Nanotechnology, Bilkent University
- 3.2. 09/04-12/06 Postdoctoral Research Associate, Bilkent University, Physics Department, Advanced Research Laboratories
- 3.3. 06/03- 01/07 Instructor, Bilkent University, Department of Physics
- 3.4. 02/02-08/02 Postdoctoral Research Associate, Hewlett Packard Palo Alto Laboratories, USA, Quantum Science Research Group

## 4. PROFESSIONAL AWARDS

- 4.1. Bronze Medal in the International Physics Olympiad 1991 Habana, Cuba. Full score in the experimental section of the same competition.
- 4.2. SEIS Medical Systems Award for development of portable Plasmon resonance imaging system, 2011

## 5. HONORS, SCHOLARLY AND PROFESSIONAL DUTIES AND ACHIEVEMENTS

- 5.1. Refereeing for journals including Nature Nanotechnology, Nano Letters, IEEE transactions on Nanotechnology, Plasmonics, Optics Express 2000-Present
- 5.2. Member of Panel on the review of projects submitted to State Planning Organization of Turkey 2008-Present
- 5.3. Member of Panels on the review of projects submitted to The Turkish Scientific and Technical Research Council 2005-Present
- 5.4. Refereed in EU FP7 ICT Project panels , Brussels 2010

## 6. MEMBERSHIP

## 7. INVITED LECTURES AND INVITED TALKS

A. Dana, İ. Akça, R. Turan, A. Aydınli , “Fabrication, characterization, and optimization of nanocrystal flash memories” , Optics East, Boston MA USA, (9 - 12 September 2007)

F. Yamaguchi, T. D. Ladd, J. R. Goldman, A. Dâna, C. P. Master, D. Leung, and Y. Yamamoto, “Crystal Lattice Quantum Computation and Concurrent Implementation”, US-Japan Seminar 2000 Coherent Quantum System, Newport, RI (September 17-21, 2000) .

F. Yamaguchi, T. D. Ladd, J. R. Goldman, A. Dâna, C. P. Master, and Y. Yamamoto, “Crystal Lattice Quantum Computation and Concurrent Implementation of Quantum Algorithms”, DARPA/QuIST Workshop, Green belt, Maryland (October 23-24, 2000) .

Y. Yamamoto, F. Yamaguchi, T. D. Ladd, J. R. Goldman, and A. Dana, “Crystal Lattice Quantum Computer”, International Conference on Experimental Implementation of Quantum Computation (IQC '01), Sydney, Australia (January 16-19, 2001) .

## 8. TEACHING

### 8.1. Graduate Courses:

- MSN 513: Micro and Nanostructured Sensors
- MSN 510: Imaging Techniques in Material Sciences and Nanotechnology
- MSN 506: Methods of Experimental Physics
- MSN 551: Introduction to Micro and Nanofabrication

### 8.2. Undergraduate Courses:

- PHYS 101                      General Physics I
- PHYS 102                      General Physics II
- PHYS 316                      Electromagnetic Theory II
- EEE 393                        Basic Electrical Engineering
- EEE 101                        Introduction to Electrical Engineering

## 9. GRADUATE STUDENT SUPERVISION

- 9.1. Kemal Gurel, MS, *Coupled surface plasmon structures and applications*, 09/07-09/09. [Coadvisor]
- 9.2. Ozlem Senlik, MS, *Micro- and nano-structured devices for thermal analysis and plasmonic applications*, 09/06-09/08 [Coadvisor]
- 9.3. Ozan Aktas, MS, *Multi-frequency fluxgate magnetic force microscopy*, 09/06-09/08.
- 9.4. Kurtuluş Abak, *New Techniques in Multi-frequency Atomic Force Microscopy and Spectroscopy*, MS 2009
- 9.5. Okan Öner Ekiz, *Chemically Specific Dynamic Characterization of Photovoltaic and Photoconductivity Effects of Surface Nanostructures*, MS 2010
- 9.6. Sencer Ayas, MS, *Plasmon enhanced absorption and emission of radiation: Fundamentals and Applications* , 2009
- 9.7. Mustafa Ürel, MS, *Electrical modelling and Characterization of process damage in GaN light emitting diodes with photonic and plasmonic crystals*, MS 2010

- 9.8. Hasan Güner, Design, Fabrication and Characterization of Surface Plasmon Resonance Based MEMS Displacement Sensors, MS 2009
- 9.9. Ali Güneş Kaya, MS, Photonic and Plasmonic crystals for enhanced light extraction from light emitting diode sources, 2010 [Coadvisor]
- 9.10. Okan Öner Ekiz, Materials for energy conversion and storage, PhD, 2011-present
- 9.11. Hasan Güner, Plasmon resonance based MEMS/NEMS arrays for infrared Imaging, PhD, 2010-present
- 9.12. Burak Turker, Integrated Plasmon Resonance Biosensors, PhD, 2009-present [CoAdvisor]
- 9.13. Sencer Ayas, Plasmon Enhanced Quantum Well Infrared Photodetectors and Focal Plane Arrays, PhD, 2010-present
- 9.14. Mustafa Urel, Nanoscale optoelectronic characterization of graphene nanocomposites and devices, PhD, 2010-present
- 9.15. Deniz Kocaay, MS, Materials and Devices for High-Density Advanced Electronic Data Storage, 2010-present
- 9.16. Serkan Karayalçın, Hybrid electrochemical-plasmonic devices for high-performance biomolecular sensing, 2010-present

## 10. PATENTS

10.1 METHOD AND APPARATUS FOR FINGERPRINTING OPTICAL MEDIA, US PATENT APPLICATION 12/831518, BERK SUNAR, GHAITH HAMMOURI, AYKUTLU DANA

10.2 PLAZMONİK ALGILAYICILAR VE ÜRETİM METODU, TÜRK PATENT BAŞVURUSU / Uluslararası PCT Başvurusu

## 11. SCHOLARLY PUBLICATIONS

11.1. Ph.D. Dissertation

Aykutlu Dana, Electrostatic force spectroscopy of near-surface localized states, Stanford University, 2003. Supervisor: Yoshihisa Yamamoto

11.2. Published Books/Book Chapters

*Electrostatic Force Spectroscopy of Localized States: Application to single electron charging of individual quantum dots*, Aykutu Dana, Publisher: VDM Verlag Dr. Müller (April 7, 2010) ISBN-13: 978-3639238860

*Optical Media Fingerprints for License Distribution Protocols*, Ghaith Hammouri, Aykutlu Dana, and Berk Sunar, in *Towards Hardware Intrinsic Security: Foundation and Practice*, Christian Wachsmann, Ahmad-Reza Sadeghi (eds.), Lecture Notes in Computer Science (LNCS), Springer Verlag, 2010.

*CDs Have Fingerprints Too*. Ghaith Hammouri, Aykutlu Dana, Berk Sunar, In: Clavier, C., Gaj, K., (eds.) *Proceedings of the 11th Workshop on Cryptographic Hardware and Embedded Systems (CHES 2009)*, LNCS, vol. 5747, pp. 348-362, Springer-Verlag, Heidelberg, Germany (2009)

11.3. Articles in refereed journals

**2014**

49. Sencer Ayas, Andi Cupallari, Okan Oner Ekiz, Yasin Kaya, and Aykutlu Dana, *Counting Molecules with a Mobile Phone Camera Using Plasmonic Enhancement*, **ACS Photonics**, 2014

**2013**

48. S Ayas et al, *Label-Free Nanometer-Resolution Imaging of Biological Architectures through Surface Enhanced Raman Scattering*, **Scientific Reports**, 3, 2624, 2013
47. Y Kaya, S Ayas, AE Topal, H Guner, A Dana, *Sensitivity Comparison of Localized Plasmon Resonance Structures and Prism Coupler*, **Sensors and Actuators B: Chemical** - online
46. S Burzhuev, A Dâna, B Ortaç, *Laser synthesized gold nanoparticles for high sensitive strain gauges*, **Sensors and Actuators A: Physical** 203, 131-136
45. A Celebioglu, Z Aytac, OCO Umu, A Dana, T Tekinay, T Uyar, *One-step synthesis of size-tunable Ag nanoparticles incorporated in electrospun PVA/cyclodextrin nanofibers*, **Carbohydrate Polymers** 99, 808-816

**2012**

44. Rashad Mammadov, Ayse B Tekinay, Aykutlu Dâna, Mustafa O Guler, *Microscopic characterization of peptide nanostructures*, **Micron**, 43, 2, 69-84, 2012
43. Hakan Ceylan, Mustafa Urel, Turan S Erkal, Ayse B Tekinay, Aykutlu Dâna, Mustafa O Guler, *Mussel Inspired Dynamic Cross-Linking of Self-Healing Peptide Nanofiber Network*, **Advanced Functional Materials**, Online DOI: 10.1002/adfm.201202291
42. Goksu Cinar, Hakan Ceylan, Mustafa Urel, Turan S Erkal, Emine Deniz Tekin, Ayse Begum Tekinay, Aykutlu Dâna, Mustafa O Guler, *Amyloid Inspired Self-Assembled Peptide Nanofibers*, **Biomacromolecules**, 2012, 13 (10), 3377–3387
41. S Ayas, H Guner, B Turker, OO Ekiz, F Dirisaglik, AK Okyay, A Dâna, *Raman Enhancement on a Broadband Meta-Surface*, **ACS Nano**, 2012, 6 (8), 6852–6861
40. H Acar, R Genc, TS Erkal, M Urel, A Dâna, MO Guler, *Self-Assembled Peptide Nanofiber Templated One-Dimensional Gold Nanostructures Exhibiting Resistive Switching*, **Langmuir**, 2012, 28 (47), 16347–16354

**2011**

39. O. Altan Bozdemir, Sundus Erbas-Cakmak, O. Oner Ekiz, Aykutlu Dâna, and Engin U. Akkaya, *Towards Unimolecular Luminescent Solar Concentrators: Bodipy based Dendritic Energy Transfer Cascade with Panchromatic Absorption and Monochromatized Emission*, **Angewandte Chemie International Edition**, in press DOI: 10.1002/anie.200
38. Dagdas, YS ; Aslan, MN ; Tekinay, AB ; Guler, MO ; Dâna, A , *Nanomechanical characterization by double-pass force-distance mapping* **Nanotechnology**, 22 (29)

295704 2011

37. Ekiz, OO; Urel, M ; Guner, H ; Mizrak, AK ; Dâna, A ; Reversible Electrical Reduction and Oxidation of Graphene Oxide **ACS NANO**, 5 (4) 2475-2482 2011
36. Kurum, U ; Ekiz, OO ; Yaglioglu, HG ; Elmali, A ; Urel, M ; Guner, H; Mizrak, AK ; Ortac, B ; Dâna, A , Electrochemically tunable ultrafast optical response of graphene oxide , **Applied Physics Letters**, 98 (14) 141103 2011
35. Diker, H ; Varlikli, C ; Mizrak, K ; Dâna, A , Characterizations and photocatalytic activity comparisons of N-doped nc-TiO<sub>2</sub> depending on synthetic conditions and structural differences of amine sources, **ENERGY**, 36 (2): 1243-1254 2011
34. Turker, B ; Guner, H ; Ayas, S ; Ekiz, OO ; Acar, H ; Guler, MO; Dâna, A. , Grating coupler integrated photodiodes for plasmon resonance based sensing, **LAB ON A CHIP**, 11 (2): 282-287 2011
33. Dagdas, YS ; Tombuloglu, A ; Tekinay, AB ; Dâna, A; Guler, MO, Interfiber interactions alter the stiffness of gels formed by supramolecular self-assembled nanofibers, **SOFT MATTER**, 7 (7) 3524-3532 2011
32. Mammadov, R., Tekinay, A. B., Dâna, A., Guler, M. O., "Microscopic Characterization of Peptide Nanostructures", **Micron**, 2011, DOI: 2011, 10.1016/j.micron.2011.07.006.

## 2010

31. O. E. Ekiz, A. K. Mızrak and A. Dâna, "Chemically Specific Dynamic Characterization of Photovoltaic and Photoconductivity Effects of Surface Nanostructures", **ACS Nano**, 4 (4), 1851-1860 (2010).
30. H. E. Kondakci, M. Yaman, A. Dâna, and Mehmet Bayindir, "A photonic band gap infrared spectrometer", **Applied Optics** 49, 3596 (2010).
29. S. Suzer, H. Sezen, G. Ertas, A. Dâna, "XPS measurements for probing dynamics of charging", **Journal of Electron Spectroscopy and Related Phenomena**, 176 1-3 52-57 (2010).

## 2009

28. B. Kaplan, H. Guner, O. Senlik, K.Gurel, Mehmet Bayindir, and A. Dâna, "Tuning optical discs for plasmonic applications", **Plasmonics**, 4, 237 (2009).
27. K.Gurel, B. Kaplan, H. Guner, Mehmet Bayindir, and A. Dâna, "Resonant transmission of light through surface plasmon structures," **Applied Physics Letters**, 94, 233102 (2009).
26. H. E. Kondakci, M. Yaman, O. Koylu, A. Dâna, and Mehmet Bayindir, "All-chalcogenide glass omnidirectional photonic band gap variable infrared filters", **Applied Physics Letters**, 94, 111110 (2009).
25. A. Dâna, "Lineshapes, shifts and broadenings in dynamical X-ray photoelectron spectroscopy", **Applied Surface Science** 256 5 1289-1295 (2009).

## 2008

24. S. Suzer , H. Sezen, A. Dâna, "Two-Dimensional X-Ray Photoelectron Spectroscopy for Composite Surface Analysis" *Anal. Chem.*, 80 (10), 3931–3936, 2008
23. I. B. Akça, A. Dâna, A. Aydinli, M. Rossetti, L. Li, A. Fiore, and N. Dagli, "Electro-optic and electro-absorption characterization of InAs quantum dot waveguides," *Opt. Express* 16, 3439-3444 (2008)
22. I. B. Akça, A. Dâna and A. Aydinli, "Comparison of electron and hole charge-discharge dynamics in germanium nanocrystal flash memories", *Appl. Phys. Lett.* 92, 052103 (2008)
21. U. Bostanci, M. K. Abak, O. Aktaş, A. Dâna, "Nanoscale charging hysteresis measurement by multi-frequency electrostatic force spectroscopy", *Appl. Phys. Lett.* 92, 093108 (2008)
20. K. Abak, O. Aktaş, R. Mamadov, I. Gürsel and A. Dâna, "Parametrically coupled multi-harmonic force imaging", *Applied Physics Letters*, 2008
19. A. Dâna, I. Akça, R. Turan, A. Aydınli and T. Finstad, 'A Figure of Merit for the optimization of Nanocrystal Memory design', *Journal of Nanoscience and*

Nanotechnology, 8, 2, 510, 2008

**2007**

18. H. Sezen, G. Ertas, A. Dâna, and S. Suzer, "Charging/Discharging Dynamics of thin PS/PMMA films as Probed by Dynamic x-ray Photoelectron Spectroscopy", *Macromolecules*, 40 (12), 4109-4112, 2007
17. A. Dâna, S. Ağan, S. Tokay, A. Aydınli, and T. G. Finstad, "Raman and TEM studies of Ge nanocrystal formation in SiO<sub>x</sub>:Ge/SiO<sub>x</sub> multilayers", *Phys. stat. sol. (c)* 4, 288, 2007
16. S. Foss, T.G. Finstad, A. Dâna and A. Aydınli, 'Growth of Ge Nanoparticles on SiO<sub>2</sub> / Si Interfaces during Annealing of Plasma Enhanced Chemical Vapor Deposited Thin Films' *Thin Solid Films*, 515, 16, 6381, 2007
15. S. Suzer, A. Dâna, G. Ertas, 'Differentiation of Domains in Composite Surface Structures by Charge-Contrast XPS', *Anal. Chem.*, 79 (1), 183 -186, 2007

**2006**

14. A. Dâna, S. Tokay, A. Aydınli, 'Formation of Ge nanocrystals and SiGe in PECVD grown SiNx:Ge thin films', *Materials Science in Semiconductor Processing*, 9, 4, 848, 2006
13. A. Dâna, I. Akça, O. Ergun, R. Turan, A. Aydınli and T. Finstad, 'Charge storage in quantized energy levels of nanocrystals' *Physica E*, 38,1, 94, 2007
12. S. Suzer and A. Dâna, 'X-ray Photoemission for Probing Charging / Discharging Dynamics', **J. Phys. Chem. B**, 110 (39), 19112 -19115, 2006.
11. S. Ağan, A. Dâna and A. Aydınli, 'TEM studies of Ge nanocrystal formation in PECVD grown SiO<sub>2</sub>:Ge/SiO<sub>2</sub> multilayers', *Journal of Physics: Condensed Matter*, 2006
10. A. Kocabaş, A. Dâna and A. Aydınli 'Excitation of a Surface Plasmon With an Elastomeric Grating', *Appl. Phys. Lett.* 89, 041123 (2006)
9. L. Razzari, A. Gnoli, and M. Righini, A. Dâna and A. Aydınli, 'Excited-state dynamics and nonlinear optical response of Ge nanocrystals embedded in silica matrix', *Appl. Phys. Lett.* 88 (2006) 181901
8. A. Kocabas, F. Ay, A. Dâna, A. Aydınli, 'An elastomeric grating coupler', *Journal of Optics A-Pure and Applied Optics* , 2006
7. A. Dane, U. K. Demirok, A. Aydınli, S. Suzer, 'X-ray photoelectron spectroscopic analysis of Si nanoclusters in SiO<sub>2</sub> matrix', *J. Phys. Chem.*, 110 (3), 1137 -1140, 2006

**2005**

6. S. Ağan, A. Celik-Aktas, J. M. Zuo, A. Dâna, A. Aydınli, 'Synthesis and size differentiation of Ge nanocrystals in amorphous SiO<sub>2</sub>', *Applied Physics A-Materials Science & Processing*, 2005
5. A. Dâna and Y. Yamamoto, 'Electrostatic force spectroscopy of near surface localized states', *Nanotechnology*, 16 S125-S133, 2005
4. A. Kocabas, F. Ay, A. Dâna, I. Kiyat, A. Aydınli, 'High-refractive-index measurement with an elastomeric grating coupler', *Optics Letters* , 2005

**1998**

3. A. Dâna, F. Ho and Y. Yamamoto 'Mechanical parametric amplification in piezoresistive gallium arsenide microcantilevers', *Appl. Phys. Lett.* 72, 1152 (1998)
2. M. McCord, A. Dâna, F. Pease, 'The micromechanical tunneling transistor', *J. Micromech. Microeng.* 8, 209-212 (1998)

**1995**

1. A. Fischer, A. Compaan, A. Dane and A. Aydınli , 'Resonant Raman and photoluminescence of CdTe films for PV Using Diode Lasers', *Materials Science Forum*, vol. 173-174, 349-354 (1995).

11.4. Articles in non-refereed or general journals

11.5. Refereed proceedings

- H. E. Kondakci, M. Yaman, O. Koylu, A. Dana, Mehmet Bayindir, *All-chalcogenide variable infrared filter*, SPIE Proceedings (2009).

11.6. Selected Published conference abstracts (or extended abstracts)

- H. Esat Kondakci, M. Yaman, O. Koylu, A. Dana, M. Bayindir, *All-chalcogenide glass omnidirectional photonic band gap variable infrared filters*, SPIE Optics and Photonics, 2-8 August 2009, San Francisco, USA.
- O. Senlik, H. Guner, K. Gurel, B. Kaplan, M. Bayindir, A. Dana, *Optical discs for plasmonic applications: from plasmon resonance biosensors to doubly resonant infrared sensing*, MRS Fall Meeting, 1-5 December 2008, Boston, USA .
- O. Senlik, A. Dana, M. Bayindir, *Nanocalorimetry: Calorimetry of novel materials of ultra-small volumes using micro and nanoelectomechanical devices*, MRS Fall Meeting, 1-5 December 2008, Boston, USA.
- O. Senlik, H. Guner, K. Gurel, M. O. Oktel, A. Dana, M. Bayindir, *Measurement of photonic forces in coupled nanoplasmonic structures*, MRS Fall Meeting, 1-5 December 2008, Boston, USA.

## 12. CURRENT RESEARCH INTEREST(S)

### 12.1 Nanodevices and Materials

- Micro and Nano-Electromechanical Systems and Sensors
- Nanoelectronics: Nanocrystal and quantum dot/wire devices, organic molecular devices, memory, transistor and sensors applications
- Thermoelectrics and Solar energy conversion systems
- Electrical device modelling at the nanoscale, low-dimensional electronic systems
- Nano-contact mechanics, mechanical properties of nanostructured materials, linear and nonlinear dynamics of nanostructures
- Graphene based materials and Devices

### 12.2 Microscopy, Imaging and Nanometrology

- Scanning probe microscopy, novel imaging modes
- Optical and electron microscopy: Contrast and resolution, novel imaging modes.
- Nano-scale electrical characterization, Novel spectroscopic techniques
- Nanocalorimetry

### 12.3 Plasmonics and Sensors

- Plasmon resonance based sensors
- Plasmon enhanced Raman spectrometry
- Plasmonics for energy conversion and high efficiency optical devices
- Plasmon enhancement for improved infrared detectors and imaging
- Miniature visible and infrared spectrometers using bolometric plasmonic sensors
- Process development for micro and nanoscale device fabrication

## GRANTS

- 1.1. *Project Title:* Measurement of small forces using micro and nano electromechanical systems and imaging, *Funding Agency:* TUBITAK, *Funding Amount:* 216,000 TL, *Position:* Principal Investigator, *Period:* 2007-2010.
- 1.2. *Project Title:* SEMINANO: Semiconductor Nanostructures, *Funding Agency:* EU FP6, *Funding Amount:* 300,000 Euro, *Position:* Researcher, *Period:* 2004-2007 (P.I.: Prof. Dr. Atilla Aydınli)
- 1.3. *Project Title:* Grup IV Yarıiletken Nanokristallerin Çığlama Tekniđi ile Üretilerek Elektronik ve Fotonik Aygıtlara Uygulanması, 104T520, *Funding Agency:* TUBITAK, *Funding Amount:* 130,000 TL *Position:* Researcher, *Period:* 2005-2007, (P.I.: Prof. Dr. Raşit Turan)
- 1.4. *Project Title:* Dynamical XPS measurements for nanoscale characterization, 106T409, *Funding Agency:* TUBITAK, *Funding Amount:* 210,000 TL *Position:* Researcher, *Period:* 2005-2007, (P.I.: Prof. Dr. Şefik Süzer)



- 1.5. *Project Title:* Integrated Plasmonic Sensors, 111M344, *Funding Agency:* TUBITAK, *Funding Amount:* 257,000 TL *Position:* Principal Investigator, *Period:* 2011-2014,
- 1.6. *Project Title:* Nanobacterphage-SERS, *Funding Agency:* EU-FP7, *Funding Amount:* 317,000 Euro, *Position:* Principal Investigator, *Period:* 2011-2014
- 1.7. *Project Title:* National Nanotechnology Research Center, *Funding Agency:* State Planning Organization, *Funding Amount:* 27 Million USD, *Position:* Researcher, *Period:* 2006-Present