

# Curriculum Vitae

## Aykutlu Dâna

BIOGRAPHICAL Date and place of birth: 2-12-1973 ISPARTA / TURKEY

### CONTACT INFORMATION

**Present Affiliation:**

National Nanotechnology Research Center, Material Science and Nanotechnology Programme, Bilkent University.

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### EDUCATION

2003 PhD. Electrical Engineering, Stanford University, CA – USA

Advisor: Yoshihisa Yamamoto, Thesis title: ‘Electrostatic force spectroscopy of near-surface electronic states’

1999 MS Electrical Engineering, Stanford University, CA – USA

1995 BS Electrical Engineering, Bilkent University, Ankara – TURKEY

### ACADEMIC INTERESTS

Nanocrystal flash memory devices, sensors, measurement of small forces, cryogenic scanning probe microscopy, NEMS, quantum dots, nano-electronic and optical devices, spectroscopy, theoretical modeling of semiconductor devices and phenomena

### ACADEMIC EXPERIENCE

Postdoctoral Research Staff and instructor

9/2004-1/2007 Bilkent University, Ankara, Turkey

Research included fabrication and characterization of silicon and

germanium nanocrystals in silicon oxide and nitride. Fabricated and modeled charging dynamics of nanocrystal flash memory elements using germanium nanocrystals. Also worked on optical characterization of luminescent silicon and germanium nanocrystals. In addition, developed a model for dynamical XPS measurements and their interpretation.

#### Research Intern

3/2002-9/2002 , Hewlett-Packard Laboratories, Palo Alto, CA – USA

Worked briefly on a scanning probe microscope design for characterization of molecular films.

#### Research Assistant

1995-2002 Stanford University, CA – USA

During his PhD. Research, worked on low temperature scanning force microscopy. The research included fabrication of GaAs MEMS devices with integrated piezoresistors of submicron dimensions to be used for attonewton force detection. Fabricated a low temperature non-contact atomic force microscope based on fiber interferometric deflection detection. Developed theory for Electrostatic Force Spectroscopy and experimentally demonstrated the principle using InAs quantum dots.

#### TEACHING EXPERIENCE

Lectured EE101 ‘Introduction to Electrical Engineering’, EE 393 ‘Basic Electrical Engineering’, Phys 316 “Electromagnetic Theory II”, Phys101 and Phys102, MSN 506 “Methods of experimental physics” and MSN551 “Introduction to micro and nanofabrication” at Bilkent University

#### HONORS & AWARDS

Bronze Medal in the International Physics Olympiad 1991 CUBA. Full score in the experimental section of the same competition.

#### TECHNICAL SKILLS

Hands on experience with semiconductor device fabrication equipment such as plasma deposition systems, optical and electron beam lithography, wet chemical processing, metrology tools, electron and scanning probe microscopes. Also extensive experience with RF measurement equipment and lasers. Strong background in electrical engineering and device physics. Extensive

experience with mechanical design and machining.

HOBBIES Natural language processing, Automatic Word Sense Disambiguation and Machine Translation, Electronic circuit and system design, Music

PUBLICATIONS **Works in Progress and in Review**

I. Akça, A. Dâna, A. Aydınli ‘Performance characterization of InAs quantum dot lasers as an optical modulator’

A. Dâna, I. Akca, A. Aydınli, R. Turan and T. G. Finstad, ‘Comparison of Electron and Hole charge-discharge dynamics of Ge nanocrystals flash memories’

A. Dana, S. Tokay, I. Akça and A. Aydınli, “Effect of tunnel nitride thickness on carrier storage dynamics of silicon nanocrystal memories”

S. Suzer , H. Sezen, A. Dana, “2-Dimensional X-Ray Photoelectron Spectroscopy for Composite Surface Analysis”

**Published**

**2007**

Hikmet Sezen, Gulay Ertas, Aykutlu Dâna, and Sefik Suzer, "Charging/Discharging Dynamics of thin PS/PMMA films as Probed by Dynamic x-ray Photoelectron Spectroscopy", accepted for publication in Macromolecules

A. Dana, S. Ağan, S. Tokay, A. Aydınli, and T. G. Finstad, “Raman and TEM studies of Ge nanocrystal formation in SiOx:Ge/SiOx multilayers”, Phys. stat. sol. (c) 4, 288, 2007

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’ accepted for publication in Thin Solid Films

A. Dâna, I. Akça, R. Turan, A. Aydınli and T. Finstad, ‘A Figure of Merit for the optimization of Nanocrystal Memory design’, accepted for publication in the Journal of Nanoscience and

## Nanotechnology

S. Suzer, A. Dâna, G. Ertas, 'Differentiation of Domains in Composite Surface Structures by Charge-Contrast XPS', Analytical Chemistry

2006

A. Dâna, S. Tokay, A. Aydinli, 'Formation of Ge nanocrystals and SiGe in PECVD grown SiNx:Ge thin films', accepted for publication in Materials Science in Semiconductor Processing.

A. Dâna, I. Akça, O. Ergun, R. Turan, A. Aydınli and T. Finstad, 'Charge storage in quantized energy levels of nanocrystals' accepted for publication in Physica E

S. Suzer and A. Dâna, 'X-ray Photoemission for Probing Charging/Discharging Dynamics', Journal of Physical Chemistry B, published online 9/6/2006

S. Agan, 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, **18** 5037 (2006)

A. Kocabaş, A. Dâna and A. Aydınli 'Excitation of a Surface Plasmon With an Elastomeric Grating', Applied Physics Letters, **89** 41123 (2006)

L. Razzari, A. Gnoli, and M. Righini, A. Dâna and A. Aydinli, 'Excited-state dynamics and nonlinear optical response of Ge nanocrystals embedded in silica matrix', Applied Physics Letters, **88** 181901 (2006)

A. Kocabas, F. Ay, A. Dâna, A. Aydinli, 'An elastomeric grating coupler', Journal of Optics A-Pure and Applied Optics **8**, 85 (2006)

A. Dane, U. K. Demirok, A. Aydinli, S. Suzer, 'X-ray photoelectron spectroscopic analysis of Si nanoclusters in SiO<sub>2</sub> matrix', Journal of Physical Chemistry B **110**, 1137 (2006)

S. Agan, A. Celik-Aktas, J. M. Zuo, A. Dâna, A. Aydinli, 'Synthesis and size differentiation of Ge nanocrystals in amorphous SiO<sub>2</sub>', Applied Physics A-Materials Science & Processing **83**, 107 (2006)

2005

A. Dâna and Y. Yamamoto, 'Electrostatic force spectroscopy of near surface localized states', Nanotechnology 16 S125-S133

A. Kocabas, F. Ay, A. Dâna, I. Kiyat, A. Aydinli, 'High-refractive-index measurement with an elastomeric grating coupler', Optics Letters Vol. 30, No. 23 (2005)

1998

A. Dâna, F. Ho and Y. Yamamoto 'Mechanical parametric amplification in piezoresistive gallium arsenide microcantilevers', Applied Physics Letters, 72 (1998)

M. McCord, A. Dâna, F. Pease, 'The micromechanical tunneling transistor', J. Micromech. Microeng. 8 209-212

1995

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

#### **Conference Talks**

A. Dana, İ. Akça, R. Turan, A. Aydınli, "A Figure of Merit for Optimization of Nanocrystal Flash Memory Design", Nanomat 2006, Antalya, Turkey (21-23 June 2006)

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) [Invited].

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) [Invited].

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) [Invited].

A. Dâna, C. Santori and Y. Yamamoto, 'Electrostatic Force Spectroscopy of a single InAs quantum dot' NC-AFM 2001, Kyoto, Japan (1-5 September 2001)