

# Dragica Vasileska

## Associate Professor

Department of Electrical Engineering  
Arizona State University  
Tempe, AZ 85287-5706, USA  
E-mail: [vasileska@asu.edu](mailto:vasileska@asu.edu)

phone: (480) 965-6651, fax: (480) 965-8058, cell: (480) 236-1445

### PROFESSIONAL PREPARATION

- University Sts. Cyril and Methodius, Skopje, Republic of Macedonia, **B. S.** in Electrical Engineering (Diploma), May 1985.
- University Sts. Cyril and Methodius, Skopje, Republic of Macedonia, **M.S.** in Electrical Engineering, January 1992.
- Arizona State University, Tempe, Arizona, **Ph.D.** in Electrical Engineering, August 1995.
- Arizona State University, Faculty Research Associate (**postdoctoral fellow**), August 1995-August 1997.

### APPOINTMENTS

**August 15, 2003 – present:** Associate Professor, Arizona State University, Department of Electrical Engineering, Tempe, AZ.

**August 15, 1997-August 14, 2003:** Assistant Professor, Arizona State University, Department of Electrical Engineering, Tempe, AZ.

**August 15, 1995-August 14, 1997:** Faculty Research Associate, Arizona State University, Center for Solid State Electronics Research, Tempe, AZ.

**January 1991-August 15th, 1995:** Graduate Research Associate, Arizona State University, Center for Solid State Electronics Research, Tempe, AZ.

**January 1986-December 1990:** On the faculty in the College of Electrical Engineering, University Sts. Cyril and Methodius, Skopje, Republic of Macedonia.

### RESEARCH PUBLICATIONS

Dr. Dragica Vasileska has published over 70 articles in refereed journals (additional 10 are in press), 6 book articles and 35 articles in conference proceedings in the areas of solid-state electronics, transport in semiconductors and semiconductor device modeling. She has also given numerous presentations and invited talks at conferences and other meetings regarding the research activities within her group.

#### Five Publications Relevant to the Present Proposal

- D. K. Ferry, D. Vasileska, and H. L. Grubin, "Quantum Transport in Semiconductor Devices," Journal of High Speed Electronics and Systems, Vol. 11, pp. 363-385 (2001).
- D. K. Ferry, R. Akis, and D. Vasileska, "Quantum Effects in MOSFETs: Use of an Effective Potential in 3D Monte Carlo Simulation of Ultra-Short Channel Devices," IEDM Tech. Dig. (IEEE Press, New York, 2000), pp. 287-290.
- W. J. Gross, D. Vasileska and D. K. Ferry, "Ultra-small MOSFETs: The importance of the full Coulomb interaction on device characteristics," IEEE Trans. Electron Devices, Vol. 47, No. 10, pp. 1831-1837 (2000).
- F. Assad, Z. Ren, D. Vasileska, S. Datta, and M. Lundstrom, "On the performance limits for Si MOSFET's: A theoretical study," IEEE Trans. Electron Devices, Vol. 47, No. 1, pp. 232-240 (2000).
- W. J. Gross, D. Vasileska and D. K. Ferry, "3D Simulations of Ultra-Small MOSFETs with Real-Space Treatment of the Electron-Electron and Electron-Ion Interactions," VLSI Design, Vol. 10, pp. 437-452 (2000).

#### Five Other Significant Publications

- W. J. Gross, D. Vasileska and D. K. Ferry, "A Novel Approach for Introducing the Electron-Electron and Electron-Impurity Interactions in Particle-Based Simulations," IEEE Electron Device

- Lett., Vol. 20, 463 (1999).
- D. Vasileska and D. K. Ferry, "Scaled silicon MOSFET's: Part I - Universal mobility behavior," IEEE Trans. Electron Devices, Vol. 44, 577-83 (1997).
  - D. Vasileska, D.K. Schroder and D. K. Ferry, "Scaled Silicon MOSFET's: Part II – Degradation of the Total Gate Capacitance," IEEE Trans. Electron Devices, Vol. 44, 584 (1997).
  - R. Akis, D. K. Ferry, J. P. Bird and D. Vasileska, "Weak localization in ballistic quantum dots," Phys. Rev. B, Vol. 60, 2680 (1999).
  - P. Bordone, D. Vasileska, and D.K. Ferry, "Collision Duration Time for Optical Phonon Emission in Semiconductors," Phys. Rev. B, Vol. 53, 3846 (1996).

## SYNERGISTIC ACTIVITIES

- Introduction of Web-based classes in the area of semiconductor device theory, semiconductor transport and quantum mechanics.
- Development of **Green's function code** for low-field mobility calculation in Si-MOSFETs, In-GaAs/InAlAs modulation doped heterostructures, surface-channel Strained-Si/ Si<sub>1-x</sub>Ge<sub>x</sub> and buried channel Si/Si<sub>1-x</sub>Ge<sub>x</sub>/Si heterostructures; **2D and 3D Monte Carlo particle-based simulators** for transport in regular and surface-channel strained-Si MOSFETs (used by Intel); **1D-3D Schrodinger-Poisson solvers** for eigenvalue calculations in MOS capacitors and quantum dot structures (1D code is installed on Purdue PUNCH); a variety of **Poisson equation solvers**; **1D-3D drift-diffusion simulators**, etc.
- Investigated the role of the collisional broadening of the states on the low-field electron mobility and the two-dimensional density of states function
- Investigated the role of the discrete impurities and the electron-electron interactions on the device terminal characteristics, such as threshold voltage, on-state current, etc.
- Investigated the role of the quantum-mechanical space-quantization effects on the operation of ultra-small devices.

## COLLABORATORS AND OTHER AFFILIATIONS

### A. Collaborators

J.P. Bird (ASU), P. Bordone (University of Modena, Italy), S. Datta (Purdue University), R. Dutton (Stanford University), G. F. Formicone (Motorola SPS), S. M. Goodnick (ASU), W.J. Gross (Intel), K. Hess (UIUC), G. Klimeck (Purdue University), R. Lake (UC Riverside), M. Lundstrom (Purdue University), Y. Ochiai (Chiba University, Japan), W. Porod (UND), M.J. Rack (Intel), U. Ravaioli (UIUC), B.A. Sanborn (ASU), D.K. Schroder (ASU), H.H. Wieder (UC San Diego), M.N. Wybourne (Dartmouth College).

### B. Graduate and Postdoctoral Advisors

- Graduate Advisor: David K. Ferry, Arizona State University
- Postdoctoral Advisor: David K. Ferry, Arizona State University

### C. Thesis Advisor and Postgraduate-Scholar Sponsor

- REU: Jason Harris, Milorad Felbapov, Spenser Everingham.
- M.S.: X. He, S. Milicic, G. Speyer, S. Gonzalez (Hispanic), S.S Ahmed, S. Krishnan, A. Man-nargudi, S. Kaur (woman), G. Stojanovic (woman), A. Ashok.
- Ph.D.: W.J. Gross, S. S. Ahmed, S. Krishnan, I. Knezevic (woman), T. Khan, H. R. Khan.
- Postgraduate Student: Richard Akis, Barry Zorman, Denis Mamaluy and Mihail Nedjalkov.

## SCIENTIFIC HONORS

**NSF-CAREER Award** for the year 1998. **Award** from the University Sts. Cyril and Methodius (Skopje, Republic of Macedonia) for the best student from the College of Electrical Engineering (1985, 1990 and 1995).