

I. I. Kravchenko

R&D Staff
Cleanroom Process Engineer
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Education

Kyiv State University, Ukraine	Materials Sciences	M.S., <i>With distinction</i> , 1982
Institute of Metal Physics, National Academy of Sciences, Kyiv, Ukraine	Surface Physics, Solid State Physics	Ph.D., 1993

Professional Experience

2008 – Present	Cleanroom Process Engineer, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory
2002 – 2008	Nano-Fabrication Facility Engineer, University of Florida.
1997 – 2002	Electrostatic Particle Accelerator Engineer. Department of Physics, University of Florida.
1996	Research Associate, Department of Physics, University of Florida
1994 – 1995	Research Associate, Department of Materials Science, University of Wisconsin- Madison
1985 – 1993	Staff Physicist, Institute of metal Physics, National Academy of Sciences, Kyiv, Ukraine
1982 – 1984	Military service (Former USSR). Air Defense Electronics Engineer (Radar operations).

Publications (Over 70 publications)

Full publication list follows CV.

Research Interests:

1. Design and manufacture of nanometer scale metallic, semiconductor, and dielectric structures. We use electron beam lithography, dielectric and metallic thin film deposition, thin film plasma processing techniques, optical spectroscopies and ellipsometry to create and study sub-wavelength features which enable the resonant excitation of surface waves by incident electromagnetic radiation, leading to remarkable optical properties, such as extraordinarily light transmission and beaming as well as surface enhanced Raman spectroscopy.
2. Development and manufacture of electronic devices. We use electron beam and photo-lithography, dielectric and metallic thin film deposition, thin film plasma processing techniques to create and study high electron mobility transistors as well as light emitting elements.
3. Studies of single magnetic domain properties. We use electron beam lithography and photolithography, dielectric and metallic thin film deposition, thin film plasma processing techniques, magnetic low temperature measuring techniques to create nanometer scale metallic structures that allow an unambiguous determination of the magnetic states and separation of the contributions of the anisotropies, domain wall motion and spin fluctuation to the dynamic properties.
4. Manufacture technology development and optical studies of quazi-1D dielectric and semiconducting structures. We use electron beam lithography, dielectric and metallic thin film deposition, thermal processing techniques, optical spectroscopies to create and study nanowires and nanotubes that might be needed to develop next generation of energy storage and solar energy harvesting devices.

Publications

Ivan I. Kravchenko, Ph. D.

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1. C.F. Lo, L. Liu, F. Ren, H.-Y. Kim, J. Kim, S.J. Pearton, O. Laboutin, Yu Cao, J. W. Johnson, I.I. Kravchenko Effects of proton irradiation on dc characteristics of InAlN/GaN high electron mobility transistors// J.Vac.Sci.Technol.B.- 29.-2011.-p.061201.
2. L. Liu, C.-F. Lo, T.-S. Kang, Fan Ren, S. J. Pearton, I. I. Kravchenko, O. Laboutin, Yu Cao, W. J. Johnson Comparison of DC performance of Pt/Ti/Au- and Ni/Au-gated AlGa_N/Ga_N high electron mobility transistors// J.Vac.Sci.Technol.B.- 29.-2011.-p.042202.
3. D. Bhandari, I. I. Kravchenko, N. V. Lavrik, M. J. Sepaniak Nanotransfer Printing Using Plasma Etched Silicon Stamps and Mediated by in Situ Deposited Fluoropolymer//JACS.-133.-2011.-p.7722-p.7724.
4. C. F. Lo, F. Ren, C. Y. Chang, S. J. Pearton, S.-H. Chen, C.-M. Chang, S.-Y. Wang, J.-I. Chyi, I. I. Kravchenko Fabrication of InAlAs/InGaAsSb/InGaAs double heterojunction bipolar transistors// J.Vac.Sci.Technol.B.- 29.-2011.-p.031205.
5. M. A. McCarthy, B. Liu, E. P. Donoghue, I. Kravchenko, D. Y. Kim, F. So, A. G. Rinzler Low-Voltage, Low-Power, Organic Light-Emitting Transistors for Active Matrix Displays// Science.-2011.-332.-p.570-p.573.
6. Z. Marcet, H. B. Chan, D. W. Carr, J. E. Bower, R. A. Cirelli, F. Klemens, W. M. Mansfield, J. F. Miner, C. S. Pai, I.I. Kravchenko, A half wave retarder made of bilayer subwavelength metallic apertures//Applied Physics Lett.- 98.- 2011.- p.151107.
7. C.-F. Lo, L. Liu, T.-S. Kang, R. Davies., B.P. Gila, S. J. Pearton, I. I. Kravchenko, O. Laboutin, Yu Cao, W. J. Johnson, Fan Ren Improvement of Off-State Stress Critical Voltage by Using Pt-Gated AlGa_N/Ga_N High Electron Mobility Transistors// Electrochemical and Solid-State Letters.- 14.-2011.-p.H264-p.H267.
8. D. Bhandari, S.M. Wells, A. Polemi, I. I. Kravchenko, K. L. Shuford, M. J. Sepaniak Stamping plasmonic nanoarrays on SERS-supporting platforms//Journal of Raman Spectroscopy.-2011 (published online).
9. C. F. Lo, T. S. Kang, L. Liu, C. Y. Chang, S. J. Pearton, I. I. Kravchenko, O. Laboutin, J. W. Johnson, and F. Ren, Isolation blocking voltage of nitrogen ion-implanted AlGa_N/Ga_N high electron mobility transistor structure// Appl.Phys.Letts.-97.-2010.-p.262116.
10. Z. Marcet, Z.H. Hang, C.T. Chan, I. Kravchenko, J.E. Bower, R.A. Cirelli, F. Klemens, W.M. Mansfield, J.F. Miner, C.S. Pai, H.B. Chan Optical transmission through double-layer, laterally shifted metallic subwavelength hole arrays//Optics Letters.-35.-2010.-p.2124-2126.
11. J. Crepp, E. Serabyn, J. Carson, J. Ge, I. Kravchenko On-Sky demonstration of a linear band-limited mask with application to visual binary stars// Astrophysical Journal.-715.-2010.-p.1533-p.1538.

12. C.Y.Chang, C.F.Lo, F.Ren, S.J.Pearnton, I.I.Kravchenko, M.Dabiran, B.Cui, P.P.Chow Normally-on/off AlN/GaN high electron mobility transistors//Phys.Status Solidi C7.- 2010.-p.2415-2418.
13. C.F.Lo, C.Y.Chang, S.J.Pearnton, I.I.Kravchenko, M.Dabiran, A.M.Wowchak, B.Cui, P.P.Chow, F.Ren Passivation of AlN/GaN high electron mobility transistor using ozone treatment// J.Vac.Sci.Technol.B.- 28.- 2010.-p.52-p.55.
14. C.F.Lo, H.-Y.Kim, J.Kim, Shu-Han Chen, Sheng-Yu Wang, Jen-Inn Chyi, B.Y.Chou, K.H.Chen, Y.L.Wang, C.Y.Chang, S.J.pearnton, I.I.Kravchenko, A.Jang, F.Ren Proton irradiation effects on Sb-based heterojunction bipolar transistors// J.Vac.Sci.Technol.B.- 27.-2009.-L33-L37.
15. C.Y.Chang, S.J.Pearnton, C.F.Lo, F.Ren, I.I.Kravchenko, A.M.Dabiran, A.M.Wowchak, B.Cui, P.P.Chow Development of enhancement mode AlN/GaN high electron mobility transistors//Appl.Phys.Letts.-94.-2009. 26305.
16. Lim, SH.Kim, Yu-Lin Wang, J.W.Lee, D.P.Norton, S.J.Pearnton, F.Ren, I.I.Kravchenko Stable room temperature deposited amorphous InGaZnO₄ thin film transistors// J.Vac.Sci.Technol.B.- 26.-2008.-pp.959-962.
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22. L.F.Voss, L.Stanford, R.Khanna, B.P.Gila C.R.Abernathy, S.J.Pearnton, F.Ren, I.I.Kravchenko Thermal stability of Nitride-Based diffusion barriers for Ohmic Contacts to n-GaN//Journal of Electronic Materials.- 36.-2007.-p.1662-1668.
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41. L. Voss, R.Khanna, S.J. Pearnton, F.Ren, I.I.Kravchenko Improved thermally stable ohmic contacts on p-GaN based on W₂B// Applied Phys. Letters 88.-2006.- Art. No. 012104
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