

# I. I. Kravchenko

R&D Staff  
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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 80 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.**

Center for Nanophase Materials Sciences  
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1. S.-T. Hung, C.-J. Chang, C. C. Chen, C. F. Lo, F. Ren, S. J. Pearton, I. I. Kravchenko SnO<sub>2</sub>-gated AlGa<sub>N</sub>/Ga<sub>N</sub> high electron mobility transistors based oxygen sensors// *J. Vac. Sci. Technol., B* 30 (4).-2012.-p.041214
2. Chen, C. W.; Ren, F.; Chi, G. -C.; Hung, S. C.; Huang, Y. P.; Kim, J.; Kravchenko, I.; Pearton, S. J. Effects of Semiconductor Processing Chemicals on Conductivity of Graphene// *J. Vac. Sci. Technol., B* 30 (4).-2012.-p.040602.
3. Lo, C. F.; Liu, L.; Ren, F.; Pearton, S. J.; Gila, B. P.; Kim, H. -Y.; Kim, J.; Laboutin, O.; Cao, Y.; Johnson, J. W.; Kravchenko, I. I., Proton Irradiation Energy Dependence of dc and rf Characteristics on InAlN/GaN High Electron Mobility Transistors// *J. Vac. Sci. Technol., B* 30 (4).-2012.- p. 041206.
4. S. M. Wells, I. A. Merkulov, I. I. Kravchenko, N. V. Lavrik, M. J. Sepaniak Silicon Nanopillars for Field-Enhanced Surface Spectroscopy//*ACS Nano.*- 6.-2012.-p.2948-p.2959.
5. Zheng Gai, X.-G. Zhang, I I. Kravchenko, S.T. Retterer, and J. F. Wendelken Quenching of initial ac susceptibility in single-domain Ni nanobars//*Phys.Rev.B.*-85.-2012.-p.024401.
6. Lo, C. F.; Chang, C. -Y.; Chen, S. -H.; Chang, C. -M.; Wang, S. -Y.; Chyi, J. -I.; Kravchenko, I. I.; Pearton, S. J.; Ren, F. Fabrication and Characterization of Self-Aligned InAlAs/InGaAsSb/InGaAs Double Heterojunction Bipolar Transistors// *ECS Trans.*- 41 (6).- 2011.-p.117–p.127.
7. Lo, C. F.; Liu, L.; Kang, T. S.; Davies, R.; Gila, B. P.; Pearton, S. J.; Kravchenko, I. I.; Laboutin, O.; Cao, Y.; Johnson, W. J.; Ren, F. Improved Off-State Stress Critical Voltage on AlGa<sub>N</sub>/Ga<sub>N</sub> High Electron Mobility Transistors Utilizing Pt/Ti/Au Based Gate Metallization// *ECS Trans.*- 41 (6).-2011.-p.63–p.70.
8. Y.Kim, A. Kumar, A. Tselev, I. I. Kravchenko, H. Han, I. Vrejoiu, W. Lee, D. Hesse, M. Alexe, S. V. Kalinin, S. Jesse Nonlinear Phenomena in Multiferroic Nanocapacitors: Joule Heating and Electromechanical Effects//*ACS Nano.*-5.-2011.-p.9104-p.9112.
9. 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.
10. 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<sub>N</sub>/Ga<sub>N</sub> high electron mobility transistors// *J.Vac.Sci.Technol.B.*- 29.-2011.-p.042202.
11. 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.

12. 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.
13. 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.
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15. 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 AlGaIn/GaN High Electron Mobility Transistors// *Electrochemical and Solid-State Letters.*- 14.- 2011.-p.H264-p.H267.
16. 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.*-42.-2011.- p.1916-p.1924.
17. 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 AlGaIn/GaN high electron mobility transistor structure// *Appl.Phys.Lettrs.*-97.-2010.-p.262116.
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21. 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.
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