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Education:

1975-1980	MS & BS	National T.G. Shevchenko University (Kiev, Ukraine)
1983	Ph.D.	Institute of Semiconductor Physics, Ukrainian Academy of Sciences (Kiev, Ukraine)
1989	D.Sc.	Institute of Semiconductor Physics, Ukrainian Academy of Sciences (Kiev, Ukraine)
		Thesis Advisor: Prof. M. Ya. Valakh; Post-doctoral Advisor: Prof. Manuel Cardona

Employment History:

Since 1997	Research Associate Professor, Texas Center for Superconductivity at the University of Houston, Houston, Texas;
1997-1995	Visiting Professor, Technical University of Berlin (Germany)
1995-1993	Senior Research Scientist, Chalmers University of Technology, Gothenburg (Sweden)
1992-1990	Visiting Scientist, Max-Planck-Institute for Solid State Research, Stuttgart (Germany)
1990-1980	Professor, Associate Professor, Assistant Professor, Research Scientist at the Institute of Semiconductor Physics, National Academy of Sciences, Kiev (Ukraine)

Honors and Awards:

- European Community Fellowship, Technical University of Berlin (Germany), 1997-1995
- Alexander von Humboldt Foundation Equipment Donation Grant (Bonn, Germany), 1992
- Fellowship of the Max-Planck Society, Max-Planck-Institute for Solid State Research (Stuttgart, Germany), 1992
- Alexander von Humboldt Fellowship, Max-Planck-Institute for Solid State Research (Stuttgart, Germany) 1991, 1990
- Honor Medal of the National Academy of Sciences (Kiev, Ukraine), 1988
- Junior Scientist Excellence Award, Institute of Semiconductor Physics, Ukrainian National Academy of Sciences (Kiev, Ukraine), 1986, 1985, 1984, 1983

Recent Research Highlights:

- Raman scattering spectroscopy is used to monitor the transition of reduced niobium oxyfluoride $Nb_2O_2F_3$ single crystals from their high-temperature monoclinic (*I2/a*) phase into the low-temperature triclinic (*P1*) phase at Tc ≈ 90 K due to charge disproportionation of $(Nb\text{-}Nb)^{7+}$ dimers and creation of crystallographically nonequivalent dimers with long and short Nb-Nb bonds. The assignment of observed phonon lines to the specific lattice eigenmodes of the two phases is achieved based on a comparison with the results of density functional lattice dynamics calculations. Strikingly, the kinetics of the monoclinic-to-triclinic structural transformation and the volume fraction of corresponding phases below T_c are shown to strongly depend upon the sample cooling rate. Fast cooling results in a "freezing" of the high-temperature monoclinic phase and allowed to observe a spin-ordered state below $T_N \approx 49$ K.
- A novel metastable germanium allotrope was synthesized as polycrystalline powders and single crystals from the mild-oxidation/delithiation of Li_7Ge_{12} in ionic liquids. Its crystal structure, as determined by single crystal X-ray diffraction (space group *Pbcm*), features a complex covalent network of 4-bonded Ge, resulting from a well ordered topotactic oxidative condensation of $[Ge_{12}]^{7-}$ layers. It is a diamagnetic semiconductor (E_g=0.33 eV), and transforms exothermically and irreversibly to □-Ge at 363 °C.

- By means of Raman and infrared spectroscopies as well as spectroscopic ellipsometry optical properties and lattice dynamics of a number of quaternary orthorhombic and tetragonal $Cu_2(Zn,Cd)(Si,Ge,Sn)(S,Se)_4$ semiconductors and their solid solutions, that are widely used in photovoltaic applications, are studied. The results are interpreted via comparison with the results of theoretical density functional calculations, resulting in detail interpretation of the main spectral features around the fundamental absorption edge and the assignment of observed phonon modes to specific lattice eigenmodes

Lab Facilities/Expertise:

Optical properties of solids; infrared and Raman spectroscopies of high temperature superconductors, semiconductors and low-dimensional structures on their basis; lattice dynamics; electron-phonon and spin-lattice interactions; first principles electronic band structure and lattice dynamics calculations.

Five Relevant Publications (out of 233 total peer reviewed Journal publications):

1. Z. Tang, A.P. Litvinchuk, M. Gooch, and A.M. Guloy. Narrow Gap Semiconducting Germanium Allotrope from the Oxidation of a Layered Zintl Phase in Ionic Liquids. *J. Amer. Chem. Soc.* **140**, 6785 (2018);
2. A.P. Litvinchuk, M. Gooch, B. Lorenz, C.R. dela Cruz, G.N. Oh, and A.M. Guloy. Lattice dynamical Probe of Phase Transformations in Niobium Oxyfluoride $Nb_2O_2F_3$. *Phys. Rev. B* **97**, 094306 (2018);
3. T. Thao Tran, M. Gooch, B. Lorenz, A.P. Litvinchuk, M. Sorolla, J. Brgoch, C.W. Chu, and A.M. Guloy. $Nb_2O_2F_3$: A Reduced Niobium (III/IV) Oxyfluoride with a Complex Structural, Magnetic and Electronic Phase Transition. *J. Am. Chem. Soc*. **137**, 636 (2015).
4. M. Bratsch, J. Tapp, A.P. Litvinchuk, and A. Möller. $AAg_2(M'_{1/3}M_{2/3})[VO_4]_2$: Synthesis, Magnetic Properties and Lattice Dynamics of Honeycomb-Type Lattices. *Inorg. Chem.* **53**, 4994 (2014);
5. A.P. Litvinchuk, C. Thomsen, and M. Cardona. Infrared-Active Vibrations of High-Temperature Superconductors: Experiment and Theory. - in "*Physical Properties of High-Temperature Superconductors IV*", ed. by D.M. Ginsberg (World Scientific, Singapore, 1994), pp.375-469.

Complete list of Publication is accessible at Researcher ID: http://www.researcherid.com/rid/K-6991-2012
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