

## **Dr. EDUARD YU. GORDIYENKO**

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**SUMMARY:** Extensive R&D experience as an engineer and scientist in designing, prototyping and optimizing low temperature detectors and thermal imaging systems, low noise electronics and signal processing.

### **EDUCATION :**

Ph.D. in Solid Electronics. Thesis :“Multi element bolometric IR detectors with scanning on the base of high temperature superconductors”, 2006.  
M.S. State Diploma in Electronic Engineering, Department of Electronic Devices, Kharkov Institute of Radio-Electronics (now Kharkov National University of Radio Electronics), Ukraine, 1985.

### **EXPERIENCE:**

**2023 - Present:** Senior Researcher, Department of Superconducting and Mesoscopic Structures (ILTPE)

- Designed, prototyped and implemented a thermal imaging system with an extended range of measured temperatures, which allows to study low-temperature thermal fields up to  $-150$  °C.

**2012 - 2023:** Research Fellow, Department of superconducting and Mesoscopic Structures (ILTPE)

- Developed and tested an original setup to detect internal defects in aircraft composite materials using active thermography.
- Designed and prototyped a compact thermal imaging system based on uncooled  $384 \times 288$  microbolometers array.
- Developed and implemented to scientific experiments, medicine and industry various infrared imaging tools and methods.

**1993 – 2012:** Leading engineer, Department of Superconducting and Mesoscopic Structures (ILTPE)

- Designed, prototyped and characterized detectors for thermal imaging systems and far-infrared spectrometers, investigated sensitivity limits and metrology aspects of low temperature detectors characterization.
- Developed algorithms and electronic circuits for low signal registration, analog to digital converter units and microprocessor systems for digital signal processing, interface circuits for computer-monitored devices and WINDOWS-based software for signal processing and real time image registration.
- Developed and implemented to scientific experiments and industry various infrared imaging tools and methods.
- Designed and characterized high temperature superconducting (HTSC) bolometric detectors for multispectral recognition and position detection tasks.

**2005 (AUG-DEC), 2004 (JUN-DEC), 2003 (JUL-DEC):** Visiting scientist, Material Science Division, Argonne National Laboratory , USA.

- Developed a novel concept for imaging over a broad spectral range based on optical activation of superconducting microbolometers.
- Designed, fabricated and characterized spatial sensitivity and noise of YBCO bolometer arrays ( $1 \times 16$ ,  $32 \times 32$ ).
- Designed, assembled and adjusted new bolometer readout system using a local film heating by laser probe method (US patent granted).

(Project: “High-Sensitivity Infrared Imagers for Environmental and Energy Security/Safety Monitoring” funded by US Department of Energy).

**1989 - 1993:** Engineer, Department of Superconducting Electronics (ILTPE).

- Investigated the possibility to use HTSC materials for IR detectors design.
- Developed experimental setup for investigation of spatial distribution of superconducting parameters in film structures.
- Measured transport, noise and spectral properties of HTSC structures.
- Developed, assembled and tested PC controlled system for material absorption coefficient measurements at low temperatures.

**1985 - 1989:** Engineer, Special Research and Development Bureau for Cryogenic Technologies at ILTPE.

- Designed and integrated low noise electronics and low temperature setups for metrological characterization of infrared detectors.

**AWARDS, GRANTS, MEMBERSHIPS:**

Member of the Ukraine Physical Society.

Research Grants of State Department of Science and Technology of Ukraine.

**PERSONAL:** Native language – Russian, Ukrainian. Spoken foreign language – English, French.

Birth 4 SEP 1963, married.

**PUBLICATIONS:** 60 publications, including: 34 articles in scientific journals, 26 papers in conference proceeding and abstracts, 2 patents.

**SELECTED PUBLICATIONS:**

1. **Infrared Thermal Imaging controls Freezing and Warming in Skin Cryoablation.** G.O. Kovalov, G. V. Shustakova, E. Yu. Gordiyenko, Yu. V. Fomenko and M. I. Glushchuk // Cryobiology V103, P32 (2021).
2. **Nondestructive Testing of Composite Materials of Aircraft Elements.** Gordiyenko E.Yu., Glushchuk N.I., Fomenko Yu.V. et al. // Science and Innovations. V14(2), P37 (2018).
3. **The Results of the Study of Human Anomalous Fields under Irradiation.** Glushchuk N.I., Gordiyenko E.Yu., Fomenko et al. // Science and Innovation. V13(2), P43 (2017).
4. **IR imaging: Identification of Regional Metastasis.** G.V. Shustakova, N.N. Kolotilov, E.Yu. Gordiyenko et al. // Radiation diagnostics. Radiation therapy. V2, P15 (2016).
5. **Thermal Imaging System Based on a High Temperature Superconductor.** E. Yu. Gordiyenko, G. V. Shustakova, Yu. V. Fomenko, and N. I. Glushchuk // Instruments and Experimental Techniques. V56(4), P485 (2013).
6. **A Multi element Thermal Imaging System Based on an Uncooled Bolometric Array.** E. Yu. Gordiyenko, N. I. Glushchuk, Yu. Ya. Pushkar, Yu. V. Fomenko, G. V. Shustakova. // Instruments and Experimental Techniques. V55(4), P494 (2012).
7. **A Broadband imaging system for research applications.** V. Yefremenko, E. Gordiyenko, G. Shustakova et al. // Review of Science Instruments. V80, P056104 (2009).
8. **Method for detection and imaging over a broad spectral range.** V. Yefremenko, E. Gordiyenko, V. Pishko et al. // United State Patent No.:US 7,274,019 B2, (2007).
9. **Optically activated high Tc superconducting microbolometer.** V. Yefremenko, E. Gordiyenko, G. Shustakova et al. // Journal of Physics: Conference Series. V43, P1342 (2006).
10. **High-temperature superconducting microthermometers for multielement IR detectors.** E.Yu.Gordienko, N.I.Slipchenko, A.S.Garbuz. // Electronics and Computer Science. V3, P38 (2002).