



**INSTITUTE OF RADIATION PROBLEMS, MINISTRY OF SCIENCE AND
EDUCATION REPUBLIC OF AZERBAIJAN
FLEROV LABORATORY OF NUCLEAR REACTIONS AT THE JOINT INSTITUTE
FOR NUCLEAR RESEARCH
CIRRICULUM VITAE**

Matlab N. Mirzayev

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PERSONAL INFORMATION

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PERSONAL STATEMENT

My primary research focuses on the experimental nuclear physics such as the investigation of radiation effects and defects and positron annihilation lifetime spectroscopy in solids under different types of radiation conditions. I am particularly interested in understanding behaviors of the substances that are prominent materials

for radiation shielding against gamma, neutron, electron and ion irradiations. As an associate professor at Flerov Laboratory of Nuclear Reactions at the Joint Institute for Nuclear Research, I have gained precious experience in the nuclear topics such as shielding materials for nuclear applications, irradiation damage and analysis and studies of ion—radiation stability of microstructure, elemental and phase compositions. The scientific field of my researches connected with structure and phase state investigation of promising nanocomposite materials for nuclear applications. Pure boron compounds and boron-tungsten based composite materials were used in the experimental process that had been irradiated by alfa, neutrons, ions, and electron and flows of high-energy charged particles. My research area mainly focuses boron and tungsten alloys that are prominent materials due to their high melting point, low vapour pressure, very low sputtering erosion yields and high thermal conductivity for armour materials of plasma facing components. On the other hand, its limitations are associated with handling at low temperatures, plasma compatibility including neutron irradiation and radiological issues.

EDUCATION

09/2023 Doctor of science

Thesis Title: THE EFFECTS OF HEAVY ION, NEUTRON AND IONIZING IRRADIATION ON THE STRUCTURAL CHANGES AND THERMOPHYSICAL PROPERTIES OF BORON BASED COMPOUNDS

09/2019

Supreme Attestation Commission under the President of the Republic of Azerbaijan | Baku, Azerbaijan

By the decision dated October 7, 2019 (Protocol 19-K) confers on Matlab N. Mirzayev the academic title of

Associate Professor in the Specialty of Radiation Materials Science

01/2010 – 01/2014

Institute of Radiation Problems, Azerbaijan National Academy of Sciences| Baku, AZ1143 Azerbaijan

Ph.D: Radiation material science, application and technology

Thesis Title: INFLUENCE OF INTERNAL AND EXTERNAL IRRADIATION ON ELECTROPHYSICAL PROPERTIES OF URANYL-SILICATE COMPOUNDS

Degree: Ph.D on Physics, Senior Scientist

09/2005 – 07/2007

Baku State University, Faculty of Physics | Baku, AZ1143 Azerbaijan

MSc: Division of Physics Education, Master Program, Faculty Physics of Solid State

09/2001 – 07/2005

Baku State University, Faculty of Physics | Baku, AZ1143 Azerbaijan

BSc: Division of Physics Education, Bachelor Program, Faculty Physics of Solid State

EMPLOYMENT HISTORY

01/09/2017 – Present

Associate Professor | Flerov Laboratory of Nuclear Reactions | at the Joint Institute for Nuclear Research.

Scientific and Experimental Physical Department: Ion-implantation nanotechnology and radiation materials science

Head of Department: Vladimir Alexeevich SKURATOV, D.Sc.

Dubna, Russia

01/09/2017 – 18/12/2014

Senior Scientist | National Nuclear Research Center, AZ1073, Inshaatchilar pr. 4, Baku, Azerbaijan

Division: Department of Nanotechnology and Radiation Material Science

Position: Ph.D on Physics, Senior Scientist

In this period, I carried out studies on the following topics:

Determination of microstructure, elemental and phase states of the boron matrix composite under the radiation irradiation conditions. As shown in the below techniques:

- Scanning Electron Microscopy (SEM)
- X-Ray Diffraction (XRD)
- Raman Spectroscopy
- Small-Angle Neutron Scattering (SANS)
- Differential Scanning Calorimetry (DSC)
- Thermogravimetric analysis (TGA)

06/05/2007 – 23/12/2014

Research Fellow | Institute of Radiation Problems, Azerbaijan National Academy of Sciences| Baku, AZ1143 Azerbaijan

Title of department: Physics of radionuclide-containing materials.

Position: Researcher

I studied the topics as shown below during this period:

- Acquaintance with gamma irradiation technique and irradiation of composites by high-energy electrons.
- Electrophysical properties of boron composites irradiated by gamma and ions.
- Analysis and studies of ion—radiation stability of microstructure, elemental and phase compositions.
- Investigation of surface modifications and phase transformation of composite materials under the high gamma irradiation conditions.

ADDITIONAL SKILLS / RESEARCH INTEREST

I have been working as a research assistant at the Flerov Laboratory of Nuclear Reactions at the Joint Institute for Nuclear Research since 2017. In the meantime, I also have some responsibilities to give lectures at the following laboratories.

- Radiation measurement techniques
- Positron annihilation lifetime spectroscopy XRF Analyses
- XRD Analyses
- SEM Analyses
- Energy-dispersive X-ray spectroscopy (EDS, EDX)
- The investigation on behaviour of soil samples against radiation
- Selection of tracer injection and sampling procedures
- Raman Spectroscopy
- Small Angle Neutron Scattering (SANS)
- Differential Scanning Calorimetry (DSC) Thermal Analysis.
- Thermogravimetric Analysis (TGA)

OTHER SKILLS

- **IT: Good command of Microsoft office**

- Word, Excel, Power Point.
- Origin Pro
- Match 3
- Raman Tools

- **Languages:**

- Azerbaijan (Fluent)
 - Turkish (Fluent)
 - English (Fluent)
 - Russian (Fluent)
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REVIEWER & EDITOR OF JOURNAL

Journal referee:

- Journal Surface Engineering and Applied Electrochemistry
 - Vacuum
 - Modern Physics Letters B
 - International Journal of Modern Physics B
 - Pedosphere
 - Radiation Physics and Chemistry
 - Ceramics
 - Materials today communications
- Editor in Advanced Physical Research Journal.

The Journal *Advanced Physical Research* invites contributions of three types:

1. Original articles
2. State-of-the-art reviews
3. Short communications

The scope of the Journal includes the following topics and related areas:

Theoretical and Applied Physics

Condensed Matter Physics

Statistical Physics

Atomic and Molecular Physics

Optical Physics

Quantum Electronics

Radiation Materials

Nanomaterials

Physics Education