

The Theme Bank for bachelors of the International Department of «Nuclear Physics, New Materials and Technologies» for the 2023-2024 academic year

1. Study of scattering processes during the interaction of alpha nuclei with other nuclei
2. Study of the microstructural evolution of TiC nanopowders under the influence of fast neutrons
3. Monitoring of radon activity in the city of Stepnogorsk
4. Radon risk in Kazakhstan and ways to reduce it
5. Application Gamma - Beta spectroscopy
6. Metabolic processes during the scattering of alpha particles on light nuclei
7. Detection of nuclear quadrupole resonance signals
8. Ensuring radiation safety during peaceful nuclear explosions
9. Theory of reactions of unstable isotopes
10. Assessment of radon activity using Alfarad
11. Mutual distribution of protons and neutrons in the nucleus
12. Preparation and use of radionuclide Ga-68 in the diagnosis of prostate cancer and neuroendocrine diseases
13. Contribution of rho mesons to violation of T-invariance in pd scattering
14. Radiation protection of the patient during X-ray diagnostic studies
15. Scattering of heavy ions on a boron nucleus
16. Method of proportions in solving the Schrödinger equation
17. Studying the prospects for using film detectors to estimate α -radiation density
18. Optimal methods for treating brain tumors in radiation therapy
19. Influence of the concentration of initial components on the properties of composite ceramics based on oxides obtained by solid-phase synthesis
20. Study of forsterite crystals (Mg_2SiO_4) using computational infrared spectroscopy methods
21. Creation of strain-induced hardening of the surface layer in ceramics by exposure to low-energy ions
22. Fractal methods for evaluating histological images in medical diagnostics
23. Sorption technology for uranium extraction from technogenic and hydromineral raw materials using natural modified sorbents
24. Study of the application of optical spectroscopy to assess changes in polymer films - ionizing radiation detectors
25. Synthesis perovskite ceramics For solid fuel oxide elements
26. Elastic scattering alpha particles from 9Be V within phenomenological theory
27. Study radiation fortitude V modified oxide ceramics
28. Dosimetry at internal organ irradiation
29. Advantages applications various methods ray therapy
30. Study of ^{15}N scattering on ^{16}O nuclei within the framework of microscopic and phenomenological approaches
31. Quantum chemical modeling of radiation defects in magnesium fluoride crystals
32. Improving methodological techniques for recording and interpreting well logging data when developing infiltration uranium deposits
33. Study scattering deuterons on ^{11}B at energy 14.5 MeV
34. Natural radioactivity soil And definition potassium radiometric method
35. Elastic scattering deuterons on ^{206}Pb around Coulomb barrier
36. Receipt ionic streams For nuclear physics experiments.
37. Development cathode materials from double perovskites for SOFC
38. Critical Analysis of the Operating Cycle of an Organic Solar Cell with Photodye

Adsorption

39. Radiation durability nitride ceramics To exposure heavy ions
40. Receipt necessary For experiment thin films ion plasma method
41. Radiation durability To processes helium embrittlement Li_2ZrO_3 ceramics
42. Efficiency X-ray protective funds individual protection from gamma radiation in nuclear medicine
43. Manufacturing targets applied V nuclear experiments
44. Study reactions elastic scattering $^3\text{He} + ^{14}\text{C}$ at energy 72 MeV
45. Synthesis of lithium-containing Li_2ZrO_3 ceramics using the solid-phase synthesis method
46. Study of intermetallic compounds as a supporting basis for solid oxide fuel cells
47. Dosimetric research at radioactive pollution surrounding environment
48. Calculation two-particle resonances With using comprehensive Gaussian basis
49. Study own defects V crystals CuGaS_2
50. Effects doping on structural And electronic properties crystals GaN
51. Study efficiency ionic modifications nanostructured materials
52. Efficiency low-dose ray therapy at patients With COVID- 19
53. The basis of the technology for underground uranium leaching by wells: Sozak deposit
54. Studying properties materials For solid oxide fuel cells
55. Effect Josephson and its application
56. Study of the structural and strength properties of magnesium-aluminum spinel ceramics
57. Synthesis lithium-containing ceramics on basis $\text{Li}_2\text{TiO}_3 - \text{Li}_4\text{SiO}_4$ solid phase synthesis method
58. Modeling primary radiation defects V crystals LiF
59. Installation gamma knife V stereotaxic radiosurgery
60. Studying efficiency shielding composite films on basis bismuth-copper
61. Function spectral shift for sampled continuum
62. Accounting exchange processes V reactions With heavy ions
63. Asymptotic standardization coefficient V nuclear astrophysics
64. Calculation of the nucleon transfer cross section based on the solution of the nonstationary equation Schrödinger
65. Nucleon-nucleon interaction V era primary nucleosynthesis
66. Study of the corrosion resistance of modified nanostructured materials
67. Study nanostructured materials V quality basics For lithium-ion battery cathode materials
68. Mechanochemical synthesis And phase compound MgO-ZrO_2 ceramics – materials of inert matrices for nuclear fuel
69. Definition efficiency shielding gamma radiation glass-like ceramics
70. Study reactions elastic scattering $^4\text{He} + ^9\text{Be}$ at energy thirty MeV
71. Development And synthesis porous metal-ceramic basics SOFC
72. Gas sensors on one-dimensional metal oxide nanostructures
73. Carrying out radiation control on powerful radioisotope installations
74. Application of retrospective luminescent dosimetry methods to verify received radiation doses
75. Experimental study energy dependencies full reaction cross sections $^{11}\text{Li} + ^{28}\text{Si}$
76. Radiation control at help thermoluminescent dosimetry
77. Total reaction cross sections for the interaction of weakly bound ^8Li nuclei with $A=9-181$ nuclei at energies (10–30) MeV/A
78. Cluster structure ^9Be And her influence on mechanism transfers nucleons

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80. Wake Adisemen dielectric Children mathematics turde modeldeu
81. Theoretical and experimental studies of the processes of scattering of ^3He ions on a ^{16}O nucleus
82. Calculation characteristics elastic And inelastic scattering alpha particles on kernels beryllium under the FRESCO program
83. Determination of energy characteristics during deformation of irradiated metal materials
84. Studying impact radiation on organic matter
85. Empirical dependencies sections reactions For alpha particles
86. Method positronically – emission tomography V diagnostics cancer
87. Studying features localization plastic deformation And martensitic transformation in reactor steel 12X18H10T
88. Influence flow solar space rays on options earth's atmosphere
89. Influence radioactive radiation on change properties water-organic solutions
90. Study of reactions with the formation of protons during the interaction of alpha particles with aluminum
91. Study of natural and artificial radioactivity using gamma spectroscopy
92. Synthesis And structure films beta-tantalum-tungsten alloys
93. Study elastic And inelastic scattering deuterons on kernels ^9Be at energy $E_d = 14.5 \text{ MeV}$
94. Study inclusive sections reactions (p, xp) at interaction protons with energy 7 MeV with copper
95. Study elastic and inelastic scattering of alpha particles on the ^{59}Co nucleus
96. Influence radioactive radiation on change properties aqueous-inorganic solutions
97. Experiments By spectrometry nuclear radiation
98. Modern methods ray diagnostics
99. Impact exposure heavy ions inert gases (He , Kr), modeling nuclear fuel fission fragments on the properties of nitride-based coatings
100. Physico-chemical research intermediate And final products obtained from uranium mining by in-situ leaching
101. Structure And properties coatings molybdenum- cadmium
102. Solar space rays And problem solar neutrino
103. Studying interactions components radiation With massive bodies on Earth's surface
104. Application dosimetry By nails with emergency situations
105. Accounting exchange processes V elastic scattering alpha particles on core carbon
106. Comparative analysis properties track membranes for creating filtration devices based on them
107. Star nucleosynthesis – source of origin chemical elements
108. Radiation resistant functional nanomaterials on basis flexible substrates
109. Optimization protocols research on CT With purpose decrease radiation exposure to patients during carotid CT angiography
110. Optimization By decrease ray loads on patients at interventional interventions
111. Protection metals from corrosion nano- And micro-sized coatings on aluminum particle based
112. Optimization protocols research on CT With purpose decrease radiation exposure to patients during CT angiopulmonography
113. Radiosurgery installation For treatment tumors
114. Calculation energy magnetic anisotropy And elastic properties Fe-Ga , doped transition metal atoms
115. Application of radionuclides in cancer diagnostics and analysis of their photon emission different energies

116. Electronic properties hybrid structures, quantum pit - nano-sized quantum rings
117. Fractal analysis structural features tumor-like formations
118. Study effect doping ZnO metal-containing nanoparticles for practical use.
119. Possibilities ray diagnostics V assessment volume defeats lungs at coronavirus infection (COVID-19)
120. Comparative grade ray loads at use digital And analog X-ray mammography machines
121. Study of the spectrophotometric properties of carbon nanocomposite polymer films based on polymethyl methacrylate (PMMA)

Head of the Department



Zhumadilov K.Sh.

The Theme Bank for masters of the International Department of «Nuclear Physics, New Materials and Technologies» for the 2023-2024 academic year

1. Dosimetry of exposure of laboratory animals to neutron-activated dust
2. Channel coupling method for particle scattering on beryllium nuclei
3. Study of charge exchange reactions in the $^{18}\text{O} + ^{40}\text{Ca}$ system at an energy of 275 MeV
4. Study of secondary cosmic rays based on observations from the Carpet detector at the experimental complex at the L.N. Gumilyov ENU
5. Metabolic processes during the scattering of alpha particles on carbon nuclei
6. EPR dosimetry of glass and tooth enamel samples
7. Collective modes of carbon excitation within the framework of the rotational model
8. Study of the electronic structures of the Heusler alloy Mn_2CoX ($X = \text{Al}, \text{Sb}, \text{Sn}$)
9. Synthesis and properties of composite materials based on graphene oxide and its derivatives
10. Study radiation fortitude V modified oxide ceramics
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 83. Protection metals from corrosion nano- And micro-sized coatings on aluminum particle based

84. Optimization protocols research on CT With purpose decrease radiation exposure to patients during CT angiopulmonography

Head of the Department

A handwritten signature in blue ink, consisting of a large, stylized letter 'A' followed by a horizontal line and a small flourish.

Zhumadilov K.Sh.