

Curriculum Vitae A.D. Fertman

Personal information

Name: Alexander D. Fertman

Birth date / place: December 8, 1972 / Moscow, Russia

Sex: male

Family status: married

Citizenship: Russia

Languages: English (good), Russian (native)

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Educational and employment profile summary

1979 – 1989: Primary and secondary school in Moscow, Russia.

1989 – 1995: M.Sc. in Physics,

Moscow Engineering and Physics Institute (MEPhI), Russia, faculty for Theoretical and Experimental Physics, department Experimental methods of nuclear physics 1995.

Thesis: “*Time resolved measurements of electron density in discharge plasma using two wavelength interferometry*”.

1995 – 2000: Ph.D. *summa cum laude* in Physics (specialty: Instruments and experimental techniques) ,

SSC Institute for Theoretical and Experimental Physics 2000.

Thesis: “ *Diagnostic of free electron density in plasma by the energy losses of fast protons*”.

Advisers: Prof. Dr. Boris Yu. Sharkov (ITEP)

Skolkovo Foundation 01.2011 – up to now (Non-commercial organization

"Foundation for Development of the Center for Elaboration and Commercialization of New Technologies")

2011 - Adviser to the President on Nuclear technologies

2012 –up to now – Scientific Director of Nuclear Technology and Advanced manufacturing technology department (duties – organization of the partnership with international scientific and industrial communities for support of technology startup’s business development)

SSC Institute for Theoretical and Experimental Physics ((Research Institute) 1995 -2011

(1995-1996) – Diploma work;

(1996-1999) – Graduate student and engineer;

(2001-2002) – Scientist;

(2002- 2011) – Senior scientist (duties –research)

NRNU MEPhI(University)

(2009- up to now) – Assistant professor (duties - teaching)

Degrees and honors:

PhD (candidate of physical-mathematical science) in 2000;

Scholarship of President of Russian Federation in 1999-2002;

SC Rosatom Prize for leading young scientists and their scientific advisers - 2010

Spokesman (Principal Investigator) of Helmholtz – Russia Joint Research Group 112 “Experimental Study on Warm Dense Matter by Intense Heavy Ion Beams”

One of the organizers and member of the board of Society of professionals in radiation technologies

Professional interests:

Business development of technology companies.

Startup’s incubation and acceleration

Principal research interests:

Advanced Manufacturing

Radiation technologies

Photonics

Physics of beam interactions with matter in different aggregative states (gas, solid, plasma,);

Hadron therapy

Professional experiences and skills

1. R&D:

- Experimental research in high energy density (HED) physics with intense heavy ion beams.
- Development of beam diagnostic techniques and experimental methods for characterization matter under extreme conditions.
- Methods of generation extreme conditions in matter (charged particle beams, lasers, explosive generators, gas discharges).
- Experimental studies and characterization of the radioactivity induced by heavy ion beams in constructional material of accelerators.
- Expansion the range of application of heavy ions with energies 100 keV/u – 1 GeV/u to the field of applied research and technology development;
- Proton and ion beam therapy;

2. Organizational skills:

- Innovation projects' development and support.
- Partnership with Russian and international academic institutes and universities, and global leaders in nuclear and radiation (beam, laser, plasma) technology industries (Siemens, Varian, ASML, Thales et al.).
- Foresight development;
- Team building and administration;

Pedagogical activity

Lecturing for 4 and 5-th year students at the course “Experimental physics of Heavy Charged Particles (HCP) interactions with matter” is begun from September, 2005 in MEPhI(su). Scientific advising for diploma students, graduate students and young scientists.

Other pertinent information:

Took part in the experimental investigations in the rage of 3 ISTC and 3 INTAS grants;

Member of Local Organizing Committee of some Conferences;

Member of the Investment Committee in Tomsk and Novosibirsk Nanocenters

Responsible person for the relationship with Skolkovo Scientific Advisory Council (Nuclear technology and Advanced manufacturing technology Panel)

List of major publications: (totally – 120; in reviewed journals –35)

1. Belyaev G., Basko M., Cherkasov A., Fertman A., Golubev A., Rudskoy I, Savin S., Sharkov. B., Measurements of the Coulomb energy loss by fast protons in a plasma target, Phys.Rev.E, 1996, v.53, № 3, pp.2701-2707.
2. Golubev A., Belyaev G., Basko M., Cherkasov A., Fertman A. Sharkov B. ,Diagnostics of plasma target for ion beam - target interaction experiments, Fusion Engineering and Design 32-33, 1996 pp. 557-560.
3. V. Mintsev, V. Gryaznov, M. Kulish, A. Filimonov, V. Fortov, B. Sharkov, A. Golubev, A. Fertman, V. Turtikov, A. Vishnevskiy, A. Kozodaev, D.H.H. Hoffmann, U. Funk, S. Stowe, M. Geisel, J. Jacoby, D. Gardes, M. Chabot, Stopping Power of Proton Beam in a Weakly Nonideal Xenon Plasma, Contrib. Plasma Phys. 37 (1997), 4, 101-103.
4. A. Golubev, M. Basko, A. Fertman, A. Kozodaev, N. Mesheryakov, B. Sharkov, A. Vishnevskiy, V. Gryaznov, M. Kulish, V. Mintsev, V. Fortov, E. Golubev, A. Pukhov, V. Smirnov, U. Funk, M. Stetter, S. Stowe, H.-P. Flierl, D.H.H. Hoffmann, J. Jacoby, I. Iosilevskiy, Dense plasma diagnostics by fast proton beams., Phys.Rev.E 1998, v.57, № 3, pp. 3363-3367.
5. V. Mintsev, V. Gryaznov, M. Kulish, V. Fortov, B. Sharkov, A. Golubev, A. Fertman, N. Mescheryakov, W. Suss, D.H.H. Hoffmann, M. Stetter, R. Bock, M. Roth, C. Stockl, D. Gardes, On measurements of stopping power in explosively driven plasma target, Nucl. Instr. and Meth. A v.415, № 3, pp.715-719, 1998.
6. V. Gryaznov, M. Kulish, V. Fortov, V. Mintsev, B. Sharkov, A. Golubev, A. Fertman, N. Mescheryakov, W. Suss, D.H.H. Hoffmann, M. Stetter, C. Stockl, D. Gardes, About measurements of stopping power behind intense shock waves, CP429, Shock Compression of Condensed Matter 1997, The American Institute of Physics 1998, edited by Schmidt/Dandekar/Forbes **AIP Conf. Proc. -- July 10, 1998 -- Volume 429**, pp. 879-881.
7. A. Golubev, I. Bakhmetjev, A. Cherkasov, A. Fertman, V. Turtikov, B. Sharkov, V. Punin, N. Jidkov, A. Kunin, E. Vasina, V. Vatulin, D.H.H. Hoffmann, “Thick target “ approach for precise measurements of stopping ranges. In the book Inertial Fusion Sciences and Applications 99, editors C. Labaune, W.J. Hogan, K.A. Tanaka, Elsevier 2000, pp.572 – 575.
8. A. Golubev, V. Turtikov, A. Fertman, I. Roudskoy, B. Sharkov, A. Tauschwitz, U. Neuner, H. Wahl, D.H.H. Hoffmann, M. Roth, U. Funk, M. Geisel, W. Suss, Experimental Investigation the Effective Charge State of Ions in Beam-Plasma Interaction. Nuclear Instruments and Methods in Physics Research; A, 464 (2001), pp. 247 – 252.
9. M. Kulish, A. Golubev, A. Fertman, V. Turtikov, A. Tauschwitz; Dynamic plasma pressure measurements, Review of Scientific Instruments V. 74, № 5, pp. 2294-2297 (2001).
10. O.N. Rosmej, J. Wieser, M. Geissel, F. Rosmej, A. Blazevic, J. Jacoby, E. Dewald, M. Roth, E. Brambrink, K. Weyrich, D.H.H. Hoffmann, T.A. Pikuz, A.Ya. Faenov, A.I. Magunov, I.Yu. Skobelev, N.G. Borisenko, V.P. Shevelko, A.A. Golubev, A. Fertman, V. Turtikov, B.Yu. Sharkov, X-ray spectromicroscopy of fast ions and targets radiation, Nucl. Instr. and Meth. A, V.495 (2002), N 1, p.29;.
11. A. Fertman, I. Bakhmetjev, V. Batyaev, N. Borisenko, A. Cherkasov, A. Golubev, A. Kantsyrev, E. Karpikhin, A. Koldobskiy, K. Lipatov, R. Mulambetov, S. Mulambetova, Yu. Nekrasov, M. Prokouronov, I. Roudskoy, B. Sharkov, G. Smirnov, Yu. Titarenko, V. Turtikov, V. Zhivun, G. Fehrenbacher, R.W. Hasse, D.H.H. Hoffmann, I. Hofmann, E. Mustafin, K. Weyrich, J. Wieser, S. Mashnik, V. Barashenkov, K. Gudima. Induced radioactivity problem for high power heavy ion accelerators: experimental investigation and long-time predictions, Laser and Particle Beams, V. 20 (2002), pp. 511 – 514.
12. F.B. Rosmej, R. More, O.N. Rosmej, J. Wieser, N.G. Borisenko, V.P. Shevelko, M. Geissel, A. Blazevic, J. Jacoby, E. Dewald, M. Roth, E. Brambrink, K. Weyrich, D.H.H. Hoffmann, A.A. Golubev, A. Fertman, V. Turtikov, B.Yu. Sharkov, T.A. Pikuz, A.Ya. Faenov, A.I. Magunov, I.Yu. Skobelev, Methods of charge-state analysis of fast ions inside matter based on their X-ray spectral distribution, Laser and Particle Beams, V. 20 (2002), pp. 479-483.

13. I. Bakhmetjev, A. Fertman, A. Golubev, A. Kantsyrev, V. Luk'yashin, B. Sharkov, V. Turtikov, A. Kunin, V. Vatulin, N.V. Zhidkov, E.G. Baldina, U. Neuner, J. Wieser, J. Jacoby, D.H.H. Hoffmann Research into the advanced experimental methods for precision ion stopping range measurements in matter, *Laser and Particle Beams*, V. 21 (2003), pp. 1 – 6.
14. A. Golubev, A. Kantsyrev, V. Luk'yashin, A. Fertman, A. Gnutov, Yu. Panova, E. Mustafin, I. Hofmann, D. Schardt, K. Weyrich, N. Sobolevskiy, L. Latysheva Measurement of the energy deposition profile for ^{238}U ions with energy 500 and 950 MeV/u in stainless steel and copper targets, *Proceedings of 2005 Particle Accelerator Conference*, Knoxville, Tennessee. <http://accelconf.web.cern.ch/AccelConf/p05/PAPERS/RPPE034.PDF>; *Proceedings of the IEEE Particle Accelerator Conference 2005*, art. no. 1591096, pp. 2318-2320
15. O.N. Rosmej, S.A. Pikuz jr., S. Korostiy, A. Blazevic, E. Brambrink, A. Fertman, T. Mutin, V.P. Efremov, T.A. Pikuz, A.Ya. Faenov, P. Loboda, A.A. Golubev, and D.H.H. Hoffmann, Radiation dynamics of fast heavy ions interacting with matter, *Laser and Particle Beams* 2005, 23, 79–85.
16. O. N. Rosmej, A. Blazevic, S. Korostiy, and R. Bock, D. H. H. Hoffmann, S. A. Pikuz, Jr., V. P. Efremov, and V. E. Fortov, A. Fertman and T. Mutin, T. A. Pikuz and A. Ya. Faenov, Charge state and stopping dynamics of fast heavy ions in dense matter, *Physical Review A* 72, 052901 (2005)
17. I.V. Roudskoy, A.A. Golubev, A.D. Fertman, M.V. Prokuronov, A.V. Kantsyrev, B.Yu. Sharkov, V.I. Turtikov, K. Weyrich, Gamma radiation measurements as a diagnostic tool of beam-induced dense plasma, *Laser and Particle Beams* 2005, 23, 539 – 543.
18. Pikuz Jr. S.A., Efremov V.P., Rosmej O., Blazevic A., Korostiy S., Fertman A., Shutov A.V., Norman H.E., Hoffmann D.H.H. Investigations of heavy-ion tracks' energy deposition inside solid media by methods of x-ray spectroscopy, *Journal of Physics A: Mathematical and General* Volume 39, Issue 17, 28 April 2006, Pages 4765-4769
19. Kuznetsov A.P., Golubev A.A., Kozin G.I., Mutin T.Yu., Savelov A.S., Fertman A.D., A twin-wave quadrature interferometer for diagnostics of pulsed processes in hydrogen and erosion plasma, *Instruments and Experimental Techniques*, Volume 49, Issue 2, March 2006, Pages 247-252
20. A.D. Fertman, T.Yu. Mutin, M.M. Basko, A.A. Golubev, T.V. Kulevoy, R.P. Kuybeda, V.I. Pershin, I.V. Roudskoy and B.Yu. Sharkov, Stopping power measurements for 100-keV/u Cu ions in hydrogen and nitrogen; *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms* Volume 247, Issue 2, June 2006, Pages 199-204
21. Ulrich A., Adonin A., Jacoby J., Turtikov V. Fernengel, D. Fertman, A., Golubev A., Ternovoi V.Ya., Udrea S., Varentsov D., Wieser J., Excimer laser pumped by an intense, high-energy heavy-ion beam, *Physical Review Letters* 97 (15), art. no. 153901;
22. Balashov T.S., Golubev A.A., Kozodaev M.A., Rogozhkin S.V., Fertman A.D., Turtikov V.I., Zaluzhnyi A.G., Radiation-induced structure modification in monocrystalline silicon under high-energy C^{6+} irradiation, *Proceedings of SPIE - The International Society for Optical Engineering* 6260, art. no. 626008
23. Serban Udrea, Vladimir Ternovoi, Nikolay Shilkin, Alexander Fertman, Vladimir E. Fortov, Dieter H.H. Hoffmann, Alexander Hug, Michail I. Kulish, Victor Mintsev, Pavel Ni, Dmitry Nikolaev, Naeem A. Tahir, Vladimir Turtikov, Dmitry Varentsov, Denis Yuriev, Measurements of electrical resistivity of heavy ion beam produced high energy density matter: Latest results for lead and tungsten, *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 577 (2007) 257–261
24. D. Varentsov, V. Ya. Ternovoi, M. Kulish, D. Fernengel, A. Fertman, A. Hug, J. Menzel, P. Ni, D.N. Nikolaev, N. Shilkin, V. Turtikov, S. Udrea, V.E. Fortov, A.A. Golubev, V.K. Gryaznov, D.H.H. Hoffmann, V. Kim, I.V. Lomonosov, V. Mintsev, B.Yu. Sharkov, A. Shutov, P. Spiller, N.A. Tahir, H. Wahl., High-energy-density physics experiments with intense heavy ion beams *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 577 (2007) 262–266
25. A. Adonin, J. Jacoby, V. Turtikov, A. Fertman, A. Golubev, D.H.H. Hoffmann, A. Ulrich, D. Varentsov and J. Wieser, Laser effect on the 248 nm KrF transition using heavy ion beam pumping, *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 577 (2007) 357–360

26. A. Fertman, M. Pavlovič, D. Schardt, N. Sobolevskiy, A. Golubev, B. Sharkov, et al., First results of an experimental study of the residual activity induced by high-energy uranium ions in steel and copper, *Nuclear Instruments and Methods in Physics Research Section B* 260 (2007) 579–591;
27. D.Varentsov, A.Fertman, V.Turtikov, A. Ulrich, J. Wieser, V.Fortov, A.A. Golubev, D.H.H. Hoffmann, A.Hug, M. Kulish, V. Mintsev, P.A. Ni, D. Nikolaev, B.Yu. Sharkov, N. Shilkin, V.Ya. Ternovoy and S. Udrea Transverse optical diagnostics for intense heavy ion beams. *Contributions to plasma physics* 48, No. 8, 586-594 (2008).
28. I. Strašik, E. Mustafin, A. Fertman, R. Hinca, M. Pavlovič, D. Schardt, N. Sobolevskiy, A. Golubev, B. Sharkov, G. Fehrenbacher, I. Hofmann, H. Iwase, E. Kozlova and G. Mustafina, Experimental study of the residual activity induced by 950 MeV/u uranium ions in stainless steel and copper *Nuclear Instruments and Methods in Physics Research, Section B: Beam Interactions with Materials and Atoms* Vol. 266, Iss. 15, *Pages* 3443-3452
29. E. Mustafin; T. Seidl; A. Plotnikov; I. Strašik; M. Pavlovič; M. Migliorini; S. Stanček; A. Fertman; A. Lančok, Ion irradiation studies of construction materials for high-power accelerators *Pages* 460 – 469, *Radiation Effects and Defects in Solids*, Volume 164 Issue 7 & 8 2009
30. E. Kozlova, I. Strasik, A. Fertman, E. Mustafin, T. Radon, R. Hinca, M. Pavlovic, G. Fehrenbacher, H. Geissel, A. Golubev, H. Iwase, D. Schardt, Benchmark Test of the FLUKA Monte Carlo Code for Residual Production with 500 and 950 MeV/u Uranium Beams on Copper and Stainless Steel Targets, 2009 *Nuclear Technology, ANS*, Volume 168 Number 3 / December 2009 / *Pages* 747-751 5
31. Kulevoy, T. , Kuibeda, R., Kropachev, G., Kozlov, A., Chalyh, B., Aleev, A., Fertman, A., Nikitin, A., Rogozhkin, S. , ITEP MEVVA ion beam for reactor material investigation (Conference Paper), *Review of Scientific Instruments*, Volume 81, Issue 2, 2010, Article number 02B906
32. Kantsyrev, A.V. , Bakhmutova, A.V., Golubev, A.A., Demidov, V.S., Demidova, E.V., Ladygina, E.M., Markov, N.V., Smirnov, G.N., Turtikov, V.I., Fertman, A.D., Shestov, L.M., Khudomyasov, A.V., An integrated automation system for experiments on the fast extraction beamline of the TWAC-ITEP accelerator-accumulator facility, *Instruments and Experimental Techniques*, Volume 53, Issue 5, September 2010, *Pages* 663-674
33. Nikolaev, D.N. , Fedenev, A.A., Fertman, A.D., Golubev, A.A., Hoffmann, D.H.H.d, Hug, A.c, Ionita, B.c, Kantsyrev, A.V.b, Khudomyasov, A.V.b, Kulish, M.I.a, Ling, J.d, Markov, N.b, Mintsev, V.B.a, Pyalling, A.A.a, Shilkin, N.S.a, Ternovoi, V.Y.b, Turtikov, V.I.c, Udrea, S.cd, Varentsov, D.V.c, Weyrich, K.c, Yuriev, D.S.a, Shestov, L.M.b, Zhao, Y. Heavy-ion beam heated tantalum and tungsten near melting (Conference Paper), *High Temperatures - High Pressures*, Volume 40, Issue 3-4, 2011, *Pages* 281-290
34. Kuybida, R.P. , Chalykh, B.B., Shismarev, V.B., Grachev, N.Y., Fertman, A.D., Aleev, A.A., Nikitin, A.A., Orlov, N.N., Rogozhkin, S.V., Kulevoy, T.V., Imitation experiments for study of radioactive resistance reactor materials on the injector of line accelerator HIP-1, *Problems of Atomic Science and Technology*, Issue 4, 2012, *Pages* 188-190
35. Kuybida, R.P. , Kulevoy, T.V., Chalykh, B.B., Semennikov, A.I., Kropachev, G.N., Stoyakin, I.A., Cheritsa, A.O., Fertman, A.D., Aleev, A.A., Nikitin, A.A., Orlov, N.N., Rogozhkin, S.V., Setting the output channel of accelerator HIP-1 for imitational experiments for study of radioactive resistance reactor materials, *Problems of Atomic Science and Technology*, Issue 4, 2012, *Pages* 68-70
36. Polozov, S.M., Fertman, A.D. High-energy proton beam accelerators for subcritical nuclear reactors, *Atomic Energy*, Volume 113, Issue 3, January 2013, *Pages* 192-200
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