Alexey Matveichev

Education

2002—2005	**PhD in Chemical Physics**
	Institute of Problems of Chemical Physics (IPCP RAS), Chernogolovka, Russia
Title	Multidimensional numerical modeling of processes at high energy density accounting for elastic-plastic deformation and fracture effects using the modified PIC method
2000—2002	**Master of Science** in Applied Mathematics and Physics
	Moscow Institute of Physics and Technology, Dolgoprudny, Russia
	Thesis: “Implementation of a system for Internet publishing of scientific data”
1996—2000	**Bachelor of Science** in Applied Mathematics and Physics
	Moscow Institute of Physics and Technology, Dolgoprudny, Russia

Research Experience

Jan. 2013—present	**Postdoctoral researcher**, Institut Jean Lamour, University of Lorraine, Nancy, France
	Development of numerical models and solvers based upon open source CFD package OpenFOAM for simulation of metallurgical processes. *Participation in OpenFOAM’s community development process.*

- Developed numerical model and solver for simulation of electron beam melting
- Performed verification of the model by comparison with experimental data
- Modified model for application to evaporation of impurities during melting
- Developed numerical model and solver for simulation of ingot growth in electron beam furnace
- Proposed design of experiments for calibration of asymmetries during ingot growth process
- Preformed set of simulations to design beam pattern to compensate load and cooling circuit asymmetries during ingot growth process
- Proposed and created local shared work zone devoted to local development of the future solvers
- Created set of patches for OpenFOAM and foam-extend projects to be built on OS X with native compilers

Oct. 2011—Nov. 2012 | **Postdoctoral researcher**, Department of Civil and Environmental Engineering, Seoul National University, Seoul, South Korea

Development of numerical models and solvers based on OpenFOAM open source package for simulation of environmental flows

- Applied VOF-based solver for planning of experiments, as well as interpretation of experimental data (sector weir gate flow, confluent channels flow)
- Applied VOF-based solver for simulation of meandering channels, performed assessment of turbulence models for the simulation of the process
- Architected and guided construction of laboratory 196-core mini-cluster
- Maintained and supported users of the laboratory cluster

2006—2009 | **Guest researcher**, Department of Plasmas Physics, GSI Helmholtzzentrum für Schwerionenforschung, Darmstadt, Germany

Simulations for planning of ion beam experiments: estimation of beam parameters, optimization of target geometry, validation of target state.

2005—Sep. 2011 | **Researcher**, Laboratory of Equations of State, Institute of Problems of Chemical Physics of Russian Academy of Sciences, Chernogolovka, Russia

	Development of parallel 3D hydrocode, simulation of experimental setups, simulation of space experiments, development and maintenance of laboratory computational cluster.

IT & Programming Skills

Languages	C/C++, Python, Fortran
Operating systems	OS X, Linux

Selected Publications

2015	A. Matveichev, A. Jardy, J.-P. Bellot, “A full 3D model of fluid flow and heat transfer in an E.B. heated liquid metal bath”, Proceedings of the Liquid Metal Processing & Casting Congress 2015 (LMPC 2015)
	W. Choi, J. Jourdan, A. Matveichev, A. Jardy, J.-P. Bellot, “Kinetics of Evaporation of Alloying Elements under Vacuum: Application to Ti alloys in Electron Beam Melting”, High Temperature Materials and Processes, *submitted*
2009	Tahir N.A., Matveichev A.V., Kim V. et al, “Three-dimensional simulations of a solid graphite target for high intensity fast extracted uranium beams for the Super-FRS”, Laser and Particle Beams, 27(1), pp.9-17, 2009
2008	Tahir N.A., Weick H., Shutov A., Kim. V., Matveichev A. et al, “Simulations of a solid graphite target for high intensity fast extracted uranium beams for the Super-FRS”, Laser and Particle Beams, 26(3), pp. 411-423, 2008
	Tahir N.A., Kim V., Matveichev A.V., “High energy density and beam induced stress related issues in solid graphite Super-FRS fast extraction targets”, Laser and Particle Beams, 26(2), pp. 273-286, 2008
2007	Tahir N.A., Kim V., Matveichev A. et al, “Numerical modeling of heavy ion induced stress waves in solid targets”, Laser and Particle Beams, 25(4), pp. 523-540, 2007
2006	Fortov V.E., Kim V.V., Lomonsov I.V., Matveichev A.V., Ostrik A.V. “Numerical modeling of hypervelocity impacts”, International Journal of Impact Engineering, 33, pp. 244-253, 2006

Related Experience

2005—2011	**Network administrator** Department of Extreme States of Matter, IPCP RAS Responsible for installation and maintenance of department network servers.
Jun.—Sep. 2002	**Web developer** Compatti inc., Vancouver, Canada Responsible for development of CIS prototype for CBC Constantini using Java servlet technology.

Organization of Scientific Events

Jun. 2010	**2nd Workshop on High Energy Proton Microscopy**, Chernogolovka, Russia, June 2-4, 2010, http://www.ficp.ac.ru/hepm2010/
Sep. 2009	**13th International Conference on Physics of Non-Ideal Plasmas**, Chernogolovka, Russia, September 13—18, 2009, http://www.ficp.ac.ru/pnp/

Languages

Russian	Native speaker
English	Fluent
French	Basic

Interests & Achievements

2015	Liquid Metal Processing & Casting Conference (LMPC2015) best paper award
2008, 2009	Russian Science Support Fund (RSSF) grant “Best PhD of Russian Academy of Sciences (RAS)”
2005	RSSF grant “Best PhD student of RAS”
2008-2009	Informatics teacher at Italo Calvino school
2002-2006	Volunteer mathematics teacher at Center of Adaptation and Education