

# MILAN KUCHARÍK

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## Basic Information:

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## Education:

- Mar. 2002–May 2006** PhD study in Physics at the Department of Physical Electronics, Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague. Thesis title: “Arbitrary Lagrangian-Eulerian (ALE) Methods in Plasma Physics”. Awarded by the Rector’s Award of the 3rd Degree for Outstanding Doctoral Disertation Thesis on 09/18/2007 by the Rector of the Czech Technical University in Prague.
- Sep. 1996–Feb. 2002** Master study in Computational Physics at the Department of Physical Electronics, Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague. Thesis title: “Difference Schemes for Conservation Laws in 3D”.
- Jan. 2000–May 2000** One semester study at the Department of Mathematics and Statistics of the University of New Mexico, Albuquerque (NM), USA.

## Employment History:

- Since Aug. 2009** Research Scientist at the Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering.
- Jul. 2006–Jul. 2009** Postdoc in Mathematical Modeling and Analysis Group (T-7) of the Los Alamos National Laboratory, Los Alamos (NM), USA.
- May 2005–Jul. 2005** Graduate Research Assistant in the Los Alamos National Laboratory, Los Alamos (NM), USA.
- Jan. 2005–Jul. 2006** Technical staff member of the Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering.
- May 2003–Aug. 2003** Graduate Research Assistant in the Los Alamos National Laboratory, Los Alamos (NM), USA.
- May 2002–Aug. 2002** Graduate Research Assistant in the Los Alamos National Laboratory, Los Alamos (NM), USA.

## Professional Interests:

- Computational Physics, Applied Mathematics, Conservation Laws, solving PDEs in multiple dimensions.
- Development and analysis of 3D difference schemes and their applications in gas dynamics and plasma physics.
- Development of Arbitrary Lagrangian-Eulerian (ALE) methods for gas dynamics and plasma physics.
- Conservative interpolations of functions, applications in the context of ALE methods.
- Multimaterial Lagrangian models and remapping algorithms for multimaterial ALE code.
- Mesh untangling and smoothing techniques for ALE methods.
- Simulations of interactions of intense laser beam with massive or flyer targets, high speed impact simulations.

## Selected Publications:

- [1] M. Kucharik, R.V. Garimella, S.P. Schofield, and M.J. Shashkov. A comparative study of interface reconstruction methods for multi-material ALE simulations. *Journal of Computational Physics*, (LA-UR-08-08015), 2009. In press.
- [2] M. Kucharik and M. Shashkov. Extension of efficient, swept-integration based conservative remapping method for meshes with changing connectivity. *International Journal for Numerical Methods in Fluids*, 56(8):1359–1365, 2008.
- [3] T. Kapin, M. Kucharik, J. Limpouch, R. Liska, and P. Vachal. Arbitrary Lagrangian Eulerian method for laser plasma simulations. *International Journal for Numerical Methods in Fluids*, 56(8):1337–1342, 2008.
- [4] R. Garimella, M. Kucharik, and M. Shashkov. An efficient linearity and bound preserving conservative interpolation (remapping) on polyhedral meshes. *Computers & Fluids*, 36(2):224–237, 2007.
- [5] M. Kucharik, R. Liska, S. Steinberg, and B. Wendroff. Optimally-stable second-order accurate difference schemes for nonlinear conservation laws in 3D. *Applied Numerical Mathematics*, 56(5):589–607, 2006.
- [6] M. Kucharik, M. Shashkov, and B. Wendroff. An efficient linearity-and-bound-preserving remapping method. *Journal of Computational Physics*, 188(2):462–471, 2003.