Curriculum Vitae

Personal Data

Full Name:	Csizmadia, Péter
Nationality:	Hungarian
Birth date and place:	October 9, 1972, Budapest, Hungary
Marital status:	Single
Mailing address:	KFKI Research Institute for Particle and Nuclear Physics, H-1525 Budapest POB 49, HUNGARY
Tel.:	(+36)-1-392-2222/1613
Fax:	(+36)-1-395-9151
E-mail:	cspeter@rmki.kfki.hu

Education

- PhD of the Eötvös University (Budapest, Hungary) in Nuclear Physics, 2003
- Masters (Diploma) of the Eötvös University (Budapest, Hungary) in Physics, 1996

Employment

- 1996-99: Research Assistant, MTA KFKI RMKI, Department of Theoretical Physics (Budapest, Hungary)
- 1999-: Research Fellow, MTA KFKI RMKI, Department of Theoretical Physics (Budapest, Hungary)

Language and computer skills

- English (good), German (basic), Hungarian (excellent)
- C, C++, Java, Perl, HTML, JavaScript, Fortran (read only), Pascal, etc.
- Unix, Linux, Windows systems

Publications

Papers in Refereed Journals

- P. Csizmadia, T. Csörgő, B. Lukács: *New analytic solutions of the non-relativistic hydrodynamical equations*, Physics Letters **B443** (1998) 21-25 [arXiv:nucl-th/9805006]

- P. Csizmadia, P. Lévai, S. E. Vance, T. S. Biró, M. Gyulassy, J. Zimányi: *Strange hyperon and antihyperon production from quark and string-rope matter*, Journal of Physics **G25** (1999) 321-330 [arXiv:hep-ph/9809456]

- P. Csizmadia, P. Lévai: *ϕ, Ω and ρ production from deconfined matter in relativistic heavy ion collisions at CERN SPS*, Physical Review **C61** (2000) 031903 [arXiv:hep-ph/9909544]

- P. Lévai, T. S. Biró, P. Csizmadia, T. Csörgő, J. Zimányi: *The production of charm mesons from quark matter at CERN SPS and RHIC*, Journal of Physics **G27** (2001) 703-706 [arXiv:nucl-th/0011023]

- S. Cheng, S. Pratt, P. Csizmadia, Y. Nara, D. Molnar, M. Gyulassy, S. E. Vance, B. Zhang: *The effect of finite-range interactions in classical transport theory*, Physical Review **C65** (2002) 024901 [arXiv:nucl-th/0107001]

- P. Csizmadia and P. Lévai, *The MICOR hadronization model with final state interactions*, J. Phys. **G28** (2002) 1997-2000

- Y. Nara, S.E. Vance, P. Csizmadia, *A study of parton energy loss in Au+Au collisions at RHIC using transport theory*, Physics Letters **B531** (2002) 209-215 [arXiv:nucl-th/0109018]

- P. Csizmadia and P. Lévai, *Energy dependence of transverse quark flow in heavy ion collisions*, Acta Physica Hungarica **A**22 (2005) 371-380 [arXiv:nucl-th/0407054]

- P. Csizmadia, *Testing a new mesh refinement code in the evolution of a spherically symmetric Klein-Gordon field*, International Journal of Modern Physics **D**15 (2006) 107-119 [arXiv:hep-th/0505036]

- P. Csizmadia, *Fourth order AMR and nonlinear dynamical systems in compactified space*, Classical and Quantum Gravity **24** (2007) S369-S379.

- G. Hamar, L.L. Zhu, P. Csizmadia, P. Levai, *The robustness of quasiparticle coalescence in quark matter*, European Physical Journal Special Topics **155** (2008) 67-74.

- G. Hamar, L.L. Zhu, P. Csizmadia, P. Levai, *Strange hadron yields and ratios in heavy ion collisions at RHIC energy*, Journal of Physics **G**35 (2008) 044067 [arXiv:0710.4730].

Other publications

- P. Csizmadia: *Coalescence in Quark Matter*, TDK (Scientific Student Activity) thesis, 1995.
- P. Csizmadia: *Hadronization of Quark Matter*, Master (Diploma) Thesis, 1996.
- P. Csizmadia, P. Lévai, J. Zimányi: *Pion Momentum Distribution from a Microscopical Hadronization Model*, Proc. of Int. Workshop on Gross Properties of Nuclei and Nuclear Excitations XXV, January 13-17, 1997, Hirschegg, Austria, (TH Darmstadt, 1997) Ed. by H. Feldmeier, p. 117.
- P. Csizmadia, P. Lévai: *Hadron production in the MICOR model*, Proc. of Int. Workshop on Understanding Deconfinement in QCD, ECT* Trento, Italy, March 1 - 13, 1999
- P. Csizmadia, P. Lévai: *D and J/psi production from deconfined matter in relativistic heavy ion collisions*, arXiv:hep-ph/0008195,
- G. Hamar, L.L. Zhu, P. Csizmadia, P. Levai: *Strange hadron yields and ratios in heavy ion collisions at RHIC energy*, arXiv:0710.4730.

Conference talks

- *A microscopical model of quark matter hadronization*, RHIC'98 Summer School, BNL, NY, USA, July 8-14, 1998
- *Hadron production in the MICOR model*, Int. Workshop on Understanding Deconfinement in QCD, ECT* Trento, Italy, March 1 - 13, 1999
- *The MICOR hadronization model*, Parton'99 Workshop, Budapest, Hungary, May 4-7, 1999,
- *MICOR hadronization model*, Subatech, Nantes, France, June 5-16, 2000
- *The pion wind problem*, Hard Probe'2000 Workshop, BNL, NY, USA, August 1-21, 2000
- *MICOR hadronization model*, Dense Matter Winter School, Schladming, Austria, March 3-10, 2001
- *Hadronization and secondary interactions*, Budapest, Hungary, March, 2001
- *The MICOR hadronization model with final state interactions*, Strange Quarks in Matter'2001, Frankfurt, Germany, September 22-28, 2001
- *Energy dependence of the transverse flow in heavy ion collisions*, Budapest'04 Workshop, Budapest, Hungary, 24-27 March, 2004

- *Testing a High Precision Mesh Refinement Code in the Evolution of Massive Spherically Symmetric Fields*, New Frontiers in Numerical Relativity Workshop, AEI, Golm, Germany, July 17-21, 2006

Posters

- P. Csizmadia and I. Rácz, *On the cosmological relevance of oscillons*, Frontiers in Numerical Gravitational Astrophysics Summer School, Erice, Italy, June 27-July 5, 2008

Conferences, Schools and Visits

- Department of Physics, Bergen, Norway, October-November 1997
- Workshop on Gross Properties of Nuclei and Nuclear Excitations XXV, Hirschegg, Austria, January 13-17, 1997
- RHIC'98 Summer School, BNL, NY, USA, July 8-14, 1998
- Int. Workshop on Understanding Deconfinement in QCD, ECT* Trento, Italy, March 1 - 13, 1999
- Columbia University, New York, USA, January-February 2000
- Subatech, Nantes, France, June 5-16, 2000
- Hard Probe'2000 Workshop, BNL, NY, USA, August 1-21, 2000
- Quark Matter'2000 Conference, BNL/Stony Brook, USA, January 15-20, 2001
- Dense Matter Winter School, Schladming, Austria, March 3-10, 2001
- Bergen Computational Physics Laboratory, Bergen, Norway, April 2001
- Strange Quarks in Matter'2001 Conference, Frankfurt, Germany, September 22-28, 2001
- Columbia University, New York, USA, October-November 2001
- Quark Matter'2002 Conference, Nantes, France, July 18-24, 2002
- Quark Matter'2004 Conference, Oakland, CA USA, 11-17 January, 2004
- New Frontiers in Numerical Relativity Workshop, Albert Einstein Institute, Golm, Germany, July 17-21, 2006
- 1st VESF School on Gravitational Waves, Cascina, Italy, May 22-26, 2006
- Frontiers in Numerical Gravitational Astrophysics Summer School, Erice, Italy, June 27-July 5, 2008

Past and recent research

I started to work on quark matter hadronization in 1995. I have developed a model called MICOR that is based on the assumption that constituent quark matter is created in high energy heavy ion collisions. The aim was to explain the experimental momentum spectra of hadrons in CERN SPS Pb+Pb and RHIC Au+Au collisions by a hadronization process similar to coalescence.

In 2000, I began working on a simplified model of rescattering processes, the pion wind model, using the GCP generic cascade program. In the same year, we started the development of a new general cascade code, called PSYCHE, with S. E. Vance and Y. Nara. In 2001, the RHIC Transport Theory Collaboration was formed, with our program in the center. The latest version of the program, called Gromit is even more general, not just the interactions, particles and initial conditions but also the cascade algorithm is definable. It can be used to perform a "full" secondary interaction simulation starting from arbitrary initial state. In my investigations, I used my hadronization model, MICOR, to generate the initial states.

In 2005, I created a high precision adaptive mesh refinement (AMR) code, called GridRipper. Initially, it was applied to simulate the time evolution of physical fields in flat space-time, such as the Klein-Gordon equation and the Yang-Mills-Higgs system. In general, the code is able to solve hyperbolic systems of partial differential equations using the chosen integration scheme (like RK2, RK4 or ICN). The initial condition is either defined by arbitrary formulae, generated by program code or produced as the numerical solution of an ordinary differential equation. In 2008, we found a new numerical framework with I. Rácz, which made it possible to follow the time evolution of the Einstein equations even after the appearance of trapped surfaces, until a singularity is reached. Based on this finding, I applied GridRipper in problems related to cosmic inflation and the gravitational collapse of fluids and scalar fields in spherical symmetry, leading to the birth of baby universes.